ELEMENTARY
CORE Academy
UTAH STATE OFFICE OF EDUCATION & UTAH STATE UNIVERSITY

Participant Handbook

2006

UTAH STATE OFFICE OF EDUCATION

ELEMENTARY CORE ACADEMY

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Organizations:

Utah State Office of Education (USOE)
Utah State University (USU)
State Science Education Coordination Committee (SSECC)
State Mathematics Education Coordination Committee (SMECC)
Special Education Services Unit (USOE)
WestEd Eisenhower Regional Consortium

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UTAH STATE OFFICE OF EDUCATION

Leadership…Service…Accountability

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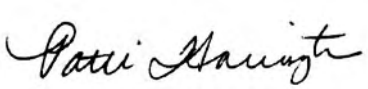
Dear CORE Academy Teachers:

Thank you for your investment in children and in building your own expertise as you participate in the Elementary CORE Academy. I hope your involvement helps you to sustain a laser-like focus on student achievement.

Teachers in Utah are superb. By participating in the Academy, you join a host of teachers throughout the state who understand that teaching targeted on the core curricula, across a spectrum of subjects, will produce results of excellence. The research is quite clear–the closer the match of explicit instruction to core standards, the better the outcome on core assessments.

I personally appreciate your excellence and your desire to create wonderful classrooms of learning for students. Thank you for your dedication. I feel honored to associate with you and pledge my support to lead education in ways that benefit all of our children.

Sincerely,



Patti Harrington, Ed.D.
State Superintendent of Public Instruction

Funding Sources

Appreciation is expressed for the tremendous educational input and monetary commitment of several organizations for the successful delivery of the Elementary CORE Academy. This year's Elementary CORE Academy was developed and funded through a variety of sources. The Utah State Office of Education (USOE), in collaboration with Utah State University (USU) and local school districts of Utah, has supported kindergarten through sixth grade teachers with professional development experiences that will enhance the educational experience for Utah children.

Major funding for the Academy comes from the following sources:

Federal/State Funds:

Utah State Office of Education
- Staff Development Funds
- Special Education Services Unit

ESEA Title II

Utah Math Science Partnership

WestED Eisenhower Regional Consortium

District Funds:

Various sources including Quality Teacher Block, Federal ESEA Title II, and District Professional Development Funds

School Funds:

Trust land, ESEA Title II, and other school funds
Utah State Office of Education Special Education Services

The state and district funds are allocations from the state legislature. ESEA is part of the "No Child Left Behind" funding that comes to Utah.

Additionally, numerous school districts, individual schools, and principals in Utah have sponsored teachers to attend the Academy. Other educational groups such as the Utah Division of Water Resources, National Energy Foundation, Utah Energy Office, and the Utah Mining Association have assisted in the development and delivery of resources in the Academy.

Most important is the thousands of teachers who take time from their summer to attend these professional development workshops. It is these teachers who make this program possible.

Goals of the Elementary CORE Academy

Overall

The purpose of the Elementary CORE Academy is to create high quality teacher instruction and improve student achievement through the delivery of professional development opportunities and experiences for teachers across Utah.

The Academy will provide elementary teachers in Utah with:

1. Models of exemplary and innovative instructional strategies, tools, and resources to meet the Core Curriculum standards, objectives, and indicators.
2. Practical models and diverse methods of meeting the learning needs of all children, with instruction implementation aligned to the Core Curriculum.
3. Meaningful opportunities for collaboration, self-reflection, and peer discussion specific to innovative and effective instructional techniques, materials, teaching strategies, and professional practices in order to improve classroom instruction.

Learning a limited set of facts will no longer prepare a student for real experiences encountered in today's world. It is imperative that educators have continued opportunities to obtain instructional skills and strategies that provide methods of meeting the needs of all students. Participants of the Academy experience will be better equipped to meet the challenges faced in today's classrooms.

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Kindergarten
Core Curriculum

K-2 Core Curriculum

Introduction

Most students enter school confident in their own abilities; they are curious and eager to learn more. They make sense of the world by reasoning and problem solving. Young students are active, resourceful individuals who construct, modify, and integrate ideas by interacting with the physical world as well as with peers and adults. They learn by doing, collaborating, and sharing their ideas. Students' abilities to communicate through language, pictures, sound, movement, and other symbolic means develop rapidly during these years.

- Young children learn by doing, collaborating, and sharing their ideas.

Literacy requires an understanding of listening, speaking, reading, writing, and viewing in many forms including print and electronic images. Today, more than ever, students must have the ability to think critically while applying new information to existing knowledge. Therefore, school literacy programs need to involve students in learning to read and write in situations that foster critical thinking and the use of literacy for independent learning in all content areas.

Young students are building beliefs about what mathematics is, about what it means to know and do mathematics, and about themselves as mathematical learners. Mathematics instruction needs to include more than short-term learning of rote procedures. Students must use technology and other mathematical tools, such as manipulative materials, to develop conceptual understanding and solve problems as they do mathematics. Students, as mathematicians, learn best with hands-on, active experiences throughout the instruction of the mathematics curriculum.

Language Arts and Mathematics are the tools for doing work in other areas. These content areas need to be integrated into other curriculum areas to provide students with optimal learning. The curriculum becomes more relevant when content areas are connected rather than taught in strict isolation. For this reason, the content areas of the Fine Arts, Health Education, Physical Education, Science, and Social Studies have been combined to enable teachers to teach more efficiently and students to learn in a real-life context that enhances lifelong learning.

The Kindergarten through Second Grade Core describes what students should know and be able to do at the end of each of the kindergarten, first, and second grade levels. It has been developed, critiqued, and revised by a community of Utah teachers, university

educators, the State Office of Education specialist, and an advisory committee representing a wide variety of people from the community. The Core reflects the current philosophy of education that is expressed in national documents developed by the International Reading Association, National Council of the Teachers of Mathematics, National Standards for Arts Education, Information Power, National Association for Sport and Physical Education, American Association for the Advancement of Science, National Council for the Social Studies, International Society for Technology and Education, and Early Childhood Standards.

Organization of the K-2 Core:

- Intended Learning Outcomes
- Standard
- Objective
- Indicator

Organization of the K-2 Core

The Core is designed to help teachers organize and deliver instruction.

- Each grade level begins with a brief course description.
- The Kindergarten, First, and Second Grade INTENDED LEARNING OUTCOMES describe the goals for students to gain knowledge and understand their world. They are found at the beginning of each grade level, are an integral part of the Core, and should be included as part of instruction.
- The first Core area consists of the Language Arts curriculum.
- The second Core area consists of the Mathematics curriculum.
- The third Core area consists of the subject areas of the Fine Arts, Health Education, Physical Education, Science, and Social Studies.
- A STANDARD is a broad statement of what students are expected to understand. Several Objectives are listed under each Standard.
- An OBJECTIVE is a more focused description of what students need to know and be able to do at the completion of instruction. If students have mastered the Objectives associated with a given Standard, they have mastered that Standard at that grade level. Several Indicators are described for each Objective.
- An INDICATOR is a measurable or observable student action that enables one to assess whether a student has mastered a particular Objective. Indicators are not meant to be classroom activities, but they can help guide classroom instruction.

Guidelines Used in Developing the K-2 Core

The Core is:

Consistent With the Nature of Learning

The main intent in the early grades is for students to value learning and develop the skills to gain knowledge and understand their world. The Core is designed to produce an integrated set of Kindergarten, First Grade, and Second Grade Intended Learning Outcomes for students, with specific goals in all content areas.

Coherent

The Core has been designed so that, wherever possible, the ideas taught within a particular grade level have a logical and natural connection with each other and with those of earlier grades. Efforts have also been made to select topics and skills that integrate well with one another appropriate to grade level. In addition, there is an upward articulation of concepts, skills, and content. This spiraling is intended to prepare students to understand and use more complex concepts and skills as they advance through the learning process.

Developmentally Appropriate

The Core takes into account the psychological and social readiness of students. It builds from concrete experiences to more abstract understandings. The Core focuses on providing experiences with concepts that students can explore and understand in depth to build the foundation for future learning experiences.

Reflective of Successful Teaching Practices

Learning through play, movement, and adventure is critical to the early development of the mind and body. The Core emphasizes student exploration. The Kindergarten, First Grade, and Second Grade Intended Learning Outcomes are central in each standard. The Core is designed to encourage instruction with students working in cooperative groups. Instruction should recognize the importance of each Core area in the classroom, school, and community.

Comprehensive

The Kindergarten, First, and Second Grade Core does not cover all topics that have traditionally been in the Kindergarten, First Grade, and Second Grade curriculum; however, it provides a basic foundation of knowledge and skills in all content areas. By emphasizing depth rather than breadth, the Core seeks to empower students rather than

- By emphasizing depth rather than breadth, the Core seeks to empower students.

intimidate them with a collection of isolated and eminently forgettable facts. Teachers are free to add related concepts and skills, but they are expected to teach all the standards and objectives specified in the Core for their grade level.

Feasible

Teachers and others who are familiar with Utah students, classrooms, teachers, and schools have designed the Core. It can be taught with easily obtained resources and materials. A Teacher Handbook is also available for teachers and has sample lessons on each topic for each grade level. The Teacher Handbook is a document that will grow as teachers add exemplary lessons aligned with the new Core.

- Student achievement of the standards and objectives in this Core is best assessed using a variety of assessment instruments.

Useful and Relevant

This curriculum relates directly to student needs and interests. Relevance of content areas to other endeavors enables students to transfer skills gained from one area of instruction into their other school subjects and into their lives outside the classroom.

Reliant Upon Effective Assessment Practices

Student achievement of the standards and objectives in this Core is best assessed using a variety of assessment instruments. Performance tests are particularly appropriate to evaluate student mastery of thinking processes and problem-solving skills. A variety of classroom assessment approaches should be used by teachers in conjunction with the Criterion Referenced Tests (CRT) that are administered to first and second grade students in Language Arts and Mathematics, and with the pre- and post-tests administered in kindergarten. Observation of students engaged in instructional activities is highly recommended as a way to assess students' skills as well as attitudes toward learning. The nature of the questions posed by students provides important evidence of their understanding.

Engaging

In the early grades, children are forming attitudes and habits for learning. It is important that instruction maximizes students' potential and gives them understanding of the intertwined nature of learning. Effective elementary instruction engages students actively in enjoyable learning experiences. Instruction should be as thrilling an experience for a child as seeing a rainbow, growing a flower, or describing a toad. In a world of rapidly expanding knowledge and technology, all students must gain the skills they will need to understand and function responsibly and successfully in the world. The Core provides skills in a context that enables students to experience the joy of learning.

The Kindergarten Core Curriculum

In kindergarten, core concepts should be integrated across all curriculum areas. Reading, writing, and mathematical skills should be emphasized as integral to the instruction in all other areas. Personal relevance of content is always an important part of helping students to value learning and should be emphasized.

Kindergarten students engage in many activities that help them develop oral language and literacy. Kindergarten students take part in language activities that extend their vocabulary, conceptual knowledge, and phonological awareness. Students learn to follow directions and develop the language of schooling.

- Reading, writing, and mathematical skills should be emphasized as integral to the instruction in all other areas.

Within a well-balanced mathematics curriculum, the primary focal points for kindergarten are developing whole-number concepts and using patterns and sorting to explore number, data, and shape. While learning mathematics, students will be actively engaged in using concrete materials and appropriate technologies such as calculators and computers.

In kindergarten, students learn about themselves and their relationship to the classroom, school, family, and community. Students are expected to develop skills in posing simple questions, measuring, sorting, classifying, and communicating information about the natural world. Students learn about their bodies and the behaviors necessary to protect them and keep them healthy. They learn basic body control while beginning to develop motor skills and moving in a variety of settings. Students become aware of strength, endurance, and flexibility in different parts of their bodies. They express their thoughts and ideas creatively, while challenging their imagination, fostering reflective thinking, and developing disciplined effort and problem-solving skills.

K-2 Intended Learning Outcomes

- Intended learning outcomes provide a direction for general classroom instruction, management, culture, environment, and inclusion.

The main intent at the early grades is for students to value learning and develop the skills to gain knowledge and understand their world.

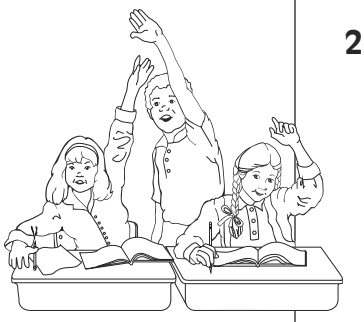
The Intended Learning Outcomes described below reflect the belief that kindergarten, first grade, and second grade education should address the intellectual, social, emotional, physical, and ethical development of children. While the Kindergarten, First Grade, and Second Grade Core Curriculum focuses primarily on content and the intellectual development of children, it is important to create a classroom culture that fosters development of many aspects of a person. By nurturing development in these interrelated human domains, young people will be healthy and discover varied and exciting talents and dreams. They will be socially and civically competent and able to express themselves effectively.

The outcomes identified below are to provide a direction for general classroom instruction, management, culture, environment, and inclusion. These outcomes should be interwoven throughout the Kindergarten, First Grade, and Second Grade Core Curriculum, which offers more specific and measurable standards for instruction.

Beginning in kindergarten and by the end of second grade students will be able to:

1. Demonstrate a positive learning attitude.

a. Display a sense of curiosity.
b. Practice personal responsibility for learning.
c. Demonstrate persistence in completing tasks.
d. Apply prior knowledge and processes to construct new knowledge.
e. Voluntarily use a variety of resources to investigate topics of interest.



2. Develop social skills and ethical responsibility.

a. Respect similarities and differences in others.
b. Treat others with kindness and fairness.
c. Follow classroom and school rules.
e. Include others in learning and play activities.
f. Participate with others when making decisions and solving problems.
g. Function positively as a member of a family, class, school, and community.

3. Demonstrate responsible emotional and cognitive behaviors.

Recognize own values, talents, and skills.

b. Express self in positive ways.
c. Demonstrate aesthetic awareness.
d. Demonstrate appropriate behavior.
e. Express feelings appropriately.
f. Meet and respect needs of self and others.

4. Develop physical skills and personal hygiene.

a. Respect physical similarities and differences in self and others.
b. Learn proper care of the body for health and fitness.
c. Develop knowledge that enhances participation in physical activities.
d. Display persistence in learning motor skills and developing fitness.
e. Use physical activity for self-expression.

5. Understand and use basic concepts and skills.

a. Develop phonological and phonemic awareness.
b. Decode, read, and comprehend written text and symbols.
c. Develop vocabulary.
d. Develop reasoning and sequencing skills.
e. Demonstrate problem-solving skills.
f. Observe, sort, and classify objects.
g. Make and interpret representations, graphs, and models.
h. Recognize how content ideas interconnect.
i. Make connections from content areas to application in real life.

6. Communicate clearly in oral, artistic, written, and nonverbal form.

a. Share ideas using communication skills.
b. Predict an event or outcome based on evidence.
c. Use appropriate language to describe events, objects, people, ideas, and emotions.
d. Listen attentively and respond to communication.
e. Use mathematical concepts to communicate ideas.
f. Use visual art, dance, drama, and music to communicate.

Kindergarten Language Arts Core Curriculum

Standard I: Oral Language—Students develop language for the purpose of effectively communicating through listening, speaking, viewing, and presenting.

Standard I: Oral Language—Students develop language for the purpose of effectively communicating through listening, speaking, viewing, and presenting.

Objective 1: Develop language through listening and speaking.

a. Listen attentively.

b. Listen and demonstrate understanding by responding appropriately (e.g., follow two-step directions).

c. Speak clearly and audibly with expression in communicating ideas.

d. Speak in complete sentences.

Objective 2: Develop language through viewing media and presenting.

a. View a variety of media presentations attentively.

b. Use a variety of formats (e.g., show and tell, drama, sharing of books) in presenting with various forms of media.

Standard II: Concepts of Print—Students develop an understanding of how printed language works.

Objective 1: Demonstrate an understanding that print carries "the" message.

a. Recognize that print carries different messages.

b. Identify messages in common environmental print (e.g., signs, boxes, wrappers).

Objective 2: Demonstrate knowledge of elements of print within a text.

a. Identify front/back, top/bottom, left/right of text/book.

b. Discriminate between upper- and lower-case letters, numbers, and words in text.

c. Show the sequence of print by pointing left to right with return sweep.

d. Identify where text begins and ends on a page.

e. Identify punctuation in text (i.e., periods, question marks, exclamation points).

Standard II: Concepts of Print—Students develop an understanding of how printed language works.

Standard III: Phonological and Phonemic Awareness—Students develop phonological and phonemic awareness.

Standard III: Phonological and Phonemic Awareness—Students develop phonological and phonemic awareness.

Objective 1: Demonstrate phonological awareness.

a. Count the number of words in a sentence.

b. Identify and create a series of rhyming words orally (e.g., cat, bat, sat, _____).

c. Recognize words beginning with the same initial sound in an alliterative phrase or sentence (e.g., Six snakes sold snacks and sodas.).

Objective 2: Recognize like and unlike word parts (oddity tasks).

a. Identify the word that does not rhyme in a series of words (e.g., bat, cat, sat, pig).

b. Identify the words with same beginning consonant sound in a series of words (e.g., man, sat, sick) and ending consonant sound (e.g., man, sat, then).

Objective 3: Orally blend word parts (blending).

a. Blend syllables to make words (e.g., /ta/.../ble/, table).

b. Blend onset and rimes to make words (e.g., /p/…/an/, pan).

c. Blend individual phonemes to make words (e.g., /s/…/a/…/t/, sat).

Objective 4: Orally segment words into word parts (segmenting).

a. Segment words into syllables (e.g., table, /ta/…/ble/).

b. Segment words into onset and rime (e.g., pan, /p/…an).

c. Segment words into individual phonemes (e.g., sat, /s/…/a/…/t/).

Objective 5: Orally manipulate phonemes in words and syllables (manipulation).

a. Substitute initial sound (e.g., replace the first sound in mat to /s/, say sat).

b. Substitute initial sound to create new words (e.g., replace the first sound in mat with letters of the alphabet).

Standard IV: Phonics and Spelling—Students use phonics and other strategies to decode and spell unfamiliar words while reading and writing.

Objective 1: Demonstrate an understanding of the relationship between letters and sounds.

a. Name all upper-and lower-case letters of the alphabet in random order.

b. Match consonant and short vowel sounds to the correct letter.

c. Blend simple cvc sounds into one-syllable words.

Objective 2: Use knowledge of structural analysis to decode words.

a. Identify and read grade level contractions and compound words.

b. Identify sound patterns and apply knowledge to decode words (e.g., blends, digraphs, vowel patterns, r-controlled vowels).

c. Demonstrate an understanding of representing the same sound with different patterns by decoding these patterns accurately in isolation and in text (e.g., ee, ea, ei, e).

d. Use knowledge of root words and prefixes (e.g., re, un, mis) and suffixes (e.g., s, es, ed, ing, est, ly) to decode words.

e. Use letter and syllable patterns to pronounce multisyllabic words.

Objective 3: Spell words correctly.

a. Hear and write letters to represent single sounds in words.

b. Spell a small number of grade level words (e.g., you, the, to, is).

c. Spell first name correctly.

Objective 4: Use spelling strategies to achieve accuracy (e.g., prediction, visualization, association).

a. Use knowledge about spelling to predict the spelling of new words.

b. Associate the spelling of new words with that of known words.

Standard IV: Phonics and Spelling—Students use phonics and other strategies to decode and spell unfamiliar words while reading and writing.

Standard V: Fluency—Students develop reading fluency to read aloud grade level text effortlessly without hesitation.

Objective 1: Read aloud grade level text with appropriate speed and accuracy.

a. Read alphabet letters in random order with automaticity.

b. Read numerals from zero to ten in random order with automaticity.

Standard V: Fluency—Students develop reading fluency to read aloud grade level text effortlessly without hesitation.

Objective 2: Read aloud grade level text effortlessly with clarity.

a. Use appropriate intonation and expression during unison oral reading with the teacher.

b. Read with automaticity approximately 25 high-frequency/ sight words.

Standard VI: Vocabulary—Students learn and use grade level vocabulary to increase understanding and read fluently.

Objective 1: Learn new words through listening and reading widely.

a. Use new vocabulary learned by listening, reading, and discussing a variety of genres.

b. Learn the meaning of a variety of grade level words (e.g., words from literature, social studies, science, math).

c. Use resources to learn new words by relating them to known words (e.g., books, charts, word walls).

Objective 2: Use multiple resources to learn new words by relating them to known words and/or concepts. See second, third, fourth, fifth, and sixth grades.

Objective 3: Use structural analysis and context clues to determine meanings of words.

a. Identify meanings of words by looking at the root word and using known endings (e.g., car, cars; jump, jumped, jumping).

b. Monitor reading using context to explain the meanings of unknown key words from text read aloud.

Standard VI: Vocabulary—Students learn and use grade level vocabulary to increase understanding and read fluently.

Standard VII: Comprehension—Students understand, interpret, and analyze narrative and informational grade level text.

Objective 1: Identify purposes of text.

a. Discuss purpose for reading.

b. Discuss author's purpose.

Objective 2: Apply strategies to comprehend text.

a. Relate prior knowledge to make connections to text (e.g., text to text, text to self, text to world).

b. Ask questions about text.

c. Make predictions using picture clues, title, and prior knowledge.

d. Make inferences and draw conclusions from text.

e. Retell identifying key ideas.

f. Compile information from text.

Objective 3: Recognize and use features of narrative and informational text.

a. Identify beginning, middle, and ending of text.

b. View a variety of simple genres: nursery rhymes, fairy tales, poems, realistic fiction, fantasy.

c. Identify information from pictures.

d. Recognize information as real/make believe.

e. View a variety of informational texts (e.g., pictures books).

Standard VII: Comprehension—Students understand, interpret, and analyze narrative and informational grade level text.

Standard VIII: Writing—Students write daily to communicate effectively for a variety of purposes and audiences.

Objective 1: Prepare to write by gathering and organizing information and ideas (pre-writing).

a. Generate ideas for writing by listening, talking, drawing, looking at literature and informational text, being read to, and reflecting on personal experiences.

b. Select topics from generated ideas.

Objective 2: Compose a written draft.

a. Draft ideas on paper, utilizing pictures with labels/words.

b. Select appropriate words to convey meaning.

Objective 3: Revise by elaborating and clarifying a written draft. See first, second, third, fourth, fifth, and sixth grades.

Objective 4: Edit written draft for conventions.

a. Edit writing of first name for appropriate capital and lower-case letters.

b. Edit writing for the spelling of a key word.

Objective 5: Use fluent and legible handwriting to communicate.

a. Print all upper- and lower-case letters of the alphabet and numerals 0-9 using proper form, proportions, and spacing.

b. Write with increasing fluency in forming manuscript letters and numerals.

c. Write name legibly using correct manuscript form.

Objective 6: Write in different forms and genres.

a. Produce personal writing (e.g., All About Me books, notes).

b. Produce traditional and imaginative stories, narrative and formula poetry as a shared writing activity.

c. Produce functional text (e.g., ABC books, labels, signs).

d. Share illustrations and writing with others.

e. Take part in producing group products.

Standard VIII: Writing—Students write daily to communicate effectively for a variety of purposes and audiences.

Kindergarten Mathematics Core Curriculum

Standard I: Students will understand simple number concepts and relationships.

Standard I: Students will understand simple number concepts and relationships.

Objective 1: Identify and use whole numbers.

a. Relate a numeral to the number of objects in a set (e.g., ☐ ☐ ☐ = 3).

b. Construct models of numbers to 10 with physical objects or manipulatives.

c. Make pictorial representations of numbers to 10 (e.g., draw four circles, draw six squares).

d. Recognize and write numerals from 0 to 10.

e. Manipulate objects to demonstrate and describe multiple ways of representing a number (e.g., 5 can be 3 and 2 more, 5 can also be 2 and 2 and 1).

Objective 2: Identify simple relationships among whole numbers.

a. Develop strategies for one-to-one correspondence and keeping track of quantities.

b. Compare two sets of objects to determine whether they have the same, fewer, or more elements.

c. Order sets of objects from 1 to 9.

d. Estimate quantities less than 10.

Objective 3: Model and illustrate meanings of the operations of addition and subtraction and describe how they relate.

a. Demonstrate the joining and separating of sets with objects to solve problems.

b. Describe the joining or separating of sets with informal language when using models.

c. Record pictorially the results from the joining or separating of sets.

Standard II: Students will identify and use patterns to represent mathematical situations.

Objective 1: Identify and sort objects according to common attributes.

a. Sort objects into groups by color, shape, size, number, or other attributes.

b. Identify which attribute was used to sort objects into a group.

c. Find multiple ways to sort and classify a group of objects.

Objective 2: Identify and use patterns to describe numbers or objects.

a. Use patterns to count orally from 1 to 20 and backward from 10 to 0.

b. Identify simple patterns in the environment.

c. Predict what comes next in an established pattern and justify thinking.

d. Duplicate, extend, and create simple patterns using objects and pictorial representations.

Standard II: Students will identify and use patterns to represent mathematical situations.

Standard III: Students will identify and create simple geometric shapes and describe spatial relationships.

Objective 1: Identify and create simple geometric shapes.

a. Identify circles, triangles, rectangles, and squares.

b. Combine shapes to create two-dimensional objects.

c. Draw circles, triangles, rectangles, and squares.

d. Recognize circles, triangles, rectangles, and squares in the students' environment.

Standard III: Students will identify and create simple geometric shapes and describe spatial relationships.

Objective 2: Describe simple spatial relationships.

a. Visualize how to fit a shape into a design.

b. Use and demonstrate words to describe position with objects (i.e., on, over, under, above, below, top, bottom, up, down, in front of, behind, next to, beside).

c. Use and demonstrate words to describe distance with objects (i.e., far, near).

Standard IV: Students will understand and use simple measurement tools and techniques.

Objective 1: Identify measurable attributes of objects and units of measurement.

a. Identify clocks and calendars as tools that measure time.

b. Identify a day, week, and month on a calendar.

c. Identify pennies, nickels, dimes, and quarters as units of money.

Objective 2: Use appropriate techniques and tools to determine measurements.

a. Compare two objects (e.g., shorter/longer, heavier/lighter, larger/smaller, more/less).

b. Find the length of an object using nonstandard units (e.g., pencils, paper clips).

c. Name the days of the week in order.

d. Sort pennies, nickels, dimes, and quarters.

Standard IV: Students will understand and use simple measurement tools and techniques.

Standard V: Students will collect and draw conclusions from data and understand basic concepts of probability.

Standard V: Students will collect and draw conclusions from data and understand basic concepts of probability.

Objective 1: Collect, organize, and display simple data.

a. Collect, organize, and record data using objects and pictures.

b. Represent data in a variety of ways (e.g., graphs made from people, pictographs, bar graphs) and interpret the data (e.g., more people like red than blue).

Objective 2: Determine the likelihood of events.

a. Describe events encountered in books read as possible or not possible.

b. Describe events as likely or unlikely (e.g., It is likely to snow today. It is unlikely an elephant will be in school).

Kindergarten Fine Arts, Health, Physical Education, Science, and Social Studies Core Curriculum

Standard I: Students will develop a sense of self.

Objective 1: Describe and practice responsible behaviors for health and safety.

a. Describe proper care of the body (e.g., proper brushing of teeth, eating a variety of foods, proper hand washing, sneezing into sleeve).

b. Recognize that food is fuel for the body.

c. Recognize signs of physical activity (e.g., heart rate, breathing, sweat).

d. Identify helpful and harmful substances to the body.

e. Recall basic safety (e.g., follow rules, maintain personal space/boundaries, know phone number, address, emergency number).

Objective 2: Develop skills in gross and fine motor movement.

a. Participate in regular physical activity that requires exertion (e.g., walk, jog, jump rope).

b. Explore a variety of fundamental and manipulative gross motor skills (e.g., hop, skip, twirl, dance, throw, catch, kick, strike).

c. Perform a variety of fine motor skills (e.g., draw, cut, paste, mold, write).

d. Maintain personal space and boundaries while moving.

e. Create and perform simple dance movements that express who one is, knowledge of the body, feelings, senses, and ideas in time and space.

Objective 3: Develop and use skills to communicate ideas, information, and feelings.

a. Identify and express ideas, information, and feelings in a variety of ways (e.g., draw, paint, tell stories, play, make believe, dance, sing).

b. Recognize similar colors as being members of the family of reds, blues, and yellows and shapes as being similar to squares, circles, and triangles.

Standard I: Students will develop a sense of self.

c. Describe sounds in terms of dynamics (loud/soft), pitch (high/low), duration (long/short; fast/slow), and timbre (tone of an animal, human, musical instrument, or machine).

d. Develop competency in beat accuracy and respond to an understanding of beat as a life force through moving, singing, chanting, or playing instruments.

e. Express emotions by selecting and playing a variety of simple rhythm instruments.

Standard II: Students will develop a sense of self in relation to families and community.

Objective 1: Describe factors that influence relationships with family and friends.

a. Identify ways individuals are alike and different.

b. Identify contributions of family members.

c. Describe how children change over time.

d. Identify behaviors to initiate play and develop friendships.

e. Demonstrate positive interactions with peers and adults.

Objective 2: Identify important aspects of community and culture that strengthen relationships.

a. Recognize and follow family and classroom rules.

b. Describe the school community (e.g., students, teachers, secretary, custodian, principal).

c. Describe resources in the community (e.g., police officer, firefighter, library, museum).

d. Describe cultural traditions in family and community.

e. Recognize national symbols and recite the Pledge of Allegiance.

Objective 3: Express relationships in a variety of ways.

a. Recognize traditions, music, dances, artwork, poems, rhymes, and stories that distinguish cultures.

b. Develop skills in storytelling through moving the body and making sounds while pretending to be characters in a familiar story.

c. Create and perform/exhibit dances, visual art, music, and dramatic stories from various cultures.

Standard III: Students will develop an understanding of their environment.

Standard III: Students will develop an understanding of their environment.

Objective 1: Investigate changes in the seasons.

a. Identify the seasons and represent each with pictures and songs.

b. Observe and describe typical weather for each of the seasons.

c. Describe the information each of the five senses provides with the changing of seasons.

d. Observe and describe changes in behavior of animals as the seasons change.

e. Describe how people change their behavior as the seasons change.

Objective 2: Observe and describe animals in the local environment.

a. Observe, describe, draw, and compare familiar animals.

b. Describe how young animals are different from adult animals.

c. Describe how animals care for their young.

d. Observe and imitate the sounds and movements of animals with songs, dances, and storytelling.

e. Distinguish between real and make-believe animal behaviors.

Objective 3: Recognize symbols and models used to represent features of the environment.

a. Recognize that maps and globes are symbols for actual places.

b. Identify items on a map of the classroom.

c. Explore basic map and globe directions and characteristics (e.g., top, bottom, right, left, land, water, Arctic Ocean, Antarctica).

d. Make representations of things observed in the environment (e.g., drawing, painting, building structures with blocks, making models with clay).

K-6 Elementary Mathematics Core Curriculum in Table Format

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Standard I: Students will understand simple number concepts and relationships.	Standard I: Students will acquire number sense and perform simple operations with whole numbers.	Standard I: Students will acquire number sense and perform operations with whole numbers.	Standard I: Students will acquire number sense and perform operations with whole numbers and simple fractions.	Standard I: Students will acquire number sense and perform operations with whole numbers, simple fractions, and decimals.	Standard I: Students will acquire number sense and perform operations with whole numbers, simple fractions, and decimals.	Standard I: Students will acquire number sense and perform operations with rational numbers.
Objective 1: **Identify and use whole numbers.** a. Relate a numeral to the number of objects in a set (e.g., □ □ □ = 3). b. Construct models of numbers to 10 with physical objects or manipulatives. c. Make pictorial representations of numbers to 10 (e.g., draw four circles, draw six squares). d. Recognize and write numerals from 0 to 10. e. Manipulate objects to demonstrate and describe multiple ways of representing a number (e.g., 5 can be 3 and 2 more, 5 can also be 2 and 2 and 1).	Objective 1: **Represent whole numbers in a variety of ways.** a. Relate number words to the numerals that represent the quantities 0 to 10. b. Sort objects into groups of tens and ones and write the numeral representing the set. c. Represent whole numbers up to 100 in groups of tens and ones using objects. d. Write a numeral when given the number of tens and ones. e. Write a numeral to 99 in expanded form (e.g., 39 is 3 tens and 9 ones or 30+9). f. Use zero to represent the number of elements in the empty set or as a placeholder in a two-digit numeral.	Objective 1: **Represent whole numbers in a variety of ways.** a. Relate number words to the numerals that represent the quantities 0-100. b. Represent whole numbers up to 1,000 in groups of hundreds, tens, and ones using base ten models, and write the numeral representing the set. c. Read and write a three-digit numeral, relating it to a set of objects and a pictorial representation. d. Write a numeral to 999 in expanded form (e.g., 539 is 5 hundreds, 3 tens, 9 ones or 500+30+9). e. Identify the place and the value of a given digit in a three-digit numeral (e.g., the two in 281 means 2 hundreds or 200). f. Demonstrate multiple ways to represent numbers using symbolic representations (e.g., thirty is the same as two groups of 15, the number of pennies in three dimes, or 58-28).	Objective 1: **Represent whole numbers in a variety of ways.** a. Model, read, and write whole numbers up to 10,000 using base ten models, pictures, and symbols. b. Write a numeral when given the number of thousands, hundreds, tens, and ones. c. Write a number up to 9,999 in expanded form (e.g., 6,539 is 6 thousands, 5 hundreds, 3 tens, 9 ones or 6000+500+30+9). d. Identify the place and the value of a given digit in a four-digit numeral. e. Demonstrate multiple ways to represent numbers using models and symbolic representations (e.g., fifty is the same as two groups of 25, the number of pennies in five dimes, or 75-25).	Objective 1: **Represent whole numbers and decimals in a variety of ways.** a. Model, read, and write numerals from tenths to 100,000. b. Write a whole number up to 99,999 in expanded form (e.g., 76,539 is 7 ten-thousands, 6 one-thousands, 5 hundreds, 3 tens, 9 ones or 70,000 + 6,000 + 500 + 30 + 9). c. Identify the place and the value of a given digit in a five-digit numeral, including decimals to tenths. d. Demonstrate multiple ways to represent numbers by using models and symbolic representations (e.g., 36 is the same as the square of six, three dozen, or 9x4). e. Identify square numbers using models.	Objective 1: **Represent whole numbers and decimals in a variety of ways.** a. Model, read, and write numerals from hundredths to one millions. b. Write a whole number up to 999,999 in expanded form (e.g., 876,539 = 8 hundred-thousands, 7 ten-thousands, 6 thousands, 5 hundreds, 3 tens, 9 ones or 8x100,000 + 7x10,000 + 6x1,000 + 5x100 + 3x10 + 9). c. Demonstrate multiple ways to represent whole numbers by using models and symbolic representations (e.g., 108=2x50+8; 108=10^2 + 8). d. Classify whole numbers from 2 to 20 as prime or composite and 0 and 1 as neither prime nor composite, using models. e. Represent repeated factors using exponents up to three (e.g., 8=2x2x2=2^3).	Objective 1: **Represent whole numbers and decimals in a variety of ways.** a. Change whole numbers with exponents to standard form (e.g., 2^4 = 2^4=16) and recognize that 10^0 = 1. b. Read and write numerals from thousandths to one billion. c. Write a whole number to 999,999 in expanded form using exponents (e.g., 876,539 = 8 x 10^5 + 7 x 10^4 + 6 x 10^3 + 5 x 10^2 + 3 x 10^1 + 9 x 10^0). d. Express numbers in scientific notation using positive powers of ten. e. Classify whole numbers to 100 as prime, composite, or neither. f. Determine the prime factorization for a whole number up to 50.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Objective 2: **Identify simple relationships among whole numbers.** a. Develop strategies for one-to-one correspondence and keeping track of quantities. b. Compare two sets of objects to determine whether they have the same, fewer, or more elements. c. Order sets of objects from 1 to 9. d. Estimate quantities less than 10.	Objective 2: **Identify simple relationships among whole numbers.** a. Identify the number that is one more or one less than any whole number from 1 to 99. b. Use the vocabulary "greater than," "less than," and "equal to" when comparing sets of objects or numbers. c. Order sets of objects and numbers from 0 to 20. d. Use ordinal numbers 1st through 5th (i.e., 1st, 2nd, 3rd, 4th, 5th).	Objective 2: **Identify simple relationships among whole numbers.** a. Identify the number that is one more, one less, ten more, or ten less than any whole number up to 100. b. Write number sentences using the terms "greater than," "less than," or "equal to," to compare numbers. c. Order four whole numbers less than 100 from least to greatest and from greatest to least. d. Use ordinal numbers 1st through 10th.	Objective 2: **Identify relationships among whole numbers.** a. Use a variety of strategies to determine whether a number is even or odd. b. Identify the number that is ten more, ten less, 100 more, or 100 less than any whole number up to 1,000. c. Compare the relative size of numbers (e.g., 31 is large compared to 4, about half as big as 60, close to 27). d. Compare whole numbers up to four digits using the symbols <, >, and =. e. Order and compare whole numbers on a number line.	Objective 2: **Identify relationships among whole numbers and decimals.** a. Identify the number that is 100 more, 100 less, 1,000 more, or 1,000 less than any whole number up to 10,000. b. Compare the relative size of numbers (e.g., 100 is small compared to a million, but large compared to 5). c. Compare whole numbers up to five digits using the symbols <, >, and =. d. Identify a whole number that is between two given whole numbers. e. Order and compare whole numbers and decimals to tenths on a number line.	Objective 2: **Identify relationships among whole numbers, fractions, decimals, and percents.** a. Order and compare whole numbers, fractions (including mixed numbers), and decimals using a variety of methods and symbols. b. Rewrite mixed numbers and improper fractions from one form to the other. c. Find the least common denominator for two fractions. d. Represent commonly used fractions as decimals and percents in various ways (e.g., objects, pictures, calculators).	Objective 2: **Identify relationships among whole numbers, fractions (rational numbers), decimals, and percents.** a. Find the greatest common factor and least common multiple for two numbers using a variety of methods (e.g., list of multiples, prime factorization). b. Order and compare rational numbers, including mixed numbers, using a variety of methods and symbols. c. Locate positive rational numbers on a number line. d. Convert common fractions, decimals, and percents from one form to another (e.g., 3/4= 0.75 = 75%).

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Objective 3: Model and illustrate meanings of the operations of addition and subtraction and describe how they relate. a. Demonstrate the joining and separating of sets of objects to solve problems. b. Describe the joining or separating of sets with informal language when using models. c. Record pictorially the results from the joining or separating of sets.	Objective 3: **Model and illustrate meanings of the operations of addition and subtraction and describe how they relate.** a. Demonstrate the joining and separating of sets with twelve or fewer objects and record the results with pictures or symbols. b. Model two meanings of subtraction: separating of sets ("take away") and comparison of sets ("how many more/fewer") using objects, pictorial representations, and symbols. c. Use correct vocabulary and symbols to describe addition (i.e., add, "and," plus, +, sum), subtraction (i.e., subtract, minus, -, take away, how many more/fewer), and equals (i.e., =, same as). d. Use zero in addition and subtraction sentences.	Objective 3: **Model and illustrate meanings of the operations of addition and subtraction and describe how they relate.** a. Demonstrate the joining and separating of sets with eighteen or fewer objects and record the results with pictures or symbols. b. Model three meanings of subtraction: separating of sets ("take away"), comparison of sets ("how many more/fewer"), and missing addends using objects, pictorial representations, and symbols. c. Separate a given set of objects into two, three, five, or ten groups of equal size. d. Model addition and subtraction of two-digit whole numbers in a variety of ways. e. Select an addition or subtraction sentence to solve a problem involving joining or separating of sets with eighteen or fewer objects. f. Recognize that addition number sentences have related subtraction sentences (e.g., 8-5=3, 3+5=8).	Objective 3: **Model and illustrate meanings of the operations of addition, subtraction, multiplication, and division and describe how they relate.** a. Model addition and subtraction of two- and three-digit whole numbers in a variety of ways. b. Model multiplication of a one-digit factor by a one-digit factor using various methods (e.g., repeated addition, rectangular arrays, manipulatives, pictures) and connect the representation to an algorithm. c. Model division as sharing equally and as repeated subtraction using various methods (e.g., rectangular arrays, manipulatives, number lines, pictorial representations). d. Demonstrate, using objects, that multiplication and division are inverse operations (e.g., 3x4=12; thus, 12÷4=3 and 12÷3=4). e. Select and write an addition, subtraction, or multiplication sentence to solve a problem related to the students' environment, and write a story problem that relates to a given equation. f. Demonstrate the effects of place value when multiplying whole numbers by 10.	Objective 3: **Model and illustrate meanings of the four operations and describe how they relate.** a. Use models to represent multiplication of a one- or two-digit factor by a two-digit factor (up to 30) using a variety of methods (e.g., rectangular arrays, manipulatives, pictures) and connect the representation to an algorithm. b. Recognize that division by zero is not possible (e.g., 6÷0 is undefined). c. Select and write a multiplication or division sentence to solve a problem related to the students' environment and write a story problem that relates to a given equation. d. Represent division of a two-digit dividend by a one-digit divisor, including whole number remainders, using various methods (e.g., rectangular arrays, manipulatives, pictures) and connect the representation to an algorithm. e. Demonstrate that multiplication and division are inverse operations (e.g., 3x4=12; thus, 12÷4=3 and 12÷3=4). f. Describe the effect of place value when multiplying whole numbers by 10 and 100.	Objective 3: **Model and illustrate meanings of operations and describe how they relate.** a. Identify the dividend, divisor, and quotient regardless of the division symbol used. b. Determine whether a whole number is divisible by 2, 3, 5, 9, and/or 10, using the rules of divisibility. c. Represent remainders as whole numbers, decimals, or fractions and describe the meaning of remainders as they apply to problems from the students' environment (e.g., If there are 53 people, how many vans are needed if each van holds 8 people?). d. Model addition, subtraction, and multiplication of fractions and decimals in a variety of ways (e.g., using objects and a number line). e Select or write the number sentences that can be used to solve a two-step problem. f. Model different strategies for whole number multiplication (e.g., partial product, lattice) and division (e.g., partial quotient). g. Describe the effect on place value when multiplying and dividing whole numbers and decimals by 10, 100, and 1,000.	Objective 3: **Model and illustrate meanings of operations and describe how they relate.** a. Represent division of a multi-digit dividend by two-digit divisors, including decimals, using models, pictures, and symbols. b. Model addition, subtraction, multiplication, and division of fractions and decimals in a variety of ways (e.g., objects, a number line). c. Apply rules of divisibility. d. Select or write a number sentence that can be used to solve a multi-step problem and write a word problem when given a two-step expression or equation.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
	Objective 4: **Use fractions to identify parts of the whole.** a. Share sets of up to ten objects between two students and identify each part as half. b. Divide geometric shapes into equal parts, identifying halves and fourths.	Objective 4: **Use fractions to identify parts of the whole.** a. Separate geometric shapes and sets of objects into halves, thirds, and fourths using a variety of models and illustrations. b. Specify a region of a geometric shape (e.g., as "___ out of ___ equal parts" when given four or fewer equal parts. c. Represent the unit fractions 1/2, 1/3, and 1/4 with objects, pictures, and symbols.	Objective 4: **Use fractions to communicate parts of the whole.** a. Identify the denominator of a fraction as the number of equal parts in the whole region or set. b. Identify the numerator of a fraction as the number of equal parts being considered. c. Divide regions and sets of objects into equal parts using a variety of models and illustrations. d. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, sixths, and eighths. e. Determine which of two fractions is greater using models or illustrations.	Objective 4: **Use fractions to communicate parts of the whole.** a. Divide regions and sets of objects into equal parts using a variety of models and illustrations. b. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, fifths, sixths, eighths, and tenths. c. Relate fractions to decimals that represent tenths. d. Determine which of two fractions is greater using models or illustrations. e. Find equivalent fractions for one-half, one-third, and one-fourth using manipulatives and pictorial representations.	Objective 4: **Use fractions to communicate parts of the whole.** a. Divide regions, sets of objects, and line segments into equal parts using a variety of models and illustrations. b. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, fifths, sixths, eighths, tenths, and twelfths. c. Represent the simplest form of a fraction in various ways (e.g., objects, pictorial representations, symbols). d. Represent mixed numbers and improper fractions in various ways (e.g., rulers, objects, number lines, symbols). e. Rename whole numbers as fractions with different denominators (e.g., 5=5/1, 3=6/2, 1=7/7). f. Model and calculate equivalent forms of a fraction and describe the process used.	Objective 4: **Use fractions and percents to communicate parts of the whole.** a. Divide regions, sets of objects, and line segments into equal parts using a variety of models and illustrations. b. Name and write a fraction to represent a portion of a unit whole for halves, thirds, fourths, fifths, sixths, eighths, tenths, twelfths, and sixteenths. c. Write a fraction or ratio in simplest form. d. Name equivalent forms for fractions (halves, thirds, fourths, fifths, tenths), ratios, percents, and decimals, including repeating or terminating decimals. e. Relate percents less than 1% or greater than 100% to equivalent fractions, decimals, whole numbers, and mixed numbers.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
	Objective 5: Solve whole number problems using addition and subtraction in horizontal and vertical notation. a. Compute addition and subtraction facts to twelve. b. Add three whole numbers with sums to twelve.	Objective 5: Solve whole number problems using addition and subtraction in vertical and horizontal notation. a. Use a variety of methods and tools to facilitate computation (e.g., estimation, mental math strategies, paper and pencil, calculator). b. Compute accurately with basic number combinations for addition and subtraction facts to eighteen. c. Add three whole numbers with sums to eighteen. d. Find the sum of two-digit whole numbers and describe the process used.	Objective 5: Solve whole number problems using addition, subtraction, multiplication, and division in vertical and horizontal notation. a. Use a variety of methods and tools to facilitate computation (e.g., estimation, mental math strategies, paper and pencil, calculator). b. Find the sum of any two addends with three or fewer digits, including monetary amounts, and describe the process used. c. Find the difference of two-digit whole numbers and describe the process used. d. Find the product for multiplication facts through ten times ten and describe the process used.	Objective 5: Solve whole number problems using addition, subtraction, multiplication, and division in vertical and horizontal notation. a. Determine when it is appropriate to use estimation, mental math strategies, paper and pencil, or a calculator. b. Find the sum and difference of four-digit numbers, including monetary amounts, and describe the process used. c. Multiply two- and three-digit factors by a one-digit factor and describe the process used. d. Divide a two-digit whole number dividend by a one-digit divisor, with a remainder of zero and describe the process used.	Objective 5: Solve problems using the four operations with whole numbers, decimals, and fractions. a. Determine when it is appropriate to use estimation, mental math strategies, paper and pencil, or a calculator. b. Use estimation strategies to determine whether results obtained using a calculator are reasonable. c. Multiply up to a three-digit whole number by a one- or two-digit whole number. d. Divide up to a three-digit whole number dividend by a one-digit divisor. e. Add and subtract decimals with digits to the hundredths place (e.g., 35.42+7.2; 75.2–13.45). f. Add, subtract, and multiply fractions. g. Simplify expressions, without exponents, using the order of operations.	Objective 5: Solve problems using the four operations with whole numbers, decimals, and fractions. a. Determine when it is appropriate to use estimation, mental math strategies, paper and pencil, or a calculator. b. Use estimation strategies to determine whether results obtained using a calculator are reasonable. c. Multiply up to a three-digit factor by a one- or two-digit factor including decimals. d. Divide up to a three-digit dividend by a one- or two-digit divisor including decimals. e. Add and subtract decimals to the thousandths place (e.g., 34.567+3.45; 65.3-5.987). f. Add, subtract, multiply, and divide fractions and mixed numbers. g. Solve problems using ratios and proportions. h. Simplify expressions, with exponents, using the order of operations.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
					Objective 6: Model and illustrate integers. a. Identify, read, and locate integers on a number line. b. Describe situations where integers are used in the students' environment.	Objective 6: Model, illustrate, and perform the operations of addition and subtraction of integers. a. Recognize that the sum of an integer and its opposite is zero. b. Model addition and subtraction of integers using manipulatives and a number line. c. Add and subtract integers.
Standard II: Students will identify and use patterns to represent mathematical situations.	Standard II: Students will identify and use patterns and relations to represent mathematical situations.	Standard II: Students will identify and use patterns and relations to represent mathematical situations.	Standard II: Students will use patterns and relations to represent mathematical situations.	Standard II: Students will use patterns and relations to represent mathematical situations.	Standard II: Students will use patterns and relations to represent and analyze mathematical situations using algebraic symbols.	Standard II: Students will use patterns, relations, and functions to represent and analyze mathematical situations using algebraic symbols.
Objective 1: Identify and sort objects according to common attributes. a. Sort objects into groups by color, shape, size, number, or other attributes. b. Identify which attribute was used to sort objects into a group. c. Find multiple ways to sort and classify a group of objects.	Objective 1: Recognize and represent patterns with one or two attributes. a. Sort and classify objects by one or two attributes. b. Identify, create, and label simple patterns using manipulatives, pictures, and symbolic notation (e.g., ABAB. . ., □ ○ △ □ ○ △ . . .). c. Identify patterns in the environment. d. Identify horizontal and vertical patterns on hundreds charts. e. Use patterns to establish skip counting by twos to 20 and by fives and tens to 100. f. Count backward from 10 to 0 and identify the pattern.	Objective 1: Recognize and represent patterns having multiple attributes. a. Sort, classify, and label objects by three or more attributes. b. Identify and label repeating and growing patterns using objects, pictures, and symbolic notation (e.g., ABAABBAAABBB...). c. Identify repeating and growing patterns in the environment. d. Construct models and skip count by twos, threes, fives, and tens and relate to repeated addition.	Objective 1: Recognize and create patterns with given attributes. a. Create and extend repeating and growing patterns using objects, numbers, and tables. b. Record results of patterns created using manipulatives, pictures, and numeric representations and describe how they are extended.	Objective 1: Recognize, describe, and use patterns and identify the attributes. a. Represent and analyze repeating and growing patterns using objects, pictures, numbers, and tables. b. Recognize and extend multiples and other number patterns using a variety of methods.	Objective 1: Recognize, analyze, and use patterns and describe their attributes. a. Analyze and make predictions about patterns involving whole numbers, decimals, and fractions using a variety of tools including organized lists, tables, objects, and variables. b. Extend patterns and describe a rule for predicting the next element.	Objective 1: Recognize, analyze, and use multiple representations of patterns and functions and describe their attributes. a. Analyze patterns on graphs and tables and write a generalization to predict how the patterns will continue. b. Create tables and graphs to represent given patterns and algebraic expressions. c. Draw a graph from a table of values or to represent an equation. d. Write an algebraic expression from a graph or a table of values.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Objective 2: Identify and use patterns to describe numbers or objects. a. Use patterns to count orally from 1 to 20 and backward from 10 to 0. b. Identify simple patterns in the environment. c. Predict what comes next in an established pattern and justify thinking. d. Duplicate, extend, and create simple patterns using objects and pictorial representations.	Objective 2: Recognize and represent relations using mathematical symbols. a. Recognize that "=" indicates a relationship in which the quantities on each side of an equation are equal. b. Recognize that symbols such as □, △, or ◇ in an addition or subtraction equation represent a missing value that will make the statement true (e.g., □ + 3 = 6, 5 +7 = △, 4 = 5 – ◇). c. Demonstrate that changing the order of addends does not change the sum (e.g., 3+2=5 and 2+3=5).	Objective 2: Recognize and represent relations using mathematical symbols. a. Recognize that "π" indicates a relationship in which the quantities on each side are not of equal value. b. Recognize that symbols such as □, △, or ◇ in an addition or subtraction equation represent a value that will make the statement true (e.g., □ +3=6, 5+7=△, 7=9-◇). c. Demonstrate that changing the order of addends does not change the sum (e.g., 3+2+7=12, 7+3+2=12) and that changing the grouping of three or more addends does not change the sum (e.g., (2+3)+7=12, 2+(3+7)=12).	Objective 2: Recognize and represent mathematical situations using patterns and symbols. a. Recognize that symbols such as □, △, or ◇ in an addition, subtraction, or multiplication equation, represent a value that will make the statement true (e.g., 5+7=△, □-3=6, ◇=2x4). b. Solve equations involving equivalent expressions (e.g., 6+4 = □+7). c. Use the >, <, and = symbols to compare two expressions involving addition and subtraction (e.g., 4+6 □ 3+2; 3+5 ◇ 16-9). d. Demonstrate that grouping three or more addends does not change the sum (e.g., 3+(2+7)=12, (7+3)+2=12) and changing the order of factors does not change the product (e.g., 3x7=21, 7x3=21). e. Use a variety of manipulatives to model the identity property of addition (e.g., 3+0=3), the identity property of multiplication (e.g., 7x1=7), and the zero property of multiplication (e.g., 6x0=0).	Objective 2: Recognize, represent, and solve mathematical situations using patterns and symbols. a. Solve equations involving equivalent expressions (e.g., 6x2= □x3 or 6x□=9+9). b. Use the <, >, = symbols to compare two expressions involving addition, subtraction, multiplication, and division (e.g., 5x4◇9÷3). c. Recognize that a given variable maintains the same value throughout an equation or expression (e.g., □+□=8; □=4). d. Demonstrate that changing the order of factors does not change the product (e.g., 2x3=6, 3x2=6) and that the grouping of three or more factors does not change the product (e.g., (2x3)x1=6; 2x(3x1)=6). e. Demonstrate the distribution of multiplication over addition using a rectangular array (e.g., 8x14=8 rows of 10 plus 8 rows of 4).	Objective 2: Represent, solve, and analyze mathematical situations using algebraic symbols. a. Recognize a variety of symbols for multiplication and division including x, •, and * as symbols for multiplication and ÷, ⌐¯¬, and a fraction bar (/ or -) as division symbols. b. Recognize that a variable (◇, n, x) represents an unknown quantity. c. Solve one-step equations involving whole numbers and a single variable (e.g., n÷7=3). d. Recognize that the answer to a multiplication problem involving a factor of zero is equal to zero (e.g., 0x45=0). e. Use expressions or one-step equations to represent real-world situations. f. Use the associative, commutative, and distributive properties to compute with whole numbers.	Objective 2: Represent, solve, and analyze mathematical situations using algebraic symbols. a. Recognize that a number in front of a variable indicates multiplication (e.g., 3y means 3 times the quantity y). b. Solve two-step equations involving whole numbers and a single variable (e.g., 3x+4=19). c. Recognize that "≈" indicates a relationship in which the quantities on each side are approximately of equal value (e.g., π ≈3.14). d. Recognize that an exponent can be represented in the following ways: 4^3 or 4^3. e. Evaluate expressions and formulas, substituting given values for the variables (e.g., 2x+4; x=2; therefore, 2(2)+4=8). f. Recognize that if the product is zero, then one or more factors equal zero (i.e., if ab=0 then either a=0 or b=0 or a and b=0).

