



**2005**

**PARTICIPANT  
HANDBOOK**



**UtahState  
UNIVERSITY**

**ELEMENTARY CORE ACADEMY**  
6517 Old Main Hill  
Logan, UT 84322-6517  
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<http://coreacademy.usu.edu>

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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 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

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# Funding Sources

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Major funding for the Academy comes from the following sources:

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- Utah State Office of Education
  - Staff Development Funds
  - Special Education Services Unit
- ESEA Title II
- Utah Math Science Partnership
- WestED Eisenhower Regional Consortium

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- Utah State Office of Education Special Education Services

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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

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## **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 newly adopted 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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***Second Grade  
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.

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

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



educators, State Office of Education specialists, 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, 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, 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, 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 intimidate them with a collection of

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

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

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.

### **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 Second Grade Core Curriculum

Second grade 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.

In second grade, students are immersed in a literature-rich environment, filled with classical and contemporary fiction and nonfiction selections, which relate to all areas of learning and interest. Students listen and speak effectively in classroom discussions. They continue to work on fluency and expression and use a combination of strategies for reading and comprehension.

Second graders extend their study of number and spatial sense to include three-digit numbers and three-dimensional figures. They make measurements and collect, organize, and display data. They use graphs to answer questions and make summary statements and predictions based on their experiences. While learning mathematics, students will be actively engaged in using concrete materials and appropriate technologies such as calculators and computers.

In second grade, students learn about their relationship to the classroom, school, family, and community. Students develop the skills of questioning, gathering information, constructing explanations, and drawing conclusions. They learn basic body control while developing 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 thoughts and ideas creatively, while challenging their imagination, fostering reflective thinking, and developing disciplined effort and problem-solving skills.

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



## 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, and second grade education should address the intellectual, social, emotional, physical, and ethical development of children. While the Kindergarten, First, 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, 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.**

- a. 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.

# Second Grade 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.  
Identify specific purpose(s) for listening (e.g., to gain information, to be entertained).

- a. Listen and demonstrate understanding by responding appropriately (e.g., follow multiple-step directions, restate, clarify, question, summarize).
- b. Speak clearly and audibly with expression in communicating ideas.
- c. Speak in complete sentences with appropriate subject-verb agreement.

*Objective 2:*   Develop language through viewing media and presenting.

- a. Identify specific purpose(s) for viewing media (i.e., to identify main idea and details, to gain information, distinguish between fiction/nonfiction).
- b. Use a variety of formats (e.g., drama, sharing of books and personal writings, choral readings, informational reports, retelling experiences, and stories in sequence) in presenting with various forms of media (e.g., pictures, posters, charts, ads, newspapers).

**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. Discriminate between letters, words, and sentences in text.
- b. Match oral words to printed words while reading.
- c. Identify punctuation in text (i.e., periods, question marks, and 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 syllables in words.
- b. Count the number of syllables in a first name.

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

- a. Identify words with same beginning consonant sounds (e.g., man, sat, sick) and ending consonant sounds (e.g., man, sat, ten) in a series of words.
- b. Identify words with same medial sounds in a series of words (e.g., long vowel sound: take, late, feet; short vowel sound: top, cat, pan; middle consonant sound: kitten, missing, lesson).

*Objective 3:* Orally blend word parts (blending).

- a. Blend syllables to make words (e.g., /ta/.../ble/, table).
- b. Blend onset and rime 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 and final sound (e.g., replace first sound in mat to /s/, say sat; replace last sound in mat with /p/, say map).
- b. Substitute vowel in words (e.g., replace middle sound in map to /o/, say mop).
- c. Delete syllable in words (e.g., say baker without the /ba/, say ker).
- d. Deletes initial and final sounds in words (e.g., say sun without the /s/, say un; say hit without the /t/, say hi).
- e. Delete initial phoneme and final phoneme in blends (e.g., say step without the /s/, say tep; say best without the /t/, say bes).