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Standard III: Students will identify and create simple geometric shapes and describe spatial relationships.	Standard III: Students will describe, identify, and create and simple geometric shapes and describe spatial relationships.	Standard III: Students will describe, identify, and create geometric shapes and describe spatial relationships.	Standard III: Students will use spatial reasoning to describe, identify, and create geometric shapes.	Standard III: Students will use spatial reasoning to recognize, describe, and identify geometric shapes.	Standard III: Students will use spatial reasoning to recognize, describe, and identify geometric shapes and principles.	Standard III: Students will use spatial and logical reasoning to recognize, describe, and identify geometric shapes and principles.
Objective 1: **Identify and create simple geometric shapes.** a. Identify circles, triangles, rectangles, and squares. b. Combine shapes to create two-dimensional objects. c. Draw circles, triangles, rectangles, and squares. d. Recognize circles, triangles, rectangles, and squares in the students' environment.	Objective 1: **Describe, identify, and create simple geometric shapes.** a. Identify, name, draw, create, and sort circles, triangles, rectangles, and squares. b. Identify circles, triangles, rectangles, and squares in the students' environment. c. Recognize that combining simple geometric shapes can create more complex geometric shapes.	Objective 1: **Describe, identify, and create geometric shapes.** a. Identify, name, draw, sort, and compare circles, triangles, and parallelograms. b. Identify and name spheres, cones, and cylinders. c. Find and identify familiar geometric shapes in the students' environment. d. Determine whether a circle, triangle, square, or rectangle has a line of symmetry.	Objective 1: **Describe, identify, and create geometric shapes.** a. Identify and draw points, lines, line segments, and endpoints. b. Identify and draw lines of symmetry on triangles, squares, circles, and rectangles. c. Determine whether an angle is right, obtuse, or acute by comparing the angle to the corner of a rectangle. d. Classify polygons (e.g., quadrilaterals, pentagons, hexagons, octagons) by the number of sides and corners. e. Identify, make, and describe cubes (e.g., a cube has 6 square faces, 8 vertices, and 12 edges).	Objective 1: **Describe, identify, and analyze characteristics and properties of geometric shapes.** a. Identify and draw parallel lines and intersecting lines. b. Identify and draw lines of symmetry on a variety of polygons. c. Identify and describe quadrilaterals (i.e., rectangles, squares, rhombuses, trapezoids, kites). d. Identify right, obtuse, and acute angles. e. Compare two polygons to determine whether they are congruent or similar. f. Identify and describe cylinders and rectangular prisms.	Objective 1: **Describe, identify, and analyze characteristics and properties of geometric shapes.** a. Identify and draw perpendicular lines. b. Draw, label, and describe rays and describe an angle as two rays sharing a common endpoint. c. Label an angle as acute, obtuse, right, or straight. d. Identify and describe equilateral, isosceles, scalene, right, acute, and obtuse triangles. e. Identify the vertex of an angle or the vertices of a polygon. f. Compare corresponding angles of two triangles and determine whether the triangles are similar. g. Identify and describe pyramids and prisms.	Objective 1: **Identify and analyze characteristics and properties of geometric shapes.** a. Identify the midpoint of a line segment. b. Identify concave and convex polygons. c. Identify the center, radius, diameter, and circumference of a circle. d. Identify the number of faces, edges, and vertices of pyramids and prisms.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Objective 2: **Describe simple spatial relationships.** a. Visualize how to fit a shape into a design. b. Use and demonstrate words to describe position with objects (i.e., on, over, under, above, below, top, bottom, up, down, in front of, behind, next to, beside). c. Use and demonstrate words to describe distance with objects (i.e., far, near).	Objective 2: **Describe simple spatial relationships.** a. Use and demonstrate words to describe position (i.e., between, before, after, middle, left, right). b. Use and demonstrate words to describe distance (i.e., closer, farther).	Objective 2: **Describe spatial relationships.** a. Create and use verbal or written instructions to move within the environment. b. Find and name locations using coordinates (A, 1). c. Identify shapes in various orientations (e.g., △ and ▽).	Objective 2: **Describe spatial relationships.** a. Give directions to reach a location. b. Use coordinates (A, 1) or regions to locate positions on a map. c. Demonstrate and use horizontal and vertical lines.	Objective 2: **Specify locations and describe spatial relationships using grids and maps.** a. Locate positions on a map of Utah using coordinates or regions. b. Give the coordinates or regions of a position on a map of Utah.	Objective 2: Specify locations and describe spatial relationships using coordinate geometry. a. Locate points defined by ordered pairs in the first quadrant. b. Write an ordered pair for a point in the first quadrant. c. Specify possible paths between locations on a coordinate grid and compare distances of the various paths.	Objective 2: **Specify locations and describe spatial relationships using coordinate geometry.** a. Graph points defined by ordered pairs in all four quadrants. b. Write the ordered pair for a point in any quadrant.
			Objective 3: **Visualize and identify geometric shapes after applying transformations.** a. Demonstrate the effect of a slide (translation) or flip (reflection) on a figure, using manipulatives. b. Determine whether two polygons are congruent by sliding, flipping, or turning to physically fit one object on top of the other. c. Identify two-dimensional shapes (nets) that will fold to make a cube. d. Create a polygon that results from combining other polygons.	Objective 3: **Visualize and identify geometric shapes after applying transformations.** a. Identify a slide (translation) or flip (reflection) on a figure using manipulatives. b. Relate cubes, cylinders, cones, and rectangular prisms to the two-dimensional shapes (nets) from which they were created.	Objective 3: **Visualize and identify geometric shapes after applying transformations.** a. Identify a slide (translation) or flip (reflection) on a figure across a line. b. Demonstrate the effect of a turn (rotation) on a figure using manipulatives. c. Relate pyramids and prisms to the two-dimensional shapes (nets) from which they were created.	Objective 3: **Visualize and identify geometric shapes after applying transformations.** a. Turn (rotate) a shape around a point and identify the location of the new vertices. b. Slide (translate) a polygon either horizontally or vertically on a coordinate grid and identify the location of the new vertices. c. Flip (reflect) a shape across either the x- or y-axis and identify the location of the new vertices.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Standard IV: **Students will understand and use simple measurement tools and techniques.**	Standard IV: **Students will understand and use simple measurement tools and techniques.**	Standard IV: **Students will understand and use measurement tools and techniques.**	Standard IV: **Students will understand and use measurement tools and techniques.**	Standard IV: **Students will understand and use measurement tools and techniques.**	Standard IV: **Students will understand and apply measurement tools and techniques.**	Standard IV: **Students will understand and apply measurement tools and techniques.**
Objective 1: Identify measurable attributes of objects and units of measurement. a. Identify clocks and calendars as tools that measure time. b. Identify a day, week, and month on a calendar. c. Identify pennies, nickels, dimes, and quarters as units of money.	Objective 1: Identify measurable attributes of objects and units of measurement. a. Identify the appropriate tools for measuring length, weight, capacity, temperature, and time. b. Identify the values of a penny, nickel, dime, and quarter. c. Estimate the length of an object by comparing to a nonstandard unit (e.g., How many new pencils wide is your desk?).	**Objective 1:** **Identify measurable attributes of objects and units of measurement.** a. Sequence a series of events of a day in order by time (e.g., breakfast at 7:00, school begins at 9:00). b. Identify the name and value of a penny, nickel, dime, quarter, and dollar. c. Estimate length, capacity, and weight using customary units.	**Objective 1:** **Identify and describe measurable attributes of objects and units of measurement.** a. Recognize the two systems of measurement: metric and customary. b. Describe the relationship between metric units of length (i.e., centimeter, meter). c. Describe the relationship among customary units of length (i.e., inch, foot, yard) and the relationship between customary units of capacity (i.e., cup, quart). d. Estimate length, capacity, and weight using metric and customary units.	**Objective 1:** **Identify and describe measurable attributes of objects and units of measurement.** a. Describe the relationship among metric units of length (i.e., millimeter, centimeter, meter), between metric units of capacity (i.e., milliliter, liter), and between metric units of weight (i.e., gram, kilogram). b. Identify a mile as a measure of distance and its relationship to other customary units of length. c. Describe the relationship among customary units of capacity (i.e., cup, pint, quart, gallon). d. Estimate length, capacity, and weight using metric and customary units.	**Objective 1:** **Identify and describe measurable attributes of objects and units of measurement.** a. Describe the relationship among metric units of length (i.e., millimeter, centimeter, meter, kilometer). b. Describe the relationship among customary units of weight (i.e., ounce, pound). c. Identify the correct units of measurement for volume, area, and perimeter in both metric and customary systems. d. Estimate length, volume, weight, and area using metric and customary units. e. Convert units of measurement within the metric system and convert units of measurement within the customary system.	**Objective 1:** **Identify and describe measurable attributes of objects and units of measurement.** a. Compare a meter to a yard, a liter to a quart, and a kilometer to a mile. b. Identify pi as the ratio of the circumference to diameter of a circle. c. Explain how the size of the unit used in measuring affects the precision. d. Estimate length, volume, weight, and area using metric and customary units.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Objective 2: **Use appropriate techniques and tools to determine measurements.** a. Compare two objects (e.g., shorter/longer, heavier/lighter, larger/smaller, more/less). b. Find the length of an object using nonstandard units (e.g., pencils, paper clips). c. Name the days of the week in order. d. Sort pennies, nickels, dimes, and quarters.	Objective 2: **Use appropriate techniques and tools to determine measurements.** a. Compare objects, using nonstandard units, according to their length, weight, or volume (e.g., pencils/length, books/weight, boxes/volume). b. Read and tell time to the nearest hour. c. Name the days of the week, months of the year, and seasons in order. d. Determine the value of a set of the same coins that total 25¢ or less (e.g., a set of 14 pennies equals 14¢, a set of 5 nickels equals 25¢, a set of 2 dimes equals 20¢).	Objective 2: **Use appropriate techniques and tools to determine measurements.** a. Compare and order objects, using nonstandard units, according to their length, weight, or capacity. b. Measure length using inches and feet, weight using pounds, and capacity using cups. c. Determine the value of a set of up to five coins that total $1.00 or less (e.g., two quarters and one dime equals 60¢; three dimes, one nickel, and one penny equals 36¢). d. Read, tell, and write time to the hour and half-hour. e. Use a calendar to determine the day of the week and date. f. Determine the perimeter of a square, triangle, and rectangle by measuring with nonstandard units.	Objective 2: **Use appropriate techniques and tools to determine measurements.** a. Measure the length of objects to the nearest centimeter, meter, half-inch, foot, and yard. b. Measure capacity using cups and quarts, and measure weight using pounds. c. Determine the value of a combination of coins and bills that total $5.00 or less and write the monetary amounts using the dollar sign and decimal notation. d. Identify the number of hours in a day, the number of days in a year, and the number of weeks in a year. e. Read, tell, and write time to the quarter-hour. f. Identify any given day of the month (e.g., the third Wednesday of the month is the 18th). g. Read and record the temperature to the nearest ten degrees using a Fahrenheit thermometer. h. Estimate and measure the perimeter and area of rectangles by measuring with nonstandard units.	Objective 2: Determine measurements using appropriate tools and formulas. a. Measure the length of objects to the nearest centimeter, meter, quarter-inch, foot, and yard. b. Measure capacity using milliliters, liters, cups, pints, quarts, and gallons and measure weight using grams, kilograms, and pounds. c. Read, tell, and write time to the nearest minute, identifying a.m. and p.m. d. Read and record the temperature to the nearest degree, in Fahrenheit, using a thermometer. e. Determine the value of a combination of coins and bills that total $20.00 or less. f. Count back change for a single-item purchase and determine the amount of change to be received from a multiple-item purchase. g. Determine possible perimeters, in whole units, for a rectangle with a fixed area and determine possible areas when given a rectangle with a fixed perimeter.	Objective 2: Determine measurements using appropriate tools and formulas. a. Measure length to the nearest 1/8 of an inch and to the nearest centimeter. b. Measure volume and weight using metric and customary units. c. Measure angles using a protractor. d. Calculate elapsed time within a.m. or p.m. time periods. e. Read and record the temperature to the nearest degree (above and below zero) when using a thermometer with a Celsius or Fahrenheit scale. f. Calculate the perimeter of rectangles and triangles. g. Calculate the area of squares and rectangles using a formula.	Objective 2: Determine measurements using appropriate tools and formulas. a. Measure length to the nearest one-sixteenth of an inch and to the nearest millimeter. b. Estimate and measure an angle to the nearest degree. c. Calculate the circumference of a circle using a given formula. d. Calculate elapsed time across a.m. and p.m. time periods. e. Calculate the areas of triangles, rectangles, and parallelograms using given formulas. f. Calculate the surface area and volume of right, rectangular prisms using given formulas.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Standard V: **Students will collect and draw conclusions from data and understand basic concepts of probability.**	Standard V: **Students will collect and draw conclusions from data and understand basic concepts of probability.**	Standard V: **Students will collect and draw conclusions from data and understand basic concepts of probability.**	Standard V: **Students will collect and organize data to make predictions and identify basic concepts of probability.**	Standard V: **Students will collect and organize data to make predictions and use basic concepts of probability.**	Standard V: **Students will collect, analyze, and draw conclusions from data and apply basic concepts of probability.**	Standard V: **Students will collect, analyze, and draw conclusions from data and apply basic concepts of probability.**
Objective 1: Collect, organize, and display simple data. a. Collect, organize, and record data using objects and pictures. b. Represent data in a variety of ways (e.g., graphs made from people, pictographs, bar graphs) and interpret the data (e.g., more people like red than blue).	Objective 1: Collect, organize, and display simple data. a. Collect physical objects to use as data. b. Collect, represent, and interpret data using tables, tally marks, pictographs, and bar graphs.	Objective 1: Collect, organize, and display simple data. a. Gather data by vote or survey. b. Sort, classify, and organize data in a variety of ways. c. Use a variety of methods to organize, display, and label information, including keys, using pictographs, tallies, bar graphs, and organized tables. d. Report information from a data display.	Objective 1: Collect, organize, and display data to make predictions. a. Collect, read, represent, and interpret data using tables, graphs, and charts, including keys (e.g., pictographs, bar graphs). b. Make predictions based on a data display.	Objective 1: Collect, organize, and display data to make predictions and answer questions. a. Identify a question that can be answered by collecting data. b. Collect, read, and interpret data from tables, graphs, charts, surveys, and observations. c. Represent data using tables, line plots, line graphs, and bar graphs. d. Identify and distinguish between clusters and outliers of a data set.	Objective 1: Formulate and answer questions using statistical methods to compare data. a. Formulate a question that can be answered by collecting data. b. Collect, compare, and display data using an appropriate format (i.e., line plots, bar graphs, pictographs, circle graphs, line graphs). c. Identify minimum and maximum values for a set of data. d. Identify or calculate the mean, mode, and range. e. Propose and justify inferences based on data.	Objective 1: Design investigations to reach conclusions using statistical methods to make inferences based on data. a. Design investigations to answer questions by collecting and organizing data in a variety of ways (e.g., bar graphs, line graphs, frequency tables, stem and leaf plots). b. Collect, compare, and display data using an appropriate format (i.e., bar graphs, line graphs, line plots, circle graphs, scatter plots). c. Compare two similar sets of data on the same graph and compare two graphs representing the same set of data. d. Recognize that changing the scale influences the appearance of a display of data. e. Develop and evaluate inferences and predictions based on data.

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
Objective 2: Determine the likelihood of events. a. Describe events encountered in books read as possible or not possible. b. Describe events as likely or unlikely (e.g., It is likely to snow today. It is unlikely an elephant will be in school).	Objective 2: Determine the likelihood of an event. a. Compare events to decide which are more likely, less likely, and equally likely. b. Relate past events to future events (e.g., The sun set about 6:00 last night, so it will set about the same time tonight).	Objective 2: Determine the likelihood of an event. a. Predict events that will be the same in one day or one week. b. Predict the outcome when there are only two possible outcomes (e.g., tossing a coin).	Objective 2: Identify basic concepts of probability. a. Describe the results of events using the terms "certain," "equally likely," and "impossible." b. Predict outcomes of simple activities (e.g., a bag contains three red marbles and five blue marbles. If one marble is selected, is it more likely to be red or blue?).	Objective 2: Use basic concepts of probability. a. Describe the results of investigations involving random outcomes as simple ratios (e.g., 4 out of 9, 4/9). b. Predict outcomes of simple experiments, including with and without replacement, and test the predictions.	Objective 2: Apply basic concepts of probability. a. Describe the results of investigations involving random outcomes using a variety of notations (e.g., 4 out of 9, 4/9, 4:9). b. Recognize that outcomes of experiments and samples are fractions between 0 and 1. c. Predict the probability of an outcome in a simple experiment.	Objective 2: Apply basic concepts of probability. a. Write the results of a probability experiment as a fraction, ratio, or percent between zero and one. b. Compare experimental results with anticipated results (e.g., experimental: 7 out of 10 tails; whereas, anticipated 5 out of 10 tails). c. Compare individual, small group, and large group results for a probability experiment.

K-2 Mathematics Glossary

addend	Any number being added. In 32+4=36, 32 and 4 are *addends*.
capacity	The maximum amount that can be contained by an object. Often refers to measurement of a liquid.
cylinder	A three-dimensional figure with two circular bases that are *parallel* and *congruent*.
difference	The amount that remains after one quantity is subtracted from another.
e.g.	This abbreviation means "for example." When used in the Core, *e.g.* is not limited to the examples given.
expanded form	A way to write numbers that shows the place value of each digit. 263 = 200 + 60 + 3 or 263 is 2 hundreds, 60 tens, and 3 ones.
growing pattern	A pattern that grows or increases.
i.e.	This abbreviation means "that is to say." When used in the Core, *i.e.* is limited to the specific examples given.
line of symmetry	A line that divides a figure into two *congruent* halves that are mirror images of each other.
numeral	A symbol used to represent a number.
obtuse angle	An angle with a measure greater than 90º and less than 180º.
obtuse triangle	A triangle with one *obtuse angle*.
one-to-one correspondence	The relationship between the spoken word and the written symbol.
ordinal number	A *whole number* that names the position of an object in sequence. First, second, and third are *ordinal numbers*.
parallelogram	A *quadrilateral* with two pairs of *parallel* and *congruent* sides.
perimeter	The distance around a figure.
pictograph	A graph that uses pictures to show data.

repeating pattern	A pattern of a group of items that repeats over and over.
sum	The answer to an addition problem. In 32+4=36, 36 is the sum.
two-dimensional	A figure that has length and width, but not height. Having area, but not volume. The image on a movie screen is two-dimensional.
whole number	Any of the numbers 0, 1, 2, 3, 4, 5, and so on.

Facilitated
Activities

Math Standard
II-1 & III-2 Activities

Attributes & Spatial Relations

Ins and Outs of Tops and Bottoms

Standard III:

Math Standard III- Students will identify and create simple geometric shapes and describe spatial relationships.

Objective 2:

Describe simple spatial relationships.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Make mathematical connections.

Content Connections:

Language Arts I, (Oral Language); (Print Carries the Message); III (Phonological Awareness); Content II, (Traditional Rhymes); Math I (subtraction)

Math Standard III

Objective 2

Connections

Background Information

These activities are designed using nursery rhymes and a finger play to teach simple spatial relationships and commonly used position words. The following are the commonly used position words that Kindergarten students should know; on, under, above, up, over, down, behind, below, top, bottom, in front of, next to, beside, far, near.

Research Basis

Sutton, J. & Krueger, A. (Eds.). (2002). *ED Thoughts*: What we know about Mathematics teaching and learning. Aurora, CO: Mid-continent Research for Education and Learning.

Mathematical learning in young children is strongly linked to sense perception and concrete experience. Children move toward an understanding of symbols, and eventually abstract concepts, only after they have first experienced ideas on a concrete level. The more avenues there are to receive data through the senses, the more connections the brain can make. The more connections that are made, the better a learner can understand a new idea.

When a school or district implements a well-designed and planned parent involvement effort, all students benefit, regardless of race, ethnicity, or income. Parent involvement means that the parents or guardians of a student are participating actively in a child's education. It ranges from volunteering in a student's classroom to reading with them before bedtime to assuming leadership through participation on school committees. Parent involvement is not effective if available only as an afterthought. Inclusion of parents requires a planned and well-coordinated effort, which takes time. The benefits of a well-coordinated parent involvement program include: higher grades; better attendance; consistent completion of homework; higher graduation rates; decreased

Materials

- ❑ *Each Peach Pear Plum*
- ❑ Can for log
- ❑ *Rhythm Instruments*
- ❑ *Position Word Cards*
- ❑ Magnetic Frogs
- ❑ *Wacky Word Game Board*
- ❑ Lunch Sacks
- ❑ Blue Foam for pond
- ❑ Die
- ❑ *Frog Log*

alcohol use, violence, and antisocial behavior; and greater support and ratings of teachers by parents and community.

Susan B. Neuman, Ed. D. (Nov./Dec 2204). Learning From Poems & Rhymes. *Scholastic Parent & Child,* page 32.

Nursery rhymes are especially powerful, because they are so memorable. Research has found that children who are familiar with nursery rhymes when they enter kindergarten often have an easier time learning to read. This is probably because rhyming helps children discover many common word patters (such as those in quick/stick or down/town). And the more familiar these patterns become in oral language, the more easily children will recognize them when they begin to encounter them in print.

Invitation to Learn

Share the book *Each Peach Pear Plum*. Emphasize the position words.

In this book

With your little eye

Take a look

And play 'I spy'

Instructional Procedures

1. Introduce a different nursery rhyme from the book to your class each day. Be sure to emphasize the position words. List the position words for each nursery rhyme on a chart.
2. Teach your class the nursery rhyme Jack and Jill by doing the following activity. Children will take turns producing a sound with a rhythm instrument for the following words:
   - Jack - lummi sticks
   - water - shake water in a jug or bottle
   - Jill - tambourine
   - down - xylophone backwards
   - up - xylophone
   - crown - a maraca
   - after - drum
3. Repeat the nursery rhyme several times, or enough times that each child gets to play an instrument. Taking turns using the instruments provides a reason to repeat the nursery rhymes and assures that the children learn the rhythm and beat of the words.
4. Teach the finger play "Five Little Speckled Frogs" using your can log, your magnetic frogs, and your blue pond. In this nursery

rhyme the following position words are taught; *up, down, on,* and *into:*

Five little speckled frogs,

Sitting on a speckled log,

Eating the most delicious bugs,

Yum, Yum.

One jumped into the pool,

Where it was nice and cool,

Now there are four green speckled frogs,

Glub, glub.

REPEAT.

5. Students will make a journal entry in their "Frog Log" of this song.
6. Each student will make a treasure box to put position word cards in. To make the treasure box you will need a lunch sack. Students could decorate the sacks.
   a. Cut down on all four corners until you come to the first creased line.
   b. Fold in the two sides and the front to reinforce the box.
   c. Fold the fourth side in half and use it for the lid.
7. Have the students cut apart their sheets of position word cards to put in their Treasure box.
8. Play a review game by letting each student pull a word out of the box and act it out for the class.
9. Play the Wacky Word Game. Use the big game board and a die. Roll a number and move along the board acting out the position words.

Assessment Suggestions

- During the treasure box review game and Wacky Word Game do a performance assessment of student understanding of position words. Make a note of words they don't understand for re-teaching.
- When the students are finished practicing their position words have them pick two words and draw a picture demonstrating their understanding of those words in their Frog Log.

Curriculum Extensions/Adaptations/ Integration

- Have a Treasure Hunt set up before the students arrive at school. Make sure to write the clues using the position words. Some sample clues to use are:

  You will find your 1st clue on top of the pencil sharpener.

  Clue #2 will be found beside the teacher's desk, under the garbage can.

  You will find your next clue in front of the playhouse.

  Your next clue is next to the shelf at the back of the room.

  The next clue will be found behind the door.

- Use hula-hoops for children to demonstrate position words for a P.E. activity. Some sample prompts could be:

  Stand inside the hoop.

  Hold the hoop over your head.

  Walk through the hoop.

  Hop beside the hoop.

- Use scarves for a movement activity in P.E. Let each child hold a scarf and move with the scarf using position words.
- English Language Learners may need additional practice using position words in everyday conversation.

Family Connections

- Each student will take the Treasure Box of position words home. They can play the game with their families. Take turns drawing a position word out of Treasure box and acting it out.
- Students take home Wacky Word game board to play with their families.

Additional Resources

Books

Tops and Bottoms, by Janet Stevens; ISBN 0-15-292851-0

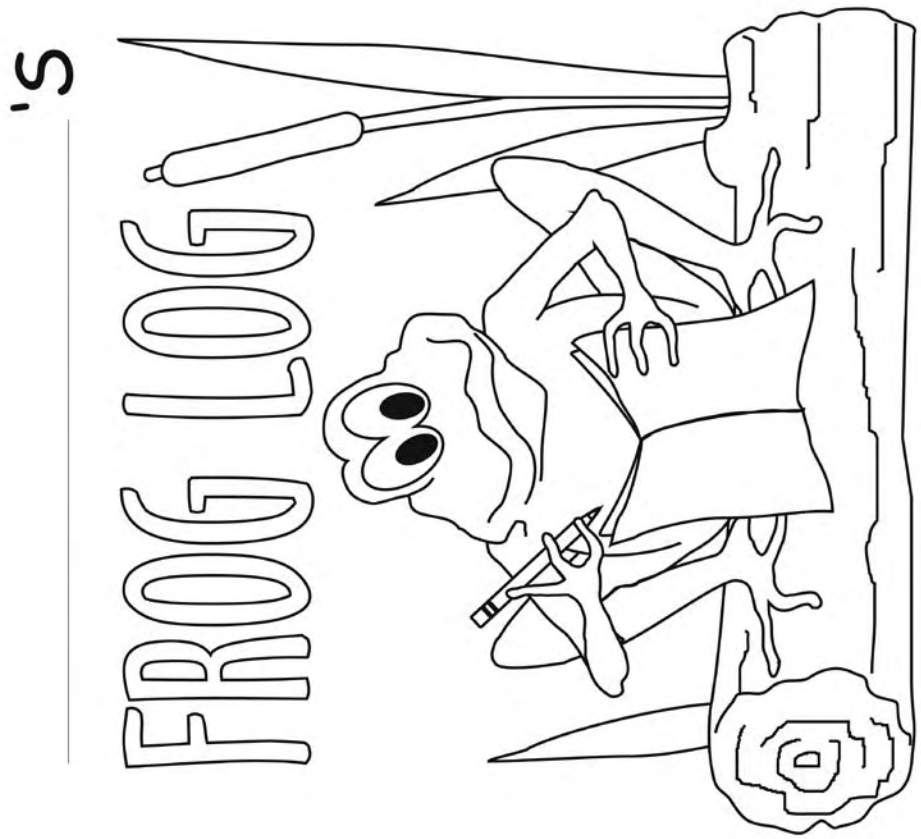
Jump Frog Jump, by Robert Kalan; ISBN 0688092411

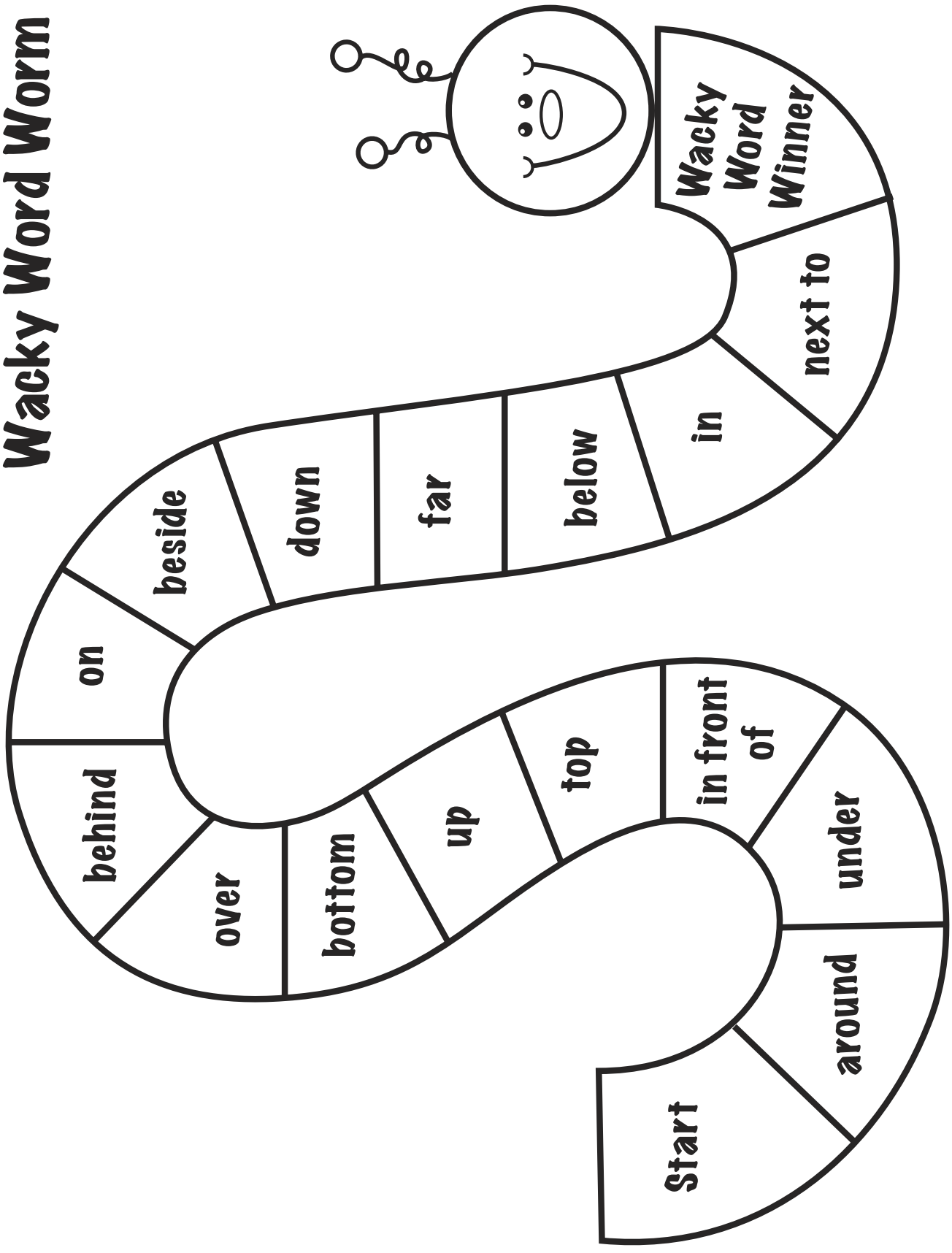
Position Word Cards

below	on
over	down
under	up
behind	top

Position Word Cards

in front of	around
bottom	near
in	far
next to	beside


FROG LOG
S'


Wacky Word Worm
Start
around
under
in front of
top
up
bottom
over
behind
on
beside
down
far
below
in
next to
Wacky Word Winner

Dear Families,

We have been learning position words in Kindergarten. We have been working on the following nursery rhymes and finger plays to help us do this. Please ask me what I've learned.

5 Little Speckled Frogs

5 little speckled frogs
Sitting on a speckled log
Eating the most delicious bugs.
Yum Yum
One jumped into the pool
Where it was nice and cool
Now there are 4 green speckled frogs
GLUB GLUB

Jack and Jill

Jack and Jill went up the hill
To fetch a pail of water.
Jack fell down
and broke his crown
And Jill came tumbling after.

Hickory Dickory Dock

Hickory Dickory Dock
the mouse ran up the clock.
The clock struck one
The mouse ran down
Hickory Dickory Dock.

Hey Diddle Diddle

Hey diddle diddle the cat and the fiddle
the cow jumped over the moon.
The little dog laughed to see such sport
And the dish ran away with the spoon.

Little Bo Peep

Little Bo Peep has lost her sheep
And can't tell where to find them.
Leave them alone and they'll come home
Wagging their tails behind them.

Old Mother Hubbard

Old Mother Hubbard went to her cupboard
To get her poor dog a bone.
But when she go there, her cupboard was bare
So then the poor dog had none.

Jack Be Nimble

Jack be nimble
Jack be quick
Jack jump over the candlestick.

Baby Bunting

Cry Baby Bunting
Daddy's gone a-hunting
Gone to fetch a rabbit skin
To Wrap Baby Bunting in
Cry Baby Bunting

Tom Thumb

I had a little husband
no bigger than my thumb;
I bought a little handkerchief
to wipe his little nose,
And a pair of little garters
to tie his little hose
I bought a little horse
that galloped up and down;
I bridled him and saddled him
and sent him out of town.

Squiggy Comes to Kindergarten

Math Standard II

Objective 1

Standard II:

Students will identify and use patterns to represent mathematical situations.

Objective 1:

Identify and sort objects according to common attributes.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
2. Develop social skills and ethical responsibility.
5. Understand and use basic concepts and skills.

Content Connections:

Language Arts Standard I (oral language); Content I (similarities and differences); Math V (graphing simple data)

Connections

Background Information

This activity is designed to help students recognize a variety of different attributes and then learn how to sort people/objects according to the different attributes.

Research Basis

Sutton, J & Krueger, A. (Eds.). (2004). ED Thoughts: *In What Way Can Integrating Curriculum Enhance Learning in Mathematics?*.

Subject integration helps a student make sense and understand the meaning of new information.

If the goal is to produce mathematically literate citizens who can apply mathematical thinking in real-life problem solving, then subject integration is essential. Problem-based learning, using real-life problems, serves as a powerful motivational tool.

Sutton, J & Krueger, A. (Eds.). (2004). ED Thoughts: *What is the Impact of Teachers Learning on Student Learning?*

One of the strongest predictors of students' success is the quality of their teacher. Highly qualified teachers with both mathematics content knowledge and pedagogical skills are more effective.

Teachers who use a more inquiry-based approach and who create learning communities need a deep, connected understanding of mathematical concepts in order to facilitate student learning.

Adams, T.L., (Winter 2000/01) Helping Children Learn Mathematics Through Multiple Intelligences and Standards for School mathematics. *Childhood Education*.

Making mathematical connections within mathematics, and between mathematics and other disciplines (NCTM, 1989, 2000), is important to helping children view mathematics as an applicable tool. Because children learn differently and benefit from operating within

Materials

- ❑ Link people manipulatives
- ❑ Small students pictures
- ❑ Squiggy sorting cards
- ❑ Squiggy attribute chart

the strength of one or more intelligences, mathematical connections can help children view mathematics from different perspectives. Children also need to gain a perspective of mathematics as a body of knowledge that is related to other subjects in multiple ways. Curriculum integration is one tool for making these connections explicit.

Invitation to Learn

Squiggy was created in a classroom in Brigham City, Utah to help children explore different attributes. Squiggy has many "people" attributes – arms, legs, eyes, a round squiggly head/body, always some kind of hat, and sometimes a nose, shoes and ears. Let's create what Squiggy can look like. (Model with the class a Squiggy giving the following parameters-one color with black outline, one squiggly head/body, a hat of some kind, 1-4 arms, 1-4 legs, 1-2 eyes, ears or no ears, shoes or no shoes, sometimes a nose and always a smile. Model how to describe a Squiggy. Have students draw their own Squiggy.)

Instructional Procedures

1. Have students describe their Squiggies with a partner or friends at their table.
2. Have students bring their Squiggy pictures and gather together.
3. Choose an attribute for a class Squiggy sort (e.g. body color, # of legs, ears/no ears). Designate a place on the floor for them to stand with their Squiggies according to the chosen attribute you are sorting by.
4. After doing several sorts, collect their drawings to laminate and place in a center.
5. Discuss attributes of real people and different ways real people can be sorted.
6. Do 2-3 student sorts using the attributes the children generate.
7. Discuss ways to sort people using just their heads.
8. Distribute people link manipulatives with pictures of students heads attached.
9. Have them hold their links and do 2-3 link people sorts.
10. Gather the links to put in a center for sorting and/or graphing.

Assessment Suggestions

- Observations are made as the students are doing the sorting. You are looking for the children to know various attributes.
- Students could graph the data for you as a teacher to assess their understanding of common attributes.

Curriculum Extensions/Adaptations/ Integration

- Students will use Squiggy Cards in a center to sort them by attributes.
- Play "Student Sort Shuffle" in P.E. by calling out different people attributes and having the students run to the other end of the gym. The students who run first will help the teacher determine attributes of the remaining children.

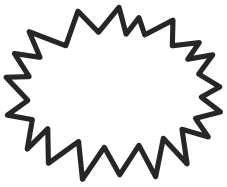
Family Connections

- Send a set of Squiggy Sorting cards home with each student.
- Have students sort the members of their families by simple attributes like eye color, hair color, and boys/girls, etc.