**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. Identify and pronounce all vowel diphthongs (e.g., oi, oy, aw, au) and consonant digraphs (e.g., ch, sh, th, wh) accurately in words.
- b. Identify and pronounce sounds for short and long vowels, using patterns (e.g., cvc, cvvc, cvcv, cvc-silent e), and vowel digraphs (e.g., ea, ee, ie, oa, ai, ay, oo, ow) accurately in two-syllable words.
- c. Identify and pronounce r-controlled vowel patterns in words (e.g., ar, or, er).
- d. Identify and blend letter sounds to pronounce 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. Use knowledge of word families, patterns, and common letter combinations to spell new words.
- b. Spell words with short and long vowel sounds, r-controlled words, words with consonant blends, consonant and vowel digraphs.
- c. Spell an increasing number of grade level high-frequency and irregular words correctly (e.g., believe, answer).
- d. Learn the spellings of irregular and difficult words (e.g., because, animals, before, answer, weight).

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

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

- a. Use knowledge about spelling to predict the spelling of new words.
- b. Visualize words while writing.
- c. Associate the spelling of new words with that of known words and word patterns.
- d. Use spelling generalities to assist spelling of new words (e.g., one vowel between two consonants, silent “e” on the end of a word, two vowels together).



**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 grade level text at a rate of approximately 80 wpm.
- b. Read grade level text with an accuracy rate of 95-100%.

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

- a. Read grade level text in three- to four-word phrases using intonation, expression, and punctuation cues.
- b. Read with automaticity 200 second grade high-frequency/sight words.

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

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

**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).

*Objective 2:* Use multiple resources to learn new words by relating them to known words and/or concepts.

- a. Use multiple resources to determine the meanings of unknown words (e.g., simple dictionaries, glossaries).
- b. Relate unfamiliar words and concepts to prior knowledge to increase vocabulary (e.g., liquid: milk, water, punch).

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

- a. Identify meanings of words using prefixes and suffixes (e.g., do/undo, write/rewrite, happy/happiness, help/helper/helpful).
- b. Use context to determine meanings of unknown key words (e.g., The store clerk glared at the children as they looked at the toys.).
- c. Use context to determine meanings of synonyms, antonyms, homonyms (e.g., sun/son) and multiple-meaning words (e.g., ring).

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

*Objective 1:* Identify purposes of text.

- a. Identify purpose for reading.
- b. Identify 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 read aloud and independently.
- c. Form mental pictures to aid understanding of text.
- d. Make and confirm predictions while reading using title, picture clues, text, and/or prior knowledge.
- e. Make inferences and draw conclusions from text.
- f. Identify topic/main idea from text; note details.
- g. Summarize important ideas/events; summarize supporting details in sequence.
- h. Monitor and clarify understanding applying fix-up strategies while interacting with text.
- i. Compile information from text.

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

- a. Identify characters, setting, sequence of events, problem/resolution.
- b. Identify different genres: fairy tales, poems, realistic fiction, fantasy, fables, folk tales.
- c. Identify information from pictures, captions, diagrams, charts, graphs, and table of contents.
- d. Identify different structures in texts (e.g., compare/contrast, cause/effect).
- e. Locate facts from a variety of informational texts (e.g. newspapers, magazines, books, other resources).

**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.*

**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 reading, discussing literature and informational text, and reflecting on personal experiences.
  - b. Select topics from generated ideas.
  - c. Identify audience, purpose, and form for writing.
  - d. Use simple graphic organizers to organize information.

- Objective 2:* Compose a written draft.
- a. Draft ideas on paper in an organized manner utilizing words and sentences (e.g., beginning, middle, end; main idea; details).
  - b. Use voice in writing (e.g., express feelings, opinions).
  - c. Select appropriate words to convey meaning.

- Objective 3:* Revise by elaborating and clarifying a written draft.
- a. Revise draft to add details, strengthen word choice, and reorder content.
  - b. Enhance fluency by using complete sentences.
  - c. Revise writing, considering the suggestions of others.

- Objective 4:* Edit written draft for conventions.
- a. Edit writing for capitals in names, first word of a sentence, and the pronoun “I”, correct punctuation of sentence endings, greetings and closings of letters, dates, and contractions.
  - b. Edit for spelling of grade level-appropriate words.
  - c. Edit for standard grammar (e.g., subject-verb agreement).
  - d. Edit for appropriate formatting features (e.g., margins, indentations, titles).