Additional Resources

Iggies Come to Kindergarten, Bernard R. Yvon and Jane Dallinger Dopheide; Arthmetic Teacher (1984) 31(5), 36-38

Squiggy Attributes



1 (red, blue, or green)

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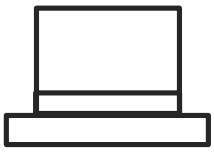
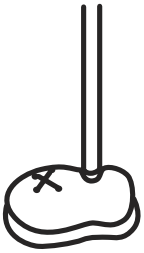


1

1 2

0 1

1 2 3 4



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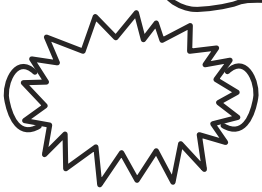

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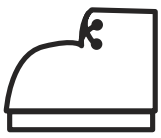

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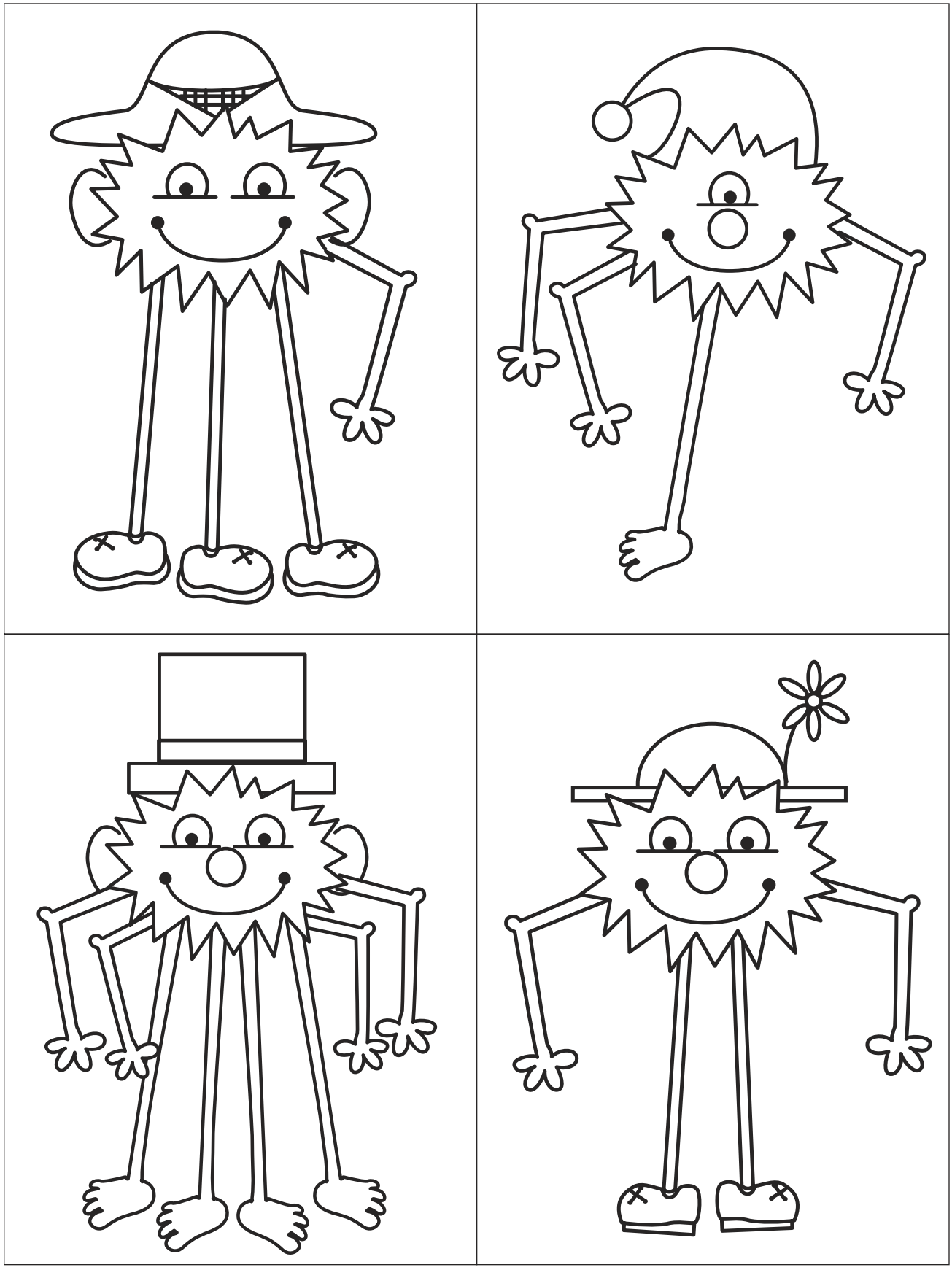

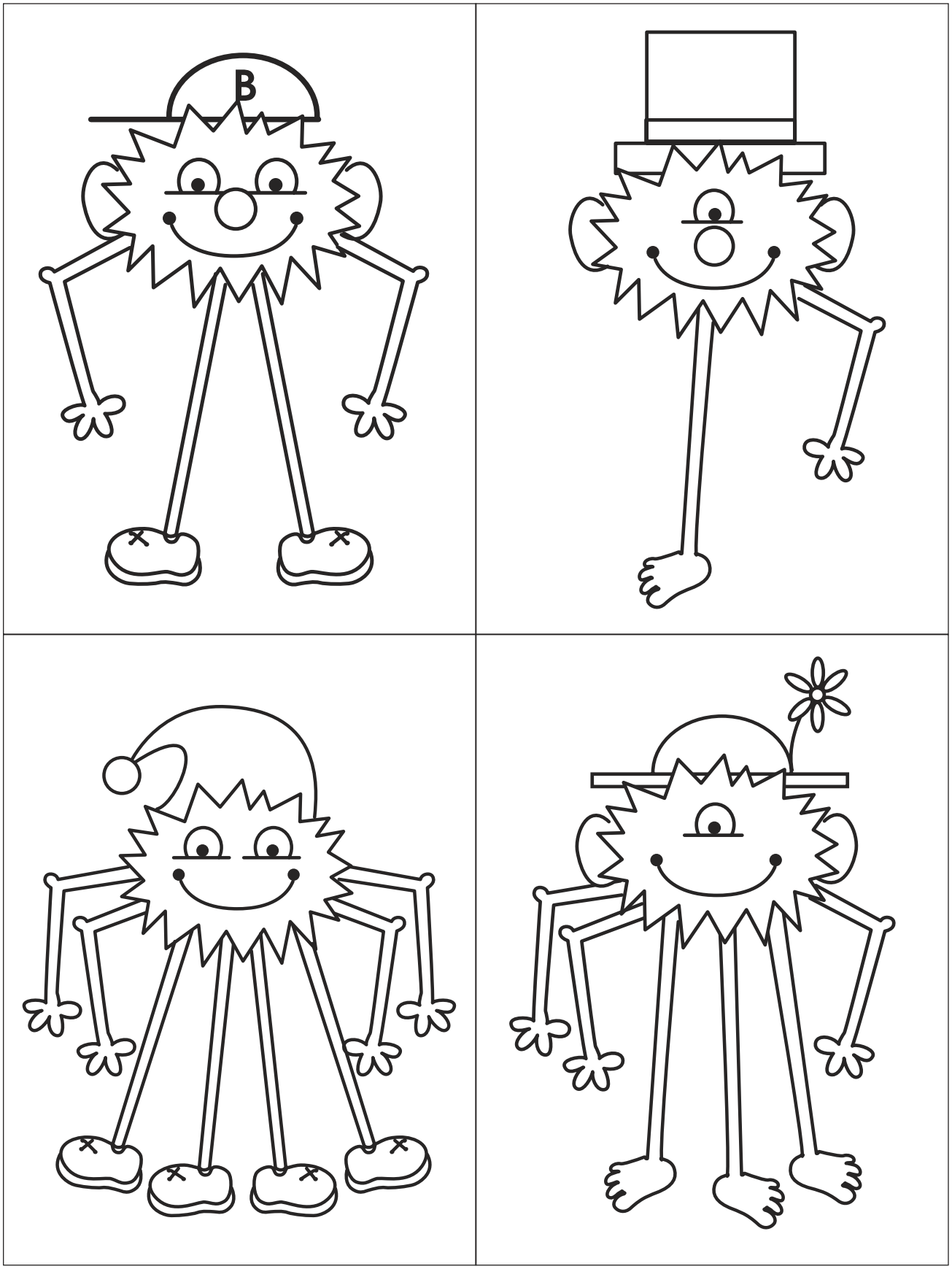
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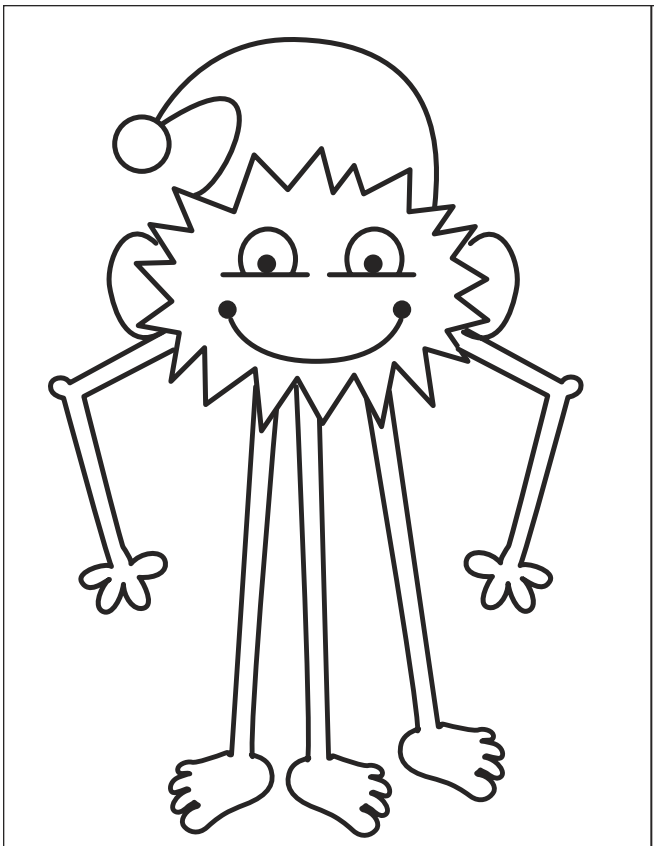
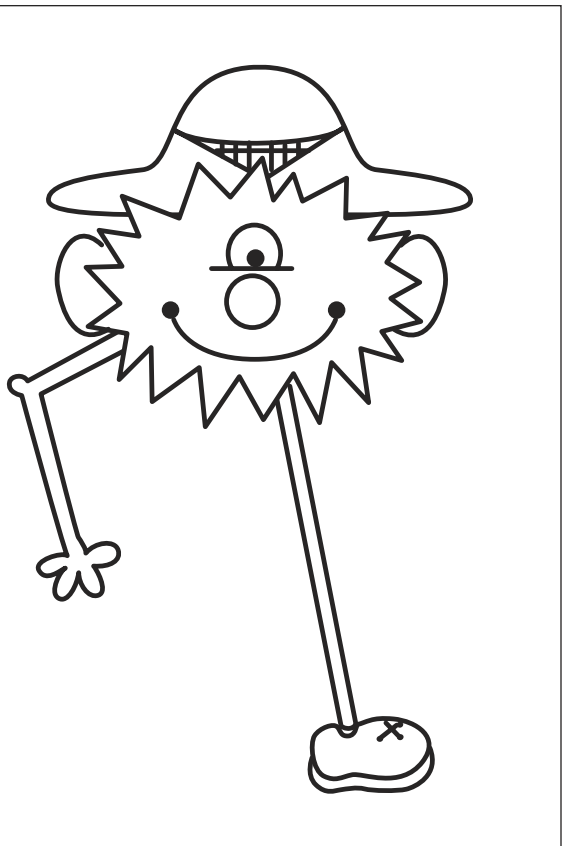
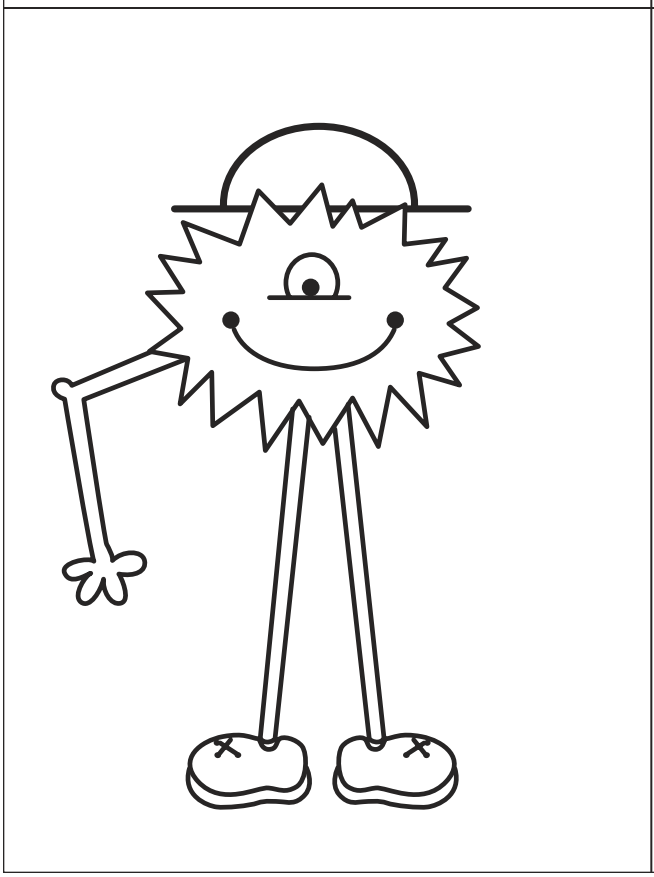
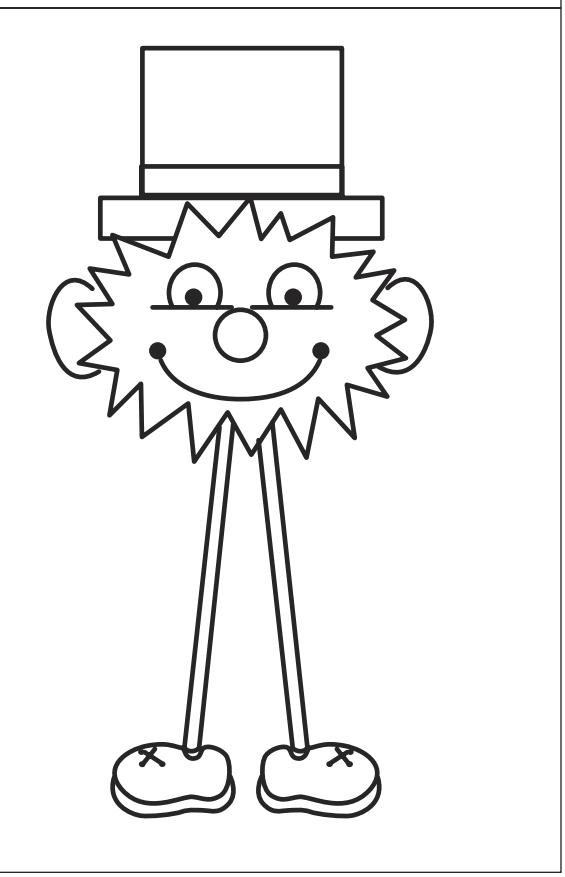








Content II-1&2
Activities

Friendship & Patriotism

Building Friendships

Content Standard II:
Students will develop a sense of self in relation to families and community.

Objective 1:
Describe factors that influence relationships with family and friends.

Intended Learning Outcomes:
2. Develop social skills and ethical responsibility.
3. Demonstrate responsible emotional and cognitive behaviors.

Content Connections:
Content I-3, Language Arts I-1, VII-2,3, Math III-1,2

Content Standard II

Objective 1

Connections

Background Information

Since building peer relationships and creating a caring classroom community is an ongoing process requiring daily opportunities to enhance friendships, this activity is comprised of four 15-minute activities that can be done separately or in combination and can be repeated often throughout the school year. Activity #1, *Getting to Know You,* is especially effective at the beginning of the school year as the children are learning names and faces of class members. The other activities can be introduced anytime, taught in any order, and repeated throughout the year using a variation of original activity. Activity #2, *Circle of Friendship*, works well to enhance relationships because circles are so inclusive. People face each other, creating a feeling of belonging. There is no front or back and no first or last. Everyone belongs. Avoid competition and games where people are tagged or cast out. Activity #3, *Conflict/ Resolution,* can be done as often as time and interest dictate. Most children respond well to puppets so using them to lead a discussion can be effective depending on the instructor's comfort level. If possible, try to use puppets representing a variety of ethnicities. Vary the story and discussion questions to fit different social issues that arise in class. Activity #4, *Buddy Art*, works well as an extension following any friendship story or activity. Have children work in pairs to create a piece of art. This requires communicating, negotiating and compromising. Give children freedom to choose whatever materials and theme they want. Be sure to celebrate all and avoid criticism and competition.

Prior to Activity #1, send home the *Getting To Know You* page to be filled out at home and returned, or complete at school if necessary. Children should bring their paper back with a picture and questions answered. Give them a reasonable deadline. Pre-assessment or kindergarten orientation is a good time to send this

paper home with child and parent, to be returned the first week of kindergarten. At the beginning of each day collect the completed papers to be read and shared later in class. After each student has shared his paper, place it in a binder using sheet protectors to create a class book. This book can be a favorite! Keep it accessible all year for the children to browse through. Children never seem to tire of reading about themselves and their new friends.

Research Basis

Brown, W., Odom, S.L., Conroy, M.A. (2001) An intervention hierarchy for promoting young children's peer interactions in natural environments. *Topics in Early Childhood Special Education* 21 930 162-175.

Researchers developed a hierarchy for promoting young children's peer relationships in the classroom. The foundation is a solid base of developmentally appropriate practices that promote children's engagement with materials and peers (meaningful learning centers, cooperative play) within an inclusive classroom. Teachers build on that with affective interventions (prompts, encouragements) to influence attitudes. Children who have difficulty with peer interactions benefit from additional friendship activities, incidental teaching of social behaviors, social integration activities, and–if necessary–explicit teaching of social skills.

Bredekamp,S. & Copple,C., (eds). (1997) *Developmentally Appropriate Practices in Early Childhood Programs* (rev.ed.). Washington DC: National Association for the Education of Young Children. 116, 168.

In order to create a community of caring within the classroom, young children need daily opportunities to interact with their classmates. They are capable of cooperative play with peers and forming friendships; however, the development of social skills is not automatic. Teachers need to supervise, coach and prompt their students in order to maintain appropriate behaviors. Children do not learn to control aggression by being harshly punished or shamed but rather by learning alternatives to aggression for resolving conflicts. They need to communicate their needs and feelings verbally.

Invitation to Learn

Have the children return their *Get To Know You* paper (or can be filled out at school). The questions should be answered and a picture of self glued in the box. Place in the front of the room near a special chair to be read at a later time. Tell them we are creating a special friendship book and they are the authors. Show the children the binder that their papers will go into. Express your enthusiasm to read about everyone.

Getting To Know You (Part 1)

1. Read a friendship story; e.g. *I Need a Friend*, by Sherry Kafka
2. Discuss that school is a great place to get to know new friends. Tell the students we are going to do a friendship song and activity to help us meet everyone in our class.
3. Begin with music "Twinkle Friends" from Dr. Jean's *Kiss Your Brain* CD. If no CD available you can sing it. As the music plays, or is sung, demonstrate the actions with one child during the first verse. Invite four children to join in for the second verse. By the third verse have everyone choose a friend and do the actions. Change partners each verse. The children will learn words quickly and may join in singing. Repeat as time and interest permits.

Words and actions for "Twinkle Friends", from Dr Jean's *Kiss Your Brain* CD (2003)

(Tune: "Twinkle, Twinkle Little Star")

Twinkle, twinkle little star (Children face partner and gently touch and wiggle fingertips)

What a special friend you are.

From your head to your toes. (Touch head then toes)

We are special friends you know. (Hold hands and circle around.)

Twinkle, twinkle little star. (Children touch fingertips)

What a special friend you are. (Give partner a hug)

Now go find another friend, (Change partners)

And we'll twinkle once again.

(Repeat verse)

Other transitions between verses:

Now, take a little hike

Find another friend you like.

Now we'll sing one more time.

Won't you be a friend of mine?"

4. Gather the children on rug with special chair in front. Choose a few children, one at a time, to share their *Getting To Know You* paper. Invite a child to sit in the Author's chair and share her paper with the class. Use microphone if available to increase motivation and engagement for the author and the class. Even a pretend microphone such as a wooden spoon wrapped in foil

Materials

- ❏ *Getting to Know You*
- ❏ *Twinkle Friends*
- ❏ CD player
- ❏ Friendship story

will add to the experience. Ask child if there is anything else about herself that she would like to share with the class. Have class repeat her name, possibly clapping the syllables in the author's name. Invite another child to share. When finished show the children the book that the class is helping to write. Encourage those who haven't returned their paper to bring it soon. Reassure those who are anxiously waiting for their page to be read that everyone will get a turn to share.

Circle of Friendship (Part 2)

Gather in an open space large enough for students to form a big circle. Push back tables and chairs, if needed.

Materials

- ❑ Open space
- ❑ 26 Big Things Small Hands Can Do

1. Begin with children gathered close together as *26 Big Things Small Hands Can Do*, by Colene Paratore is read and discussed. If no book available, then discuss all the good things hands can do. (wave, shake, clap, write, color & draw, work, help, sign, raise for a question, explore, feed, applaud, etc.)
2. Have class hold hands and form a circle. Explain this is our Friendship Circle. We are all an important part of the circle. We are all friends. It is fun to be in a circle with friends and use our hands to communicate love and friendship. Shake hands with the people next to you. Continue with positive circle activities such as the following:

- Clap your hands. We are all special friends. We can applaud each other when we like something we do. Good job!
- Shake the hands of your friends next to you.
- Give them a "High 5". How about a "High 10" using both hands?
- Wave to the friends across from you. Waving is saying with your hands, "hi," or "good bye," or "it's nice to see you."
- Everyone stand up and hold hands, forming one big circle. Let's walk (sideway-slide position) around our friendship circle. Keep holding hands. Start slow. Gradually speed up until class is sliding sideways around the circle. (Let go of hands to give more freedom of movement while sliding) Slow down to a walk. Stop and change direction. Repeat.
- Let go of each other's hands. Now hold your own hands by placing palms together and lacing your fingers through. Wiggle your fingers. This is a good thing to do when you need to keep your hands to yourself during story or instruction time. It helps

keep your fingers to yourself when they want to wiggle and touch others.

- Have everyone hold hands again. Walk carefully into the center. See how small of a circle can be created. Remind children to watch their space so they don't bump into anyone. When the class is in a small circle use a whisper voice and comment on the fun of being close together, such as: " I can whisper and you can all hear me. I can see all your eyes and bright smiles. It feels snuggly." Now make the circle as BIG as possible. Keep students holding hands while expanding the circle. Wow! We can be so big when we work together. Repeat.
- Have the students sit down and blow a kiss with their hands. Sign the phrase, "I love you." When we love and care about each other we are good friends. Remind students to use their hands in nice, friendly ways. Emphasis that hands are not for hurting. They are for working, playing and showing love and kindness.

Getting Along: Conflict/Resolution (Part 3)

Materials

- ❑ Conflict/ resolution story
- ❑ Puppets
- ❑ Conflict Resolution Topics for Young Children

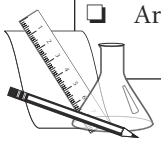
1. Read a story dealing with a peer related conflict and resolution; e.g. *My Friend and I*, by Lisa Jahn-Clough
2. Discuss questions, e.g. "What caused the bunny to break apart?" "How do you think that made the new friend feel?" "Have you ever had a problem sharing with a friend?" "Tell us about it." "What did you do about it?" "Raise your hand if you like to play by yourself sometimes." "Raise your hand if you like to play with others." "When do you like to play alone?" "When do you like to play with friends?" Give children time to think and respond.
3. Explain and discuss what "getting along" means. Suggestions for dialogue: "When we play with others it is important we get along." "What does it mean to get along?" Responses. "Yes, it means we are kind and helpful. We share and take turns. We are not mean. We do not hit or fight. Sometimes we try to get along but there are still problems. What was the problem in the story? How did the children fix the problem?"
4. Introduce a child-like puppet. Dialogue could go something like:"This is our friend Sammy. He wants to be a nice friend but he has trouble with hitting. He doesn't know how to control his hands. When he gets angry or doesn't get his way, he hits. Is that right Sammy?" Puppet nods yes (or the puppet can

whisper his answers into your ear then you tell the children what he said.) Ask Sammy what makes him want to hit? Let puppet respond. (e.g. sad, scared, jealous, angry,) Sammy can then ask the children what makes them want to hit? Interact with puppet at your comfort level.

5. Ask the children to give Sammy some ideas on how to be more kind and not to hit. Guide the discussion to include that hitting is never right and then suggest alternative behaviors. Suggested lead questions: "Have you ever been angry? What do you do when you are angry?" Include the fact that it is normal to feel anger but we need to learn how to respond appropriately to that anger. Positive responses at home might include: throwing a ball, playing a drum, holding a pillow, or going outside to scream. What about at school? Close your mouth then take a deep breath and count to 10, move to a different spot, play with someone else, write or color, squish some clay, and tell someone you are upset and want to talk."
6. As time and interest permits continue with other "friend puppets" each with a different social problem. Lead children in a discussion to give the puppet some ideas. If needed, refer to the discussion cards for topics and questions regarding conflicts and resolutions. The puppets can revisit the class throughout the year as needed.

Materials

- ❑ Art paper
- ❑ Art supplies



Buddy Art (Part 4)

Direct the children to create a piece of art in self selected partnerships. Give each pair one large piece of art paper. Provide a variety of materials to choose from. Allow freedom to create a wide variety of art. Use the puppets to visit and talk with the children as they work on their friendship art. Celebrate all the art when finished. Then display their "buddy art" on a friendship wall.

Assessment Suggestions

- Assessments for these activities are by observation and listening. Observe who easily makes friends and who has trouble choosing a partner. Watch for the child who is uncomfortable in group activities or has trouble sharing. Intervene and assist when necessary to assist children who are timid and hesitant. Show them how to ask someone to be their partner. Allow the shy child to observe if chooses. Invite him/her to join in when ready. Don't force. Listen to individual comments during

discussions. The children will guide and direct you concerning their interpersonal relationships.

Curriculum Extensions/Adaptations/ Integration

- Plan further discussion topics and/or role playing scenarios and appropriate friendship stories for extending these activities. Be guided by the individuals in your class and their particular social concerns and problems. The advanced student will likely offer more insightful comments and think beyond the obvious. The learning delayed student may comment in more simplistic terms. Both are acceptable and work appropriately together.
- Content I-3 role playing, drawing, painting, make believe, singing
- Language Arts VIII writing original dialogue for role playing, dramatization, and stories.

Family Connections

Get to Know You page can be a home connection.

- Send home an outline of simple body shape to be colored, decorated with fabric, yarn, etc. to look like the child. Bring back to school and display on wall, lined up as if holding hands. Be sure each child is represented in the display.
- Send home character education beginning readers as book check outs.
- Ask the parents to keep you informed of concerns they have about their child's friends at school. Act on those concerns and address the issues. This can be done informally as parents come and go from school, addressed during a parent teacher conference, or by a questionnaire sent home for parents to fill out.

Additional Resources

Books

26 Big Things Small Hands Can Do, Coleen Paratore; ISBN 1575421666

I Need A Friend, Sherry Kafka, big book; ISBN 0153002840

My Friend and I, Lisa Jahn-Clough: soft cover ISBN 0618391088/ hard cover ISBN 0395935458

Hands Are Not For Hitting, Martine Agassi; ISBN 1575420775

We Can Get Along, A Child's Book of Choices, Lauren Murphy Payne; ISBN 1575420139

A Leader's Guide to We Can Get Along, A Child's Book of Choices, Lauren Murphy Payne; ISBN 15754201407

Alicia's Best Friend, Lisa Jahn-Clough;ISBN 0618239510

Friends, Helme Meine;ISBN 0590737929

Do You Want To Be My Friend?, Eric Carle; ISBN 0590223224

Wanted: Best Friend, A. M. Monson; ISBN 0439077176

Will I Have a Friend?, Miriam Cohen; ISBN 0-590466348

Me First, Lynn Munsinger; ISBN 0395587069

Creative Experiences for Young Children, Mimi Brodsky Chenfeld; ISBN 032500367X

We Can Work It Out, Conflict Resolution for Children, Barbara K. Pollan; ISBN1582460299

Share and Take Turns, Cheri J. Meiners; ISBN 1575421240

Know and Follow Rules, Cheri J. Meiners; ISBN 1575421305

Talk and Work It Out, Cheri J. Meiners; ISBN 1575421763

Be Polite and Kind, Cheri J. Meiners; ISBN 1575421518

Listen and Learn, Cheri J. Meiners; ISBN 1575421232

Join and Play, Cheri J. Meiners; ISBN 1575421526

Beginning Readers, Character Education: K-3

Best Friends, Sandi Hill; ISBN 1574713329

A Great Attitude, Sandi Hill; ISBN 1574713418

How Can I Help, Christine Hood; ISBN 1574711245

*We Can share At Schoo*l, Roanne Lanczak Williams; ISBN 1574711253

Dare To Have Courage, Regina G. Burch; ISBN 157471-824X

Be a Friend; Regina G. Burch; ISBN 1574718274

Sharing Is Caring, Regina G. Burch; ISBN 1574718320

Working Together; Regina G. Burch; ISBN 1574718312

Telling the Truth, Regina G. Burch; ISBN 1574718266

Show You Understand, Regina G. Burch; ISBN 1574718355

Everyone Is Special and Unique, Regina G. Burch; ISBN 1574718347

Never Give Up, Regina G. Burch; ISBN 1574718282

Following the Rules, Regina G. Burch; ISBN 1574718290

*Would It Be Righ*t, Regina G. Burch; ISBN 1574718258

Think Before You Act, Regina G. Burch; ISBN 1574718339

You Can Count On Me, Regina G. Burch; ISBN 1574718

Articles

How Children Build Friendships, by Carla Poole, Susan Miller, Ellen Booth; Early Childhood Today, 10701214, Oct. 2003, Vol. 18, Issue 2

Additional Media

Dr. Jean, (2003) *Kiss Your Brain* [CD] [Recorded by Mark J. Dye]. drjean@drjean.org.

Getting To Know...

My Name is _____.

I like _____ to eat.

My favorite color is _____.

I like to _____ in my spare time.

The one thing that no one would ever guess about me is _____

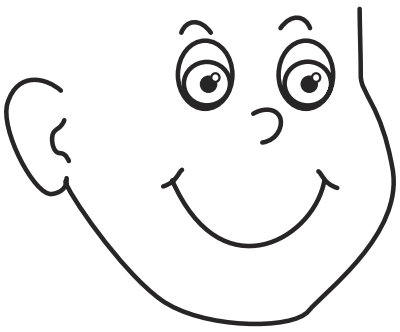
_____.

The one thing I would like every one to know about me is _____

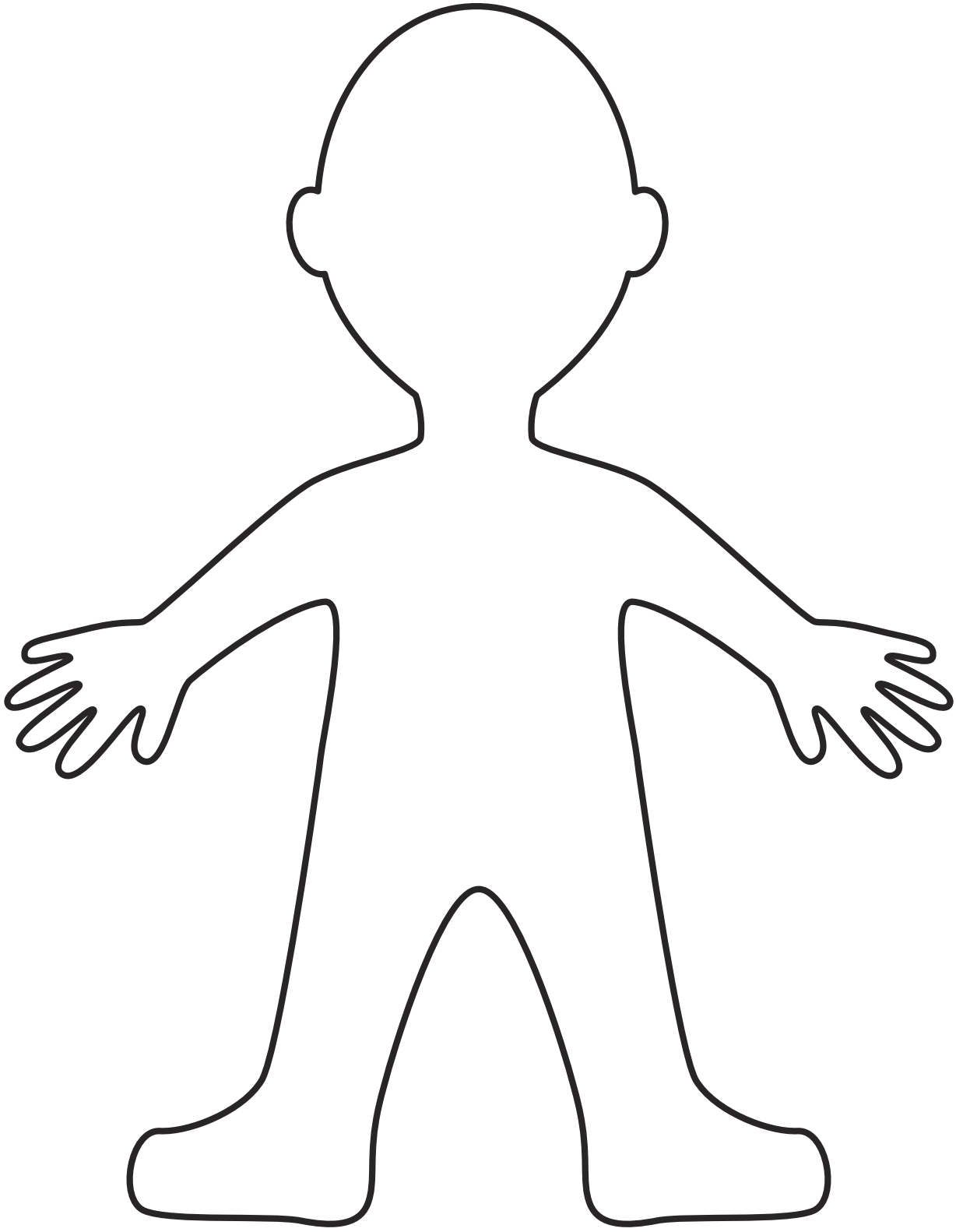
_____.

These are the color

of my hair and eyes.....



Body Shape Outline



Conflict Resolution Topics for Young Children

Teasing

What does it mean to tease?

Have you ever been teased?

Do you like to be teased?

Do you like to tease other people?

When is teasing okay?

When is teasing not okay?

Kindness

How can you tell if someone does not want to be teased?

What could you say to someone who is teasing and you want them to stop?

Who could you talk to if someone won't stop teasing you?

Hitting

Have you ever hit or pushed someone?

When have you felt like hitting, pushing or shoving?

Has anyone been so mad at you that they hit or push you?

How does that make you feel?
Do you want to push back?

Is it ever hard for you to control your fists?

Controlling Hands

What are some good ways to use our hands?

Why should we use talking, not fists?

Is it ever okay to fight back?

What are some ways to solve an angry situation without hitting?

When is it easy for you to stay in control?

Selfishness

Do you like it when someone grabs one of your favorite toys?

What do you do when someone takes your favorite toy?

If you could choose one thing to take what would it be?

How do you think your friend would feel if you took his/her favorite toy?

Sharing

When you are playing with a friend, which toys are you willing to share?

Where could you put toys that you do not want to share?

When you are playing with a friend what can you do when he/she doesn't want to share the toy you want?

Time Out

Have you ever had to be in "time out"?

What kind of trouble were you in?

When should a person be in "time out"?

Do you think it is a good idea?

When should "time out" be over?

Time In

What can you do to avoid being in "time out"?

When you are upset what can you do so you can stay in "time in"?
- Sit down & shut your eyes
- Take a few deep breaths
- Count to 10
- Think about solutions to problem

Try to be a problem solver. What does it mean to be a problem solver?

Excluding

Have you ever been left out of an activity that you wanted to be part of?

How would you feel if your friend had a party but did not invite you?

Have you ever wanted to get even by leaving that friend out of a special activity or party?

Are there times when you don't want to be in a big group?

Including

Do you always invite everyone to join in the game you are playing?

Who can you talk to when you are sad about being left out?

Share some ideas that might help you feel better when you are left out.

If you are playing a game with friends and you notice anotherchild watching what should you do?

Criticism

Has anyone ever told you they don't like you and why? How does that make you feel?

After you have worked hard then someone tells you what you did wrong how do you feel?

Should people say what they don't like about other people?

What is the meanest thing anyone has ever said to you?

Compliments

What is the nicest thing anyone has ever said to you?

How do you feel when someone says something nice?

Think of 3 people you could say something really nice to. Do you want to tell us about them? Tell us what you would say.

Remember to tell those people when you see them.

Arguments

Have you ever yelled at someone?

Has someone ever yelled at you?

When is yelling okay?
When is yelling not okay?

How do you feel when you see people arguing with each other?

How do you sometimes act when you are in the middle of an argument?

Discussions

When you have a disagreement how can you discuss the problem without yelling?

Is it okay that people disagree?

Are we all the same or are we all different?

Can we still be nice when we disagree?

It can be fun to talk about different ideas with another person. Have you ever had a discussion?

Lying

Has anyone ever said something untrue about you?

Why do you think someone would tell a lie?

How do you feel when someone lies about you?

What is the difference between a lie and a make believe story?

Truthfulness

How do you feel when you tell the truth?

When is it hard to tell the truth?

Who could you talk with if someone lied about you?

What is the difference between a true event and pretend, or an imaginary event?

Additional Friendship Activities

Nice Notes: Everyone loves a hand written note. Write each name on a paper and place in a basket, box, or whatever container available. Children pick a name and create a letter or card for that person. Can use words, pictures, designs, and even scribbles for younger children. They all send a message of friendship. Provide a mailbox system for delivery such as boxes, cubbies, or classroom slots. Post "nice words" for the children to use as a reference while they write their own messages. Nice words might include: like, love, cute, happy, cool, awesome, fun, wonderful, friend, etc. February is a great time to do this as they make valentines, but anytime is fun. Repeat often.

Friendship Riddles: Children love guessing games and here is a fun, easy one. It reinforces the positive and helps create good feelings.

Examples "I'm thinking about a helpful girl who is wearing a pink sweater with a kitty on the front. She has beautiful long brown braids with ribbons. If you know who she is, say her name then stand and turn around 3 times."

"I'm thinking about a boy who is a very good reader. He has curly black hair and a big smile. If you know who he is, say his name and give him a thumbs up."

Call and Response Chants & Rounds : Traditional rounds, such as "Row, Row, Row Your Boat" create opportunities for children to listen, sing together, and feel their importance with the whole group. It's beautiful to hear the harmony of different parts sung at the same time. Call and response chants have proven to be traditional favorites in all cultures around the world.

Buddy Works: Have children create works of art in pairs. Let them choose their own materials and themes. Clay is a good medium to use in groups. Divide in ½ or ¼ then work together to create a whole. They learn cooperation and friendliness as they enjoy the exciting process.

Friend Ship: As a group, create a boat. Can use any art form or make out of scrounged objects. Work together. Into the boat put images of all the children. Add art, stories, songs, poems the children create for their friends in the Friend Ship. Illustrate and display.

Family Place Mats: Give the children plain sheets of paper to design place mats for their family members. Include the person's name and any pictures or designs that person would enjoy. Teach about symbols and add a symbol that represents that special person. Laminate and send home as a gift.

Friends Play Together: Don't forget that children need many opportunities to work and play together in non-threatening, non-competitive situations.

Adapted from *Creative Experiences for Young Children* by Mimi Brodsky Chenfeld

Additional Circle Activities

Sit in a circle to listen to story or sing a song. Lead children in actions that support the words. Improvisation is fun.

Create different emotions. Make a happy circle. Show with your faces and bodies what a happy circle would look like. Now make a sad circle. Continue with different emotions.

How many ways can we move our circle (hop, skip, slide, walk backward, turn inside out, slide, etc.)?

Choose a leader to be in middle. Everyone follows actions/movements of the leader. Let everyone who wants to have a turn. Do not force the hesitant child.

Create a quiet circle, a giggling circle, a noisy circle, a clapping circle, a singing circle. Add whatever kind you and your children think of.

Make funny faces at the people around or across from you.

Roll a ball to each child and ask a question. After answering the child rolls the ball back. This would be a good review activity, e.g. literacy or numerical skills or it would be fun to ask personal, getting to know you questions, e.g "What is your favorite color?"

Form a Dance Circle. Put on music and let children dance freely inside the circle. African, Native American, or Caribbean music work well, or choose your favorite sounds and rhythms. The children will vary their movement to fit the various music styles.

Make a 10 speed circle. Begin walking slowly then gradually speed up until you are in the fast mode. Then gradually slow back down.

Pretend your circle is a balloon. Start holding hands and stand close together. Slowly spread apart as if blowing up a balloon. Take deep breaths and exaggerate your breathing. When as large as possible you could either pretend the balloon "pops" and the children let go of hands then fall to ground or carefully bring the children back in close together as if the air has gone out of the balloon.

Pass around an imaginary shape. The shape can change with each person. Try to guess what shape each child is holding.

Circles work well for a show-and-tell pass around; or for science when you have an interesting object, such as sea shell, for each child to hold and touch..

Circle ideas are limitless!! Think of your own and have fun!

Adapted from *Creative Experiences for Young Children* by Mimi Brodsky Chenfeld

Enhancing Peer Relationships/Leaders & Followers

Content Standard II

Objective 1

Content Standard II:
Students will develop a sense of self in relation to families and community.

Objective 1:
Describe factors that influence relationships with family and friends.

Intended Learning Outcomes:
2. Develop social skills and ethical responsibility.
3. Demonstrate responsible emotional and cognitive behaviors.

Content Connections:
Fine Arts I-2 & 3, Language Arts I-1, VII-2, 3, Math I- 2

Connections

Background Information

At times kindergarteners need assistance in making friends and learning how to get along. One strategy is to pair children up for activities. In this activity children work in pairs while addressing the social dilemma of who gets to be the leader and who follows, a common strain in relationships. Some children like to be the leader while others enjoy following. The children try both roles as they take turns being the leader; thus, learning respect for the other when they follow and building confidence when they lead. This activity can be repeated multiple times throughout the year allowing the children to change partners which gives opportunity to meet many more children as they explore new ideas.

This is a creative dance experience. Don't be afraid to move with the students. Children are born to move and are full of energy. Dance is a wonderful art form that involves cooperation and social interaction along with creativity and coordination. In preparation, it would be helpful, but not necessary, to do some of the following movement activities with the class:

- Match Me - students match the teacher in simple, stationary movements
- Follow the Leader – Teacher leads students around room in large motor movements such as skipping, jumping, galloping, sliding, crawling, etc. Students could take turns being the leader.
- Exploring Body Shapes – Children walk randomly in the room then "freeze" in an interesting body shape. Encourage various levels: high, medium, and low. Use an instrument such as a drum to signal when to stop walking and freeze in their shape

If you are not experienced directing creative movement, remember

Materials

- ❑ *Let's Be Enemies*
- ❑ CD player
- ❑ Open Space
- ❑ Comfortable clothing
- ❑ Jon Scoville's music sampler CD

that simple stationary movements work well as do large muscle movements. Move the way you are comfortable, then enjoy watching the children who are generally uninhibited and comfortable moving. Allow the shy or hesitant child to watch if she chooses. Don't force. Children need time to feel comfortable and watching is a form of participation. They will join in when ready. These children often make good stage hands by helping with props or music. There are many ways to participate.

Be enthusiastic and ENJOY!

Research Basis

Bredekamp, S. & Copple, C. (eds). (1997) Developmentally Appropriate Practices in Early Childhood Programs (rev. ed.). Washington DC: National Association for the Education of Young Children, pg.132.

Children should have daily opportunities for aesthetic expression through art, music, and dance. The arts can be the explicit focus of the activity or integrated into other areas of the curriculum. Children should be encouraged to express themselves physically, represent ideas and feelings and acquire fundamental concepts through moving freely and use large muscles in planned movement activities. The arts should be offered more often then a once a week diversion.

Gilbert, A.G. Creative Dance for All Ages: A conceptual approach (7th ed.). Reston, VA: American Alliance for Health, Physical Education, Recreation and Dance, pg.7.

Social outcomes from creative dance include the following: 1.) Learning to cooperate with others through partner and group work. 2.) Bonding with one another through positive physical contact and sharing of ideas and space. 3.) Increasing leadership skills through partner and group work. 4.) Discovering the value of individual differences through creative exploration.

Invitation to Learn

Follow the Leader

As you enter the gym have the children line up behind you. Instruct the children to follow you and do as you are doing. Proceed to do various large motor activities such as skipping, hopping, galloping, crawling, marching, etc. as you lead them along various pathways. If no gym is available, use the hallway or go outside then come back to a room with open space. Furniture may need to be cleared to create as much open space as possible. Comment on the fact that you are the leader and they are following. If time permits a few children could have a turn to be the leader.

Instructional Procedures

1. Read the book – *Let's Be Enemies*. Gather the children close to you to see this small book.
2. Discuss the story – ask questions: e.g. "Have you ever had a friend who always wants to be the leader?" "How does that make you feel?" "Do you like that?" "Do you want a turn to be the leader?" "Always or just sometimes?" "What happens when both friends want to be the boss at the same time?" "What could you do if both want to be the leader at the same time?" Allow children time to respond, using their comments to guide discussion.
3. Explain that good friends take turns – there are times you can be in charge and do things your own way but there are other times when it is best to follow. You cannot always have it your way. Good friends take turns being the leader.
4. Introduce "MIRRORING"– ask and discuss the following: "Have you ever looked in a mirror? What do you see? Yes, you see an image of yourself. What does that image do when you move? If you raise your hand what does the image of your hand do in the mirror? Yes, it does exactly what you do. However you move, your image will match. You are the leader when you are in front of the mirror. You lead and the image follows."
5. Explain activity – "We are going to do an activity called 'MIRRORING.' Let's pretend you are in front of a mirror and your friend is your image. Watch me and my partner." Proceed to choose a child to be your partner and tell the child that you will be the leader first and they are to follow you. Face each other to begin. Instruct the child to move with you as if he were a mirror image. Match exactly. Keep the movement flowing with an occasional pause. Use different levels, making your movements rise and sink slowly in space. Then change leaders. (Name of child) gets to be the leader and I will be the mirror and follow what he chooses to do. After you've modeled, invite four children to try this in front of group. Set clear rules and limits such as:
   - Stay within a specific area (determined by available space)
   - No running
   - Begin by facing each other
   - Can move forward and backward but not more then 10 steps apart

Have each pair of children first decide who will begin as the leader. Let them demonstrate for a short time. Stop and change leaders so the other partner gets to lead. Give them a few moments to demonstrate to the class. Make any necessary corrections so children clearly understand the activity. Complement, encourage and admire the movement done by the children. Give suggestions if needed.

6. Invite ALL – direct the children to choose a partner then find a place in open area where they have room to move without being in anyone else's way. Stand facing each other and wait until everyone is ready. If there is a leftover child he can be your partner. When all children are paired have them decide who gets to be the leader first. Show by raising their hand. Each pair of children should have one person with hand up. Assist those who can't decide. Tell them we will start when the music begins.
7. Turn on background music– e.g. "Creatures" by Tristan Moore, Music Sample [CD] and let them begin. Some children will have trouble following their partner. Gently remind them it is their turn to follow, try to match your partner. When ready to stop have them "freeze" in the position they are in. Look, notice and comment on interesting shapes they have formed.
8. Change roles – have the new leaders raise hand to be sure they understand. Begin music, let the new leaders lead their partner. Comment and encourage. Point out some of the exciting movement going on.
9. Watch each other – invite half the class to sit and watch. The other half performs in front of their classmates. Each pair must decide, again, who will be the leader and who will follow before you begin. When finished discuss with the children the interesting things you saw. Now change places and let the other half perform for their peers. When finished discuss with the children what they liked and why they liked it.
10. Discussion - Ask the class if they liked being the leader best or if they preferred following. Guide the discussion to emphasize these ideas: 1.) Following is fun because you don't have to think of the ideas. 2.) Leading is fun because you can do it your way. 3.) We get along better if we are willing take turns being the leader.

Assessment Suggestions

- Assessments for his activity would involve listening and observing. Listen to comments made by children during discussions. Pay attention to their concerns with friendship issues. During the "Mirroring" activity observe the children. Watch for individual ability to lead and ability to follow. Observe those who choose a partner easily and those who struggle to find a partner. In addition to social skills watch for the student's creativity and large motor control.
- The children assess as they watch one another perform. You could offer suggestions of what to look for as they watch, such as: "Is the partner following? Can you tell who the leader is? Do they match? Can you see interesting shapes they make together? What makes it interesting to watch?" etc.

Curriculum Extensions/Adaptations/ Integration

- This activity is very open-ended and naturally adapts to different abilities. The highly coordinated child will likely move faster and quicker, and may explore more complex movements. The child who is less mature physically may choose more simple movements. How the children are paired can help meet individual needs. Two highly creative children working together will come up with interesting body shapes and movement. A hesitant child who has a hard time thinking of ideas will respond better with a strong leader to follow. It is good to revisit this activity throughout the year so they experience multiple partners with a variety of abilities.
- If you have a physically disabled student this activity is easily modified. For example, it can be done from a sitting position using upper body movements. The able bodied student would match the student with special needs as far as movement possibilities but each should have a turn to both lead and follow.
- Math III-2. The children explore spatial relationships, specifically negative and positive space as they create various shapes with their bodies. Positional words are used to describe where and what they are doing.
- Language Arts I-1, VII -2, 3. As you read and discuss the story the children listen and respond to discussion about the text.

They can use prior experience and make connections to the text. If you repeat this activity at a later time, they children can retell the story and identify key ideas. The book *Let's Be Enemies* can be placed in a browsing box in the room.

- Content I-2. The children are developing gross motor skills as they explore a variety of movements. They must maintain their personal space and boundaries while moving. They are using the elements of dance which are time, space, energy, and body.

Family Connections

- *Let's Be Enemies* could be sent home to read. The social problem of one person always wanting to be the boss could lead to a valuable family discussion. In addition, books on character education and peer relationships could be sent home to read and discuss with family.
- Mirroring is a good activity to incorporate into a parent sharing time or program at school. After demonstrating the activity, invite the parents to come and partner with their child. Fun for all!

Additional Resources

Books

Let's Be Enemies, by Janice May Udry; ISBN 0064431886

Creative Dance for All Ages, by Anne Green Gilbert; ISBN 0883145324

First Steps in Teaching Creative Dance to Children; by Mary Joyce; ISBN 1559341629

Additional Media

Moore, T. [CDs] [Recorded by Tristan Moore] University of Utah's Children's Dance Theatre Contact: www.TristanMoore.com

Scoville, J [CDs] [Recorded by Jon Scoville] Albert Bicycle Music, Olympia Station #221, Felton, CA Contact: foosounds@aol.com or www.albertsbicycle.com

Palmer, Hap [CDS,Cassettes, LPs] Composed by Hap Palmer, ***Songs for Learning Through Music and Movements, Hap Palmer Recordings From Educational Activities***; Educational Activities Freeport, N.Y.

Call 1-800-645-3739 or Contact: www.happalmer.com

Simple Symbols and American Children

Content Standard II

Objective 2

Content Standard II:

Students will develop a sense of self in relation to families and community.

Objective 2:

Identify important aspects of community and culture that strengthen relationships.

Intended Learning Outcomes:

2. Develop social skills and ethical responsibility.

Content Connections:

Language Arts II-1 (Environmental Print), VI-1 (Variety of Genres), VII-3 (Informational Texts); Content III-3 (Symbols and Models)

Connections

Background Information

Children begin at a very early age to learn the meaning of symbols in our culture and environment. Understanding the meaning of some universal symbols, such as traffic signs and signals, handicap logos, gender signs on restrooms, etc., is essential for responsible membership in society. Other signs and symbols are reflective of middle American values and habits: golden arches and other fast food logos; polka dot donut boxes, labeling on media and entertainment products, etc.

Preschool and Kindergarten children learn symbols for alphabet letters and numerals. Many children arrive at school with a firm grasp of these abstract symbols. Other children require time and support to learn these essential literacy and numeric skills. Just as adult support is required for mastery of the early academic skills, teachers need to help children understand that our national symbols "represent thoughts, feelings, emotions and physical objects." Exposure to national symbols helps children develop a sense of patriotism and belonging in their communities and country. Participation and civic involvement are important democratic values that can be enhanced and encouraged. Activities to teach and instill a respect for our flag, the pledge of allegiance, liberty bell, statue of liberty, bald eagle and others are introduced.

Fast Flag Facts for Teachers

1. A Continental Congress resolution established a flag with 13 stripes, alternating red and white and 13 white stars on a blue field.
2. As the number of states grew, the flag was becoming too large. Congress voted in 1818 to keep just 13 stripes in recognition of the original 13 colonies and add a new star for each new state.