- Objective 5:* Use fluent and legible handwriting to communicate.
- a. Write demonstrating mastery of all upper- and lower-case manuscript letters and numerals using proper form, proportions, and spacing.
  - b. Increase fluency in forming manuscript letters and numerals.
  - c. Produce legible documents with manuscript handwriting.

*Objective 6:* Write in different modes and genres.

- a. Produce personal writing (e.g., journals, friendly notes and letters, personal experiences, family stories, literature responses).
- b. Produce traditional and imaginative stories, narrative and formula poetry as an individual/shared writing activity.
- c. Produce informational text (e.g., ABC books, how-to books, observations).
- d. Produce writing to persuade (e.g., express opinions).
- e. Produce functional texts (e.g., lists, labels, signs).
- f. Share writing with others using illustrations, graphs, and/or charts to add meaning.
- g. Publish 4-6 individual products.

# Second Grade Mathematics Core Curriculum

**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.**

*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 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 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 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 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.



**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.**

*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., ABAABBAABBB . . .).
- 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 2:* Recognize and represent relations using mathematical symbols.

- a. Recognize that “ $\neq$ ” indicates a relationship in which the quantities on each side are not of equal value.
- b. Recognize that symbols such as  $\square$ ,  $\triangle$ , or  $\diamond$  in an addition or subtraction equation represent a value that will make the statement true (e.g.,  $\square + 3 = 6$ ,  $5 + 7 = \triangle$ ,  $7 = 9 - \diamond$ ).
- 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.,  $(2 + 3) + 7 = 12$ ,  $2 + (3 + 7) = 12$ ).

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

*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 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.,  $\triangle$  and  $\nabla$ ).

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

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

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

*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 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.

**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. 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 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).

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

## Second Grade Fine Arts, Health, Physical Education, Science and Social Studies Core Curriculum

**Standard I:**  
Students will develop a sense of self.

**Standard I: Students will develop a sense of self.**

*Objective 1:* Describe and adopt behaviors for health and safety.

- a. Explain the importance of balance in a diet.
- b. Distinguish communicable from noncommunicable diseases (e.g., chicken pox, common cold, flu; asthma, cancer, diabetes).
- c. Relate behaviors that can help prevent disease (e.g., hand washing, good nutrition, fitness, universal precautions).
- d. Identify the harmful effects of tobacco on self and others (e.g., death, heart and lung disease, shortness of breath).
- e. Adopt basic safety habits (e.g., wear a seatbelt, practice bicycle safety, find adult help in an emergency).

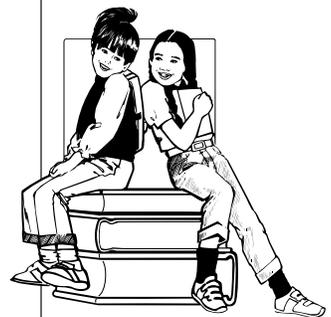
*Objective 2:* Develop and apply skills in fine and gross motor movement.

- a. Participate daily in sustained periods of physical activity that requires exertion (e.g., one to five\* minutes of walking, jogging, jump roping).
- b. Perform fundamental locomotor and nonlocomotor skills in movement sequences and game applications (e.g., walk-hop-skip, run-stretch-skate, run-hop-lay up).
- c. Perform manipulative skills exhibiting a majority of correct technique components (e.g., soccer kick: eyes on ball, step with foot opposite to kicking foot, contact ball with inside of foot, follow through).
- d. Identify components of physical fitness (i.e., strength, endurance, flexibility) and corresponding activities.
- e. Create and perform unique dance movements and sequences that expand physical skills while demonstrating personal and spatial awareness.

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

- a. Express personal experiences and imagination through dance, storytelling, music, and visual art.

- b. Create, with improving accuracy, works of art depicting depth (e.g., close objects large, distant objects small) using secondary and tertiary colors.
  - c. Develop ability to sing in tune with relaxed strength and clarity.
  - d. Develop consistency in rhythmic accuracy of body percussion and instrument playing.
- \* Some students may not be able to sustain activity for one minute due to various medical concerns.



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

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

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

- a. Describe characteristics of healthy relationships (e.g., caring, responsibility, trust, respect).
- b. Identify benefits of cooperating and sharing.
- c. Explain how families and communities change over time.
- d. Recognize how choices and consequences affect self, peers, and family.
- e. Identify behaviors that might create conflict situations and ways to resolve them.

*Objective 2:* Examine important aspects of the community and culture that strengthen relationships.

- a. Explain why families, schools, and communities have rules.
- b. Compare rural, suburban, and urban communities.
- c. Relate goods and services to resources within the community.
- d. Participate in activities that promote public good (e.g., respect cultural and ethnic differences, identify community needs) and recite the Pledge of Allegiance.
- e. Recognize the positive and negative impact of media.

*Objective 3:* Express relationships in a variety of ways.

- a. Describe traditions, music, dances, artwork, poems, rhymes, and stories that distinguish cultures.
- b. Develop an acting ability to relate to characters' thoughts and feelings (e.g., needs, hopes, frustrations, fears) in stories and plays.
- c. Create and perform/exhibit dances, visual art, music, and dramatic stories from a variety of cultures expressing the relationship between people and their culture.

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

*Objective 1:* Investigate relationships between plants and animals and how living things change during their lives.

- a. Observe and describe relationships between plants and animals.
- b. Describe the life cycle of local plants and animals using diagrams and pictures.
- c. Create pictures and stories about real animals and compare them to make-believe stories about animals.

*Objective 2:* Observe and describe weather.

- a. Observe and describe patterns of change in weather.
- b. Measure, record, graph, and report changes in local weather.
- c. Describe how weather affects people and animals.
- d. Draw pictures and create dances and sounds that represent weather features (e.g., clouds, storms, snowfall).

*Objective 3:* Investigate the properties and uses of rocks.

- a. Describe rocks in terms of the parts that make up the rocks.
- b. Sort rocks based upon color, hardness, texture, layering, and particle size.
- c. Identify how the properties of rocks determine how people use them.
- d. Create artworks using rocks and rock products.

*Objective 4:* Demonstrate how symbols and models are used to represent features of the environment.

- a. Identify and use information on a map or globe (i.e., map key or legend, compass rose, physical features, continents, oceans).
- b. Use an atlas and globe to locate information.
- c. Locate continents and oceans on a map or globe (i.e., North America, Antarctica, Australia, Africa, Pacific Ocean, Atlantic Ocean).