3. Original versions of the colonial flag included the British Union Jack, which became obsolete with the signing of the Declaration of Independence.
4. During the Civil War, President Lincoln insisted that no stars be removed for the seceded states. The Union troops fought under the flag containing all of its stars.
5. Symbols on the flag include: stars representing a new constellation, stripes for each original state/colony, number of stars representing the number of states in the US, the triangular folded flag represents the tri-corner hats worn during the American Revolution.
6. Historians disagree about the meaning of the three colors, but some suggestions are: **Red** – courage, sacrifice, blood shed in wars; **White** – purity, peace, hope; **Blue** – loyalty, freedom and justice.
7. During flag ceremonies, the flag is raised swiftly, but lowered slowly.
8. Important dates:

- July 4, 1776 – Declaration of Independence is signed. A new flag is designed.
- June 14, 1777 – Continental Congress makes the Stars and Stripes America's official flag.
- September 13, 1814 – Francis Scott Key wrote "The Star Spangled Banner".
- 1916 - Flag Day is unofficially designated as June 14 by President Woodrow Wilson.
- August 3, 1949 - Harry Truman signs legislation making National Flag Day on June 14.

Research Basis

DeLoache, J.S. (1995). Early understanding and use of symbols: the model model. Current Directions in Psychological Science, 4, 109-113.

Symbols set human thought apart from other creatures. Adults have had so much experience with symbols that we assume everyone interprets them in the same way we do. Participation in any culture requires an understanding of various relevant symbols. Through experience children learn about abstract and representational relationships.

Browne, William P. (2001). Citizenship education: Policy and practice in the elementary grades. Education, 94, (2), 149-159.

Although "citizenship training" is a traditional educational goal, it has not been systematically included in elementary school curriculum. "National loyalty, patriotism, and allegiance" can best be developed through the use of rituals and routines in the classroom, such as the Pledge of Allegiance.

Invitation to Learn

Prior to the children arriving at school, display signs and wordless logos around the room. As the children arrive, let them discover the posted items. These displays may include: pictures of road signs, fast food restaurant signs, empty boxes of familiar products, handicap parking labels, etc. As the children observe the displays, begin a discussion of what each item represents. Include the words symbol and represents (or "stands for") at this stage in the discussion to begin the children's understanding of the concept of symbol.

Instructional Procedures

Materials

- ❑ Photos, signs, or a book (I Read Symbols) with pictures of signs and symbols
- ❑ Classroom American flag
- ❑ White art paper or cardstock
- ❑ Marbles
- ❑ Red and blue paint
- ❑ Shallow pans or trays
- ❑ American Flag Book
- ❑ Crayons
- ❑ Markers
- ❑ Colored pencils

Symbols and the American Flag

1. Display a picture or draw a simple symbol on the chalk/whiteboard. Begin with something universally recognized, such as restroom signs. After establishing the children's schema for symbols, point to the American flag in your classroom. Ask: "What is that?" Most of the children will say that it is the flag. Ask some of the following questions, or other questions to lead the discussion:
   - What does it stand for?
   - Is this America?
   - Where are some of the places you have seen the flag flying?
   - What do you notice about the flag?
   - What is it a symbol of?
   - What colors do you see?
2. Display the classroom flag near the children's eye level. Spread it out so the children can see all the parts of the flag. Ask the children to identify the colors of the flag. Discuss with the children the suggested meanings of the three colors. Working either with large groups or as a center activity, have the children complete the chart The Colors of My Flag. Put some red tempera paint in one dish and blue paint in another. Place marbles in each dish and roll them around to coat completely

with paint. Have the children place their paper, print side down, in the cake pan. Drop a marble onto the paper and move it around by tilting the cake pan. Repeat this with marbles of both colors until the child is satisfied with his painting. These can be mounted and displayed in the classroom, or sent home to share with families.

3. For an additional center activity, let each child complete The American Flag book. Using the templates, prepare enough books in advance for the class members. Set up a sample of a completed book, or provide support for the children to fill in the blanks. Make crayons, markers, or colored pencils available.

Pledge of Allegiance Words	
Pledge	Promise
Allegiance	Loyalty, faithfulness, devotion
United States of America	Our country. Display a US map that shows all 50 states
Republic	A political unit where people are elected (such as senators) to make decision for the people
Stands	A symbol
Nation	A group of people who work together under one government
Indivisible	Not able to be divided or split apart
Liberty	Freedom. No slavery. Exercising your own judgment and making your own decisions
Justice	Fair treatment for everyone
For all	Every citizen in the United States

The Pledge of Allegiance

1. Students recite the Pledge of Allegiance from the beginning of their school experience. It is likely that few kindergarteners recite it correctly, or with any real understanding of its meaning. Read through the book, *The Pledge of Allegiance*. This book has only the complete text of the pledge, illustrated with photographs. Share the book, *I Pledge Allegiance* by Bill Martin, Jr. As the book is read, pause to allow discussion about the different words and concepts

Materials

- ❏ Pledge of Allegiance poster
- ❏ A version of T*he Pledge of Allegiance*
- ❏ *I Pledge Allegiance*
- ❏ Pledge of Allegiance certificates
- ❏ Photo of each child

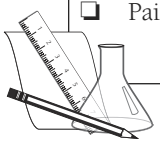
that are explained. The "Pledge of Allegiance Words" chart provides a quick reference for some explanations. After discussing the definitions of the various words in the Pledge of Allegiance, continue to recite the pledge together daily, carefully emphasizing the "new" words.

2. Prepare a Pledge of Allegiance Certificate for each child. Take each child's picture, preferably in front of a flag. Mount the photographs on the certificates, which have been copied onto cardstock. Have each child decorate his/own certificate before sending them home.

The Bald Eagle

Materials

- ❑ Bald eagle headdresses
- ❑ 3" x 6" blue construction paper
- ❑ 2" wide strip of heavy paper
- ❑ Stars cut outs or stickers
- ❑ Scissors
- ❑ Glue
- ❑ Stapler
- ❑ Black markers
- ❑ Red paint
- ❑ Paintbrushes

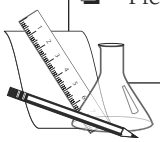


1. Conduct a short discussion about the bald eagle. Display pictures of bald eagles. Share the following information with the children:
   - Several other countries used an eagle as their symbol. America's early leaders didn't want to choose a national bird that was used so commonly.
   - Benjamin Franklin wanted the turkey, which is native to America, to be named the national bird. Other leaders objected because the turkey was not considered majestic enough to be a symbol of this new country.
   - In 1782, Congress chose the Bald Eagle, which is native to America, to be the new country's national bird. It was thought to be regal, strong and unique enough to represent America.
2. To make the bald eagle headdresses, give each child the wing and head papers. Cut out wings and heads. Use markers to draw an eye and color the beak on the head. Paint red stripes across the wings (to resemble our flag). Let the paint dry completely. Glue the head to one end of the blue body piece. Glue the body to the middle of the dried wings. Attach the stars to the blue body. Glue or staple the eagle headdress to the middle of the strip of oaktag. Staple each child's headband to fit their own head size.

American Symbols Lotto

Materials

- ❑ Lotto game boards
- ❑ Game markers
- ❑ Picture cards



1. This activity requires the advance preparation of the lotto game boards and cards. It is most fun to play the game when everyone has a board that is slightly different from other boards. You can make this board by copying several sheets of the picture page and several blank game board pages. Then,

glue the pictures in different arrangements on the lotto boards. Laminate the boards for protection. Create a set of picture cards on cardstock also. Laminate these as well.

2. Play the game with a small group. Pass out game markers to each child. Take turns drawing a card. If that national symbol is on a child's game board, he/she covers it with their game marker. As an extension, children can be asked to tell one fact or idea about the symbol before they cover their picture. Play until someone has a row of game markers covering pictures or until someone has "blackout", with every section of the board covered.

American Flag Collage

1. Before implementing this activity send home a note, asking families to save red and white "treasures" to use on the American flag collage. Collect these items for several days, perhaps a few weeks. Ask the children to watch for red and white things as you've discussed the colors in the flag. They can save bottle caps, fabric, ribbon, Styrofoam packing pieces, buttons, etc. Engage the children in an activity sorting the items by color as they arrive at school.
2. Before having the children work on the flag, prepare the flag paper itself. If using oaktag, glue three sheets along the 36" side creating a flag base of approximately 68" x 36". Measure for the stripes (approximately 2.75"). Beginning at the bottom, draw the lines across the length of the paper. After six stripes, the bottom border of the blue field has been created. Then measure the width of the field and the seven remaining stripes go from the field to the edge of the paper.
3. Work with one small group of children at a time. Begin by letting the group of children sponge paint the blue field. As each successive center group works on the flag, have them stay within a stripe. Encourage them to completely fill in the stripe with the appropriate color.
4. Let the glue dry thoroughly and display.

Materials

- ❑ Large paper base for the flag
- ❑ Blue paint
- ❑ Sponges
- ❑ White stars
- ❑ ½" x 6" white strips – 2 per child
- ❑ Red and white "treasures"
- ❑ Glue
- ❑ Scissors

Assessment Suggestions

- An anecdotal assessment that all teachers can use is simply an observation during the pledge of allegiance to note whether the children's demeanors change and level of participation increases.

- Observe an increased awareness of signs and symbols in "normal" classroom/school activities ("Look, there's an arrow in the parking lot!"). Also, children will demonstrate a further comprehension of national symbols in their everyday lives ("David's shirt has a flag on it").
- Children can be asked to individually recite the Pledge of Allegiance.
- Look for an increased awareness of flags and symbols from other cultures. This is particularly relevant if the teacher has invited parents or community members into the classroom to share information about other countries and cultures. Also, during times of world-wide sporting events, children will focus on the flags and the origins of different participants.
- After completing the flag activity in the computer lab (see curriculum extensions in the next section), evaluate the children's work. Have they included 13 stripes? Did they select the appropriate colors? Do they represent stars?

Curriculum Extensions/Adaptations/ Integration

- Discussion of symbols can be extended into other areas of the curriculum. Before or after a session in your school's computer lab, discuss the "symbols" the children use to complete their computer tasks. For example, if the students are working with Kid Pix, they may have to click the mouse on the "KP" that is one of many symbols on the computer's dock. Once in the program, what symbols are present for the children to access the tools they need?
- Extend discussions of symbols in the curriculum by helping children to understand that letters are symbols that represent sounds and numerals are symbols that represent numbers.
- Kindergarten children can create a predictable chart or class book. Some ideas: "I love America because_____"; "A is for _____, B is for _____"; "I'm proud to be an American because _____."
- If you have access to a computer lab and/or mobile writing lab at your school, consider a technology-based project at the end of your study of patriotic symbols. Kindergarten classes can create "An American ABC" book on the computers instead of with paper and pencil. Each child can choose, or be assigned a letter. They can have experience on the computers typing "A

is for _____" and illustrating their page of the book. Publish the book for your classroom. Consider making a copy of the entire book for each child to take home. You may want to reduce the page size so you can economize on paper.

- Also in the computer lab, children can use the draw tools and stamps to draw symbols. American flags are a simple first experience.
- Another project using the computers available in many schools is to create a slide show. Select a fun poem or the text of one of the familiar patriotic songs: America, the Beautiful; The Star Spangled Banner; etc. Also, simply using the text of the pledge of allegiance could be fun for your students. The children can create their own illustrations and record their voices singing or reading that section of the poem/song.

Family Connections

- Celebrate the diversity of your school community by inviting parents or other community members into your classroom to share and teach about their own country/culture of origin. Presenters should be encouraged to bring in flags, ethnic clothing, artifacts, maps, etc. Follow the local laws and guidelines about any food that the presenter is allowed to share with students.
- Invite families to create an individual child's flag or a family flag at home. Send home a letter explaining the activity, giving guidelines, completion date, etc. When these are returned to school, make sure each child has something to display. The teacher may have to provide support at school for some children to complete this task. Alternatively, each child could gather things, bring them to school, and create the flag during a large or small group activity time. In this situation, the teacher can have photographs or artwork available to all the children to include on their flags. When the flags are complete, participate in a parade for parents, office, or other school staff. Don't forget the drums and noisemakers! Display the flags.

Additional Resources

Books

Across America, I Love You, by Christine Loomis; ISBN 0439235901

America a Patriotic Primer, by Lynn Cheney; ISBN 043945994X

America the Beautiful, Katharine Lee Bates; ISBN 0439333024

Celebrating Patriotic Holidays, by Joel Kupperstein; ISBN 1574715747

I Am America, by Charles R. Smith, Jr.; ISBN 0439740401

I Pledge Allegiance, by Bill Martin, Jr. and Michael Sampson; ISBN 0763625272

I Read Symbols, by Tana Hoban; ISBN 0688023320

If I Were President, by Catherine Stier; ISBN

L is for Liberty, by Wendy Cheyette Lewison; ISBN 0448432285

The Pledge of Allegiance, by Francis Bellamy; ISBN 0439216729

The Star Spangled Banner, by Francis Scott Key; ISBN 0439407672

The Statue of Liberty, by Lucille Recht Penner; ISBN 0439491452

Red, White, Blue, and Uncle Who? The Stories Behind Some of America's Patriotic Symbols, by Teresa Bateman; ISBN 0823417840

This Land is Your Land, by Woody Guthrie; ISBN 0316392154

Videos

American History for Children: United States Flag, Schlessinger Video Productions, ISBN 157225064X

Articles

The Flap Over the Flag, by Bernard A. Weisberger, American Heritage, 41, 7.

Web sites

americanhistory.si.edu (Star Spangled Banner)

historychannel.com (Star Spangled Banner Project)

enchanted learning.com/crafts/patriotic/

first-school.ws/theme/h_united_states

awesomelibrary.org/Flag.html

Google ("patriotic activities" for many more resources)

www.orientaltrading.com

Additional Media

God Bless The USA; A Child's Tribute to America, (Classroom Classics, www.classroomclassics.com);

We the People, (Classroom Classics, www.classroomclassics.com);

Kids Celebrate America, (Turn Up the Music, Inc. 877-777-7523)

God Bless the USA: Kids Sing Songs for America, (Madacy Entertainment Group, Inc., #MK2 1389)

Print Shop Essentials, (Broderbund), ISBN 0439334349 (clip art for symbols, shapes, etc.)

Name _____

The Colors of My Flag

Some of the stripes on my flag are _____.
This means courage and sacrifice.

My flag has _____ stripes and stars.
This means purity, peace and hope.

My flag has a _____ field. This means
loyalty, freedom and justice.

Name _____

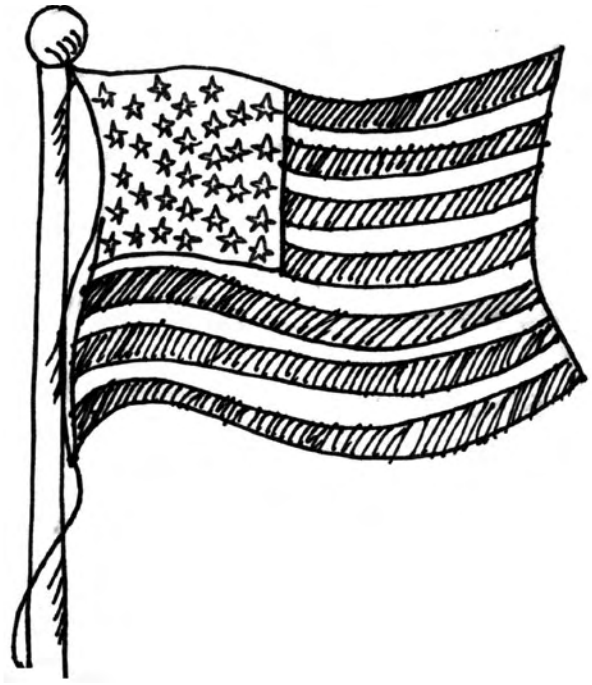
The Colors of My Flag

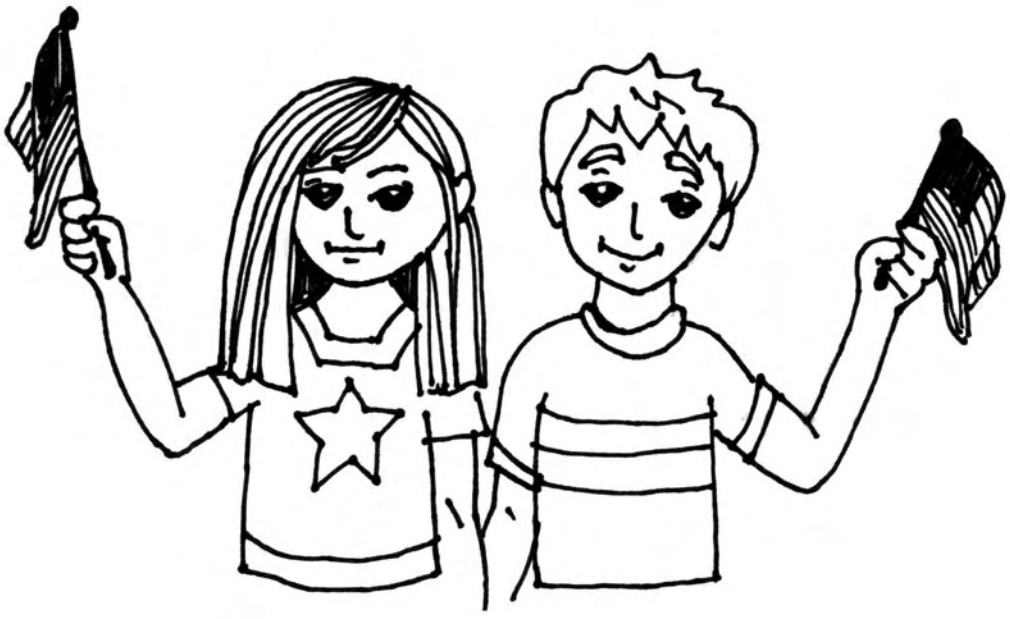
Some of the stripes on my flag are _____.
This means courage and sacrifice.

My flag has _____ stripes and stars.
This means purity, peace and hope.

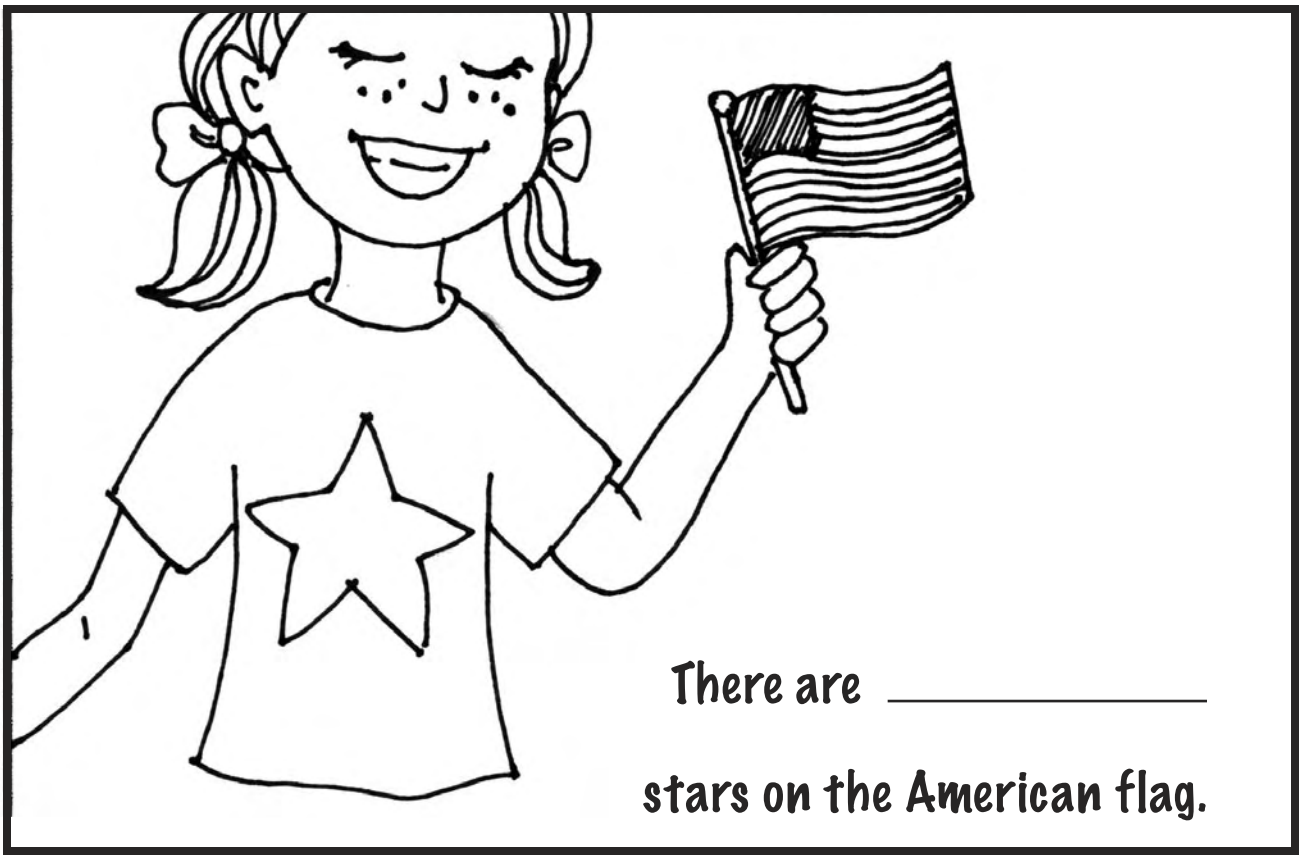
My flag has a _____ field. This means
loyalty, freedom and justice.

The American Flag

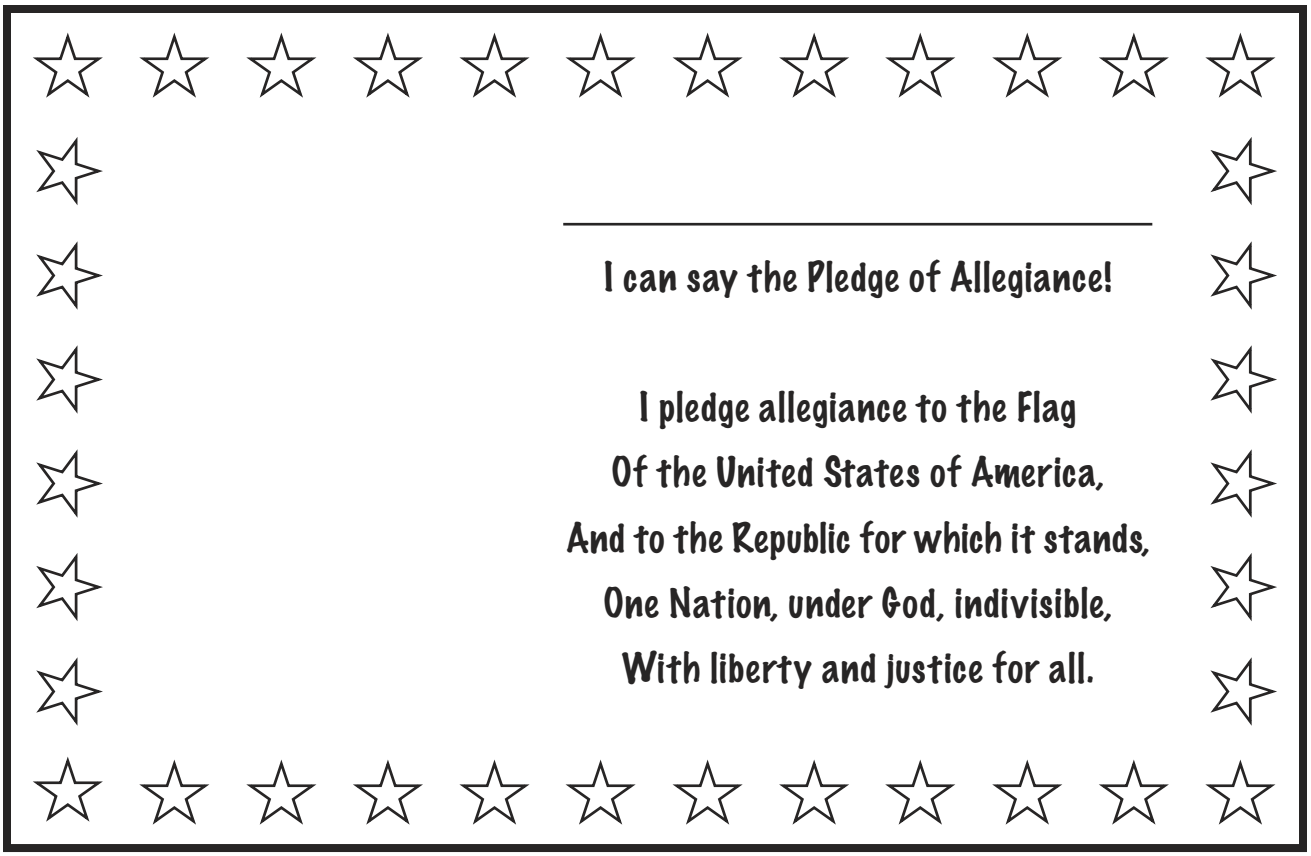




The three colors on the American flag are _____, _____, and _____.


There are _____
stars on the American flag.


I show respect by standing to say
the pledge of allegiance out loud.



I can say the Pledge of Allegiance!

I pledge allegiance to the Flag
Of the United States of America,
And to the Republic for which it stands,
One Nation, under God, indivisible,
With liberty and justice for all.

Child's or Family Flag not to send home to parents:

My Flag!

Parents,

Please help your child create his/her own flag at home. Have your child think of symbols that represent him/her. You may want to use traced hands, photos, drawings, favorite colors, sports symbols, pictures of family and/or pets, pictures or cut outs from magazines and other sources, etc. Use the attached paper or a paper of your choice with the same measurements (18x24"). Be creative! Please return this to school by Friday, _____ for "Kindergarten Flag Day".

Thanks for your support!

American Symbol Lotto

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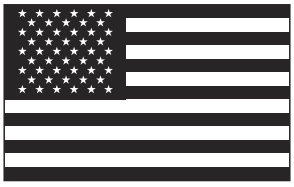
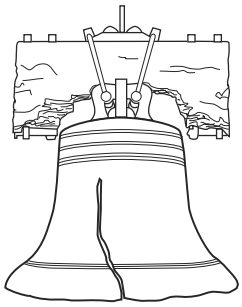
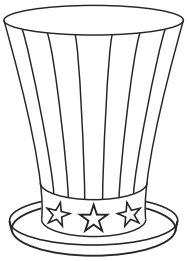
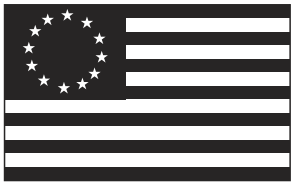
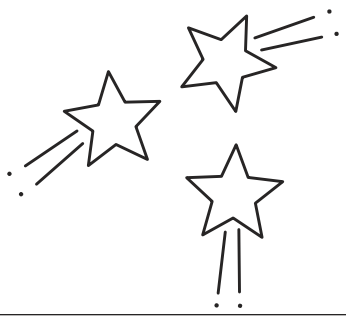
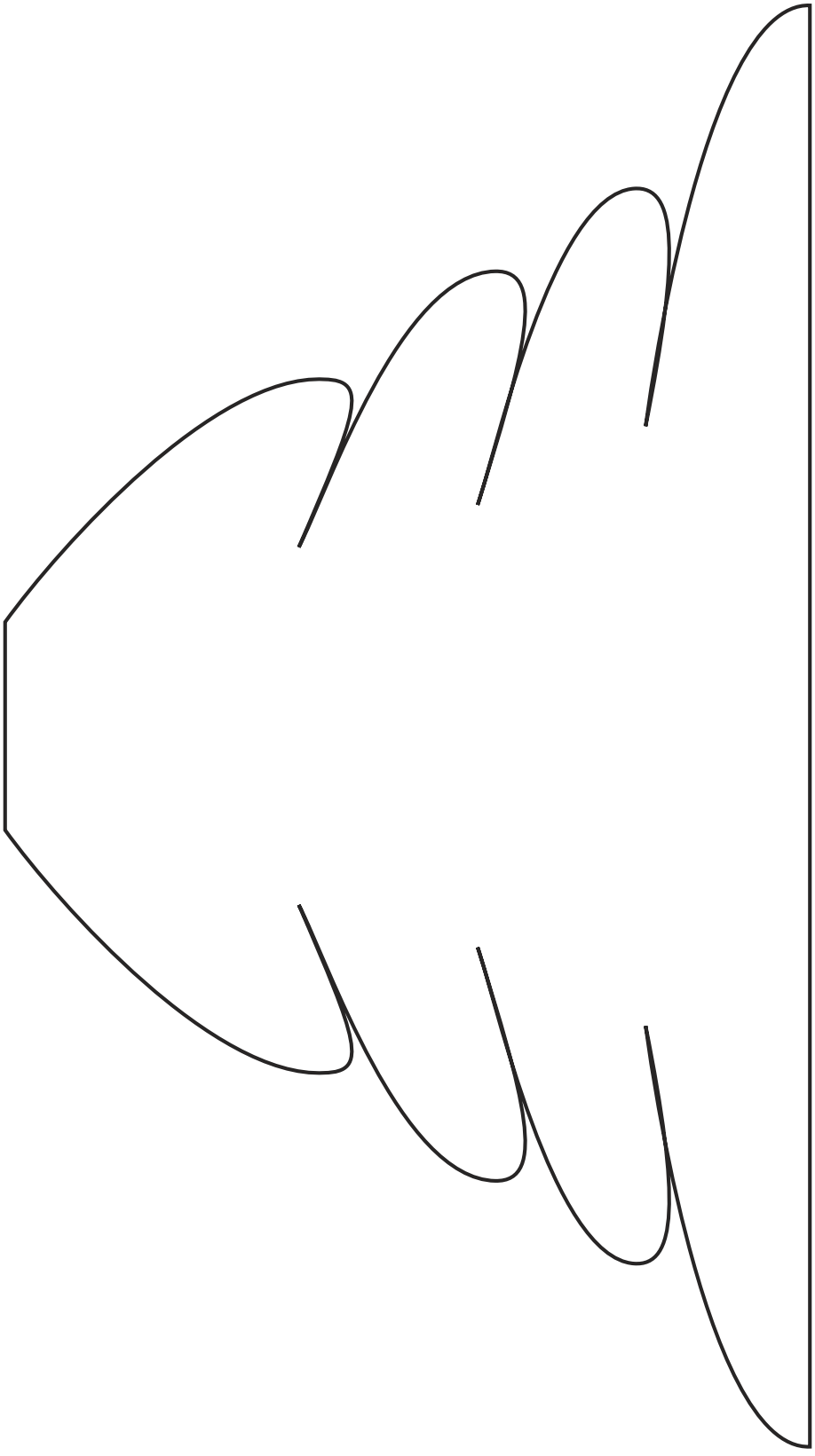
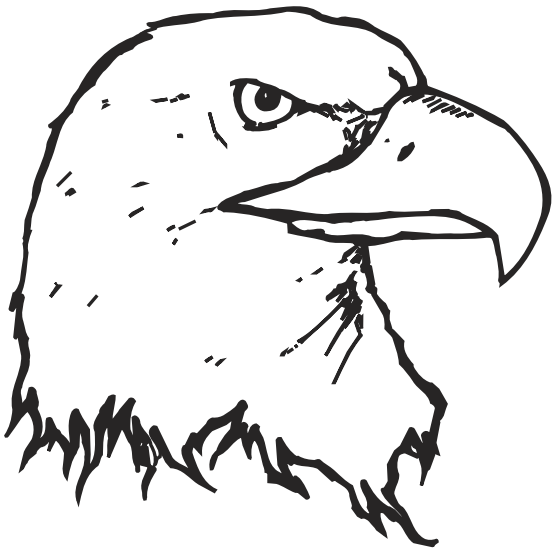
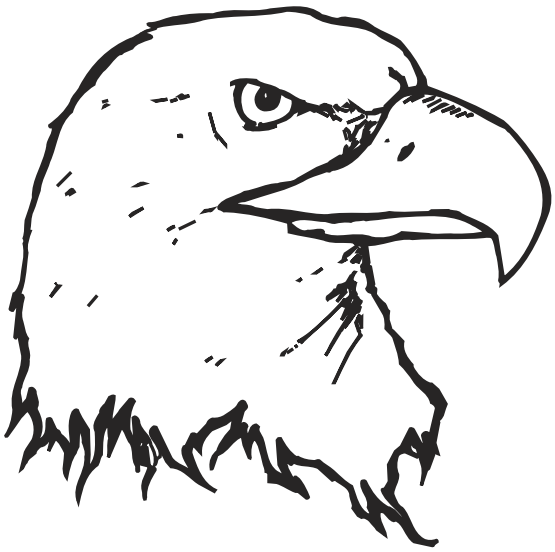
	50	
		1776
		

Bald Eagle Headdress Wings



Bald Eagle Headdress Head





Math I-3
Activities

Addition & Subtraction

Add A Quack, Quack Here

Standard I:
Students will understand simple number concepts and relationships.

Objective 3:
Model and illustrate meanings of the operations of addition and subtraction and describe how they relate.

Intended Learning Outcomes:
1. Demonstrate a positive learning attitude.
2. Understand and use basic concepts and skills.

Content Connections:
Language Arts I-1 (Oral Language); II-1 & 2 (Concepts of Print); VI-1 (Vocabulary); VIII-1, 5, & 6 (Writing); Math I-1 (Whole Numbers);

Math Standard I

Objective 3

Connections

Background Information

Children are always adding things together without even knowing it. Children are adding together dice as they play games that require dice. As teachers, we need to begin using the language of addition long before we begin teaching the symbols of addition. We can begin by using the language of addition throughout our school day. We can say things like "two snowy days plus three foggy days equals five days all together in January."

Students need practice joining sets of concrete objects and using mathematical language to communicate what they are doing. *Math Their Way* encourages teachers to teach numbers and their operations in three steps or levels. The first is the concept level. This is the level where children explore the numbers up to ten with real objects and situations without the use of numerals or mathematical symbols. They practice mathematical language to describe what they are doing. The second level is connecting. Students learn to put objects and numbers together to match equations written with the correct mathematical symbols. At the final level, symbolic, students learn to record their own equations using the correct mathematical symbols. The math centers the students will be learning in this activity will develop a sound basis in the concept level and provide experience and exposure to the connecting and symbolic levels of subtraction.

Important vocabulary terms to use and understand:

addend- "Any number being added. In 32+4=36, 32 and 4 are addends."

numeral- "A symbol used to represent a number."

Materials

- ❏ Unifix® cube trains of seven cubes for each student
- ❏ *Quack and Count*
- ❏ *Quack Addition* recording sheet for each student
- ❏ *Quack Addition* overhead

sum- "The answer to an addition problem. In 32+4=36, 36 is the sum."

Other important vocabulary terms that are helpful but not mandatory for Kindergarten students to know and understand: all together, equals, how many, in all, more, plus

Please note that this lesson and center ideas are designed for kindergarten students towards the end of the school year (about the last two or three months). Some students may be ready for formal lessons in addition at the symbolic level earlier in the year but most students will need a lot of practice at the concept level first. Many of the center activities for addition in this lesson can be adapted to fit the needs of the students in your class. Please make adaptations as needed for the ability level of your students.

Research Basis

Canobi, K. H., Reeve, R.A., & Pattison, P.E. (2002). Young children's understanding of addition concepts. *Educational Psychology*, 22 (5), Pages 513-532.

Young children, ages four to six, where studied to find out their understanding of additive composition ("larger sets are made up of smaller sets"), commutative (a+b=b+c) and associative properties (problems can be recombined in different ways ie: (a+b) +c= a+(b+c)) of addition. One group was given manipulatives to work through the addition problems while the other group was not. The study found that students who had the use of physical objects used the objects in the beginning to complete their addition problems. After using the manipulatives for a time, they started using other strategies to complete the addition problems without the use of the manipulatives.

National Association for the Education of Young Children and National Council for Teacher of Mathematics (2002). Early childhood mathematics: Promoting good beginnings. A joint position statement of the NAEYC and NCTM. Washington DC: Author.

The NAEYC and the NCTM came together and defined their positions on mathematics for children ages three to six. They state, "early childhood programs should furnish materials and sustained periods of time that allow children to learn mathematics through playful activities that encourage counting, measuring, ...playing board and card games..." (pg. 11) The groups also suggest that mathematics programs for young children "provide carefully planned experiences that focus children's attention on a particular mathematical idea or set of related ideas…in large and small group activities and learning centers."

Rillero, P. & Allison, J. (1997). Creative Childhood Experiences in Mathematics and Science: Projects, Activity Series and Centers for Early Childhood. ERIC Source (ED 411 145). Retrieved January 2, 2006, from http://www.eric.ed.gov

Rillero discusses the use of activity centers in early childhood classrooms. He defines activity centers as areas for children to investigate in a self-directed manner, with greater autonomy, which promotes learning. He suggests using a skills approach where certain mathematical or science skills are the focus of the center. He also encourages the use of mathematical manipulatives as a foundation for more abstract thinking in the activity centers.

Invitation to Learn

Give each student seven Unifix® cubes (the set of seven may be in a variety of colors) to explore and manipulate. Encourage students to combine them into groups in a variety of ways.

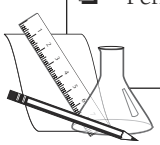
Instructional Procedures

1. Gather students together on the rug near a whiteboard leaving their Unifix® cubes at their desks.
2. Read the book *Quack and Count* to the class. Point out the addition problems throughout the story. A student in the class is more than likely going to point out that all the addition problems in the book have a sum of seven. Discuss with the class there are many ways to make seven and we are going to practice them today.
3. Have one student come up and break your Unifix® cube train of seven cubes into two pieces and say "Quack" when it breaks.
4. Have the student hide one hand behind his/her back and hold the other hand in front of him/her.
5. Have the class help you count the number of cubes in the student's hand. Write this numeral on the board as the first addend.
6. Have the student show the cubes behind their back and count them together as a class. Write this numeral on the board as the second addend below the first numeral/addend.
7. Introduce the numerals on the board as ways to represent the physical Unifix® cubes.
8. Walk the students through the concept, connecting, and symbolic levels of addition.

9. Have the class read the addition problem out loud with you (ex. "Two plus five equals seven").
10. Explain to the class the process of addition. In addition we combine sets of objects together to find out how many we have all together. Explain how we use addition to solve real life problems (e.g. adding coins together to buy a candy bar, adding number of boys and girls in class, adding number of plates needed for dinner, etc.).
11. As a class, brainstorm a list of ideas of things we combine or add together.
12. Continue playing "Quack" several more times, giving several students an opportunity to come up and help.
13. After modeling this procedure several times, introduce the class to the *Quack Addition* recording sheet on an overhead. Demonstrate how to record their answers on their paper.
14. Allow students to return to the desks and their Unifix® cubes and play "Quack" on their own and record their addition problems on the paper.
15. When students have completed the Quack Addition recording sheet, they may choose a math center focusing on addition.

Materials

- ❑ *Adding Beads Addition Cards*
- ❑ Pony beads (several different colors)
- ❑ Crayons
- ❑ *Adding Beads* recording sheet
- ❑ *Adding Beads Center Instructions*
- ❑ Pencils



Center #1 Adding Beads

1. Students will choose an *Adding Beads Addition Card.*
2. They will string one color of pony beads on their card for the first addend.
3. They will string another color of beads for the second addend.
4. Students will slide the string through the slit on their card to lock the beads in place.
5. Students will draw beads on their *Adding Beads* recording sheet using the same color of crayon as their actual beads.
6. Students will write their addition equation on their *Adding Beads* recording sheet.
7. Students will add the beads together and record the sum on their paper.
8. Students will choose another addition card and continue the activity.

*Teacher Preparation: Copy *Adding Beads Addition Cards* on cardstock. Cut cards apart and laminate. Punch a hole in the

upper left hand corner of the card. Tie a string or yarn about 6-7 inches long to the card. Cut a slit about ½ inch deep about an inch from the top right corner where students can lock their beads in place.

Center #2 My Book of 8

Materials

- ❑ Red/yellow counters
- ❑ Small paper cups
- ❑ Red, yellow and orange crayons
- ❑ My Book of 8 book cover
- ❑ My Book of 8 pages
- ❑ My Book of 8 Center Instructions

1. Students will take eight red/yellow counters and shake them in a paper cup.
2. They will spill the counters on the table.
3. First they will use a red crayon and color in the number of counters red side up on their book page.
4. Using the red crayon, they will record this numeral on the first addend line of the addition equation.
5. Then they will use a yellow crayon and color in the number of counters yellow side up.
6. Then they will write this numeral in yellow on the second addend line.
7. They will count all the counters and record the sum in orange.
8. Students will continue the activity by shaking their counters again and recording their equations.

*Teacher Preparation: Copy *My Book of 8 Book* Covers on cardstock or regular paper for your class. Copy *My Book of 8* pages, making enough copies for 8-10 pages per student. Cut book covers and pages in half. To assemble book, place one book cover on top of 8-10 book pages and staple.

Center #3 Number Tile Addition

Materials

- ❑ Number tiles
- ❑ *Number Tile Addition cards*
- ❑ *Number Tiles recording sheet*
- ❑ *Number Tiles Center Instructions*
- ❑ Pencils

1. Students will choose a *Number Tile addition card.*
2. They will count the number of objects on the card for the first addend.
3. They will find the corresponding numeral tile and place it in the box.
4. They will count the number of objects for the second addend and place the correct numeral tile in the box.
5. Students will count the sum and place the correct numeral tile in the box.
6. Students will record their equation on their *Number Tile Addition* recording sheet.

7. Students will continue the activity by choosing a new addition card.

*Teacher Preparation: Copy *Number Tile Addition Cards* on cardstock. Cut cards apart and laminate.

Materials

- ❑ Dice (different colors)
- ❑ Crayons
- ❑ *Dice Addition Graph* recording sheet
- ❑ *Dice Addition Graph Center Instructions*
- ❑ Pencils

Center #4 Dice Addition Graph

1. Students will choose two dice of different colors and choose the corresponding colors of crayons.
2. They will shake the dice.
3. Students will color in the first column of the *Dice Addition Graph* for the number of dots on one die using the matching color of crayon.
4. Students will write the total number of boxes colored for the first addend.
5. They will color in the graph for the number of dots on the second die with the matching color of crayon.
6. Students will write the total number of boxes colored for the second addend.
7. The students will record the sum rolled at the end of their addition equation.
8. Students will continue the activity by rolling the dice again and recording a new equation.

Materials

- ❑ *Addition Concentration Cards*
- ❑ *Addition Concentration* Center Instructions
- ❑ Paper
- ❑ Crayons
- ❑ Pencils

Center #5 Addition Concentration

1. Students will lay all the cards face down on the floor or table.
2. The first student will draw two cards. If the equation and the answer match, the student keeps the cards and draws again. If the equation and the answer do not match, the student returns the cards, face down on the floor or table and it is the next students turn.
3. Students continue taking turns until all of the equation and answer cards have been matched together.
4. Students can then choose one or two of their equation cards and draw pictures to represent the equation.
5. Students can record the equation below their drawing.

*Teacher Preparation: Copy *Addition Concentration* cards on cardstock. Laminate and cut apart.

Assessment Suggestions

- *Math Center Observation Sheet* can be used to record a student's thought processes, accuracy, and/or areas of difficulty as they complete the addition problems. The following questions or statement starters can be used to assess students learning:
  1. What are you doing?
  2. How did you do that?
  3. What would happen if…?
  4. Can you do it another way?
  5. What are you thinking?
  6. Does that make sense to you? Why?
  7. Do you think this will happen every time? Why?
  8. Tell me more about….
  9. Why do you think that will work?
  10. I wonder ….
- Student's recording sheets can be collected for assessment and placed in a portfolio.
- Observe students and listen to the interaction and conversation they are having during Math Centers.

Curriculum Extensions/Adaptations/ Integration

- Additional cards can be made for advanced learners by using sums larger than 10.
- Teachers can make a special activity tub for children who are struggling by placing only facts up to five in their center materials.
- Teachers can use manipulatives in math centers that correlate with their current topics or themes.
- Make a "Quack and Count" class book by having students make up equations using a specific number of ducks. A class book could be made by using another animal (e.g. "Moo and Count" or "Hiss and Count").
- Adding Beads can be adapted for a subtraction center. The Subtraction Beads materials are on the Core Academy website at http://coreacademy.usu.edu/ under Materials 2006.

Family Connections

- Prepare a Take Home Backpack, which includes addition activities for students to share with their families. You could include books on addition, addition flash cards, and addition games.
- The Addition Homework (included) assignment can be sent home for the students to complete and return.

Additional Resources

Books

A Collection for Kate, by Barbara Derubertis; ISBN 1575650894

Adding Animals, by J. Y. Morton; ISBN 1567849512

Animals on Board, by Stuart J. Murphy; ISBN 0439365716

Centered on Success Grade K, by the Mailbox; TEC 60819

Domino Addition, by Lynette Long; ISBN 0881068772

File Folder Centers Math Grs. K-1, by The Mailbox; TEC60923

Fish Eyes, by Lois Ehlert; ISBN 0152280510

Hands-On Math: K-1, by Virginia Johnson (Edited by Janet Bruno); ISBN 3055402600 (CTP 2600)

The Hershey's Kisses Addition Book, by Jerry Pallota; ISBN 0439241731

I Can Add, by Ray Gibson; ISBN 1580861644

Instant Math Centers: K-1, by Creative Teaching Press; ISBN 1574716891 (CTP 2597)

Jack the Builder, by Stuart J. Murphy; ISBN 0060557753

Learning Center Collection Math Grade K, by The Mailbox; TEC 60863

Little Number Stories Addition, by Rozanne Lanczak Williams; ISBN 1574710079

The M&M's Addition Book, by Barbara Barbieri McGrath; ISBN 0881063495

Mathematics Their Way, by Mary Baratta-Lorton; ISBN 020186150X

Mathematics Their Way Summary Newsletter, by Cynthia Garland; ISBN 0201861542 (Available free online at http://www.center.edu/NEWSLETTER/newsletter.shtml)

Math: Make It Your Way, by Keri King, and Kari Sickman (Edited by Teri L. Fisch; ISBN 1574718991 (CTP 2576)

Math Mats and More, by The Mailbox; TEC 284

Math Tub Topics: K-2, by Creative Teaching Press; ISBN 1574719548 (CTP 2812)

Mission: Addition, by Loreen Leedy; ISBN 0823414124

Shoe Box Learning Centers: Addition & Subtraction: 30 Instant Centers, by Jacqueline Clark; ISBN 0439537940

Take it to Your Seat Math Centers K-1, by Jill Norris; ISBN 1557999317

20 Instant Math Learning Centers Kids Will Love!, by Traci Ferguson Geiser and Krista Pettit; ISBN 0439227291 (Scholastic)

Quack and Count, by Keith Baker; ISBN 0152050256

Ten Black Dots, by Donald Crews; ISBN 0688135749

Workjobs, by Mary Baratta-Lorton; ISBN 0201043114

Articles

The Building Blocks of Math, by Marilyn Burns; ***Instructor***, October/November 2005, 42-43.