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



# K-6 Elementary Mathematics Core Curriculum in Table Format

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
<p><b>Standard I:</b> Students will understand simple number concepts and relationships.</p> <p><b>Objective I:</b> <b>Identify and use whole numbers.</b></p> <ol style="list-style-type: none"> <li>Relate a <i>numeral</i> to the number of objects in a set (e.g., <math>\square \square \square = 3</math>).</li> <li>Construct models of numbers to 10 with physical objects or manipulatives.</li> <li>Make pictorial representations of numbers to 10 (e.g., draw four circles, draw six squares).</li> <li>Recognize and write numerals from 0 to 10. 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).</li> </ol>	<p><b>Standard I:</b> Students will acquire number sense and perform simple operations with whole numbers.</p> <p><b>Objective I:</b> <b>Represent whole numbers in a variety of ways.</b></p> <ol style="list-style-type: none"> <li>Relate number words to the <i>numerals</i> that represent the quantities 0 to 10.</li> <li>Sort objects into groups of tens and ones and write the numeral representing the set.</li> <li>Represent <i>whole numbers</i> up to 100 in groups of tens and ones using objects.</li> <li>Write a numeral when given the number of tens and ones.</li> <li>Write a numeral to 99 in <i>expanded form</i> (e.g., 39 is 3 tens and 9 ones or 30+9).</li> <li>Use zero to represent the number of elements in the empty set or as a placeholder in a two-digit numeral.</li> </ol>	<p><b>Standard I:</b> Students will acquire number sense and perform operations with whole numbers.</p> <p><b>Objective I:</b> <b>Represent whole numbers in a variety of ways.</b></p> <ol style="list-style-type: none"> <li>Relate number words to the <i>numerals</i> that represent the quantities 0-100.</li> <li>Represent <i>whole numbers</i> up to 1,000 in groups of hundreds, tens, and ones using base ten models, and write the numeral representing the set.</li> <li>Read and write a three-digit numeral, relating it to a set of objects and a pictorial representation.</li> <li>Write a numeral to 999 in <i>expanded form</i> (e.g., 539 is 5 hundreds, 3 tens, 9 ones or 500+30+9).</li> <li>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).</li> <li>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).</li> </ol>	<p><b>Standard I:</b> Students will acquire number sense and perform operations with whole numbers, and simple fractions.</p> <p><b>Objective I:</b> <b>Represent whole numbers in a variety of ways.</b></p> <ol style="list-style-type: none"> <li>Model, read, and write <i>whole numbers</i> up to 10,000 using base ten models, pictures, and symbols.</li> <li>Write a <i>numeral</i> when given the number of thousands, hundreds, tens, and ones.</li> <li>Write a number up to 9,999 in expanded form (e.g., 6,539 is 6 thousands, 5 hundreds, 3 tens, 9 ones or 6,000+500+30+9).</li> <li>Identify the place and the value of a given digit in a four-digit numeral.</li> <li>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).</li> </ol>	<p><b>Standard I:</b> Students will acquire number sense and perform operations with whole numbers, simple fractions, and decimals.</p> <p><b>Objective I:</b> <b>Represent whole numbers and decimals in a variety of ways.</b></p> <ol style="list-style-type: none"> <li>Model, read, and write numerals from tenths hundredths to one million.</li> <li>Write a <i>whole number</i> up to 99,999 in <i>expanded form</i> (e.g., 876,539 = 8 hundred-thousands, 7 ten-thousands, 6 hundreds, 3 tens, 9 ones or 70,000+6,000+500+30+9).</li> <li>Identify the place and the value of a given digit in a five-digit numeral, including decimals to tenths.</li> <li>Demonstrate multiple ways to represent whole numbers by using models and symbolic representations (e.g., <math>108=2 \times 50+8</math>; <math>108=10^2 + 8</math>).</li> <li>Classify whole numbers from 2 to 20 as <i>prime</i> or <i>composite</i> and 0 and 1 as neither prime nor composite, using models.</li> <li>Represent repeated factors using <i>exponents</i> up to three (e.g., <math>8=2 \times 2 \times 2</math>).</li> </ol>	<p><b>Standard I:</b> Students will acquire number sense and perform operations with rational numbers.</p> <p><b>Objective I:</b> <b>Represent whole numbers and decimals in a variety of ways.</b></p> <ol style="list-style-type: none"> <li>Change <i>whole numbers</i> with <i>exponents</i> to <i>standard form</i> (e.g., <math>2^4=16</math>) and recognize that <math>10^0 = 1</math>.</li> <li>Read and write <i>numerals</i> from thousandths to one billion.</li> <li>Write a whole number to 999,999 in <i>expanded form</i> using <i>exponents</i> (e.g., <math>876,539 = 8 \times 10^5 + 7 \times 10^4 + 6 \times 10^3 + 5 \times 10^2 + 3 \times 10^1 + 9 \times 10^0</math>).</li> <li>Express numbers in <i>scientific notation</i> using positive powers of ten.</li> <li>Classify whole numbers to 100 as <i>prime</i>, <i>composite</i>, or neither.</li> <li>Determine the <i>prime factorization</i> for a whole number up to 50.</li> </ol>	

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

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
<p><b>Objective 3:</b> Model and illustrate meanings of the operations of addition and subtraction and describe how they relate.</p> <p>a. Demonstrate the joining and separating of sets of objects to solve problems.</p> <p>b. Describe the joining or separating of sets with informal language when using models.</p> <p>c. Record pictorially the results from the joining or separating of sets.</p>	<p><b>Objective 3:</b> Model and illustrate meanings of the operations of addition and subtraction and describe how they relate.</p> <p>a. Demonstrate the joining and separating of sets with twelve or fewer objects and record the results with pictures or symbols.</p> <p>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.</p> <p>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).</p> <p>d. Use zero in addition and subtraction sentences.</p>	<p><b>Objective 3:</b> Model and illustrate meanings of the operations of addition and subtraction, and describe how they relate.</p> <p>a. Demonstrate the joining and separating of sets with eighteen or fewer objects and record the results with pictures or symbols.</p> <p>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.</p> <p>c. Separate a given set of objects into two, three, five, or ten groups of equal size.</p> <p>d. Model addition and subtraction of two-digit whole numbers in a variety of ways.</p> <p>e. Select an addition or subtraction sentence to solve a problem involving joining or separating of sets with eighteen or fewer objects.</p> <p>f. Recognize that addition number sentences have related subtraction sentences (e.g., <math>8-5=3</math>, <math>3+5=8</math>).</p>	<p><b>Objective 3:</b> Model and illustrate meanings of the operations of addition, subtraction, and multiplication, and describe how they relate.</p> <p>a. Model addition and subtraction of two- and three-digit whole numbers in a variety of ways.</p> <p>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.</p> <p>c. Model division as sharing equally and as repeated subtraction using various methods (e.g., rectangular arrays, manipulatives, number lines, pictorial representations).</p> <p>d. Demonstrate, using objects, that multiplication and division are inverse operations (e.g., <math>3 \times 4 = 12</math>; thus, <math>12 \div 4 = 3</math> and <math>12 \div 3 = 4</math>).</p> <p>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.</p> <p>f. Demonstrate the effects of place value when multiplying whole numbers by 10.</p>	<p><b>Objective 3:</b> Model and illustrate meanings of the four operations and describe how they relate.</p> <p>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.</p> <p>b. Recognize that division by zero is not possible (e.g., <math>6 \div 0</math> is undefined).</p> <p>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.</p> <p>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.</p> <p>e. Demonstrate that multiplication and division are inverse operations (e.g., <math>3 \times 4 = 12</math>; thus, <math>12 \div 4 = 3</math> and <math>12 \div 3 = 4</math>).</p> <p>f. Describe the effect of place value when multiplying whole numbers by 10 and 100.</p>	<p><b>Objective 3:</b> Model and illustrate meanings of operations and describe how they relate.</p> <p>a. Identify the <i>dividend</i>, <i>divisor</i>, and <i>quotient</i> regardless of the division symbol used.</p> <p>b. Determine whether a whole number is divisible by 2, 3, 5, 9, and/or 10, using the <i>rules of divisibility</i>.</p> <p>c. Represent remainders as <i>whole numbers</i>, 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?).</p> <p>d. Model addition, subtraction, and multiplication of fractions and decimals in a variety of ways (e.g., using objects and a number line).</p> <p>e. Select or write the number sentences that can be used to solve a two-step problem.</p> <p>f. Model different strategies for whole number multiplication (e.g., partial product, lattice) and division (e.g., partial quotient).</p> <p>g. Describe the effect on place value when multiplying and dividing whole numbers and decimals by 10, 100, and 1,000.</p>	<p><b>Objective 3:</b> Model and illustrate meanings of operations and describe how they relate.</p> <p>a. Represent division of a multi-digit dividend by two-digit divisors, including decimals, using models, pictures, and symbols.</p> <p>b. Model addition, subtraction, and division of fractions and decimals in a variety of ways (e.g., objects, a number line).</p> <p>c. Apply <i>rules of divisibility</i>.</p> <p>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.</p>