Web sites

http://illuminations.nctm.org/

http://theschoolbell.com/Links/math/number_families/main/index.html

http://www.littlegiraffes.com/mathadditionsubtraction.html

http://www.thevirtualvine.com/math.html

http://www.mrspohlmeyerskinderpage.com/mathsense.html

http://wwwd.mathsolutions.com

Organizations

National Association for the Education of Young Children, 1509 16th St. N.W., Washington, DC 20036 (202) 232-8777 or (800) 424-2460, http://naeyc.org

National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-1502 (703) 620-9840, http://www.nctm.org

Name_____

"Quack" Addition

___ + ___ = _____	___ + ___ = _____
___ + ___ = _____	___ + ___ = _____
___ + ___ = _____	___ + ___ = _____
___ + ___ = _____	___ + ___ = _____
___ + ___ = _____	___ + ___ = _____

Name_____

"Quack" Addition

___ + ___ = _____ ___ + ___ = _____
___ + ___ = _____ ___ + ___ = _____
___ + ___ = _____ ___ + ___ = _____
___ + ___ = _____ ___ + ___ = _____
___ + ___ = _____ ___ + ___ = _____

Addition Cards

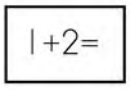
0+0=	0+1=
0+2=	0+3=

Name _____

Adding Beads

_____ __ + __ = ____	_____ __ + __ = ____
_____ __ + __ = ____	_____ __ + __ = ____
_____ __ + __ = ____	_____ __ + __ = ____
_____ __ + __ = ____	_____ __ + __ = ____
_____ __ + __ = ____	_____ __ + __ = ____

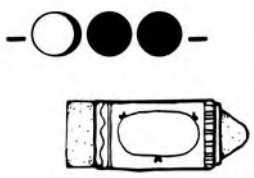
Adding Beads



1. Choose an addition card.

2. Choose one color of bead and string enough for the 1st number.

3. Choose another color of bead and string enough for the 2nd number.

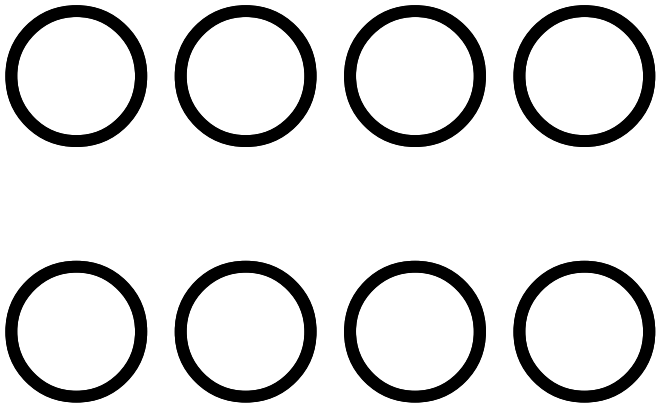


4. Draw the beads on your "Adding Beads" sheet.

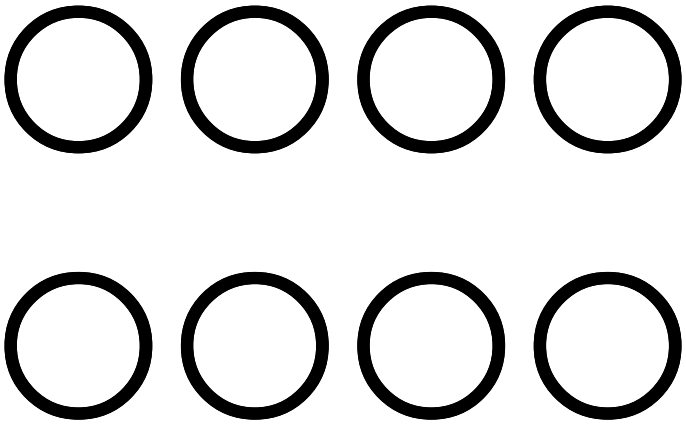
5. Add the beads together.

6. Write the addition problem.

My Book of 8



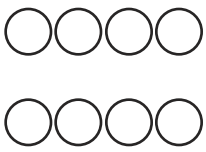
by _____



_____ + _____ = _____

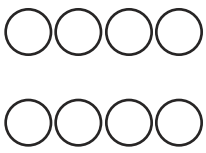
My Book of 8

1. Shake counters and spill on table.



2. Color the number of **red** counters face up.

3. Write the number of **red** counters in your book.

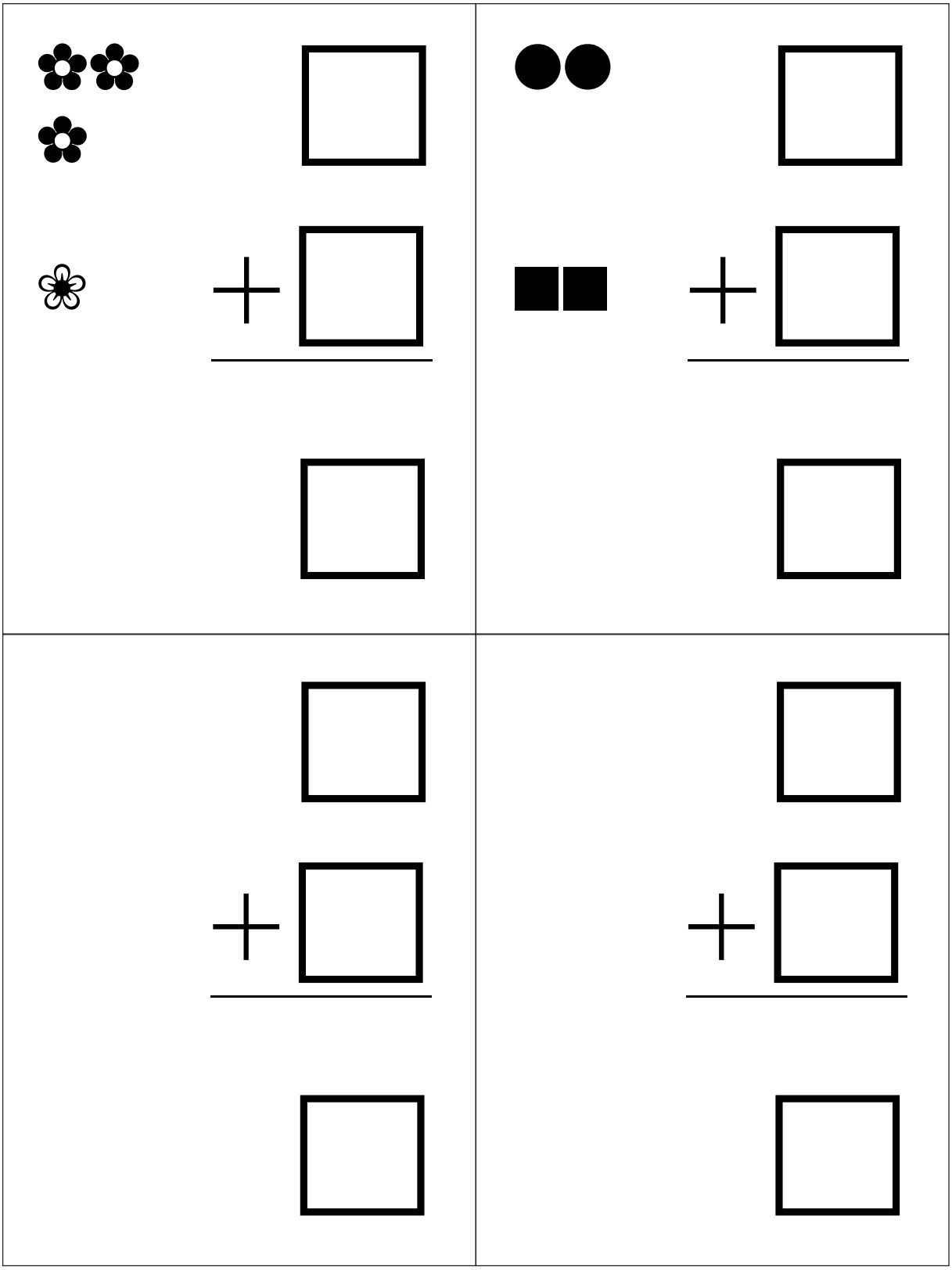


4. Color the number of **yellow** counters face up.

5. Write the number of **yellow** counters.

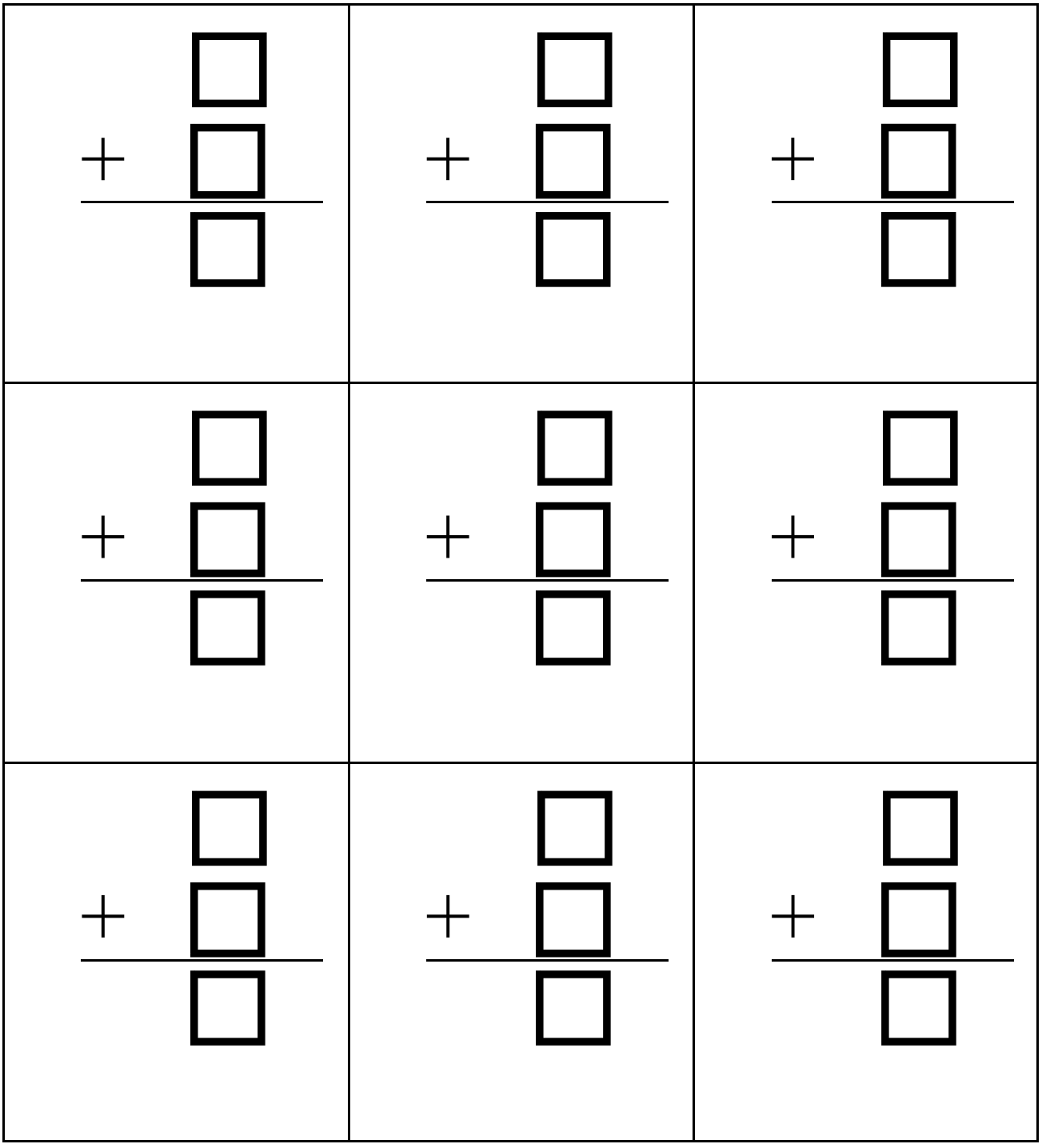
6. Record total number of counters in **orange**.

Number Tile Addition Cards

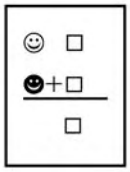


Name _____

Number Tile Addition



Number Tile Addition

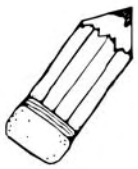


1. Choose an addition card.

2. Count the 1st set of objects and find the correct number tile and place it in the box.

3. Count the 2nd set of objects and find the correct number tile and place it in the box.

4. Count the total number of objects and put the correct number tile in the box.



5. Write your equation on your paper.

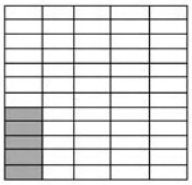
Name_____

Dice Addition Graph

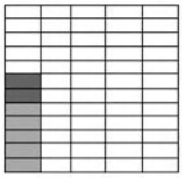
_____ + _____ = _____	_____ + _____ = _____	_____ + _____ = _____	_____ + _____ = _____	_____ + _____ = _____

Dice Addition Graph

1. Roll two dice of different colors

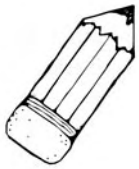


2. Color in graph fo the number of 1st die.



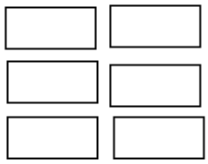
3. Color in graph for the number of 2nd die.

5+2=7

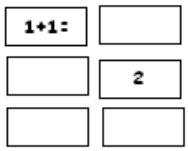


4. Record equation below the graph.

Addition Concentration

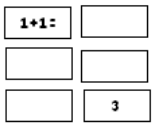


1. Lay addition cards and answers out face down.

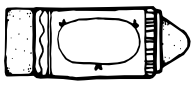


2. Choose two cards.

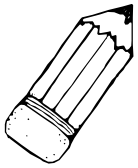
3. If they go together, go again.



4. If they do not go together, turn over and it is your friend's turn.



5. Draw a picture for one or two of your addition cards.



6. Write your equation

_____'s Math Center Observation Sheet

Math Standard: _____

Objective: _____

Dates: _____

(Student's name)			

Center #1 _____ **Center #2** _____

Center #3 _____ **Center #4** _____

Center #5 _____ **Center #6** _____

Center #7 _____ **Center #8** _____

Name _____

ADDITION HOMEWORK

Assignment: Please have your child complete one or more of the following problems and return to school by _____:

1. Set the table for dinner. Draw of picture of the plates and cups on the table. Add them together. How many do you have in all? Write your equation on your paper.
2. Go on a scavenger hunt and find all the telephones in your house. Draw a picture of each one. Now look for all the telephone books you have at home and draw a picture of them. Add the number of telephones to the number of telephone books in your home. Record your equation on your paper.
3. Draw a picture of all of your pets. Write an equation that shows how many pets you have all together.
4. Draw a picture of all the boys in your family. Draw a picture of all the girls in your family (don't forget your parents). Write an equation for the total number of people in your family.
5. Draw a picture of all the cars and trucks you have at your house. Write an equation to show the total number of vehicles at your house.

Sensational Subtraction Centers

Math Standard I

Objective 3

Standard I:
Students will understand simple number concepts and relationships.

Objective 3:
Model and illustrate meanings of the operations of addition and subtraction and describe how they relate.

Intended Learning Outcomes:
1. Demonstrate a positive learning attitude.
2. Understand and use basic concepts and skills.

Content Connections:
Language Arts I-1 (Oral Language); II-1 & 2 (Concepts of Print); VI-1 (Vocabulary); VIII-1, 5, & 6 (Writing); Math I-1 (Whole Numbers);

Connections

Background Information

Subtracting, like adding, is a task children are always doing without even knowing it. As teachers, we need to begin using the language of subtraction long before we begin teaching the symbols of subtraction. We can begin by using the language of subtraction throughout our school day. We can say things like "20 total students minus 3 absent students equals 17 total students at school today."

Students need practice taking sets of concrete objects apart and using mathematical language to communicate what they are doing. *Math Their Way* encourages teachers to teach numbers and their operations in three steps or levels. The first is the Concept level. This is the level where children explore the numbers up to ten with real objects and situations without the use of numerals or mathematical symbols. They practice mathematical language to describe what they are doing. The second level is connecting. Students learn to put objects and numbers together to match equations written with the correct mathematical symbols. At the final level, Symbolic, students learn to record their own equations using the correct mathematical symbols. The math centers the students will be learning in this activity will develop a sound basis in the concept level and provide experience and exposure to the connecting and symbolic levels of subtraction.

Important vocabulary terms to use and understand:

difference- "The amount that remains after one quantity is subtracted from another."

numeral- "A symbol used to represent a number." (K-2 Integrated Core, 121)

Materials

- ❑ *Elevator Magic*
- ❑ Masking tape
- ❑ *Smiley Face, Heart* and *Star* pictures
- ❑ Overhead projector
- ❑ *Subtraction* Math Mat overhead
- ❑ Overhead manipulatives
- ❑ *Subtraction Sentences* overhead
- ❑ Vis-à-vis marker
- ❑ *Subtraction Math Mat* for each student
- ❑ *Subtraction Sentence* sheet for each student
- ❑ 10 manipulatives for each student

Other key words to know and understand:

Equals, left, take away, remain, minus, separate

Please note that this lesson and center ideas are designed for kindergarten students towards the end of the school year (about the last two or three months). Some students may be ready for formal lessons in subtraction at the symbolic level earlier in the year but most students will need a lot of practice at the concept level first. Many of the center activities for subtraction in this lesson can be adapted to fit the needs of the students in your class. Please make adaptations as needed for the ability level of your students.

Research Basis

National Association for the Education of Young Children and National Council for Teacher of Mathematics (2002). Early childhood mathematics: Promoting good beginnings. A joint position statement of the NAEYC and NCTM. Washington DC: Author.

The NAEYC and the NCTM came together and defined their positions on mathematics for children ages three to six. They state, "early childhood programs should furnish materials and sustained periods of time that allow children to learn mathematics through playful activities that encourage counting, measuring, playing board and card games." (pg. 11) The groups also suggest that mathematics programs for young children "provide carefully planned experiences that focus children's attention on a particular mathematical idea or set of related ideas…in large and small group activities and learning centers."

Rillero, P. & Allison, J. (1997). Creative childhood experiences in mathematics and science: Projects, activity series and centers for early childhood. *ERIC Source* (ED 411 145). Retrieved January 2, 2006, from http://www.eric.ed.gov

Rillero discusses the use of activity centers in early childhood classrooms. He defines activity centers as areas for children to investigate in a self-directed manner, with greater autonomy, which promote learning. He suggests using a skills approach where certain mathematical or science skills are the focus of the center. He also encourages the use of mathematical manipulatives as a foundation for more abstract thinking in the activity centers.

Invitation to Learn

Who has ever ridden on an elevator? Where were you when you rode in the elevator? How many of you have pushed the buttons in the elevator? Today we are going to read a story about a boy named Ben who is riding an elevator with his mother. Ben gets to push the buttons

as they stop on several floors on their way down. Read *Elevator Magic* to the class. While reading, emphasize the subtraction problems in the book. Have the class figure out one or two of the problems with you.

Instructional Procedures

1. Using masking tape, make a large *Subtraction Math Mat* on the floor (large enough for several students to stand inside each box.) Tape the *Smiley Face, Heart* and *Star* icons in the corresponding boxes. (See *Subtraction Math Mat* for a template to make the floor model.)
2. Tell the class they we are going to practice subtraction. Have the class sit where they are able see the large *Subtraction Math Mat* taped on the floor. Introduce the class to the *Subtraction Math Mat* by showing them the box with the smiley face. Explain this is where we will put the total number of manipulatives we are starting with. Point to the box with the heart and explain that the number of objects taken away will be moved here. In the final box with the star, we will move the remaining manipulatives to find the difference or how many remain for our answer.
3. Demonstrate with the following story problem how to use the *Subtraction Math Mat*.

   Five children were playing basketball at recess (Place five children in the smiley box). Two children left to go down the slide (Move two of the five children down in the heart box). How many children are left playing basketball (Move the remaining three children down into the star box)?
4. Write the subtraction sentence on the white board where everyone can see.
5. Make up several scenarios for the students to act out on the large *Subtraction Math Mat*.
6. Have the class sit where they are able see the overhead projector. Demonstrate how to use the *Subtraction Math Mat* with several other examples using the overhead projector and overhead manipulatives.
7. Have one student choose a number between 1-10. Place that number of manipulatives in the smiley face box. Have another student choose a number lower than the number in the smiley box and move the manipulatives to the heart box. Move the remaining manipulatives into the star box.

8. Introduce the class to the *Subtraction Sentences* sheet. Show the class how to record the numerals for the subtraction problems on their sheets.
9. Handout a *Subtraction Math Mat*, 10 manipulatives (choose the number of manipulatives for your class depending on their abilities with subtraction) and a Subtraction Sentences sheet to each student. As a class do three or four subtraction problems together with the teacher demonstrating on the overhead. After doing several together, allow the class to finish filling out the *Subtraction Sentences* sheet by choosing a number between 1-10 and then a lower number than previously chosen.
10. When students have completed the *Subtraction Sentences* sheet, they may choose a math center focusing on subtraction.

Center #1 Bingo Marker Subtraction

Materials

- ❑ Bingo markers
- ❑ *Bingo Marker Subtraction Cards*
- ❑ *Bingo Marker Subtraction* recording sheets
- ❑ Stapler
- ❑ *Bingo Marker Subtraction Center Instructions*
- ❑ Pencils

1. Students will choose a subtraction card from the box.
2. Using a Bingo Marker, students will dot the total number of circles on the *Bingo Marker Subtraction* recording sheet.
3. Students will then write the total number of dots on the subtraction sentence on their recording sheet.
4. Students will cross out the number of dots that are taken away.
5. Students will write the number on the number sentence.
6. Students will count and write the total number of dots left on their recording sheet.
7. Students will return the subtraction card to the box, choose another subtraction card and continue the activity.
8. At the end of Math Centers, students can staple all their *Bingo Marker Subtraction* recording sheets together to make a subtraction booklet.

Center #2 Macaroni Subtraction

Materials

- ❑ Dyed salad macaroni
- ❑ Pipe cleaners
- ❑ Dice
- ❑ *Macaroni Subtraction* recording sheet
- ❑ *Macaroni Subtraction Center Instructions*
- ❑ Crayons
- ❑ Pencils

1. Students will roll two dice.
2. Students will lace macaroni noodles on a pipe cleaner for the largest number.
3. Students will record the total number of macaroni noodles on their pipe cleaner on their *Macaroni Subtraction* recording sheet.
4. They will draw the macaroni noodles on their *Macaroni Subtraction* recording sheet.

5. Students will subtract the lower number on the dice of macaroni noodles from the pipe cleaner.
6. Students will record how many macaroni noodles they took away.
7. Students will cross out the correct number of macaroni noodles on their drawing.
8. Students will count the macaroni noodles to determine how many are left and record it on their *Macaroni Subtraction* sheet.
9. Students will continue rolling the dice and recording their subtraction problems until Math Centers are over.

Center #3 Golf Tee Subtraction

Materials

- ❑ *Golf Tee Subtraction cards*
- ❑ Golf tees
- ❑ *Golf Tee Subtraction* recording sheet
- ❑ *Golf Tee Subtraction Center Instructions*
- ❑ Pencils

1. Students will choose a *Golf Tee Subtraction* card.
2. They will place golf tees in the holes of the card for the first number, placing their tees from left to right.
3. They will take golf tees out of the holes for the number that are taken away, making sure all the golf tees remaining are placed in each hole from left to right.
4. Students will turn the card over to check their answer on the back of the card.
5. They are correct if the holes with golf tees in them are colored on the back.
6. Students will record their subtraction problem on their *Subtracting Golf Tees* recording sheet.
7. Students will continue the activity by choosing a new subtraction card.

*Teacher Preparation: Copy *Golf Tee Subtraction Cards* onto cardstock (choose a darker color like green, blue, red, etc.). Cut cards apart. Using a paper punch, punch out all the black circles on each card. Color several Hole Reinforcements with a marker a color that can be easily seen on your cardstock. Leave several Hole Reinforcements white. On the back of each Golf Tee Subtraction Card, place a colored reinforcement for the solution to the subtraction problem (starting with the hole on the right hand side of the card). Place a white reinforcer on the remaining holes. For example, if the problem is 4-2=, you will place two colored reinforcers on the last two holes on the right. The first 8 holes will have a white reinforcer on them. Laminate and cut out your cards. You will need to punch your holes again after laminating your cards.

Center #4 Subtraction Stamp Book

1. Students will begin by stamping 10 objects on one page of their *Subtraction Stamp Book*.
2. Students will record the total number of stamps on their subtraction sentence.
3. Students will choose a number card from the box (numbers 0-10).
4. They will cross out this number of objects on the book page.
5. Students will record how many were taken away and write how many objects are left.
6. Students will continue this activity until their booklets are filled.

*Teacher Preparation: Copy *Subtraction Stamp Book Covers* on cardstock or regular paper for your class. Copy Subtraction Stamp Book pages, making enough copies for 8-10 pages per student. Cut book covers and pages in half. To assemble book, place one book cover on top of 8-10 book pages and staple.

Materials

- ❑ *Subtraction Stamp Book pages*
- ❑ *Subtraction Stamp Book Cover*
- ❑ Various stamps
- ❑ Stamp pads
- ❑ Number stamps
- ❑ *Subtraction Stamp Book Number Cards 0-9*
- ❑ *Subtraction Stamp Book Center instructions*
- ❑ Pencils

Center #5 Domino Subtraction

1. Students will choose a domino.
2. Students will duplicate the dots on their domino onto their *Domino Subtraction* recording sheet.
3. They will count the total number of dots on their domino.
4. Students will write the total number of dots in the subtraction sentence.
5. Students will cross out the dots in the bottom section of their domino.
6. They will write how many dots were crossed out in the subtraction sentence.
7. Students will count the remaining dots and write that number in the subtraction sentence.
8. Students will continue this activity by choosing another domino.

Materials

- ❑ Dominos
- ❑ *Domino Subtraction* recording sheet
- ❑ *Domino Subtraction Center Instructions*
- ❑ Pencils

Assessment Suggestions

- *Math Center Observation Sheet* can be used to record a student's thought processes, accuracy, and/or areas of difficulty as they

complete the subtraction problems. The following questions or statement starters can be used to assess students learning:

1. What are you doing?
2. How did you do that?
3. What would happen if…?
4. Can you do it another way?
5. What are you thinking?
6. Does that make sense to you? Why?
7. Do you think this will happen every time? Why?
8. Tell me more about….
9. Why do you think that will work?
10. I wonder ….

- Student's recording sheets can be collected for assessment and placed in a portfolio.
- Observe students and listen to the interaction and conversation they are having during Math Centers.

Curriculum Extensions/Adaptations/ Integration

- Additional cards can be made for advanced learners by using subtraction problems larger than 10.
- Teachers can make a special activity tub for children who are struggling by placing only facts up to five in their center materials.
- Teachers can add thematic manipulatives to the math centers to correlate with their current theme.
- Several of the subtraction centers can be adapted into addition center. The Bingo Marker Addition and Golf Tee Addition materials are on the Core Academy website at http://coreacademy.usu.edu/ under *Materials 2006*.

Family Connections

- The Subtraction Homework (included) assignment can be sent home for the students to complete and return.
- Prepare a Take Home Backpack, which includes subtraction activities for students to share with their families.

Additional Resources

Books

Centered on Success Grade K, by the Mailbox; TEC 60819

Elevator Magic, by Stuart J. Murphy; ISBN 0590512358

File Folder Centers Math Grs. K-1, by The Mailbox; TEC60923

Five Little Ducks, by Raffi; ISBN 0517583607

Five Little Monkeys Jumping on the Bed, by Eileen Christelow; ISBN 0395557011

Hands-On Math: K-1, by Virginia Johnson (Edited by Janet Bruno); ISBN 3055402600 (CTP 2600)

Have You Seen My Ducklings?, By Nancy Tafuri; ISBN 0688109942

The Hershey's Kisses Subtraction Book, by Jerry Pallota; ISBN 0439337798

Instant Math Centers: K-1, by Creative Teaching Press; ISBN 1574716891 (CTP 2597)

Lights Out!, by Lucille Recht Penner; ISBN 1575650924

Little Number Stories Subtraction, by Rozanne Lanczak Williams; ISBN 1574710087

The M&M's Subtraction Book, by Barbara Barbieri McGrath; ISBN 1570913595

Mathematics Their Way, by Mary Baratta-Lorton; ISBN 020186150X

Mathematics Their Way Summary Newsletter, by Cynthia Garland; ISBN 0201861542 (Available free online at http://ww.center.edu/NEWSLETTER/newsletter.shtml)

Math: Make It Your Way, by Keri King, and Kari Sickman (Edited by Teri L. Fisch; ISBN 1574718991 (CTP 2576)

Math Mats and More, by The Mailbox; TEC 284

Math Tub Topics: K-2, by Creative Teaching Press; ISBN 1574719548 (CTP 2812)

Monster Musical Chairs, by Stuart J. Murphy; ISBN 0064467309

Rooster's Off to See the World, by Eric Carle; ISBN 0689826842

Shark Swimathon, by Stuart J. Murphy; ISBN 006446735X

Shoe Box Learning Centers: Addition & Subtraction: 30 Instant Centers, by Jacqueline Clark; ISBN 0439537940

Subtraction Action, by Loreen Leedy; ISBN 0823417646

Take it to Your Seat Math Centers K-1, by Jill Norris; ISBN 1557999317

Ten Little Ladybugs, by Melanie Gerth; ISBN 1581170912

20 Instant Math Learning Centers Kids Will Love!, by Traci Ferguson Geiser and Krista Pettit; ISBN 0439227291 (Scholastic)

Workjobs, by Mary Baratta-Lorton; ISBN 0201043114

Web sites

http://illuminations.nctm.org/

http://theschoolbell.com/Links/math/number_families/main/index.html

http://www.littlegiraffes.com/mathadditionsubtraction.html

http://www.thevirtualvine.com/math.html

http://www.mrspohlmeyerskinderpage.com/mathsense.html

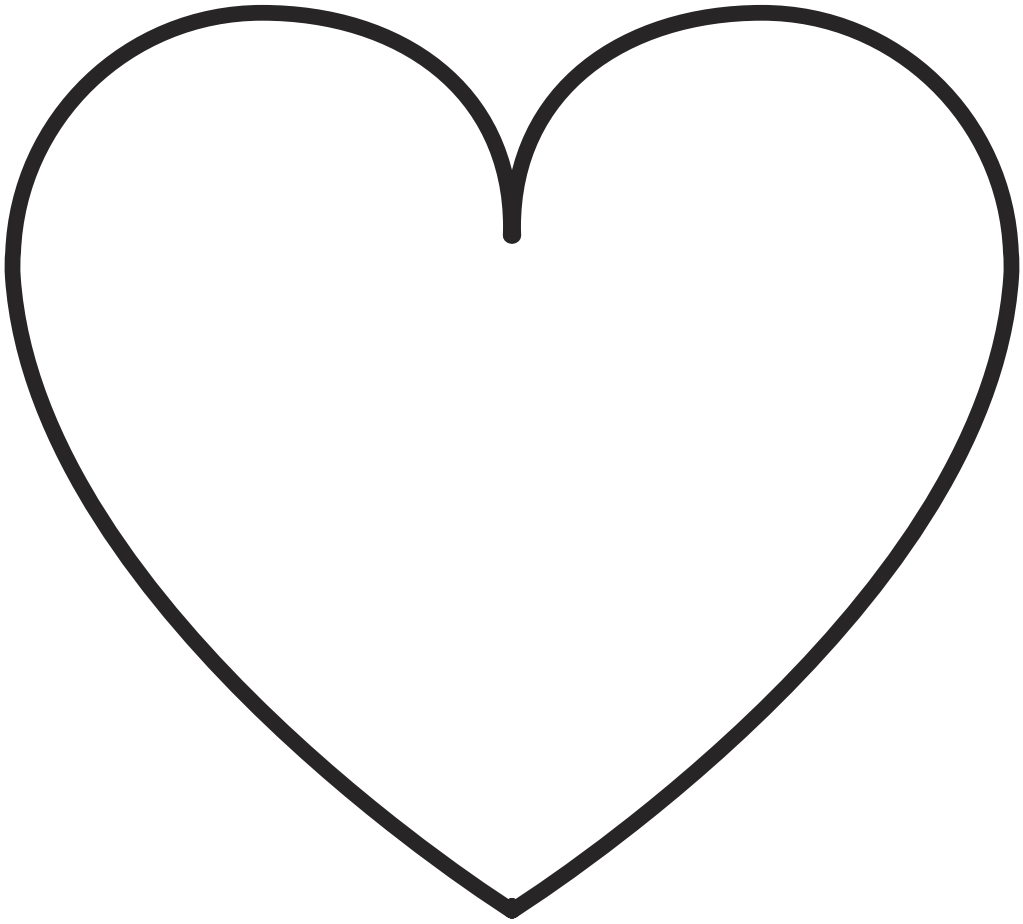
Organizations

National Association for the Education of Young Children,1509 16th St. N.W., Washington, DC 20036 (202) 232-8777 or (800) 424-2460, http://naeyc.org

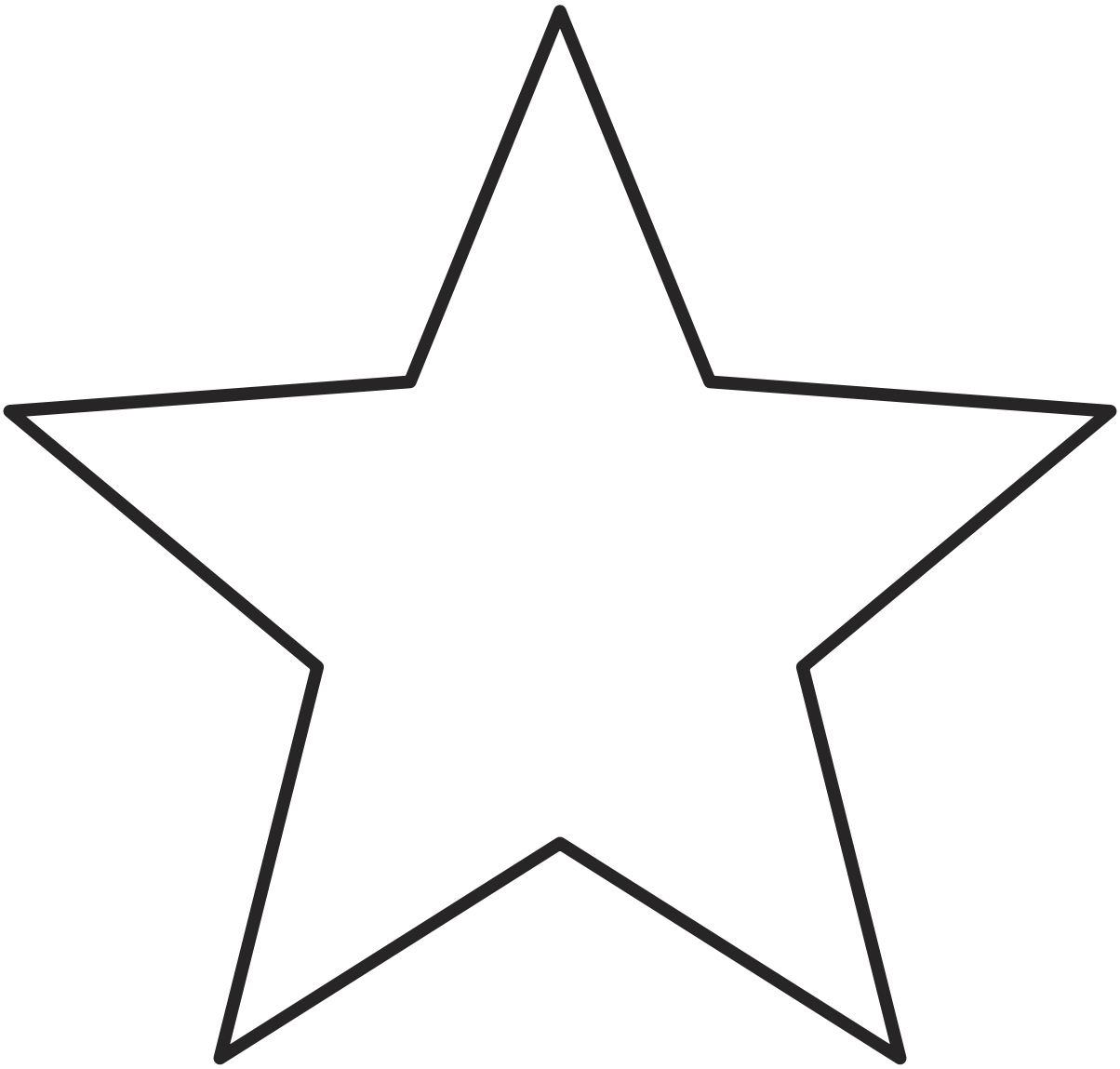
National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-1502 (703) 620-9840, http://ww.nctm.org

Smiley Face

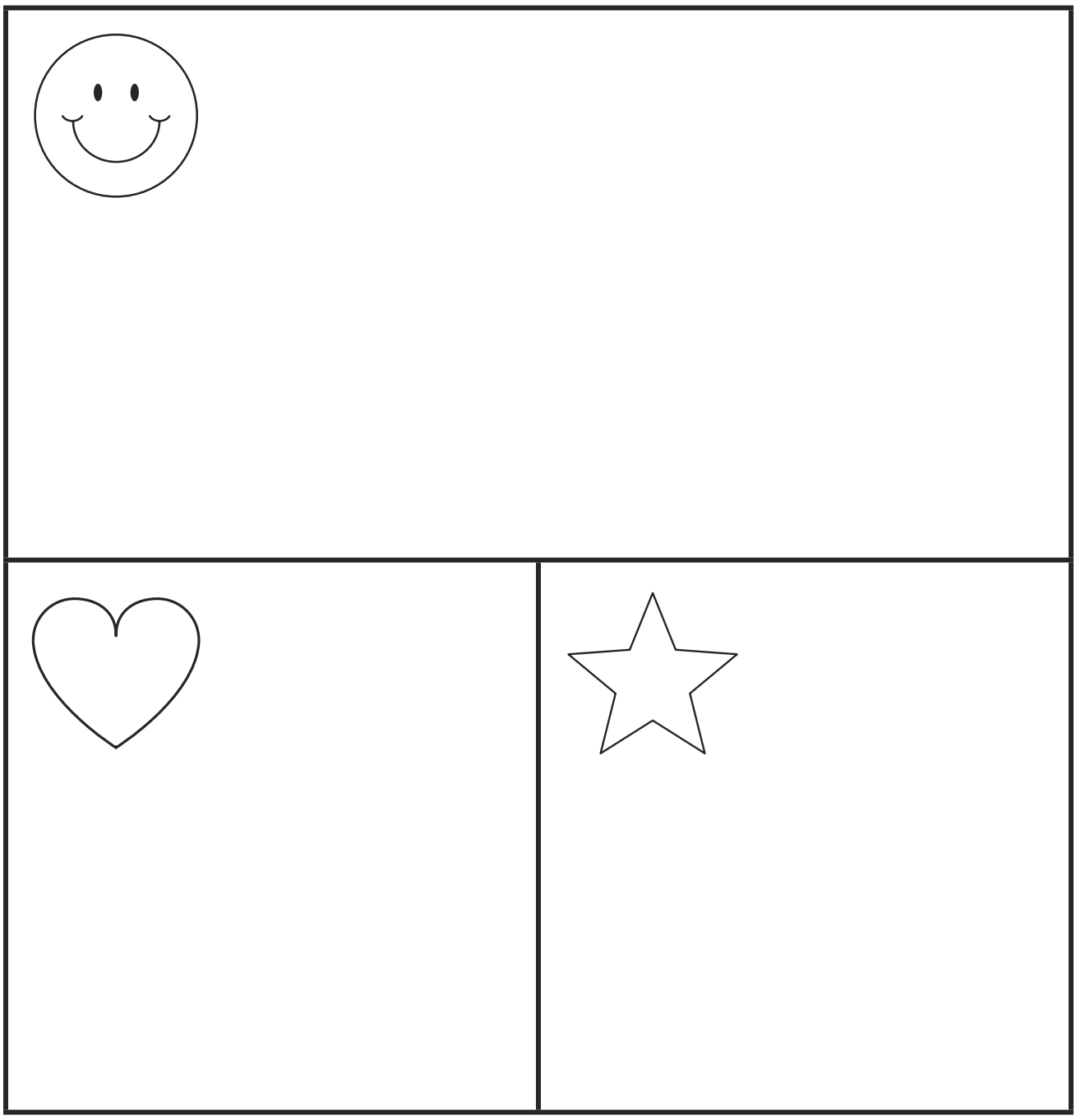
Heart



Star

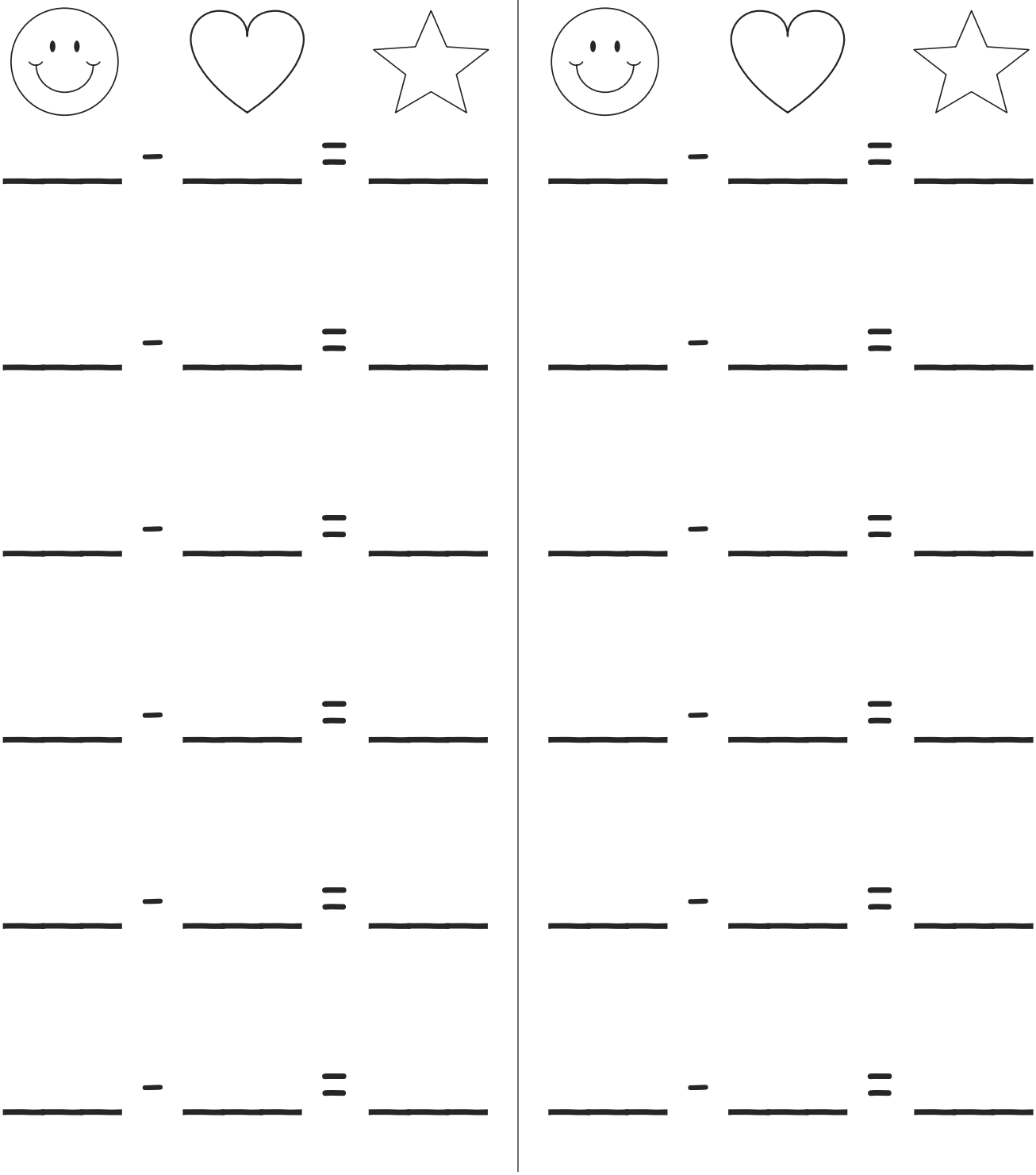


Subtraction Math Mat



Name _____

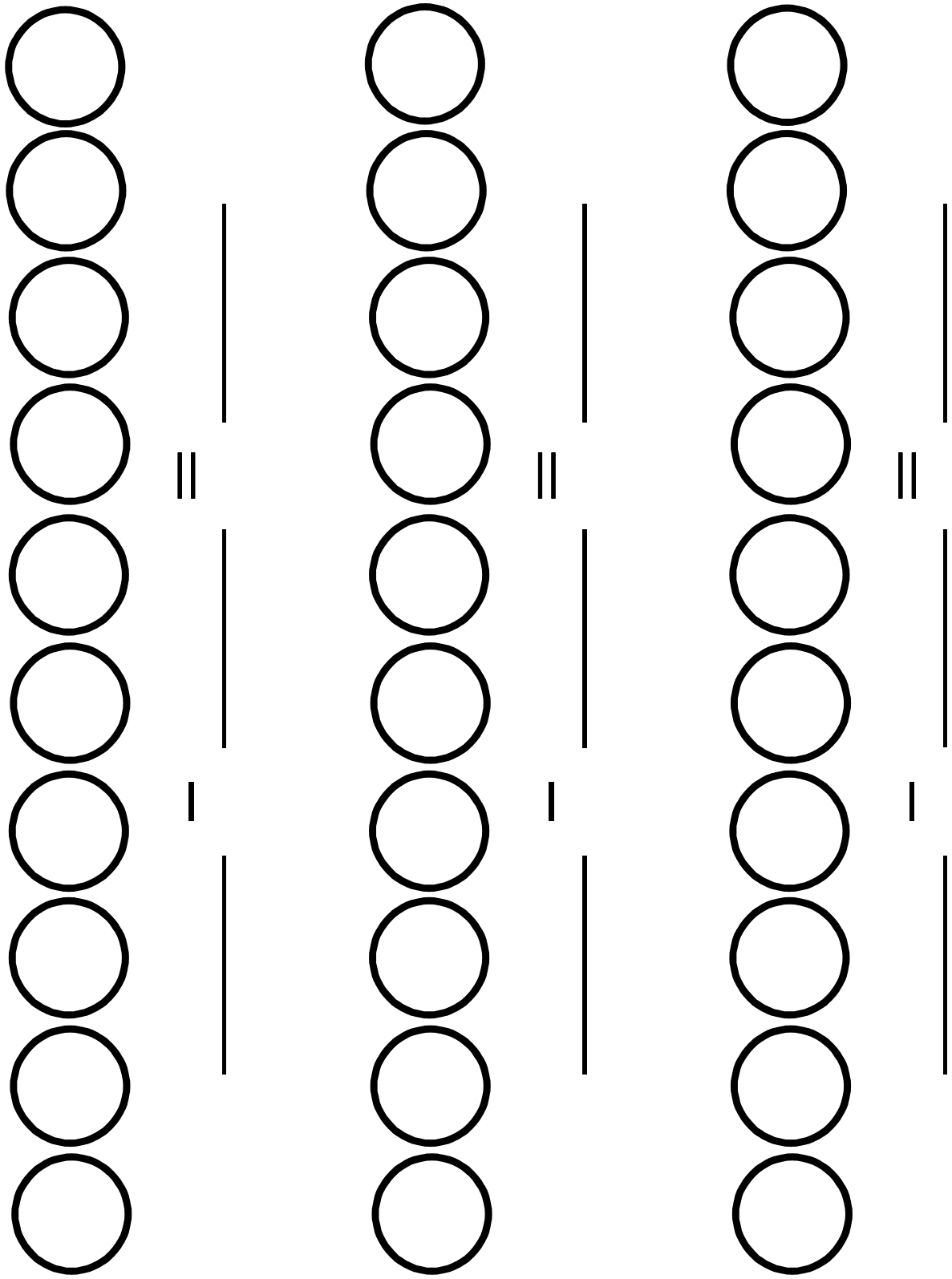
Subtraction Sentences



Subtraction Cards

0 – 0 =	1 – 0 =
1 – 1 =	2 – 2 =
2 – 1 =	2 – 0 =
3 – 3 =	3 – 2 =

Bingo Marker Recording Sheet

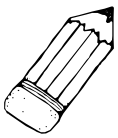


Bingo Marker Subtraction

2 – 1 =

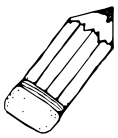
1. Choose a subtraction card.

2. Dot stamp total number of circles



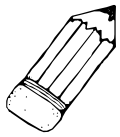
3. Write total number of dots stamped on the subtraction sentence.

4. X out the number that go away.



5. Write the number of circles X-ed out.

2 – 1 = 1



6. Record the total number of dots stamps left.

Name _____

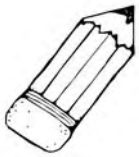
Macaroni Subtraction

_____ ___ − ___ = ___	_____ ___ − ___ = ___
_____ ___ − ___ = ___	_____ ___ − ___ = ___
_____ ___ − ___ = ___	_____ ___ − ___ = ___
_____ ___ − ___ = ___	_____ ___ − ___ = ___
_____ ___ − ___ = ___	_____ ___ − ___ = ___

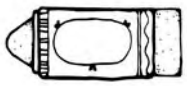
Macaroni Subtraction

1. Roll two dice

2. Lace macaroni on the pipe cleaner for the larger number.



3. Record number on your paper.



4. Draw macaroni noodles.

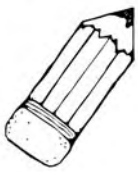
5. Take away correct number of noodles.

6. Record number on paper.

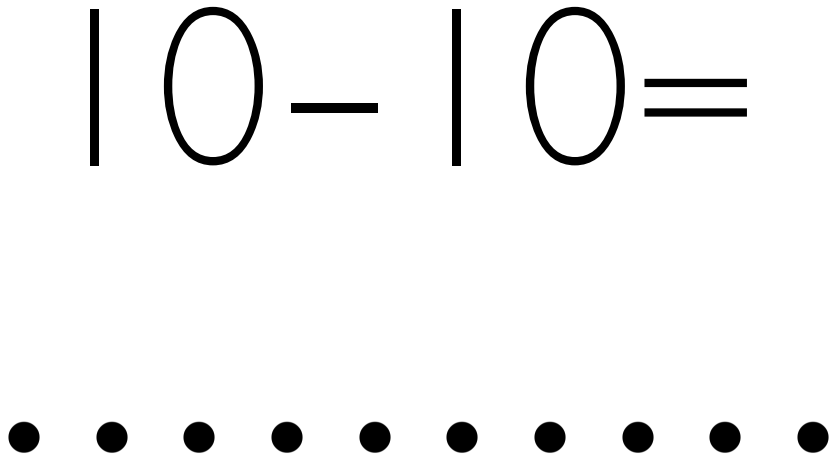
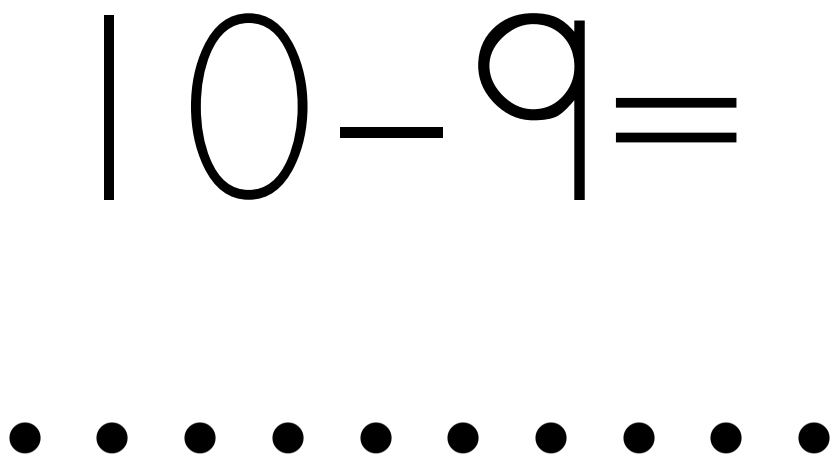
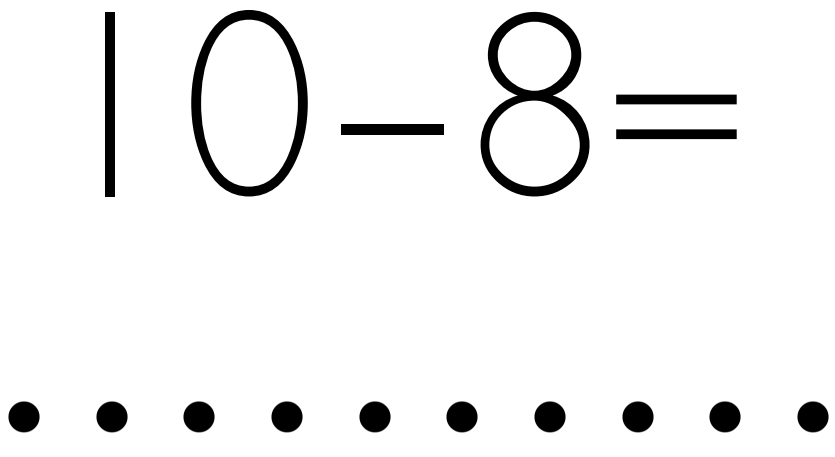
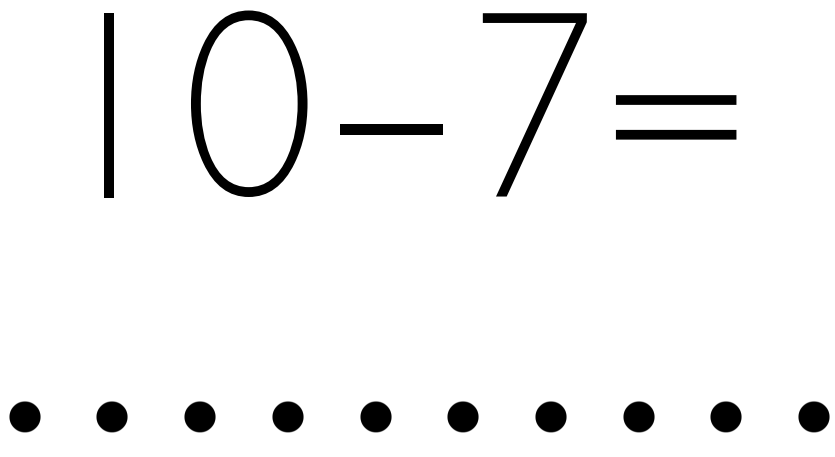
7. Cross out noodles on drawing.

5-2=3

8. Write total remaining on your sheet.

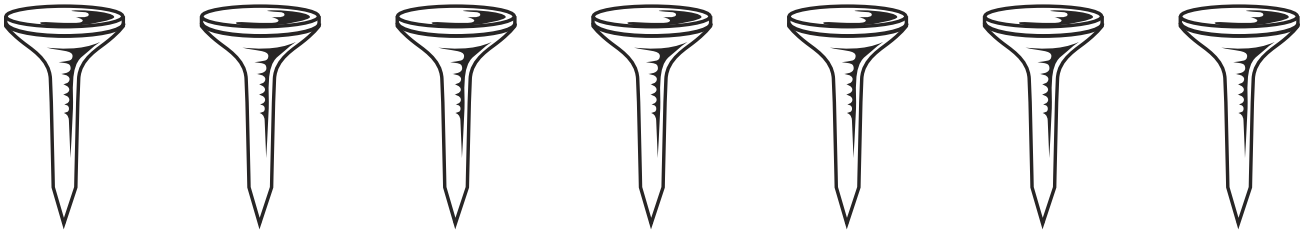


Golf Tee Subtraction Cards

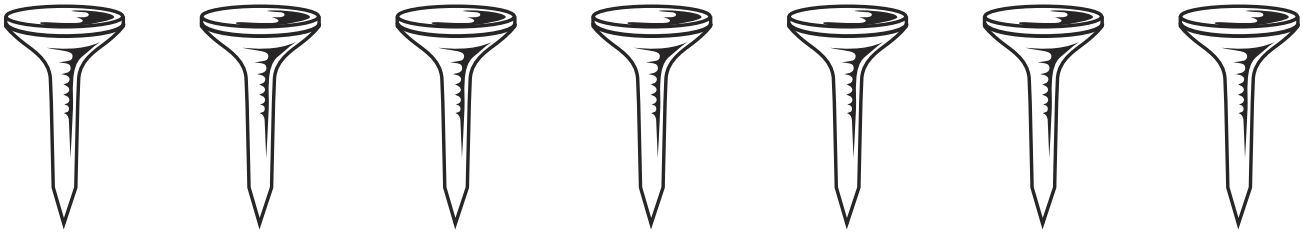
10 − 10 = 	10 − 9 = 
10 − 8 = 	10 − 7 = 

Name _____

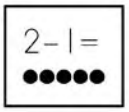
Golf Tee Subtraction



___ − ___ = ___	___ − ___ = ___
___ − ___ = ___	___ − ___ = ___
___ − ___ = ___	___ − ___ = ___
___ − ___ = ___	___ − ___ = ___
___ − ___ = ___	___ − ___ = ___



Golf Tee Subtraction

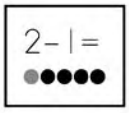


1. Choose a subtraction card.

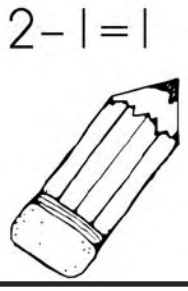
2. Insert golf tees for the total number.

3. Remove golf tees for the number taken away.

4. Count the number of remaining golf tees.



5. Turn the card over to check your answer.



6. Record the subtraction problem on your paper.

Subtraction Stamp Book

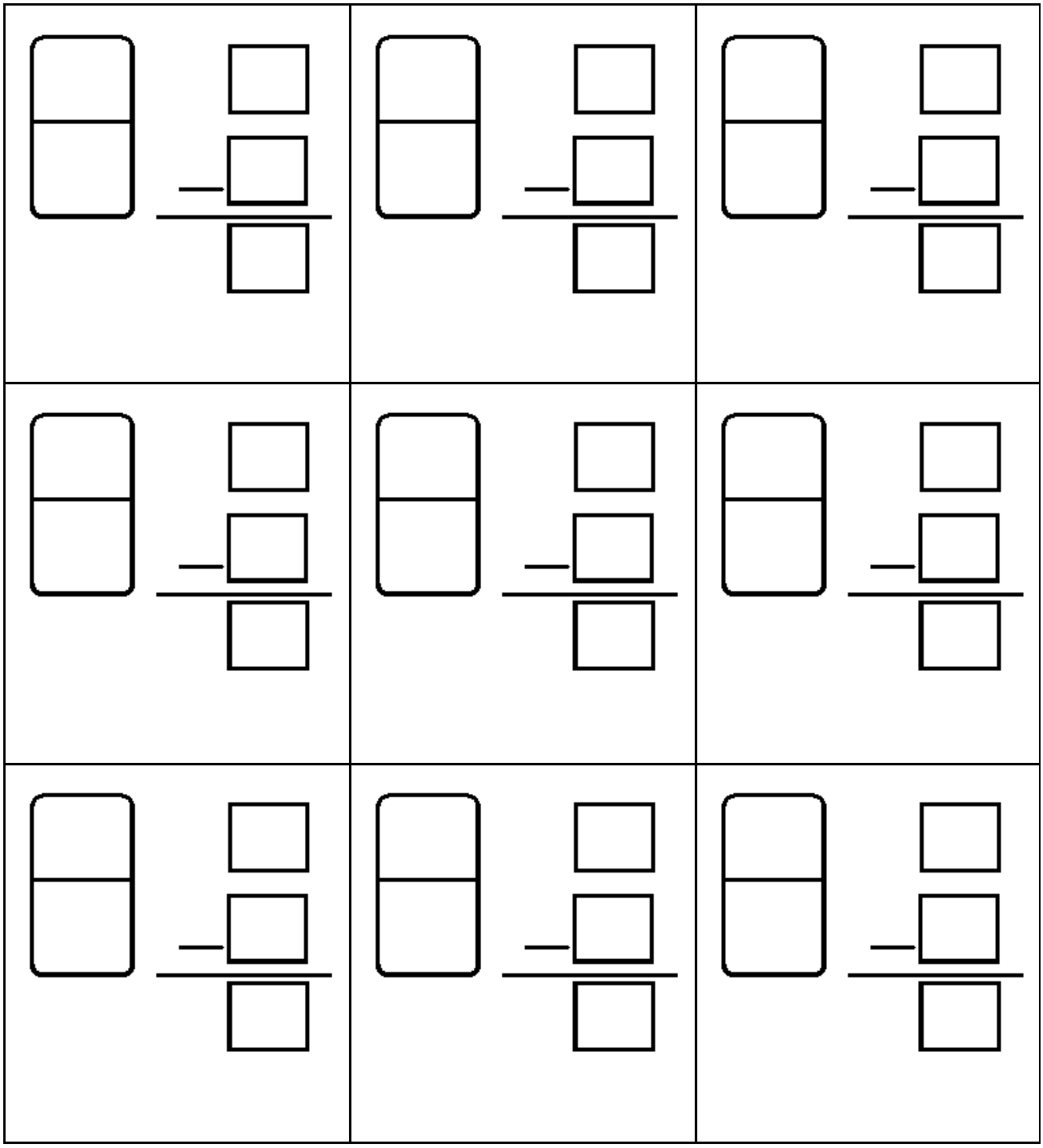
Name _____

Number Cards

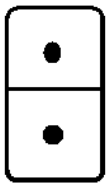
4	9
3	8
2	7
1	6
0	5

Name _____

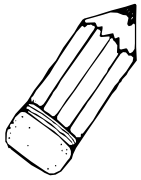
Domino Subtraction



Domino Subtraction

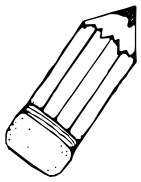


1. Choose a domino.

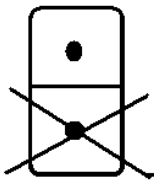


2. Duplicate the domino on your recording sheet.

2

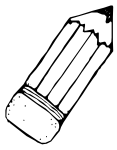


3. Count the total number of dots on your domino and write it on your subtraction sentence.



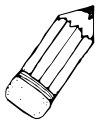
4. Cross out the lower section.

1



5. Write the number of dots crossed out.

1



6. Write the remaining number of dots on your paper.

SUBTRACTION HOMEWORK

Assignment: Play "WHAT'S LEFT?" with a member of your family. Write two of your equations on the bottom of this paper and return to school by _____.

WHAT'S LEFT?

Materials: 5-10 objects (coins, spoons, blocks, paper clips, Froot Loops, etc.) and two small bowls

How to play the game: Place a number of manipulatives in one bowl. The first person takes out some of the objects and places them on the table and covers them with the second container while the second person turns around. The first person says to the other person," I had 5 blocks and I took out 3. What's left? The second person gives the answer. The first person takes the cover off the objects and they check the answer. Each person takes turns covering and turning around.

_____ played "What's Left?" with _____.
Here are two of my equations:

Content III-2
Activities

Local Animals

Bug Hunt

Standard III:
Students will develop an understanding of their environment.

Objective 2:
Observe and describe animals in the local environment.

Intended Learning Outcomes:
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:
Math I & V, Language I & VIII

Content Standard III

Objective 2

Connections

Background Information

Animals include many different kinds of creatures including insects. Insects are invertebrates, which lack backbones. Ninety-five percent of all animals are invertebrates. Some, like worms, have soft bodies with no bones at all. Others, like snails, have soft bodies, but carry a hard shell for protection. Soft-bodied invertebrates that live in water or on land are grouped as mollusks. Those invertebrates that have tough coatings on the outside of their bodies (exoskeletons), jointed legs, and a segmented body are called arthropods. Insects, spiders (arachnids), centipedes/millipedes, and sow 'bugs', shrimp, lobster, and crabs (crustaceans) are all arthropods. There are over 900,000 species of insects, which makes them the biggest group of arthropods. Insects have distinctive features, which include: three body parts (head, thorax, and abdomen), eyes, mouth, antennae, six legs, and most of the adults have wings. The young do not look like the parents.

Research Basis

Stein, M., McNair, S., & Butcher, J. (2001). Drawing on student understanding. *Science And Children*, 38(4),18

Using artistic expression as a tool for learning supports the standards by enhancing students' abilities to communicate science explanations, engage in science as a means for explanation, and communicate their ideas to the public and to their classmates.

Reyner, A. (2005). Art influences learning. *Early Childhood News*, 17 (5), 21.

Art is an outstanding tool for teaching ... academic subjects such as math, science, and literacy. When children study any given concept, they learn it better and retain it longer if they do an art activity that reinforces that learning.

Materials

- ❑ My Bug Hunt (2 per child)
- ❑ Pencils
- ❑ Magnifying glasses
- ❑ Bug collection/viewing containers
- ❑ Large chart paper
- ❑ Insect tweezers
- ❑ Laps boards or clipboards
- ❑ Drawing paper
- ❑ *What Do Insects Do?*
- ❑ *What Is An Insect?*
- ❑ *Insect Song*
- ❑ Colored butcher paper
- ❑ Found objects- (bolts, washers, chenille pipe cleaners, ornament hangers, paperclips, fabric, paper, googly eyes, and beads)

Invitation to Learn

How many of you have ever played with sow bugs (also called pillbugs, or roly-polies)? Have you ever kept one for a pet or had races with them? Have you ever caught a butterfly or trapped a spider in a jar? Do you know which ones of those are insects?

Instructional Procedures

1. Once the invitation to learn has been extended ask the children to share what they already know about insects. Record this information on a KWHL (Know, Want to know, How, and what was Learned) chart. Keep this chart available for the children to see and refer to throughout the activity.
2. After letting the children know they will be going on a bug hunt, explain that first they need to learn how to use the tools that are needed. Demonstrate the correct way to use a magnifying glass and how to use the insect tweezers. Once the children have practiced using both in class, collect the equipment to be redistributed outside. Explain to the children that they will not be collecting insects to keep; they will be looking for them and recording what they look like.
3. Provide each child with a lapboard or clipboard and a pencil. Time should be taken to show the children how to walk with these materials held safely. If the location you have chosen is far enough away, consider other options for getting these materials to the site. If you have a field reference guide include that with your supplies.
4. At the site pass out the *My Bug Hunt* handout and other supplies. Remind the children that as they look for bugs they should not touch any of them. They should look at and then draw all of the bugs they find. Ask the children to include all the details that are noticed. Encourage the children to draw any items they think are important. Even though snails, worms, pillbugs, and spiders might be drawn, don't correct the children at this time. Hand out the materials and let the children look. At first it will be hard to see any bugs. Encourage the children to look closely and use their tweezers to turn over leaves, small rocks, and pieces of bark.

5. Teacher suggestions will encourage some children to look in places where they might find insects. Point out insects that are noticed by the teacher or parent helpers.
6. When 10-15 minutes have passed have the children regroup and turn in their supplies.
7. After returning to the classroom, ask the children how many different kinds of insects they found. At this point ask them how you can tell if everything they found was an insect. Some children will name the type of insect and other children will simply refer to the size or a specific characteristic of the insect.
8. As the children name characteristics that they noticed, create a mind map and a list as these questions are answered. Does an insect have a head? What does it look like? As the children name a feature of an insect draw that shape in an exaggerated way on chart paper or a white board. Does it have a body? Does it have legs? How many legs does it have? Once all of the key features are named and drawn, add a large circle a different color around your insect so it becomes the center of an idea web.
9. Read the book *What Do Insects Do?* by Susan Canizares and Pamela Chanko. Now record the responses the children give when you ask them to tell you what else they know about insects and what they do. Examples could include: they eat leaves, some have cocoons, some can sting you, etc.
10. Ask the children about other things they found that were not insects, but were interesting.
11. Hang up the children's drawings so everyone can see them before you read the next day.

Day two

12. Read the book *What Is An Insect* by Susan Canizares and Mary Reid (or other similar book) with the children. After reading refer to the KWHL chart and add details that the children have noticed from their drawings and the story.
13. Go on a second bug hunt. This second time, ask the children to check how many legs their insects have. If there are wings or long legs these details should be drawn. This time the spiders, snails, and pill bugs should not be drawn since none of those are insects.

14. After this second bug hunt ask the children to use their drawings to help them create a large drawing of the most interesting insect they found. Be sure to have a range of drawing supplies available. Have the children cut these drawings out and put them into the bulletin board that has stylized grass and plants on it. The idea is that the insects are partially hidden. Give the mural a cute title like "Look what we found on our bug hunt!"
15. Before returning to the KWHL chart teach the children Dr. Jean's Insect song.
16. Assess the child's newly discovered knowledge of insects by asking each to invent their own insect. These can be done with paper or with found objects to create a sculpture. A large bolt, chenille pipe cleaners, paper, paperclips, beads, and fabric all can be used to create great insect sculptures.
17. In small groups create a large chart on lined chart paper with each child's response to the prompt: Insects have _____ ____ (Insects can _____). Or Insects cannot _____ ____ (Insects do not _____).
18. Each child will then illustrate a page or two for the double flip book the class will assemble. The chart will be cut up into strips with each child's sentence (from #17 above) given to use as a reference when adding his or her own copy to artwork. Once assembled this book can be read to the whole class. The encouragement of humor on the second sentence will make this book a class favorite.

Assessment Suggestions

- Assess the child's newly discovered knowledge of insects by asking each to invent their own insect. It needs to have all the body parts that every insect has, but may be a colorful and as big or small as the child chooses. These may be drawings or watercolor resists.
- A variation of the drawn or painted insect is to construct a three-dimensional model of the chosen or invented insects. A broad range of supplies should be made available. The supplies may be set up in a center or provided for the whole group. Large bolts wrapped with yarn and chenille stems make a wonderful armature for an insect.

Curriculum Extensions/Adaptations/ Integration

- Some advanced learners may choose to learn about specific insects. The Internet is replete with insect sites for children of different ages. Some advanced learners may choose to share an insect collection or ant farms. A story about a day in the life of an insect would give the reading and writing child a chance to stretch. The advanced learner could also use a field guide taken out on the bug hunt.
- Small viewing jars with insects in them can be shared with children with limited mobility. Deaf students will need interpreters that can expand their language to include relevant vocabulary.
- Math- Totals can be figured using tally marks. Insects can be sorted by size (small, medium, and large) or other characteristics.
- Language- A small book can be written and drawn which tells about the bug hunt. An acrostic poem could be created with the word insect.

Family Connections

- Flashlight bug hunt using the same recording sheet.
- Bug report
- Bug collection

Additional Resources

Books

Insects: A Guide to Familiar American Insects, by Herbert S. Zim and Clarence Cottam;

What Do Insects Do?, by Susan Canizares and Pamela Chanko; ISBN 0-590-3979-X

Science Tools, by Susan Canizares and Betsey Chessen; ISBN 0-439-04603-3

What Is An Insect?, by Susan Canizares and Mary Reid; ISBN 0-590-39790-7

Where Do Insects Live?, by Susan Canizares and Mary Reid; ISBN 0-590-39793-1

Bug Dictionary, by Jill Bailey; ISBN 0-439-57296-7

A Pill Bug's Life, by John Himmelman; ISBN 0-516-26798-1

Big Bugs, by Seymour Simon (this is a Scholastic book)

Rookie Read-About Science: It's a Good Thing There Are Insects, by Allan Fowler; Scholastic Item # NTS411343

CDs

Kiss Your Brain, by Dr. Jean Feldman (drjean.org)

Web sites

http://enature.com

http://www.ento,vt,edu/~sharov/3d/virtual.html

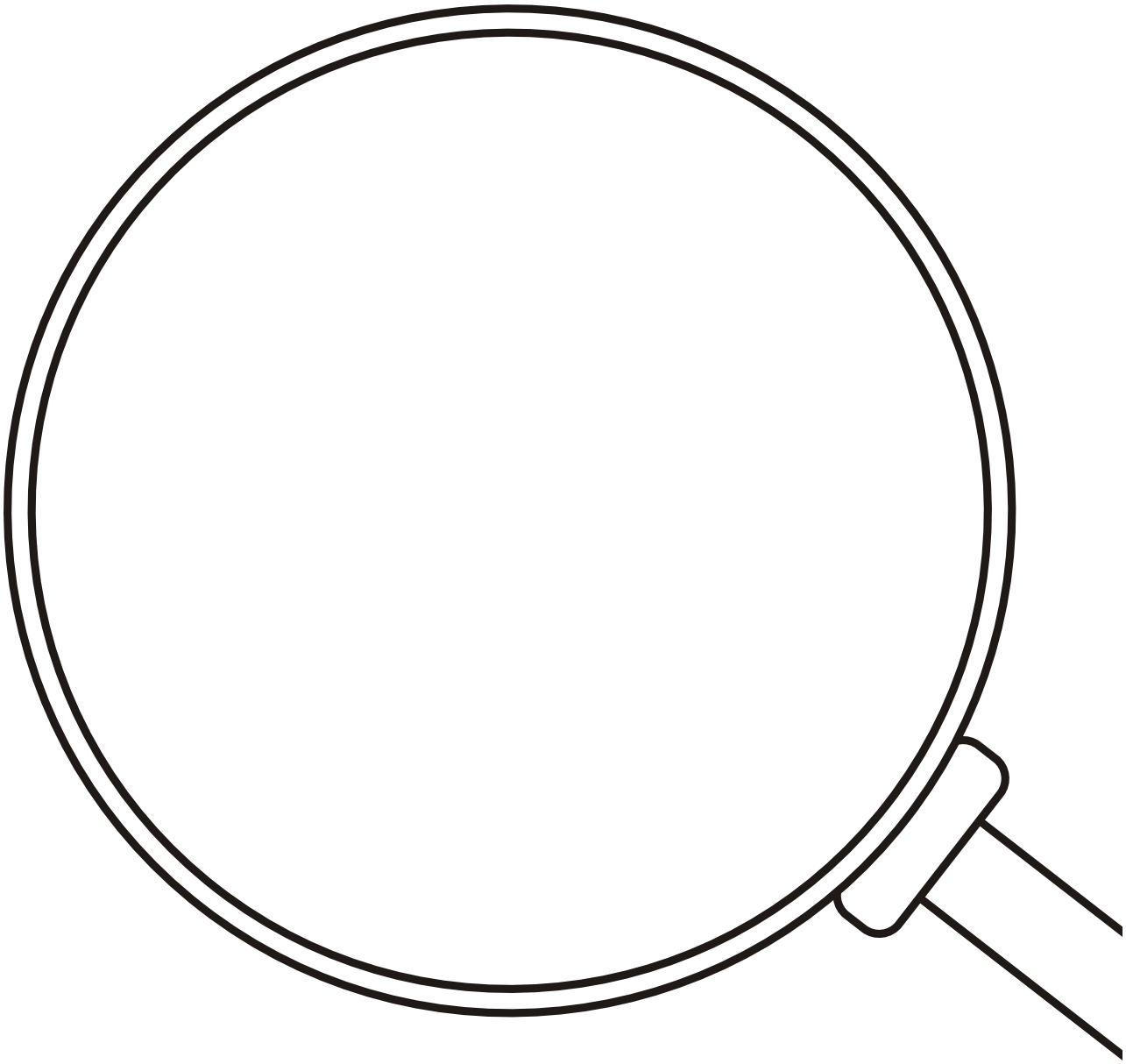
http://teacher.scholastic.com/fieldtrp/science/bugs.htm

http://www.pestworldforkids.org

Additional Media

How Many Bugs In A Box, software on CD-ROM from Scholastic.com; Item # NTS356402

My Bug Hunt



Look What

_____

found on the bug hunt.

Hide & Seek Butterflies

Content Standard III

Objective 2

Connections

Standard III:
Students will develop an understanding of their environment.

Objective 2:
Observe and describe animals in the local environment.

Intended Learning Outcomes:
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:
Math V, Language Arts I

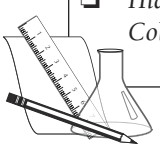
Background Information

There are different kinds of places, or habitats, where animals live. Each habitat or environment has a climate that encourages certain types of plant and animal life. In Utah, we have deserts, forests, and wetlands all of which are also impacted by altitude. Another habitat that is often forgotten is the city. Animals rely on their environment for many things. Not only do they depend on their environment for food, air, water, and space they rely on it for shelter. Shelter can be provided in many ways. Many animals live in the open or in trees, on plants, or even on the ground. Many animals find safety in their environment by blending in and becoming camouflaged. Since many other creatures eat insects it is important to understand how they remain unseen. The relationship of the physical characteristics of an organism and its environment needs to be understood in order to appreciate and not harm that environment. Butterflies are an insect that is familiar to the children in most communities and are particularly suited to this activity. Other insects or animals can be studied as well if they are particularly important to your area.

The development of inquiry skills is part of the process of discovering explanations for occurrences in our surroundings. As children collect information they need to have a way to record their information to analyze later. The use of a data sheet will aid students in making predictions, collecting their data, analyzing it, drawing conclusions, and providing evidence for their conclusions. Children need to test their predictions and evaluate the results.

Materials

- ❑ Colored toothpicks
- ❑ Toothpick Chart
- ❑ Fabric of Utah's environments
- ❑ Newspaper
- ❑ Crayons, markers, or colored pencils
- ❑ *How to Hide a Butterfly and Other Insects*
- ❑ Butterfly
- ❑ *Hide & Seek Data Collection Sheet*



Research Basis

Stein, M., McNair, S., & Butcher, J. (2001). Drawing On Student Understanding. *Science And Children,* 38 (4), 21

Young children can often express their understanding and concept development more effectively through drawings than verbally or in written assignments. They are often more engaged in details of their understanding when they draw. Examining drawings, their emerging understandings become evident.

Hudson, P. & Hudson, S. (2001). Linking visual arts with science & technology in the primary classroom. *Australian Science Teachers Association,* 17 (4), 29.

Integration has obvious benefits for alleviating and addressing the overcrowded curriculum. Through visual arts, primary science and technology students can transfer and consolidate knowledge and synthesize new experiences. Students need to have a wide range of perceptual experiences relating to their environment.

Invitation to Learn

Sprinkle (a pre-counted amount of) colored toothpicks over a section of grass in your schoolyard. Ask the children to find all of the toothpicks. Once they have been found ask the children to place them on a chart to record how many of each color has been found. Explain to the children that originally each color group had the same number of toothpicks. Ask for ideas on why it was hard to find all of certain colors.

Instructional Procedures

1. Before class prepare one set of crayons (6-8), markers, or colored pencils for each team of four children. The colors in each set should be chosen to match the colors found in the fabric in each different habitat.
2. Fabric that has natural looking patterns found in different habitats should be mounted and hung around the classroom. Be sure to have a representative fabric from each of Utah's environments (hot desert, high desert, forest, wetland foliage) plus a square of solid black and white. The fabric should be all the same size (36" X 36" is good). Even though these will be already hung prior to the reading of the book, don't draw attention to them.
3. Read the book *How to Hide a Butterfly and Other Insects* by R. Heller
4. Discuss the book briefly to assess the children's understanding.
5. Divide the class into cooperative learning teams with four students in each. Give each team a pre-selected set of crayons

and black lines of four butterflies. Let the children color their own butterfly as they wish using the pre-selected colors.

6. Bring the students together for a discussion about habitats that were noticed in the book. Ask the children to then describe habitats they might have seen in their community. Hopefully, the children will comment on how dry a desert is and how moist and lush wetlands can be. During the discussion encourage discussion about how a butterfly's color and pattern can help its environment protect it. Other questions might include: What does an animal need to survive? What is a shelter? How many different kinds of shelters can you think of? Ask the children where a butterfly lives and what they think it's shelter might be or ask the child if they know that some animals live in the open on trees, plants, or on the ground. When the question surfaces on how an animal that lives outside in the open can be safe from being seen and eaten it is time to connect the question to the butterfly they each have made.
7. Data collection– point out each labeled environment in the room. Give each child a Data Collection sheet. Each student needs to then examine his or her butterfly and predict which habitat would be the safest for it. This will be recorded on the sheet. Since each habitat is labeled the children can copy the name onto their paper. As a group each prediction will be tested. The groups will rotate from habitat to habitat with their butterflies. Each insect will be taped onto the fabric and the group will decide if this habitat helps the butterfly hide or not. When they have decided which habitat camouflaged the butterfly the best the children will mark their sheet. The children then leave their butterfly on the habitat that it seems best suited. When this portion is complete the small group will look at their decisions and compare their choices. If the students have decided that a butterfly is better suited to a different habitat it can be moved.
8. Conclusions– the teams need to identify why they think their butterflies were best suited to certain environments. Children may identify color, shape, or wing pattern as the reason a butterfly can hide in a given habitat.
9. After the small groups talk about their completed data sheets, members from each team explain their ideas to the whole group. This takes some guiding if your children haven't done this before.

10. Ask the children to create a drawing of a camouflaged butterfly. These can be compiled into a class book and looked at again and again.
11. During this whole process a newspaper has been hanging in a different part of the room. Very carefully placed on the newspaper is a butterfly made of newspaper. Choose a portion with lots of type to create a butterfly that will blend right in. The children might notice this right away and they might not realize the camouflaged butterfly is there until the teacher points it out. Whenever the children notice it, take a moment to ask and answer questions that might be generated. The teacher might ask "Why couldn't we see this butterfly earlier?" and the children should be able to identify the pattern and color of the butterfly's wings as the reasons.

Assessment Suggestions

- Ask the children to create a drawing of a camouflaged butterfly. Look for evidence that the child is trying to hide the butterfly visually camouflaging it.
- Ask a series of questions such as, "What did you learn about butterflies and where they live?"
- Keep a portfolio for each child to document his or her growth and progress in acquiring inquiry skills and content knowledge.

Curriculum Extensions/Adaptations/ Integration

- Two and three inch sections of colored chenille pipe cleaners used as caterpillars can be hidden in plain sight in your classroom. These 'caterpillars' could be used as the invitation to learn or as an extension to this activity. Ask the children to find as many as they can and chart the results. Determine which ones were the hardest to find. This could also be used as a forum to evaluate understanding.
- Consider working with a fourth grade buddy class as a follow up exercise. Have your kindergartners teach their fourth grade friends how to do this investigative activity. After the activity has been completed and the new conclusions drawn, have the buddy pairs create butterflies that will be camouflaged in those environments. This time it will be with the benefit of

experience and new knowledge. This investigation fits neatly into kindergarten and fourth grade CORE Standards.

- Math- Create freely formed pieces of art that use the crayon-resist technique. Be sure to stress the concept of symmetry as a type of pattern. After drawing with crayons, paint using watercolors, and cut the butterflies out. Integrate these into a math bulletin board.
- Language- An acrostic poem could be created with the word butterflies.

Family Connections

- A family butterfly garden is a wonderful way for insects, specifically butterflies, to be enticed to the backyard. Planning of the garden can begin in the cold weather months and planting can begin in the spring. The child will have experiences that will extend Kindergarten learning into the summer.
- If the weather is warm enough that the butterflies have begun showing up a Butterfly sighting log or chart could be kept.

Additional Resources

Books

How to Hide a Butterfly and Other Insects, by R. Heller; ISBN 0-448-40477-X

If At First You Do Not See; by Ruth Brown; ISBN 0-8050-1031-9

How to Hide a Meadow Frog and Other Amphibians, by R. Heller; ISBN 0-448-40965-8

How to Hide a Crocodile and Other Reptiles, by R. Heller; ISBN 0-448-40477-X

How to Hide an Octopus and Other Sea Creatures, by R. Heller; ISBN 0-448-40215-7

Web sites

http://www.specificurl.com

http://www.mesquiteisd.org/imovie/monarchbutterfly.htm

http://butterflywebsite.com/faq.cfm

http://www.150.si.edu/150trav/discover/bfly.htm

http://www.butterflies.org/hidenseek.htm

http://www.abcteach.com/Butterflycenters/butterfly2.htm

http://www.monarchwatch.org/garden/index.htm

http://www.hhmi.org/coolscience/butterfly

Toothpick Chart

red	
green	
yellow	
blue	
orange	
purple	

Butterfly

Hide & Seek
Data Collection Sheet

for _____

PREDICTION
My butterfly will be safest in the _____ environment.

DATA
My butterfly was hardest to see in the

garden	desert	forest	wetlands	night	city

CONCLUSION

My butterfly was safest in the _____ environment because_____

_____

Hide & Seek
Data Collection Sheet

for _____

PREDICTION
My butterfly will be safest in the _____ environment.

DATA
My butterfly was hardest to see in the

garden	desert	forest	wetlands	night	city

CONCLUSION

My butterfly was safest in the _____ environment because_____

_____

Math IV-1&2
Activities

Measurement Methods

The Length of my Foot

Standard IV:
Students will understand and use simple measurement tools and techniques.

Objective 2:
Use appropriate techniques and tools to determine measurements.

Intended Learning Outcomes:
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:
Math V; Language Arts II, IV, VI, VII

Math Standard IV

Objective 2

Connections

Background Information

The concept of using units to measure length will be explored in these activities. This measuring skill allows the students to compare the length of objects without placing them side by side. It also allows them to ponder these questions: How long? How short? How much longer? How much shorter?

Because students' attention is drawn to the unit being used, the importance of labeling and recording the unit, as well as the number of units measured will be emphasized. Since non-standard units vary in size, children can be shown the importance of the size as well as the number of units in describing the length of an object. These activities will require the use of equal-length units. The most important concept to emphasize with the children is that more units are needed to measure a given quantity when the units are small than when they are large.

Additionally, research has shown that activities that involve estimating the length of an object in two different sized units and then checking these estimates by measuring are highly recommended. Therefore, the following activities are designed to develop that skill.

Materials

- ❑ *How big is a Foot?*
- ❑ Brightly colored box
- ❑ Left shoe
- ❑ Right shoe
- ❑ Adult pair of scissors
- ❑ Child-sized pair of scissors

Research Basis

Hiebert, J. (1984). Why do some children have trouble learning measurement concepts? *Arithmetic Teacher*, 31 (7), 19-24 .

In this study, researchers found that even though children do not yet conserve or reason transitively on standard Piagetian tasks, they still benefit from concrete measuring activities. It was also determined that children in both control and experimental groups experienced some common difficulties and showed some basic misconceptions.

Clements, D.H., (1999). Teaching Length Measurement: Research Challenges. *School Science and Mathematics,* 99,(1), 5-11.

Researchers have found that standard units need to be utilized simultaneously with non-standard units as young children are learning measurement skills. Teaching young children to measure with only non-standard units does not necessarily lead to competence in measuring skills.

Preparation

1. In advance, invite three parent helpers to come and assist you on the day this concept will be introduced to the students. Plan to have the volunteers stay one hour.
2. In preparation for this concept to be introduced, share the book *Shoes, Shoes, Shoes* by Ann Morris. Set up a "Shoe Store" in the dramatic play area. Materials for the play area could include any of the following:

   *Shoe racks with numbered labels for shoe size

   *Shoe measurement tools

   *Standard measuring tools: Measuring tape, yard sticks, rulers,

   *Nonstandard measuring tools: connecting cubes, blocks, yarn, beans

   *Triple beam balance for comparing weights of various shoes, or bathroom scales

   *Shoe advertisements from retail stores

   *Venn diagram made from hula hoops to sort shoes according to characteristics (color, laces vs. none, heels vs. no heels, etc.)

   *Paper for sorting labels, price tags, shoes sizes, etc.

   *"Heel to Toe" recording sheet for shoe measurements and estimations (See recording sheet)

   *Cash register and play money
3. The week before this concept is to be introduced, send a note home to parents, inviting them to donate an old pair of shoes for our classroom "Shoe Store" or gather the shoes yourself. Explain to the students that the class will be having a Shoe Store in the dramatic play area and that we need shoes to sort according to style, size and color. We will measure and weigh the shoes, as well as pretend to be workers and shoppers in our store.

As children arrive the following day, have them place the shoes they brought in the Shoe Store.

Invitation to Learn

Gather students in a large group for listening and discussing. Display a brightly colored shoe box.

Say: What two things do you think I have in this colorful box? Hmmmm....let me give you some clues...

They begin with the letter "s"

The sound at the beginning of this pair of items is "sh"

You can wear them

You can even measure things with them.

After students have had the opportunity to guess, take a right and left shoe from the shoe box, each of a dramatically different size, style, and color. Try to put both shoes on your feet. After much effort, stop and ask the children what the problem is.

Set the shoes aside and gather students in a large group setting appropriate for sharing the story, How Big is a Foot? by Rolf Myller. (The book concerns a king's decision to surprise his wife, the queen, on her birthday. The king plans to have a bed made for her. This gift was sure to be a great surprise, because beds had not yet been invented. This book is a terrific precursor for helping children understand that non-standard as well as standard units need to be equal in length.)

Instructional Procedures

1. Discuss the story *How Big is a Foot?* by Rolf Myller . Ask why the king needed to measure the length and width of the bed. Ask the students why the king's bed was different from the apprentice's bed. Ask students to identify what the king and the apprentice used to make the measurements for the bed.
2. Introduce the idea of a *unit*. A variety of units can be used to find the length (the measurement used to determine the distance between two points) of an object. Units can be connecting cubes, wooden cubes, unsharpened pencils, straws, toothpicks, paper clips, tongue depressors, beans, buttons, blocks, or even our feet! Help the students understand that the most important thing is that the units used to measure an object need to be the same size.

Ask: "What did the king use to measure the length of the queen's bed?"

"Why was this a problem?"

"What other things would have been better to use to measure the bed's length? Let's list some non-standard units you can think of."

Responses should indicate that there was a difference between the size of the king's foot and that of the apprentice's foot when the bed was being measured. Help guide the children's understanding to the concept that if the king had just used the same person's foot for all of the measurements, there wouldn't have been a problem. But because their feet were not the same size, the measurements were different. Measurement units need to be the same size.

Illustrate this concept to the students by telling them you want to measure the chalk tray. Tell them that you will be measuring it with a large pair of adult scissors.. Have the students estimate how many scissor-lengths long it will be. Then measure it. Repeat the procedure using a child-sized pair of scissors. Help them to recognize the differences between the measurements, even though both measurements were made with scissors.

3. Explain to the students that they are about to visit four measurement centers. In each center, they will be measuring items with various kinds of units. Children should be reminded to remember the following:

    - Place the first unit at the end of the object.
    - Each unit must touch, must be placed end to end, and must be in a straight line.
    - Describe the length of the object to the nearest unit.

    When measurements are not exact, students can use language such as *almost 3 toothpicks, between 6 and 7 paperclips, close to 5 beans,* or *about 10 straws.*

    The children will now begin "Math Centers". Four centers activities will be placed at numbered tables in the classroom. The teacher will divide students into groups of four. Preferably, each group will only have six students. Group 1 will go to Table 1, Group 2 will visit Table 2 and so on. Invite the parent volunteers as they arrive to sit at one of the four centers. A brief description of what the volunteers will be teaching will be at their center. The centers will last approximately 10-12 minutes each. When a bell rings two times, children will clean

up their materials, give recording sheets to the parent volunteer, and stand by their chair until the signal is given to move to the next center.

Center 1: Heel to Toe

1. Procedure: Invite children to choose a shoe from the class "Shoe Store". The children will place the shoe on a place mat in front of them at their table. The children will be directed to use an assortment of non-standard units to measure the shoe they have chosen. Prior to measuring, the students will be given a pencil and a "Heel to Toe" recording sheet. The sheet will ask students to "guess" how many units (e.g. paperclips, blocks, toothpicks, etc.) will be needed to measure the shoe. They will record their guess and then they will make the actual measurement and record it. The parent volunteer will help children to realize that the smaller the non-standard unit, the more units it takes to measure the shoe.

Materials

- ❏ *"Heel to Toe"* recording sheet
- ❏ One shoe from "Shoe Store" dramatic play area
- ❏ Regular-sized paperclips
- ❏ Connecting cubes
- ❏ Wooden blocks
- ❏ Lima beans
- ❏ Toothpicks

Center 2: Bull's-eye Bean Bag Toss

1. Procedure: Lay the bull's-eye target board flat on the floor in an open area in the classroom or outside on the black-top. Each child is given a matching colored pair of bean bags. The teacher will design a starting line, far enough away from the bull's-eye to present a challenge to the students. Students will take turns throwing their bags toward the bull's-eye target. After each player has thrown the bean bags, they will use the nonstandard unit of measurement to measure the distance of their nearest bag to the bull's-eye target. The student that has the closest beanbag goes first (or last) in the next round. The students may also want to measure the distance of the bag that is farthest from the bull's-eye. As students become more skillful in this activity, they can begin to record results of each toss and compare their progress in landing on the target from one round to the next.

Materials

- ❏ A bull's-eye target board
- ❏ 6 pairs of bean bags, each set of a different color
- ❏ One of these non-standard units of measurement:

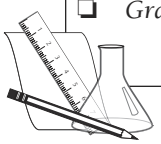
  connecting cubes

  jumbo paper clips

  straws cut in identical lengths

Materials

- ❑ 6 crayon boxes
- ❑ 6 pieces of chalk
- ❑ 6 blocks
- ❑ 6 markers
- ❑ bead counter
- ❑ 12 beads
- ❑ jumbo pipe cleaner
- ❑ *Grab Bag Measurements*



Center 3: Grab-bag Measurements

1. As children arrive at this center, the parent volunteer will give each child a jumbo-sized pipe cleaner. Wooden beads will be placed in a large container in the center of the table. Students will take 12 beads and slide them onto the pipe cleaner. Beads will be pushed tightly together on the pipe cleaner and students can bend the ends upward to hold the beads in place. This measuring device will be called a bead counter.
2. The parent volunteer will model for students how to measure with a bead counter. He/she will take an object and place the bead counter at the end of the object and will then count the beads from the beginning point to the ending point. If the object does not end exactly on a bead, the volunteer will describe the measurement to the nearest bead.
3. Procedure: Give each child or pair of students a sack with a variety of objects inside the bag. The teacher will have a cheat sheet with the bead counter measurements of each of the objects written on it. The teacher begins by looking in each of the bags and saying, "I spy an object that is 3 beads long . Each group of children will look through their bag, estimating which object it will be and then recording it. They will then make the measurement and record it.
4. If time remains in the center, the volunteer will then begin the game, "I Spy". He/she will say, 'I spy something in the room that is black and 10 beads long. Can you find what it is?"(It's a chalkboard eraser.) The children will find the item in the classroom and measure it, using their bead counter The volunteer will repeat with many other items. Ideas for measuring could include a pencil, a pink eraser, a glue bottle, a small pair of scissors, a crayon box, a stapler, a tape dispenser, a piece of chalk, or the children's hands. "I Spy" gives the children an opportunity to use their new bead counters and to practice estimation skills while using a learning the measurement concept using units of measure.

Materials

- ❑ Regular-sized paper clips
- ❑ Measuring Me! recording sheet
- ❑ Paper for four classroom graphs with the following titles and pictures:

  "Our Wrist Size" (In paper clips)

  "Our Ankle Size" (In paper clips)

  "Our Head Size" (In paper clips)

  "Our Knee Size" (In paper clips)

Center 4: Measuring Me!

1. Under the title of each graph, the teacher will divide the paper into five columns, with a number in each column that may be the measurement for that particular body part.
2. Procedure: The students at this center will be divided into partners. They will work together to predict how many paper clips they will need to measure body parts, such as around the

wrist, the ankle, the head, and the knee. They will predict how many paper clips they'll need for the measurement and then they will link the paper clips together and measure the specific body part of their partner. Each person records the results of their estimates and body measurement on the "Measuring Me" recording sheet.

3. As the partners finish this activity, they will take the results on their recording sheet and graph their results on the corresponding body graph. Following the center time, the results can be discussed.

Assessment Suggestions:

- Circulate among the students to ensure that they are measuring with units correctly. Check to see that they are placing the units end to end without leaving spaces or overlapping units. Check to see that units are placed in a straight line. Observe whether children are using appropriate units for appropriate distances or objects. For example, are they trying to measure the length of the room with toothpicks, or the length of a crayon with a straw? If necessary, lead a discussion on which units are suitable for measuring long and short objects or distances. As children measure they will have measurements that are not exact. Model such language as almost, between, close to, or about. Avoid formal language such as inches, meter, units, and non-standard, etc.

- Ask key questions to students as you make anecdotal records:

  How many units long do you think this is?

  Is it shorter or longer than you thought it would be?

  Would it be better to use popsicle sticks or paper clips to measure this? Why?

  Measure this item with paper clips. How long is it?

  Measure it with straws. How long is it?

Curriculum Extensions/Adaptations/ Integration

As young children perform measurements, it is easier for them when the objects they are measuring with are connected, like connecting cubes, paper clip chains, bead counters and so on. Iterating

one unit over and over is much more difficult. This activity may help teach the concept of placing one single unit at the beginning of the object to be measured and iterating it end to end until they reach the end of the object to be measured.

Imprinted Snakes

Materials

- ❑ Play dough
- ❑ Paper clips (Jumbo and regular sized)
- ❑ Laminated place mat for each student

1. Procedure: Give each child a ball of play dough to work with. Instruct students to break off a piece of play dough and roll it into a snake.
2. Ask, "How many regular-sized paper clips long do you think your snake is? Make a guess. How could you find out using only 1 paper clip?" Allow children to brain storm ideas.
3. Suggest pressing the paper clip into the play dough to make imprints which go from one end of the snake to the other. Remind children that they must make the first imprint so that the end of the paper clip is at the end of the snake and that each imprint must touch the one before it.
4. You may wish to challenge the students to create a snake that is a specific length. "Roll a snake that you think might be 7 paper clips long. Make paper clip imprints to check your guess."
5. If children work as partners, they could challenge their partner to make a snake a specific length and then check each other's snakes by imprinting with paper clips.

Variation: Have the students use the jumbo paper clips and compare the lengths they found with the regular sized clips.

Growing Gardens

1. Kindergarten students love the aspects of the planting process and many measurement concepts can be taught using a classroom garden. Gardens in all their colors, shapes, and sizes offer mathematical connections to many books. Books that are terrific resources to invite students to engage in this kind of classroom project are the following:

Anna's Garden Songs, by Mary Q. Steele

Apples and Pumpkins, by Anne Rockwell

Growing Vegetable Soup, by Lois Ehlert

How a Seed Grows, by Helene Jordan; ISBN 0-06-445107-0

My Hand Rake, by Jonanne Barkan

Pierrot's ABC Garden, by Anita Lobel

Planting a Rainbow, by Lois Ehlert

Solomon's Secret, by Savior Pirotta

The Sunflower Garden, by Janice May Urdy

2. The teacher could have each of the students plant three sunflower seeds a thumbnail in depth in a clear, plastic cup. Use potting soil that has been moistened for the planting. Place a piece of plastic wrap over the top of the cup and secure with a rubber band. Set in the sunlight for 5 or more days. The seeds will begin to sprout and the children can watch as the white roots work themselves down through the soil. Soon, a tiny green sprout (or more) will pop up through the soil.
3. Invite children to use a popsicle stick to measure the growth of their sprout. Remind them to place popsicle stick gently on the surface of the soil and mark the ending point of the sprout on their popsicle stick. They may continue to make these measurements until the plant is ready to take home.
4. You may also use two varieties of bean counters for these measurements. Lay a 12" piece of clear packaging tape on a table with the sticky side up. Lay ten large, dry lima beans end to end in the middle of the tape. Write the numerals 1-10 on the beans with a fine tip marker. Fold the bottom of the tape up and the top of the tape down to seal in the beans. Trim off the ends. Make another bean counter using smaller beans, such as pole beans or bush beans. Invite children to perform their measurements using this form of non-standard measurement.

Additional Resources

Books

Frog and Toad are Friends, by Arnold Lobel

How Big is a Foot? by Rolf Myller; ISBN 0-440-40495-9

Betcha! by Stuart J. Murphy; ISBN 0-06-446707-4

References

Coombs, B., Harcourt, L., & Young, S. (1993). Explorations 1 in Math. New York: Addison-Wesley Publishing Co..

Hinnant, H. (1999). Growing gardens and mathematicians: More books and math for young children. *Young Children*, Mar 1999, 23-26.

Lubinski, C. & Thiessen, D. (1996). Exploring measurement through literature. *Teaching children Mathematics*, Jan 1996, 260-63.

Kubota-Zarivnij, K. (1999). How do you measure a dad? *Teaching Children Mathematics*, Dec 1999, 260-64, 251.

McGregor, J. ((1996). How do you measure up? *Teaching Children Mathematics*, Oct 1996, 84-85.

Schwartz, S.L. (1995). Developing power in linear measurement. ***Teaching Children Mathematics***, Mar 1995, 412-16.

Thompson, C. & Van de Walle, J. (1985). Let's do it: Learning about rulers and measuring, Apr 1985, 8-12.

Websites

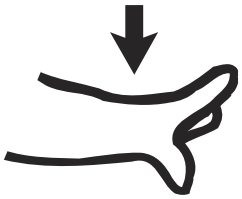
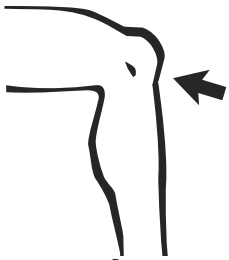
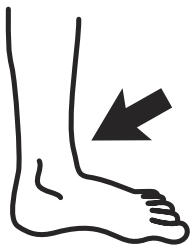
standards.nctm.org/document/chapter4/meas.htm

Family Connections

- In class, read the story "The Lost Button" in *Frog and Toad Are Friends* (Lobel 1970). Send a tongue depressor home with students as well as a class newsletter, inviting parents to help their child collect used buttons. Instruct parents to help their child find 10 buttons of the same size and glue the buttons onto the tongue depressor. Students may use this new "button ruler" to measure household items. In the newsletter, invite students to find two things that are shorter and two things that are longer than their foot.

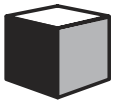
Name _____

Measuring Me!

body part	my guess	# of paper clips
 my head		
 my wrist		
 my knee		
 my ankle		

Heel to Toe

The shoe is _____ paper clips long. 

The shoe is _____ cubes long. 

The shoe is _____ blocks long. 

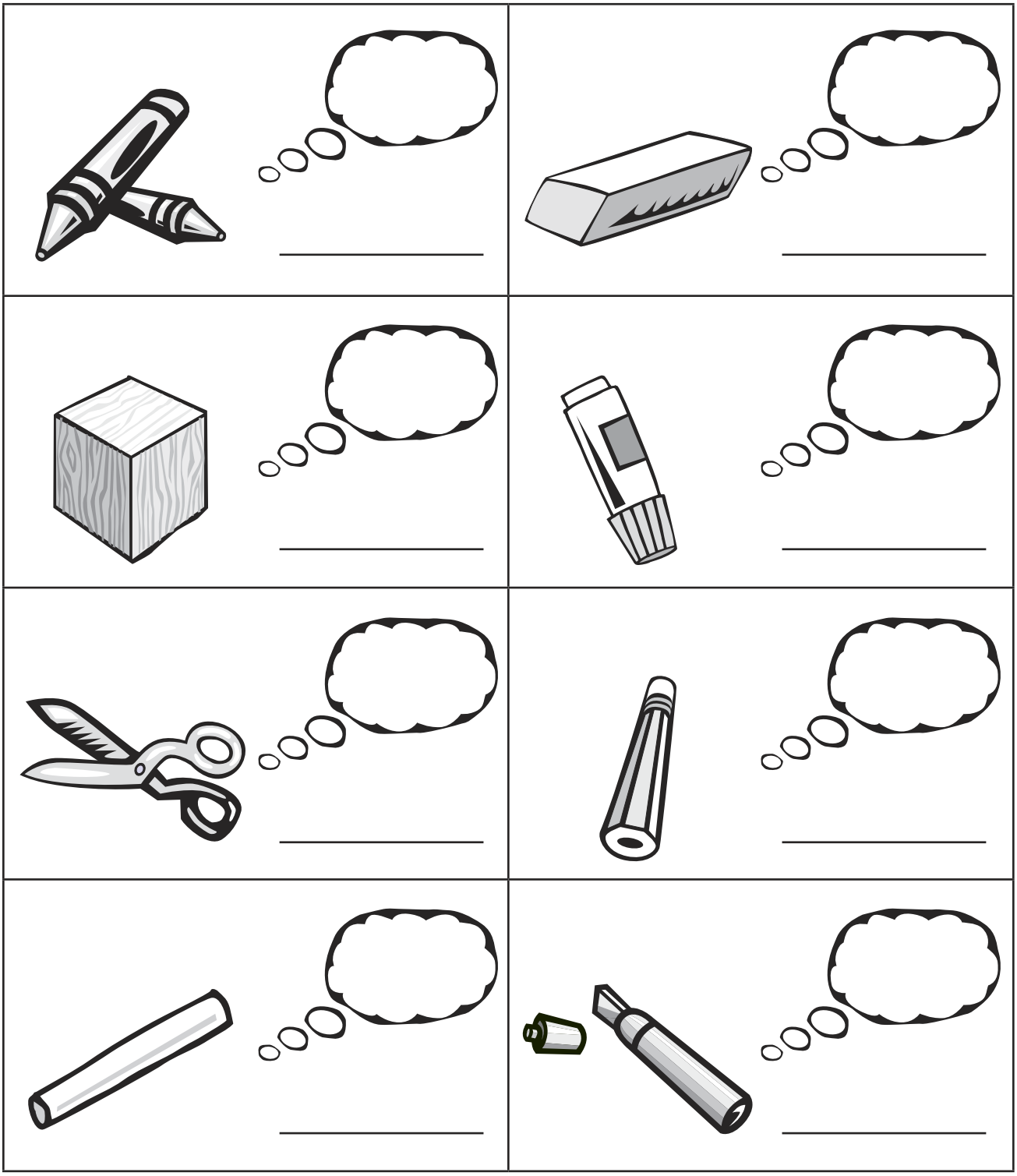
The shoe is _____ lima beans long. 

The shoe is _____ toothpicks long. _____

Name _____

Grab-bag Measurements

Measure the items with a bead counter.



Lengths of Ladybugs

Math Standard IV

Objective 2

Connections

Standard IV:
Students will understand and use simple measurement tools and techniques.

Objective 2:
Use appropriate techniques and tools to determine measurements.

Intended Learning Outcomes:
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:
Math V; Language Arts II, IV, VI, VII

Background Information

Definition: Nonstandard units of measure are objects such as connecting cubes, paper clips, or toothpicks, that have the same size but are not typically used to find length.

Not only are measurement problems common in daily human affairs and therefore, competence in measuring immediately practical, but measurement can be made the instructional basis for most of the mathematical concepts we need.

The concept of using units to measure length will be explored in these activities. We will use nonstandard units of measure, familiar to children, to avoid formalities that are inappropriate for Kindergarten students. As the students use units to measure length or distance, they should be taught to: place the first unit at the end of the object, have each unit touch the unit that is placed before it, and describe the length of the object to the nearest unit. Children should be encouraged to estimate before they measure objects or distance.

Another concept that children need to take into account is the notion that the total length of a path is the sum of the individual units that compose it. They learn from this to assign number to length. The children will be exploring this concept as they count the individual units used to measure distance and record their findings.

Finally, when children make the transition from non-standard measurements to using a ruler to measure standard units, teachers can develop concepts and procedures such as accurate alignment, starting at zero, and focusing on the lengths of the units rather than only the numbers on the ruler. Using manipulable units to

Materials

- ❑ *Ladybug on the Move*
- ❑ black medium- point marker
- ❑ chart paper
- ❑ red cardstock
- ❑ yarn
- ❑ Ladybug rulers
- ❑ Ladybug lima beans
- ❑ *Go Ladybug Go!*
- ❑ "Flaps" for interactive book
- ❑ re-sealable sandwich bags

make their own rulers helps students connect their experiences and ideas. Therefore, in this activity, children will learn to align ladybug rulers, bead counters, and single non-standard units (ladybug lima beans) at the beginning and ending points, and focus on the length of the object according to units rather than only numbers.

Research Basis

Hiebert, J. (1984). Why do some children have trouble learning measurement concepts? *Arithmetic Teacher*, 31 (7), 19-24.

In this study, researchers found that even though children do not yet conserve or reason transitively on standard Piagetian tasks, they still benefit from concrete measuring activities. It was also determined that children in both control and experimental groups experienced some common difficulties and showed some basic misconceptions.

Clements, D.H., (1999). Teaching length measurement: Research challenges. *School Science and Mathematics,* 99,(1), 5-11.

Researchers have found that standard units need to be utilized simultaneously with non-standard units as young children are learning measurement skills. Teaching young children to measure with only non-standard units does not necessarily lead to competence in measuring skills.

Invitation to Learn

Gather students in a large group appropriate for listening to the story *Ladybug on the Move* by Richard Fowler. The book is designed to be interactive and involves the adventures of a ladybug as she travels in search of a new home. Unfortunately, every place she finds is already occupied. A manipulable ladybug moves from page to page throughout the story to engage student interest.

The book provides a great opportunity for measuring short increments of distance on each page.

Instructional Procedures

1. After reading the story to students, turn back through the book and allow students to estimate which page shows the longest trip the ladybug made. Measure the trip on three or four pages using precut yarn. Tape each piece of outstretched yarn onto chart paper or poster board in front

of the class and record which path it represents (for example, "leaf to stone"). This exercise illustrates measuring distance with yarn (a nonstandard measure). Ask students to compare the lengths. This activity will give students the chance to compare length and discuss such concepts as *shorter, longer,* and *more than, less than.*

2. Teacher will provide each student with their own adapted version of *Go Ladybug Go!*.

   Attached to each booklet will be a laminated cardstock ladybug which will be hole-punched and connected to the spine of the booklet with yarn. On the back of the booklet, a construction paper pocket will be glued onto the back, which will hold the "ladybug" ruler.

   Each child will assemble the booklet using the following steps:

   Page 1: Cut out and glue a leaf flap

   Page 3: cut and glue a rock flap over the printed spider

   Page 5: cut and glue a flower pot flap over the ant

   Page 7: cut and glue a blanket flap over the cat

   Page 9: cut and glue a watering can flap over the slugs

   Pages 11: cut and glue a flower flap over the bees

   Page 12: cut and glue a leaf flap

3. After the booklet is assembled, each child will receive a plastic bag with 10-15 ladybug lima beans inside. As a class, read the *Go Ladybug Go!* booklet together. Invite children to use the laminated ladybug on the string to move through the pages as the teacher reads the text aloud. After the initial reading of the booklet, begin again, but as the story progresses, instruct the children to measure the distance the ladybug travels on each of the pages by using the ladybug lima beans. Model for students how to measure the length of each path by placing the beans at the beginning of the path and placing them from end-to-end until the end of the path. Have students record the number of lima beans they used in the space provided on each page of the booklet. Have them follow this exercise by then using the ladybug ruler to measure the same path, being sure to align the ruler at the beginning of the path and model for children how to count

the ladybug units until they come to the end of the path. Have them record their responses on the space provided.

4. Continue through the entire book, pausing at each page for children to make their measurements.

Assessment Suggestions

- It is important to determine whether students understand the concept of lengths and how to measure them using nonstandard units of measurement. Take anecdotal records about the following information:

  How accurately do students measure using a particular choice of units?

  Can students transfer their skills for measuring length to other objects and measurement activities?

  Can students measure the length of assorted objects using a variety of materials?

- Use the assessment form entitled *Ladybug Lima Bean Lengths* to assess the ability of students to measure lines using nonstandard units of measurement.
- Discuss with students as to why more lima beans were needed to measure each path than ladybug units on the ruler. Explain the concept that more lima beans were needed because they were smaller than the ladybug units on the ruler.

Curriculum Extensions/Adaptations/ Integrations

1. Besides using the ladybug ruler, students may be equally engaged using a "Bean Counter". Lay a 12" piece of clear packaging tape on a table with the sticky side up. Lay 12 ladybug lima beans end to end in the middle of the tape. (Write the numbers 1-12 on the beans if you desire with a fine tip marker.) Fold the bottom of the tape up and the top of the tape down to seal in the beans. Trim off the ends. Children can then perform their lima bean measurements in the interactive story of Ladybug on the Move, or they can find objects within the classroom to measure. You may assign them to find objects that are one bean long, five

beans long, etc. You may also use nonstandard units such as paperclips or buttons.

2. Using the interactive book, *Go Ladybug Go!*, have children estimate how many lima beans long each pathway is before they actually measure it. Follow this activity by having them estimate how many ladybug units will be needed on their ladybug ruler to measure each path before it is actually done. Have children compare their estimates with their measurements.

Resources

Books

Ladybug on the Move, by Richard Fowler; ISBN 0-15-200475-0

Super Sand Castle Saturday, by Stuart J. Murphy; ISBN 0-06-446720-1

Website

www.drjean.com

http://illuminations.nctm.org/index

Family Connections

1. Invite children to explore the length of objects at home using their ladybug ruler. Ask them to find two things that are shorter and two things that are longer than their foot.
2. When their interactive book *Go Ladybug Go!* is completed in class, have the children take their books home to share and read with family members. Encourage the children to use their manipulable ladybug to visit each page as they read the story to their family.

Lima Bean Ladybugs

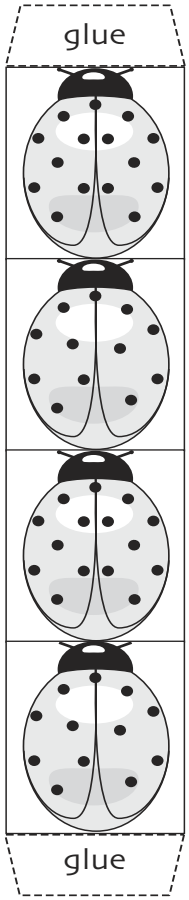
Instructions for making Lima Bean Ladybugs

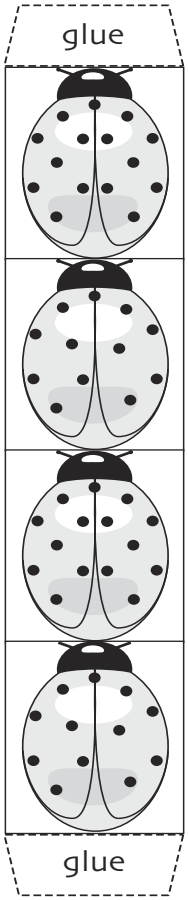
1. Purchase the following:
   a. Several bags of large, dry lima beans
   b. Red spray paint
   c. Black permanent marker with medium point
2. Put the lima beans on newspaper and spray with red paint. When first side is dry, turn and repeat painting process.

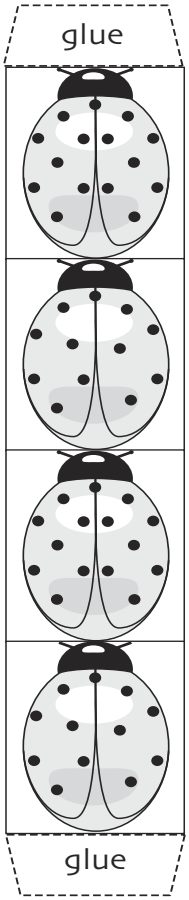
3. When the lima beans are completely dry, use the black marker to decorate one side of the red lima bean to look like a ladybug. On the other side you may wish to write a numeral if you are making a ladybug bean counter.

Ladybug Ruler

After printing out the pictures below, cut the ladybug lengths and tape them together to make ladybug rulers.



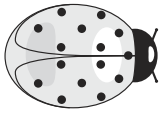




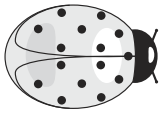
Ladybug Line-Up

Measure the length of each stick using ladybug lima beans. Write the number of ladybug lima beans you used under each line.

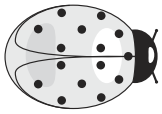
1. 

This line is _____  's long.

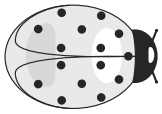
2. 

This line is _____  's long.

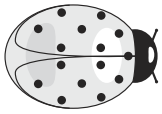
3. 

This line is _____  's long.

4. 

This line is _____  's long.

5. 

This line is _____  's long.

6. 

Hunting for "Measured" Treasure

Math Standard IV

Objective 2

Connections

Standard IV:
Students will understand and use simple measurement tools and techniques.

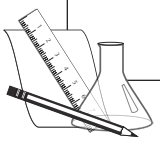
Objective 2:
Use appropriate techniques and tools to determine measurements.

Intended Learning Outcomes:
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:
Math V

Materials

- ❑ listed for each center



Background Information

Measurement is a skill which children and adults use daily to organize and understand their surroundings. The focus of this lesson is on making comparisons.

In these activities, the children will compare and order objects according to length. The children will be learning to conserve length, meaning that the length of an object is not altered by a change in its spatial position, even though it may appear to look longer or shorter than before. When measuring, children need to place items on a base line when making comparisons and/or ordering objects according to length. Transitivity is the ability to infer, for example, that length A is longer than length C if direct comparison shows that A is longer than an intermediate length B and that B is longer than C. Piaget found that young children judge length in terms of end points only. Children also judge a line segment and a bent path with the same end points to have the same length.

Research Basis

Hiebert J. (1981). Cognitive development and learning linear measurement. *Journal for Research in Mathematics Education*, 12(3), 197-211.

Researchers found that the children do not seem to use the prerequisite knowledge of conservation and transitivity when they solve measurement tasks. Simple skills or techniques allow children to bypass the logical structure of many measurement tasks.

Hiebert J. (March, 1984). Why do some children have trouble learning measurement concepts? *Arithmetic Teacher*, 19-24.

In this study, researchers found that "a number of the [1st grade] children considered the length of an object to be determined only by the position of its endpoint rather than the distance between the beginning point and the endpoint."

Invitation to Learn

Have students sit in a circle or semi-circle around the teacher. Display an ordering mat (see example) for the children. Ask, "Where is the starting line? Whenever we are trying to determine which of two objects is shortest or longest, we have to put the objects on a starting line." The teacher should run her finger along the starting line. "The starting line provides each object with a fair chance, just like the starting line for runners in a race."

"On the starting line are two characters. What character is the shortest? Which character is the tallest?"

Display two similar items such as yarn or straws cut to different lengths. Show the children how you will hide the length of the objects by placing them in your closed hand so that only a portion is revealed.

Invite two students to come forward, pick an item from your closed hand, and tell whether they think they have the longer or the shorter object. Have one child place his/her yarn on the base line or starting line. Then have the second student place his/her yarn. Ask the class to determine whose yarn was longest and shortest. Continue until the concept is familiar to the students.

Instructional Procedures

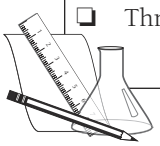
1. In advance, invite three parent volunteers to come and assist you on the day this concept will be introduced to the students. Plan to have the volunteers stay for one hour for the math centers activity.
2. Explain to the students that they are about to visit four measurement centers. In each center, they will be comparing items and deciding if they are longer or shorter. As they visit each center, remind students to make sure that they place the objects that they work with on the starting line at the bottom of their place mat.

3. The children will now begin math centers. Four center activities will be placed at numbered tables in the classroom. The teacher will divide students into four groups. Preferably, each group will only have six students. Group 1 will go to Table 1, Group 2 will visit Table 2 and so on. Invite the parent volunteers as they arrive to sit at one of the four centers. A brief description of what the volunteers will be teaching will be at the center. The centers will last approximately 10-12 minutes each. When a bell rings two times, children will clean up their materials, and stand by their chair until the signal is given to move to the next center.

Longest Straw: Center 1

Materials

- ❑ Three shoeboxes
- ❑ Various lengths of straws, or sticks.
- ❑ Three place mats



1. This center will reinforce the concept that the length of an object can be described by using another object in direct comparison.
2. Procedure: The children who visit this center will be placed in pairs. Each child draws one straw from the box. The children lay the straws on the baseline of the place mat to determine whose straw is the longest. By prior agreement, the child who has the longest, or shortest straw keeps both straws. If the straws are the same length, they are returned to the box or the children can choose to make a rule to handle this situation, like placing the identical straws in a tray on the table. The game is over when all the straws are removed from the box.

An extension of this activity would be to have the children tally how many draws are required to match all the pairs.

Hunting for Measured Treasure: Center 2

Materials

- ❑ Yarn
- ❑ Masking tape

1. Procedure: Show the pieces of yarn or adding machine tape to the groups and ask each child to choose a piece to use on a "Measure Hunt". Ask children to look around the classroom and find one object that is the same size as their piece of yarn or tape.
2. Have the parent volunteer model how to use the yarn for measuring by choosing a piece and inviting children to follow her around the room as she holds up yarn to different items, making sure that the end of the yarn touches the ending point of the object. This will help

children conceptualize a "baseline". The volunteer can then determine if the yarn and the object are the same length, or if one is shorter or longer.

3. The volunteer may now encourage the students to take their piece of yarn and search the room to find objects the same length as their yarn pieces. Encourage students to "hunt" in quiet and courteous way, so as not to disturb the other centers.
4. Now ask children to exchange their piece of yarn for one of a different length. Before they measure new objects, invite them to measure objects that matched their previous yarn length. How does it compare? Encourage the students to find objects that are **longer** than their piece of yarn. Next, encourage them to find objects that are **shorter** than their piece of yarn.

   As an extension, ask the children in the group if they will order their pieces of yarn, from shortest to longest. Provide a piece of masking tape on the floor as a base line. This will give them experience and practice in order and seriation.

Animal Trails: Center 3

Make four paths of different lengths on the floor using colored masking tape in an open area of the classroom.

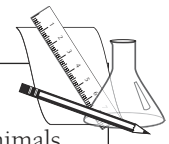
Path #1: At the head of this path, place a picture of a duck and at the end of the path, place a pond, and cut from blue construction paper.

Path #2: At the head of this path, place a picture of a cow and at the end of the path; place a picture of a barn, or a toy barn.

Path #3: At the head of this path, place a picture of a pig and at the end of the path, place a picture of mud, or an oval cut from brown construction paper.

Path#4: At the head of this path, place a picture of a hen and at the end of the path; place a picture of a nest.

1. Procedure: On the *Animal Trails* recording sheet, have children guess how many of their steps it would take to walk each path. Then have them walk each path, making sure to put their heel at the end of the path and placing their heel



Materials

- ❑ *Animal Trail* animals
- ❑ *Animal Trails* recording sheet
- ❑ Masking tape
- ❑ Blue construction paper
- ❑ Brown construction paper

next to their toe as they count the steps of the path. Have them record the number of steps each path takes.

2. On their recording sheets, have the students circle the longest path, and place an "X" next to the shortest path.

Materials

- ❑ Various items e.g.: straws, ribbons, popsicle sticks, toothpicks, pencils, crayons, paper strips, or pieces of string or yarn.
- ❑ A place mat with a Wikki Stix baseline for each pair of students

Place Your Order: Center 4

1. Procedure: At this station, children will be divided into partners. Have each pair of children take a bin of materials and a place mat.
2. One child chooses three objects from the bin and orders them on the place mat using the baseline at the bottom. The parent volunteer should direct the child to read aloud the order created. Have the child choose one more object from the bin and challenge his/her partner to place it in order on the mat.
3. If the partner does not place it in the appropriate position, the child should try again before trading roles with his or her partner.

Variation: One child places an object on the ordering mat. The child then challenges the partner to choose 2 objects to place on the mat. The partner then needs to order the objects from shortest to longest. After the partner orders the items, he or she may then offer a new challenge.

Assessment Suggestions

- It is important that children use the base line properly when comparing and ordering objects by length. Circulate among the students while they are involved in the activities to make sure that they are placing objects on the base line.
- These questions can form the basis of discussions as you observe children at work:

  Which is longer/shorter? Show me.

  Show me something longer/shorter than this object.

  Where does this belong in the order?

  Read the order aloud.

- To determine which children compare and order objects by length, have them complete a simple task. Provide each child with a mat that has a base line at the bottom and two

items to compare according to length. Place a green dot at the bottom left on the base line to indicate where to begin. Say, "Show me the object you think is shorter/longer." Ask, "How could you check your guesses? Show me. What object is shorter? Longer?" Give another object to the child and ask him/her to place it on their mat in the correct order. Say, "Show me the longest. Now show me the shortest." Repeat the activity as needed.

Curriculum Extensions/Adaptations/ Integration

- Using connecting cubes, have students work in groups of three.
- Have one student in the group make a train of connecting cubes.
- Have the second student make a train that is shorter.
- Have the third student make a train that is longer.
- Have the children repeat the activity until everyone has a chance to make the first train.
- Encourage them to make their trains, using different pattern combinations.

Additional Resources

Books

Bigger and Smaller, by Robert Proman

Pancakes, Pancakes, by Eric Carle

The Apple Bird, by Brian Wildsmith

The Carrot Seed, by Ruth Krauss

The Little Red Hen, by Paul Galdone

The Story of Ferdinand, by Munro Leaf

50 Math Activities for your Kindergarten Classroom, by Scholastic Books; ISBN 0-590-32773-9

The Three Billy Goats Gruff, by Paul Galdone

References

Coombs, B., Harcourt, L., & Young, S. (1993). *Explorations 1 in Math.* New York: Addison-Wesley Publishing Co.

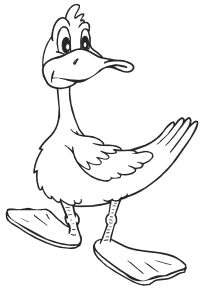
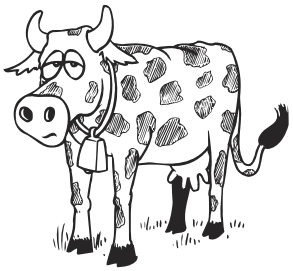
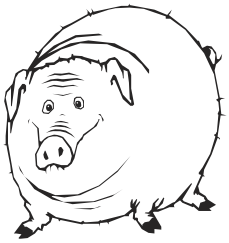
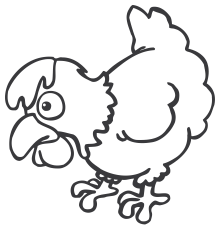
Schwartz, S.L. (1995). Developing power in linear measurement. *Teaching Children Mathematics*, Mar 1995, 412-16.

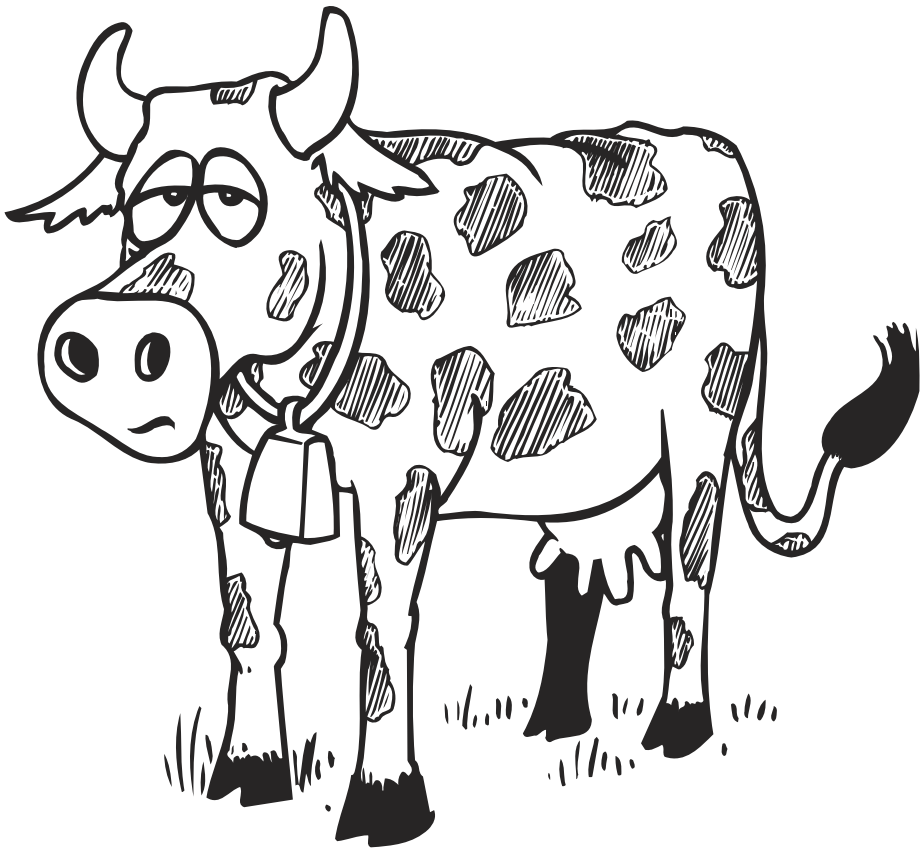
Family Connections

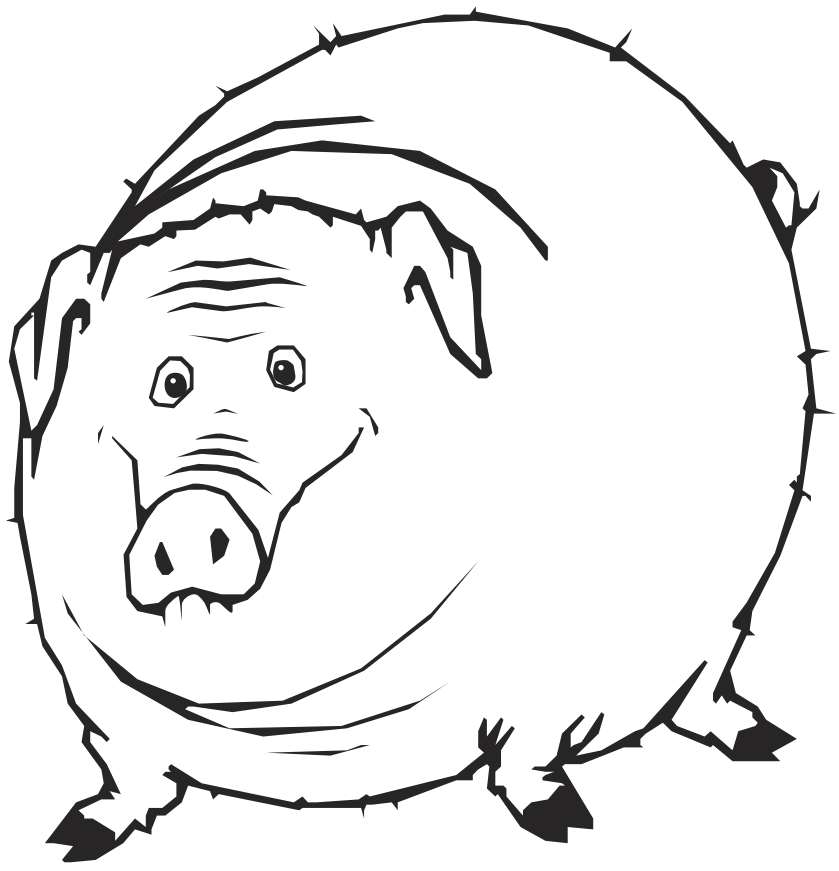
1. Invite parents to help their child gather together several items at home that are longer than they are wide such as a pencil, crayon, piece of chalk, ruler, paintbrush, screw driver, etc. Have parents encourage their child to arrange objects from shortest to longest by placing them side by side aligned evenly at the bottom.

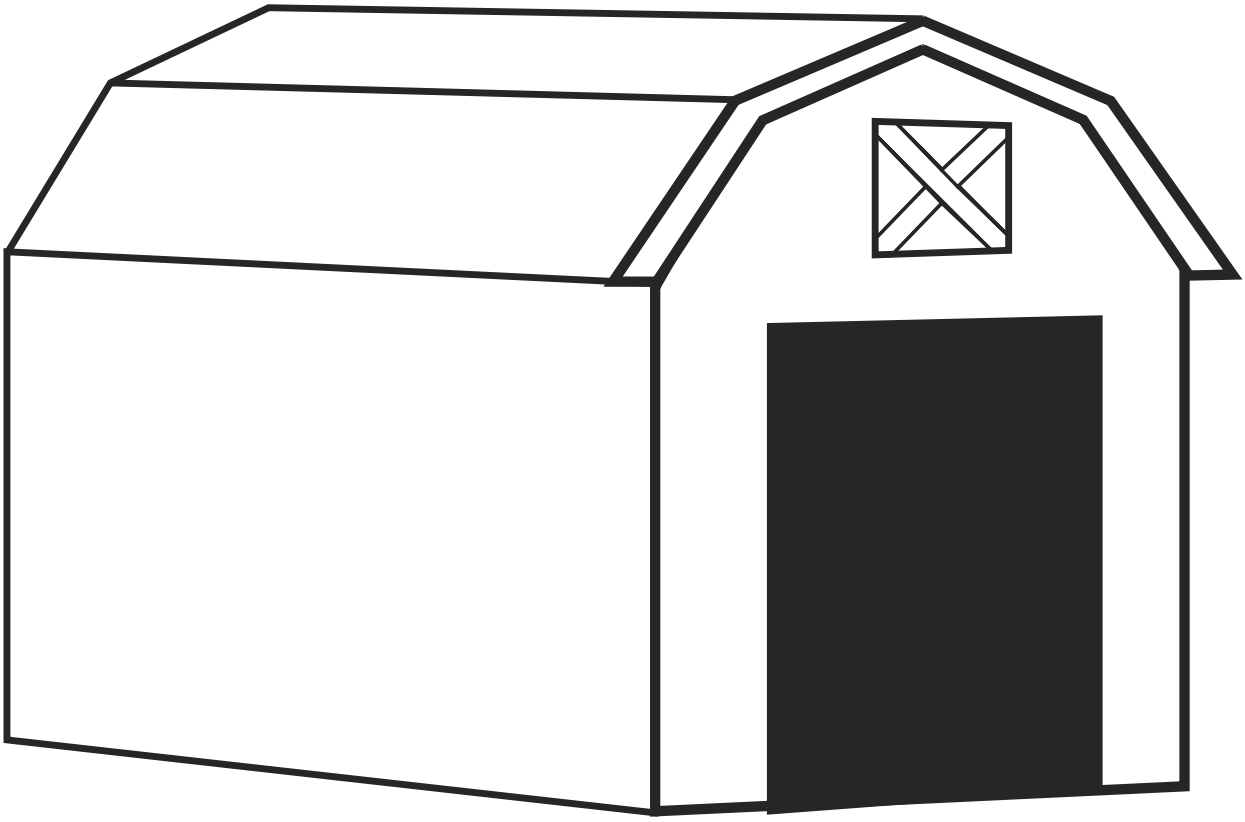
Name _____

Animal Trails

path	my guess	# of steps
 duck to pond		
 cow to barn		
 pig to mud		
 hen to nest		







Content I-2
Activities

Motor Development

Hinges I, Hinges II

Standard I:
Students will develop a sense of self.

Objective 2:
Develop skills in gross and fine motor movement.

Intended Learning Outcomes:
4. Develop physical skills and personal hygiene.

Content Connections:
Movement enhances all learning.

Content Standard I

Objective 2

Connections

Background Information

These activities are designed to teach students to use their bodies in daily activities, by promoting a regular routine of using large and small motor skills, personal space, and boundary awareness.

Students need to be familiar with the large motor skills such as jump, skip, hop, run, and walk. Many times we think students automatically understand these terms. Language barriers can be decreased by providing all children with an opportunity to differentiate the actions for each term. Gender differences and maturity also play a part in motor readiness. Opportunities for student and teacher awareness can be experienced through group discussions, stories and physical activities.

It is important to establish a routine whole group setting with rules and expectations all ready in place. The room set up should lend itself to large group movements. These prior preparations will enhance the activities for this learning objective.

Research Basis

Jerry West, Kristen Denton, & Elvie Germino-Hausken (2000) America's kindergartners, *Reading Rockets, 1.3,4,5,7*

This is a longitudinal study of the kindergarten class of 1998-1999, in terms of their family backgrounds and their cognitive, social and physical development.

Jeanette V0-Vu (2000/) Critical issue: Promoting children's readiness to learn *North Central; Regional Educational Laboratory 1.2.3.4.6.*

This study promotes the idea that students come to school with different cultural, educational, and environmental experiences to draw from. Readiness is also determined by adequate nutrition and physical activity.

Materials

- ❑ Four containers (shoe box size)
- ❑ Curriculum flash cards
- ❑ Four bean bags
- ❑ Different types of music (fast, slow, loud, soft, happy, and sad)
- ❑ Instrument to play music
- ❑ *Motor Skills Cue Cards*
- ❑ *Curriculum Flash Cards*
- ❑ *Student check list for understanding and mastery*
- ❑ *Letter Cards*
- ❑ *Color Cards*
- ❑ *Number Cards*
- ❑ *Real Door Hinges*

Invitation to Learn

Listen to this music, how does it make you feel? What does your body feel like doing? Use at least one part of your body to demonstrate the rhythm of the music. Move another part of your body to the rhythm. Combine the movement of the two different body parts. This is a good way to start a large motor activity. It can also be adapted to small motor activities.

Instructional Procedures

1. Give each child a large instructional scarf. Have the students move the scarf to the rhythm of the different kinds of music you provide.
2. Let them experiment moving around the room as they use their scarves.
3. Repeat this activity this time giving each child a large feather. This time direct the students to throw the feather in the air and then pick it up.
4. Talk about the different part of their body they use in each of these activities.
5. Direct the students to return to the sitting area. Talk about different ways you can sit on the floor, such as cross legs, one leg in front and one leg in back, on your knees, squatting on your feet, etc.
6. Show students the door hinge. Discuss the different hinges in the body.
7. Use a human joint model to demonstrate how human hinges work.
8. Let some students demonstrate their body hinges to the other students. Review what hinges they used in the previous activities.
9. Encourage children not to touch each other. This can lead into the topic of personal space.
10. Review the *Motor Skills Cue Cards*. Talk about these action movements each time you meet together. Make sure each child understands what the words mean and the required body actions.
11. Let the children make the positions with their body.
12. Use music to allow time for the students to more around the room in their different body positions.

13. Each of the shoebox size containers will contain Curriculum Flash Cards such as numbers, letters, sight words, shapes, colors and other curriculum items.
14. The students will take turns tossing a beanbag into the container review with them where to stand and what body parts it takes to complete this task. You either let this student identify the curriculum cards or they can toss a bean bag to a classmate who will then answer the questions. This task encourages other large motor skills such as tossing and catching. This is a good time to use the student *Check List for Understanding and Mastery*. This activity can be used for any curriculum area.
15. Use the color cards and the number cards for this activity.
16. Divide the class in two groups. One group will meet in the front of the room the other groups meet in the back of the room. There are two of each color cards.
17. Pin one set of color cards on each group. There are two cards for each number. Give one set to each group. Make sure that each side has matching pairs.
18. Turn on some music. Use a variety of music selections.
19. Use the *Motor Skills Cue Cards* to identify the movement you want the student to use as they move around the room.
20. When the music stops the students will stop and stay in their personal space.
21. Start the music again during this time they are going to find a person with the same color. Have them join hands when the music stops. Have everyone identify his or her color. This activity is simple enough for special needs children.
22. An extension of this activity would be to have the student find their same number. When the music stops children could joins hands and identify their number. When the music starts again have the students twirl around as many times as their number indicates.

The advance learner could find different numbers, add or subtract them, and twirl around the sums or the differences.

Assessment Suggestions

- Observe the children as they participate. Watch for understanding and following directions.
- Use a pre and post check list to account for understanding and mastery of the large motor skills.

Curriculum Extensions/Adaptations/ Integration

- Use the *Motor Skill Cue Cards* to direct the movement of the children when they get ready to change activities, go out for recess or other activities. Just before the activity let a child pick one of the *Motor Skills Cue Cards.* Have the student demonstrate the skill and have the others model the same skill. This allows daily review of the skills and an opportunity to continually practice them.
- An extension of this activity would be to have the student find their same number. When the music stops children could joins hands and identify their number. When the music starts again
- Have the students twirl around as many times as their number indicates.
- The advance learner could find different numbers, add or subtract them, and twirl around the sums or the differences.

Family Connections

- Provide each student with a checklist of motor skill used at school. Encourage parents to use their own checklist to provide family activities that support the large motor skills.
- Send home a copy of the *Motor Skills Cue Cards.*

Additional Resources

CD's

Disney Babies, Disney Records

Smart Symphonies, Mead, Johnson & Company

Humpty Dumpty, Neva Eder

Children's Favourite Songs, Disney Records

Tony Chestnut & Fun Time Action Songs, The Learning Station ISBN# 3810-87000-2

Jump-Start Action Song with Ronno, Kimbo Educational ISBN # 5829-29168-2

ABC slide & Learn Interactive flash cards, Hinkler Books ISBN # 7819525725

DVD

The Wiggles Dance Party, The Wiggles Classic Collections ISBN# 1-57132-696-0

Video

Elmocize, Elmocize, ISBN# 1-57330-552-9

Large Motor Skills Check List

Date _____ Class _____

Name	Run	Bounce	Balance	Twirl	Jump	Duck

Large Motor Skills Check List (cont.)

Date _____ Class _____

Name	Throw	Kick	Crawl	Hop	Catch	Walk

Small Motor Skills Check List

Date _____ Class _____

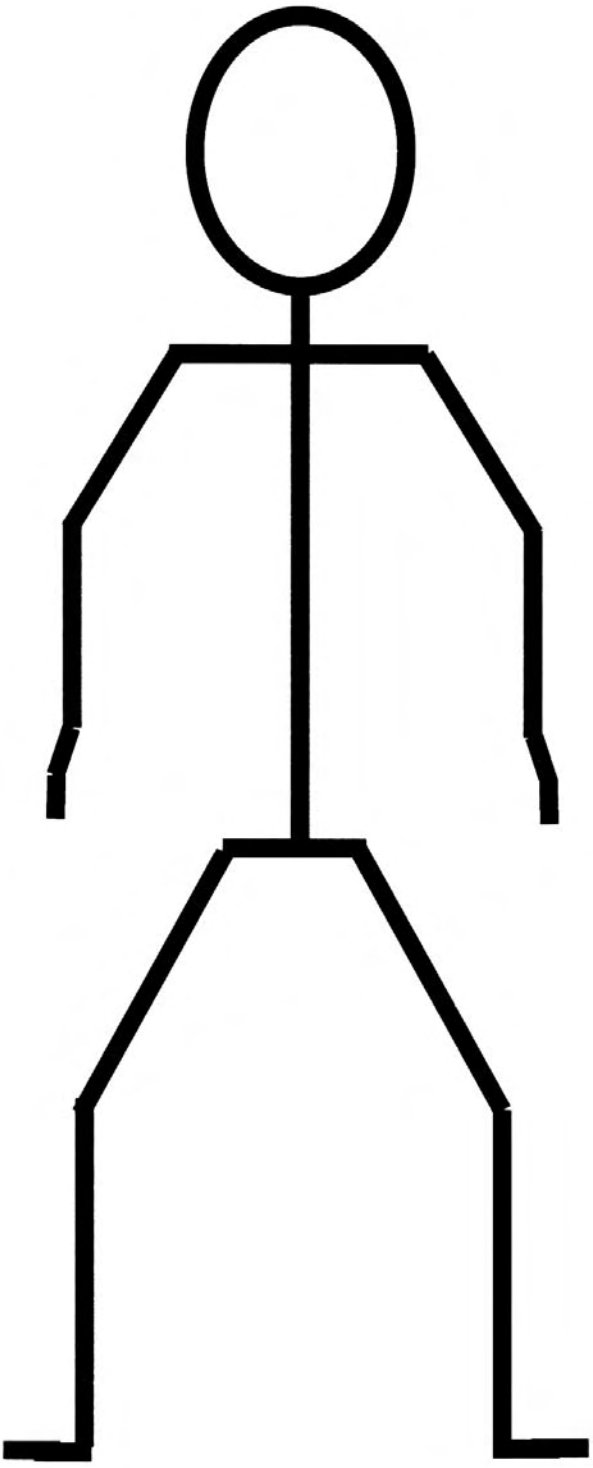
Name	Hold Pencil	Write Name	Color in Lines	Cut	Write Letters	Write Numbers

Small Motor Skills Check List (cont.)

Date _____ Class _____

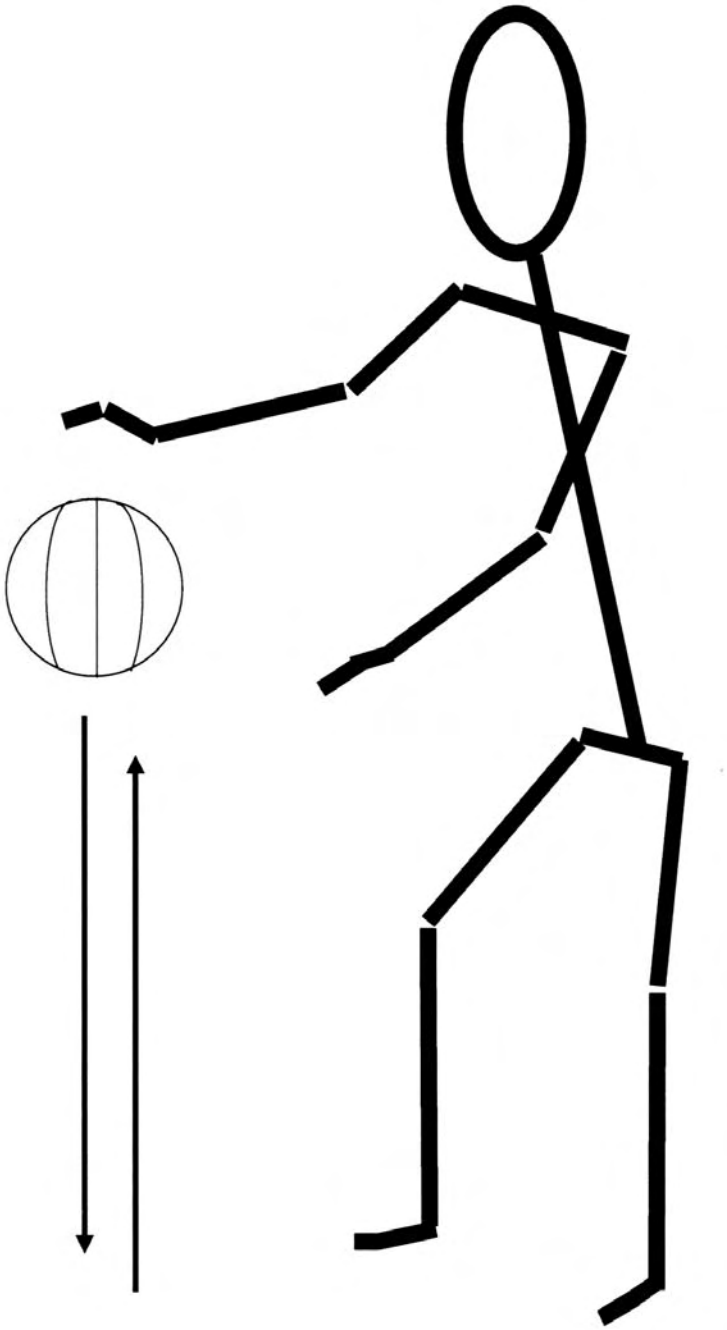
Name	Tie Shoes	Sew	Connect Dots	Stack Object	Roll Dough	String Beans

Standing

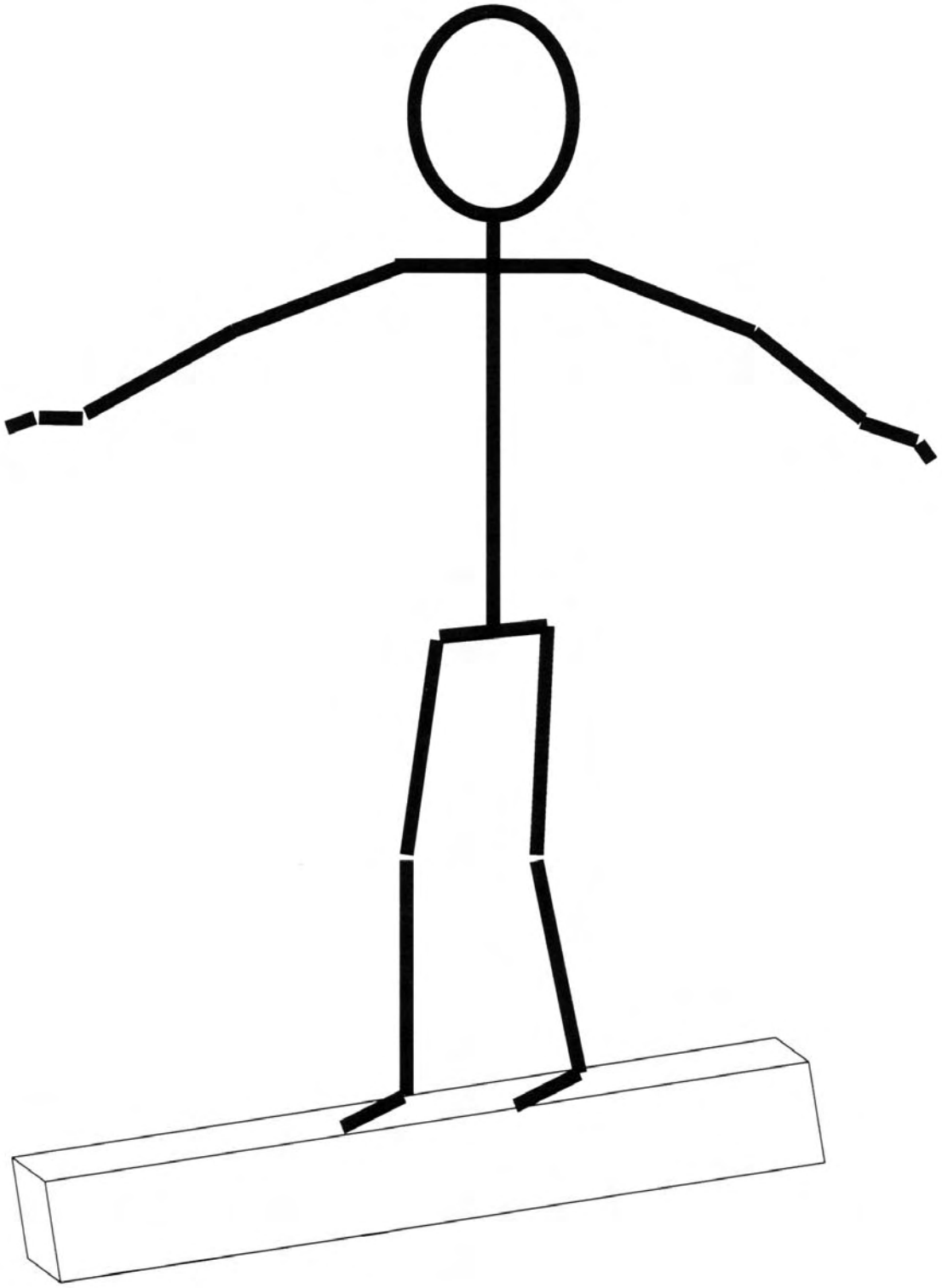


Run

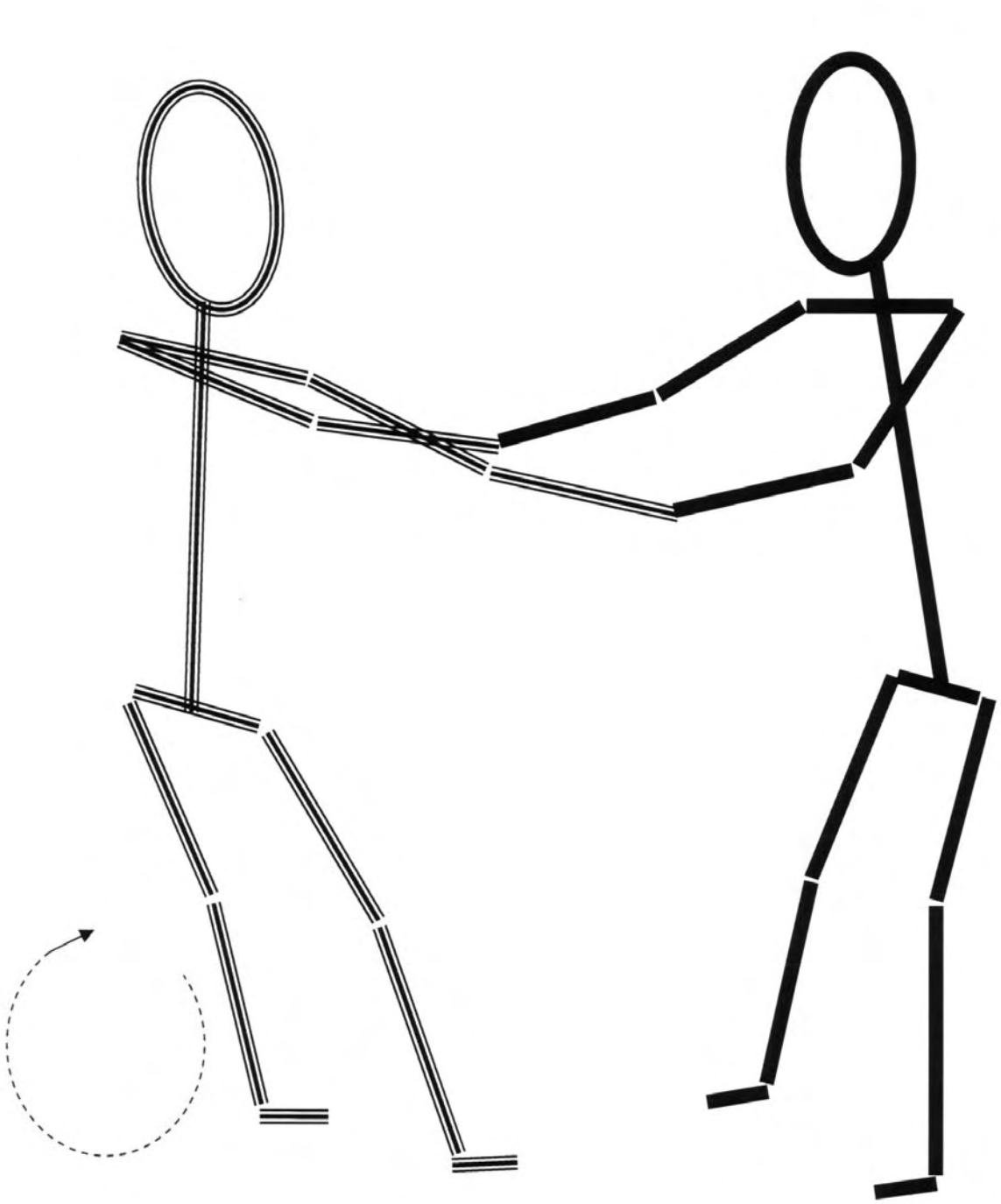
Bounce



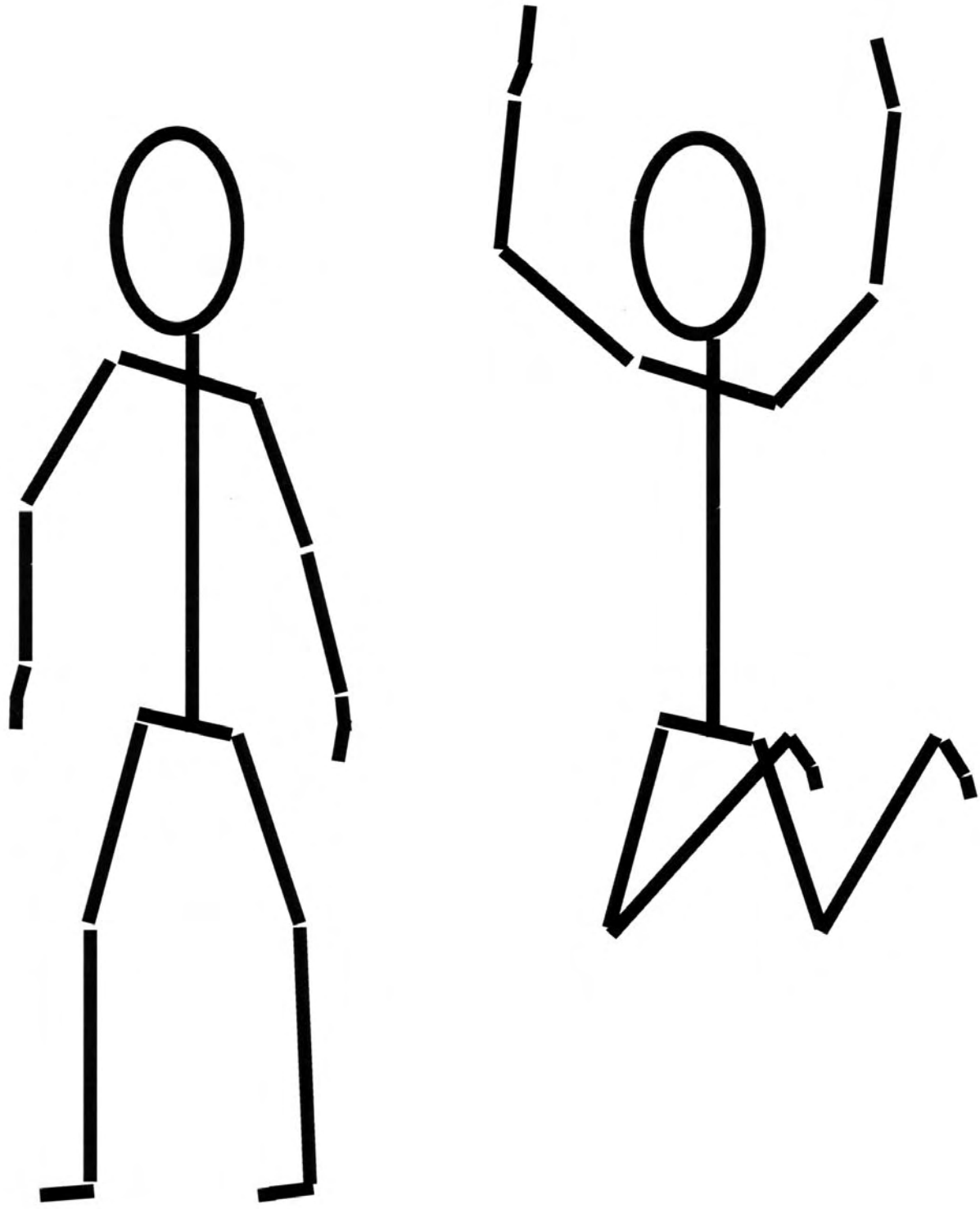
Balance



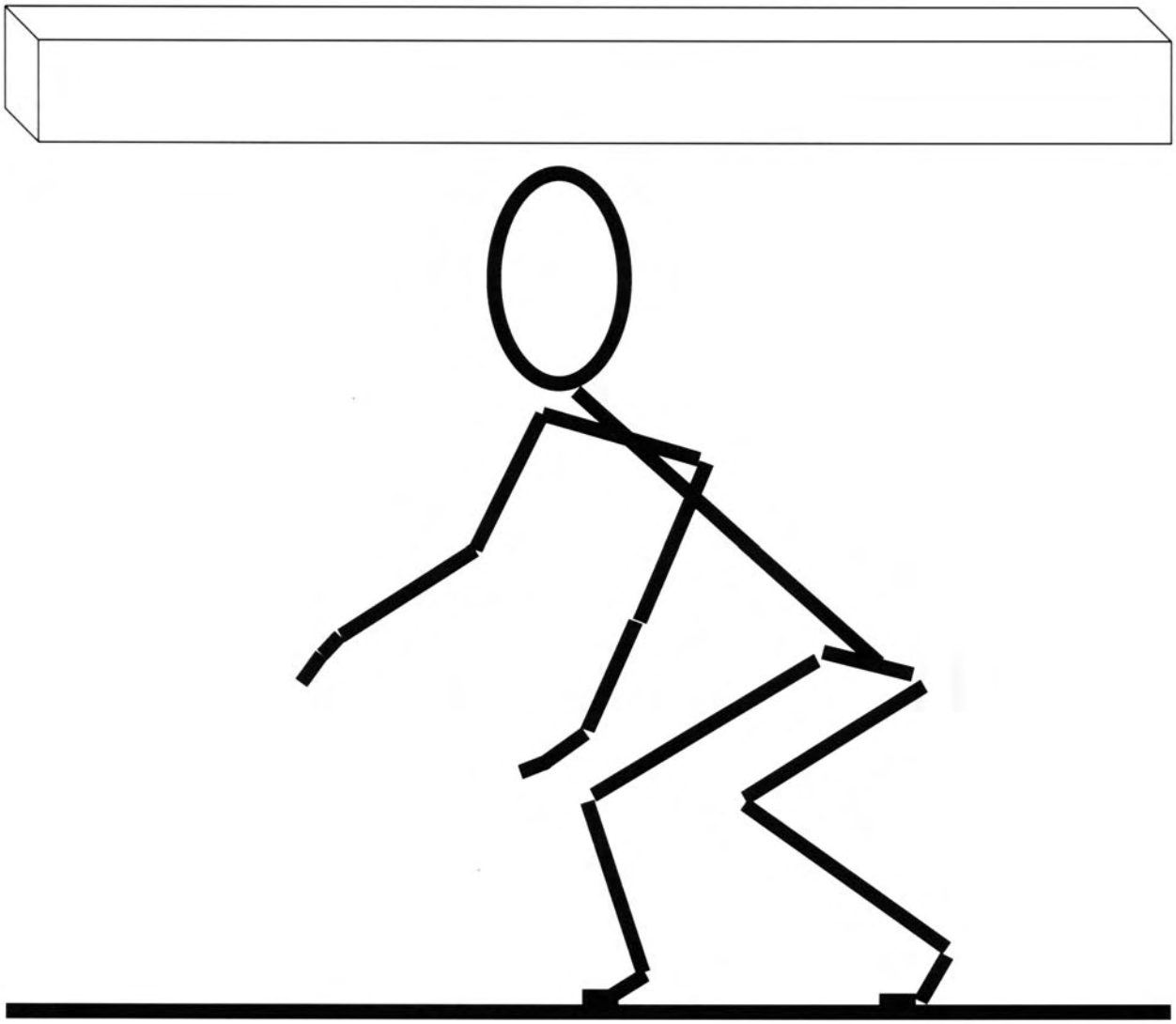
Twirl



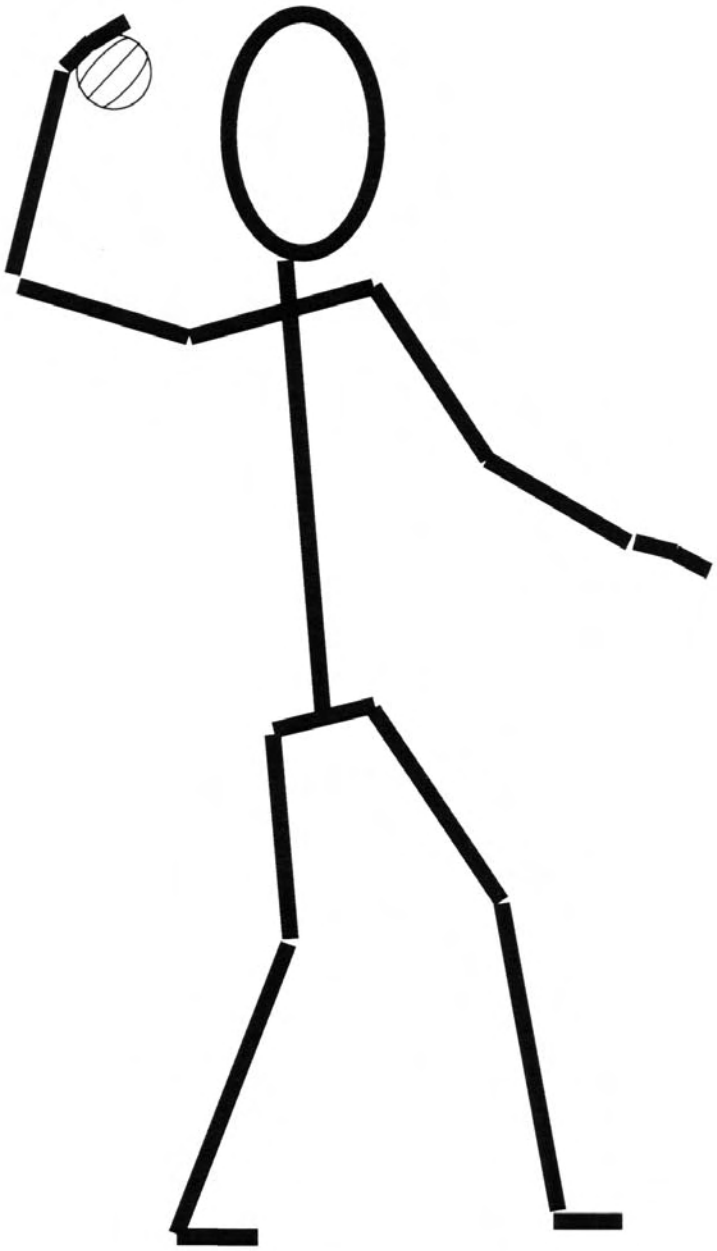
Jump



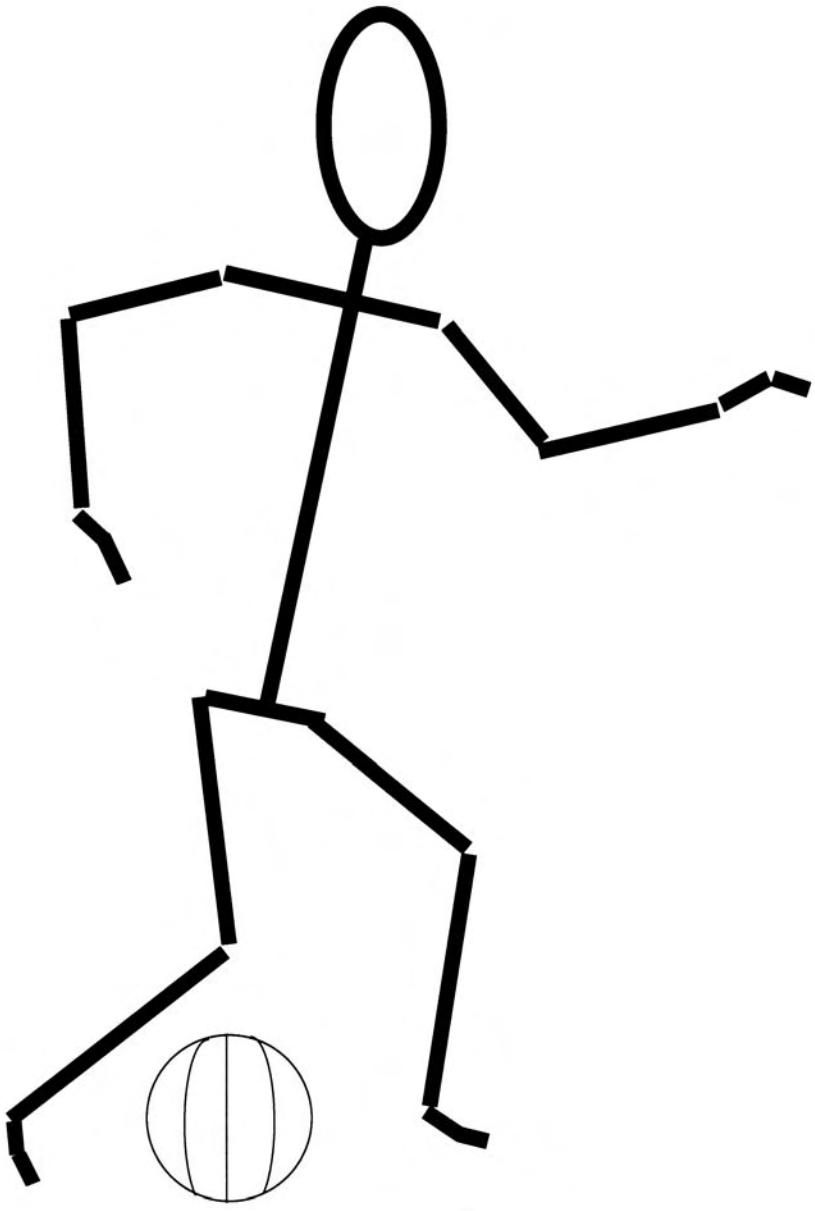
Duck



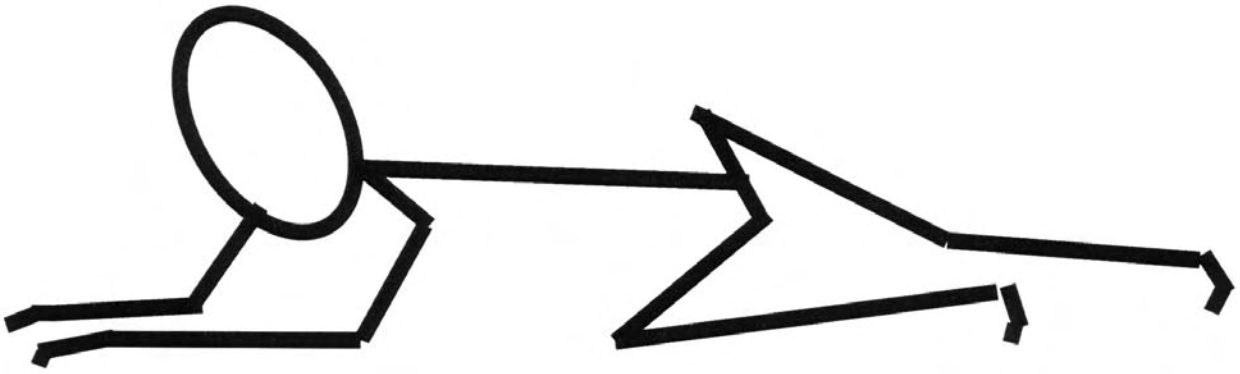
Throw



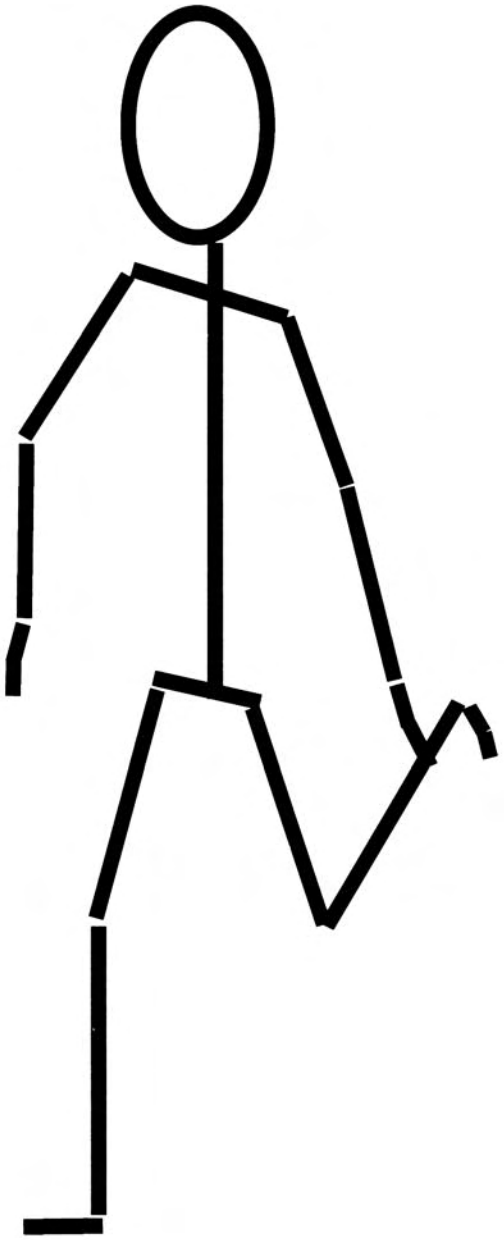
Kick



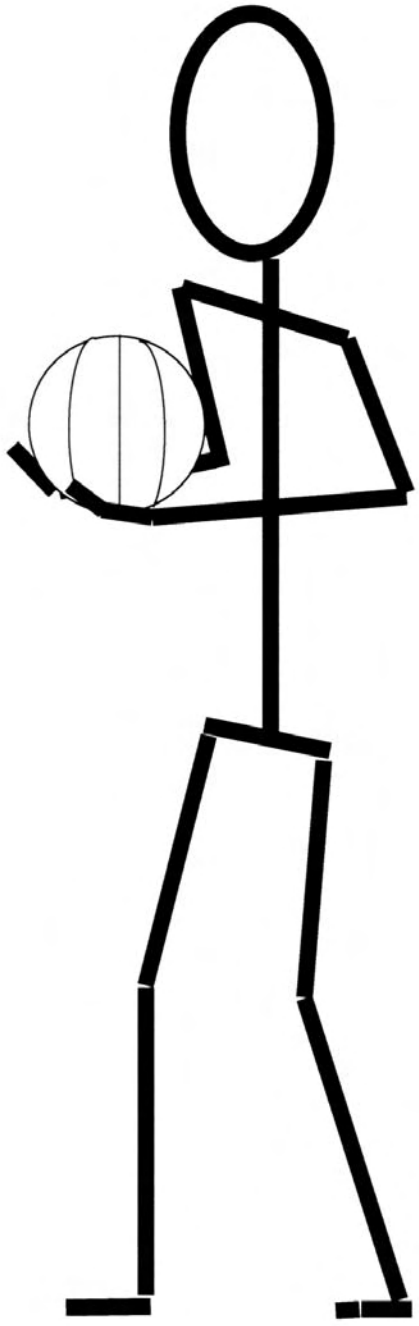
Crawl



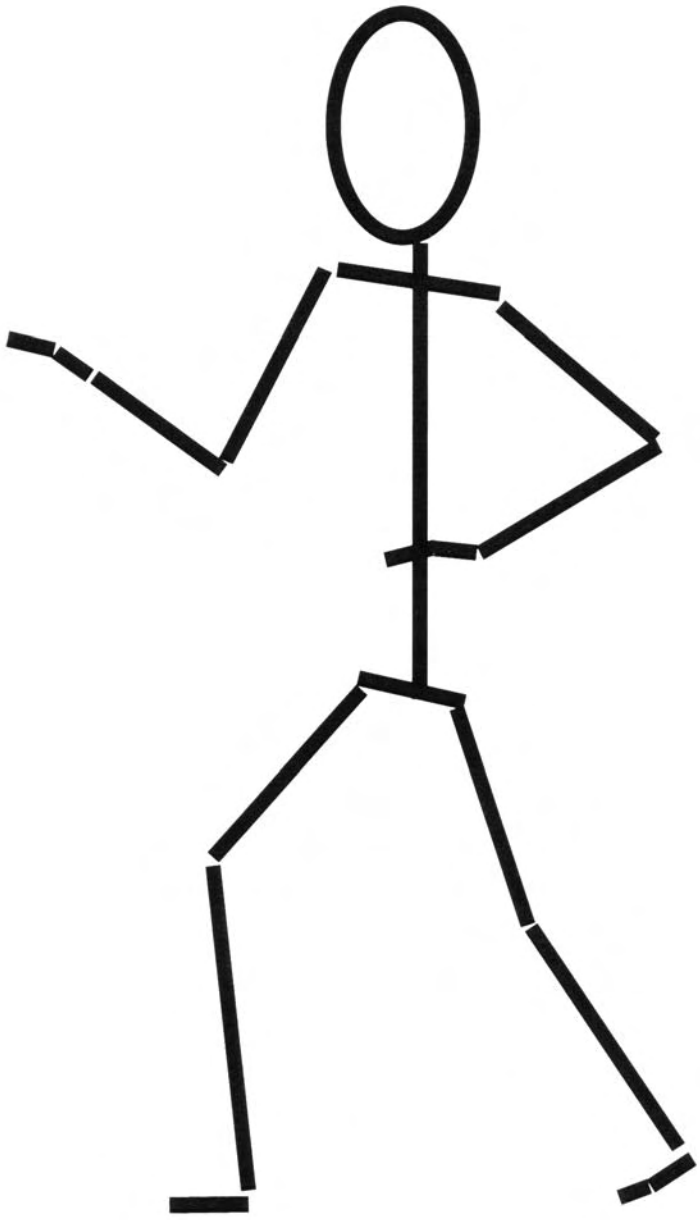
Hop



Catch



Walk



Hinges Are a Part of You

Content Standard IV

Objective 2

Connections

Standard IV:
Students will develop a sense of self.

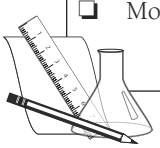
Objective 2:
Develop skills in gross and fine motor movement.

Intended Learning Outcomes:
4. Develop physical skill and personal hygiene.

Content Connections:
Movement enhances all learning

Materials

- ❑ Eight 6" pipe cleaners per child
- ❑ Eight 10" pipe cleaners per child
- ❑ 2 large pieces of paper per child
- ❑ Crayons
- ❑ *Motor Skills Cue Cards*
- ❑ Writing paper
- ❑ Pencil
- ❑ Chart paper
- ❑ Markers
- ❑ *Hinges*
- ❑ Movement CD's
- ❑ Real door hinges
- ❑ *Small motor skills checklist*
- ❑ CD Player
- ❑ Model of a human joint



Background Information

Handwriting is used in every aspect of education and daily activities. These activities are designed to promote writing readiness addressing dominate hand use, small muscle development, eye-hand coordination, ability to copy, and an orientation to reading readiness. A child's ability to scribble, hold a writing tool correctly, and draw an object from memory results in their reading readiness, formal handwriting and remembering details. Good modeling is important for writing readiness.

Research Basis Concepts

Deborah Marr, (2001) Handwriting readiness: Locatives and Visuomotor skills in the Kindergarten year, *ECRP,* Spring Volume #3, 1-17

This study visits the idea that handwriting is an integral part of every child's school experience, promoting knowledge of spatial and temporal concepts along with the development of graphomotor tasks.

John Cabin ,MD (2004) Handwriting without tears, ***Readiness Research*** Carither, B. & Farquharson,F. (2004). Learning Styles, Orlando, FL: Valerncia Community College, Retrieved March 2004 from the World Wide Web: http://faculty.volencia.ccfl.us/ffarquharson/learning_styles/ Hood, K. (1995). Exploring Learning Styles and Instruction. Athens, GA: University of Georgia. Retrieved from the World Wide Web March 2004 http.//jwilson.core.uga.edu/EMT705/EMT705.Hood.html

This group of studies indicates that student achievement is significantly increased with multi-sensory instruction. Awareness of this finding will immensely help teachers in both the design and the implementation of teaching that enhances learning.

Dr. Wayne D. Lance,(2005) Teaching writing: Preschool, kindergarten, and First grade, international children's education,1,2,3, Retrieved, February 1992 Issue of Parents Teaching Overseas.

This article indicates that the preparation for writing should begin at home in the preschool years. These steps are important to help a child have success in Kindergarten and First Grade writing experiences.

Invitation to Learn

Raise both hands in the air. Pick up the crayon and write your name on the paper on your desk. Raise your hands again. This time put the hand you used behind your back and use the other hand to write your name. This is a good way to start your small motor activities. Discuss how hard it is to write with the hand that has not been developed for writing skills.

Instructional Procedures

1. Give each child four pieces of pipe cleaners. Tell the students to experiment with them and try to make one or two different figures. Watch the children as they work with the pipe cleaners. Observe how they use their hands to form different objects.
2. Talk to the students about the joints in your body and how they are like hinges. Show them how a real hinge works. Compare this movement to a body joint model. You may want to bring several different sizes of hinges.
3. Have the students look at their hands. Ask them to find the different hinges in their hands and fingers. Ask them to bend their hands and fingers as you demonstrate to them how their hands and fingers work like hinges. Talk about what hinges you have to use to hold a pencil, open and close their hands.
4. Teach them the song "Hinges."
5. Show several motor skill cards and ask them to identify the position.
6. Give them four additional pieces of pipe cleaners. Demonstrate how to make a stick figure, one piece for the head, one piece for the body, one piece for the arms, and one piece for the legs.
7. Use the *Motor Skills Cue Cards* to discuss other hinges in the body. Display the cards.
8. Let them practice making the different positions with their stick figure. Give them time to experiment.
9. Let them make their favorite position and have them set the stick figure down on their table. This will remind students

of the different large motor positions and it gives them an opportunity to work with their small motor muscles. Using the large pieces of paper have the students draw the position of their stick figure. Also have them copy the words on the card that describes their position.

10. Let the children use their stick figures as a model as they draw different positions on a large piece of paper. This indicates eye hand coordination and the transfer of information.
11. Use the children's drawings to help compose a story about what we do at school. Display the pictures around the room. Using large chart paper write the ideas that the children bring up. You can direct a story with their ideas.
12. After a few sentences have been written have the students act out the story using the motor skills positions in the story. Each child will copy the story on their own writing papers.

Curriculum Extension/Adaptations/ Integration

- Advanced students could start to write their own stories using pictures and some words they are familiar with.
- Students could also share their own versions of their stories with the class.
- Clay could also be used to make stick figures.
- 2003-2004 Kindergarten Core Academy Activity: Aluminum

Assessment Suggestions

- Observe the children as they participate in the activity. Watch for understanding following directions and meaning of activity cards and positions.
- Observe the use of their small motor skills.
- Use the pre- and post- check list to account for the understanding and mastery of the small motor skills.

Clay could also be used to make stick figures.

Writing Extensions (2003-2004 Kindergarten Core Academy Activity: Aluminum Stick Figures)

Family Connections

The child can take home their pipe cleaner stick figures. Provide a home note explaining your class activity and ways parents can encourage small and large motor skills such as holding a pencil correctly, copying letters, figures, and numbers.

Additional Resources

CD & Book, ***Music Movement***, Steven Traugh, ISBN 2554444, Teacher's Discount www.tdbestprice.com

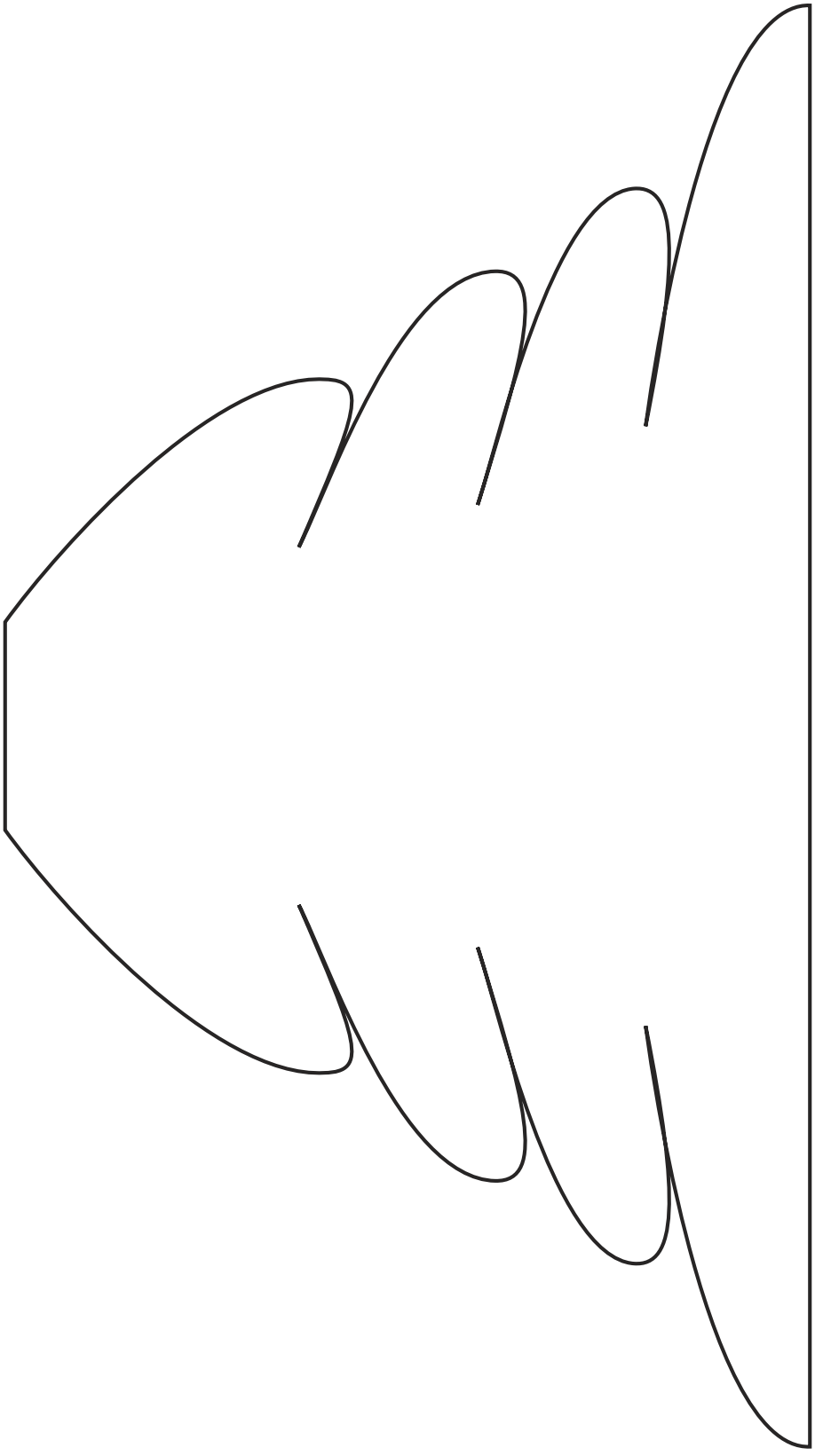
Movement Aluminum Stick Figures Activity

CD ***Action, & Fun,*** Teachers Discount, ISBN 277942, www.tdbprice.com 2003-2004 Utah Core Academy Kindergarten

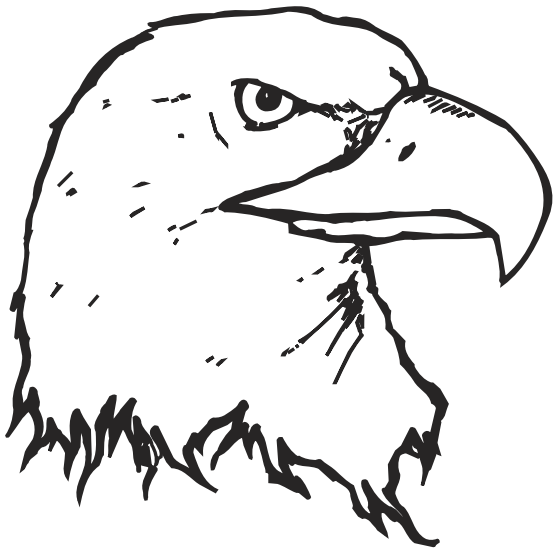
CD Dr. Jean, Friends and Letters

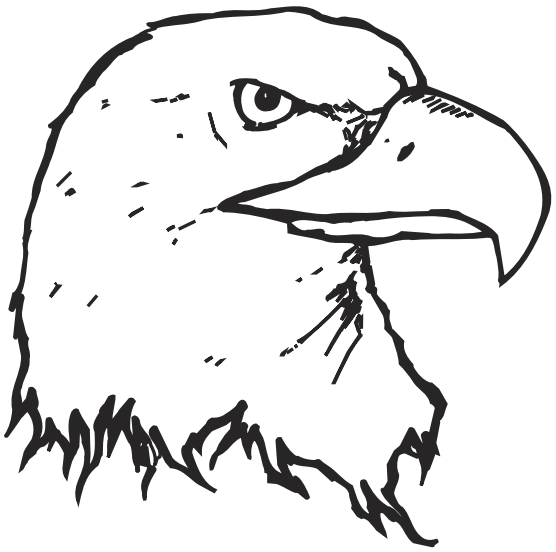
Appendix

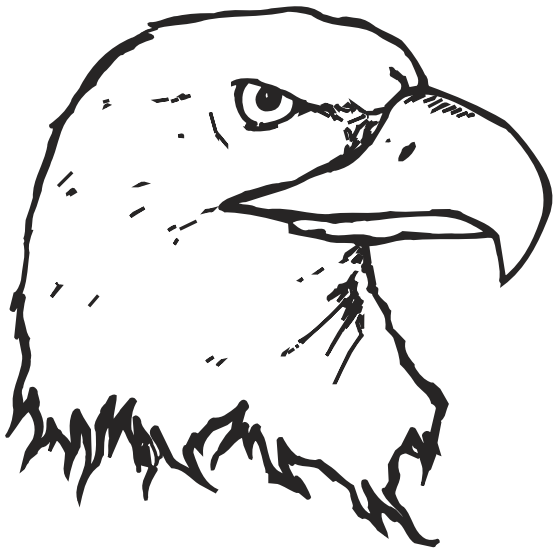
Bald Eagle Headdress Wings



Bald Eagle Headdress Head







Name_____

"Quack" Addition

___ + ___ = _____	___ + ___ = _____
___ + ___ = _____	___ + ___ = _____
___ + ___ = _____	___ + ___ = _____
___ + ___ = _____	___ + ___ = _____
___ + ___ = _____	___ + ___ = _____

Name_____

"Quack" Addition

___ + ___ = _____ ___ + ___ = _____
___ + ___ = _____ ___ + ___ = _____
___ + ___ = _____ ___ + ___ = _____
___ + ___ = _____ ___ + ___ = _____
___ + ___ = _____ ___ + ___ = _____

Name _____

Subtraction Sentences

___ - ___ = ___

___ - ___ = ___

___ - ___ = ___

___ - ___ = ___

___ - ___ = ___

___ - ___ = ___

___ - ___ = ___

___ - ___ = ___

___ - ___ = ___

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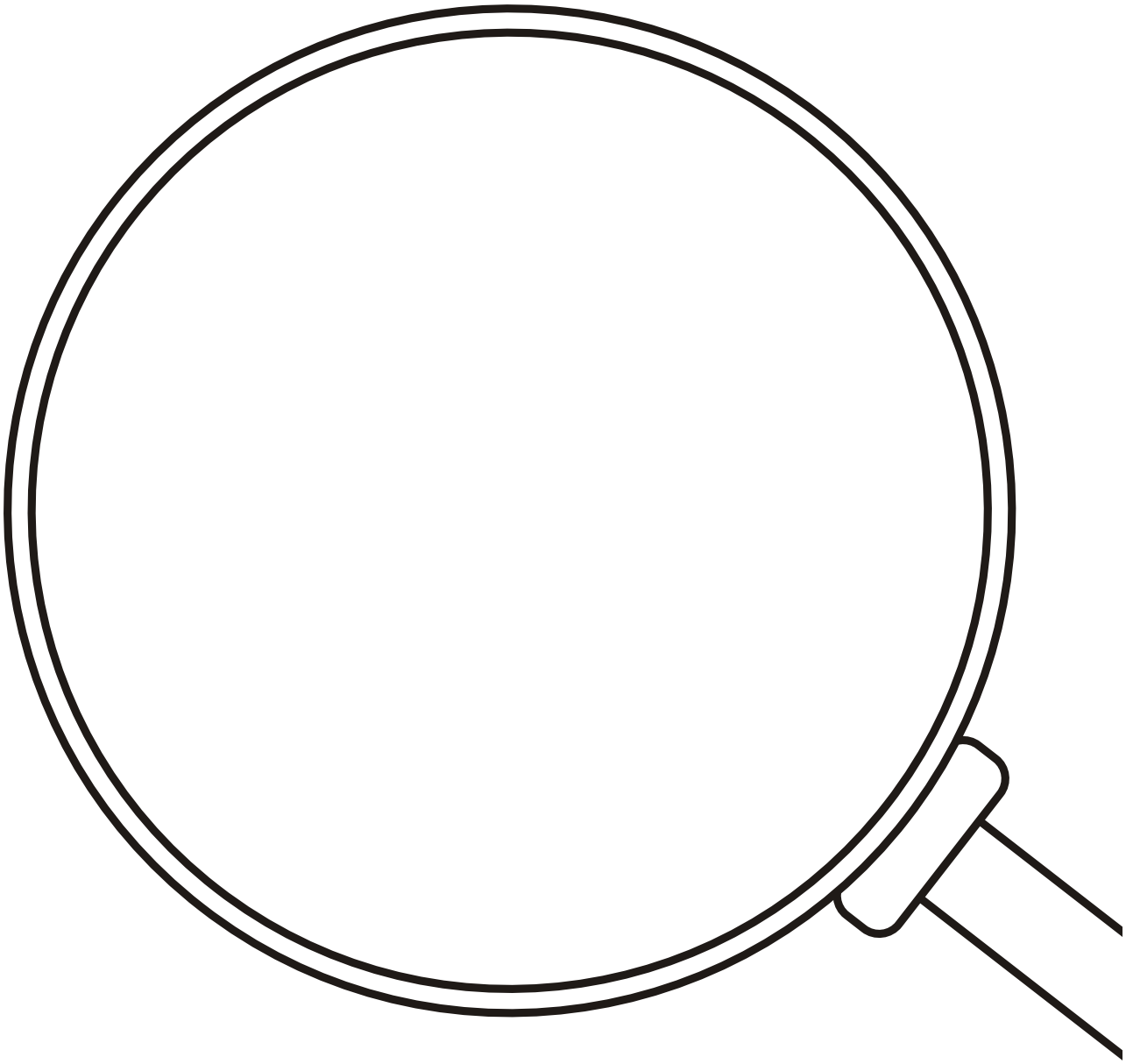
___ - ___ = ___

My Bug Hunt



Look What

_____

found on the bug hunt.

Butterfly

Hide & Seek
Data Collection Sheet

for _____

PREDICTION
My butterfly will be safest in the _____ environment.

DATA
My butterfly was hardest to see in the

garden	desert	forest	wetlands	night	city

CONCLUSION

My butterfly was safest in the _____ environment because_____

_____

Hide & Seek
Data Collection Sheet

for _____

PREDICTION
My butterfly will be safest in the _____ environment.

DATA
My butterfly was hardest to see in the

garden	desert	forest	wetlands	night	city

CONCLUSION

My butterfly was safest in the _____ environment because_____

_____