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

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

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
<p><b>Standard II:</b> Students will identify and use patterns to represent mathematical situations.</p> <p><b>Objective 1:</b> Identify and sort objects according to common attributes.</p> <p>a. Sort objects into groups by color, shape, size, number, or other attributes.</p> <p>b. Identify which attribute was used to sort objects into a group.</p> <p>c. Find multiple ways to sort and classify a group of objects.</p>	<p><b>Standard II:</b> Students will identify and use patterns and relations to represent mathematical situations.</p> <p><b>Objective 1:</b> Recognize and represent patterns with one or two attributes.</p> <p>a. Sort and classify objects by one or two attributes.</p> <p>b. Identify, create, and label simple patterns using manipulatives, pictures, and symbolic notation (e.g., ABAB... , <math>\square \bigcirc \square \bigcirc \triangle \dots</math>).</p> <p>c. Identify patterns in the environment.</p> <p>d. Identify horizontal and vertical patterns on hundreds charts.</p> <p>e. Use patterns to establish skip counting by twos to 20 and by fives and tens to 100.</p> <p>f. Count backward from 10 to 0 and identify the pattern.</p>	<p><b>Standard II:</b> Students will identify and use patterns and relations to represent mathematical situations.</p> <p><b>Objective 1:</b> Recognize and create patterns with given attributes.</p> <p>a. Create and extend repeating and growing patterns using objects, numbers, and tables.</p> <p>b. Record results of manipulatives, pictures, and numeric representations and describe how they are extended.</p>	<p><b>Standard II:</b> Students will use patterns and relations to represent mathematical situations.</p> <p><b>Objective 1:</b> Recognize, describe, and use patterns and identify the attributes.</p> <p>a. Represent and analyze repeating and growing patterns using objects, pictures, numbers, and tables.</p> <p>b. Recognize and extend multiples and other number patterns using a variety of methods.</p>	<p><b>Standard II:</b> Students will use patterns and relations to represent and analyze mathematical situations using algebraic symbols.</p> <p><b>Objective 1:</b> Recognize, analyze, and use patterns and describe their attributes.</p> <p>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.</p> <p>b. Extend patterns and describe a rule for predicting the next element.</p>	<p><b>Objective 6:</b> Model and illustrate integers.</p> <p>a. Identify, read, and locate integers on a number line.</p> <p>b. Describe situations where integers are used in the students' environment.</p>	<p><b>Objective 6:</b> Model, illustrate, and perform the operations of addition and subtraction of integers.</p> <p>a. Recognize that the sum of an integer and its opposite is zero.</p> <p>b. Model addition and subtraction of integers using manipulatives and a number line.</p> <p>c. Add and subtract integers.</p>

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
<p><b>Objective 2:</b> Identify and use patterns to describe numbers or objects.</p> <p>a. Use patterns to count orally from 1 to 20 and backward from 10 to 0.</p> <p>b. Identify simple patterns in the environment.</p> <p>c. Predict what comes next in an established pattern and justify thinking.</p> <p>d. Duplicate, extend, and create simple patterns using objects and pictorial representations.</p>	<p><b>Objective 2:</b> Recognize and represent relations using mathematical symbols.</p> <p>a. Recognize that “=” indicates a relationship in which the quantities on each side of an equation are equal.</p> <p>b. Recognize that symbols such as <math>\square</math>, <math>\triangle</math>, or <math>\diamond</math> in an addition or subtraction equation represent a missing value that will make the statement true (e.g., <math>\square + 3 = 6</math>, <math>5 + 7 = \triangle</math>, <math>4 = 5 - \diamond</math>).</p> <p>c. Demonstrate that changing the order of addends does not change the sum (e.g., <math>3+2=5</math> and <math>2+3=5</math>).</p>	<p><b>Objective 2:</b> Recognize and represent mathematical patterns using symbols.</p> <p>a. Recognize that symbols such as <math>\square</math>, <math>\triangle</math>, or <math>\diamond</math> in an addition, subtraction, or multiplication equation, represent a value that will make the statement true (e.g., <math>5+7=\triangle</math>, <math>\square-3=6</math>, <math>\diamond=2\times4</math>).</p> <p>b. Solve equations involving equivalent expressions (e.g., <math>6+4 = \square+7</math>).</p> <p>c. Use the <math>&gt;</math>, <math>&lt;</math>, and <math>=</math> symbols to compare two expressions involving addition and subtraction (e.g., <math>4+6 \square 3+2</math>; <math>3+5 \diamond 16-9</math>).</p> <p>d. Demonstrate that grouping three or more addends does not change the sum (e.g., <math>(2+3)+7=12</math>, <math>2+(3+7)=12</math>).</p>	<p><b>Objective 2:</b> Recognize, represent, and solve mathematical patterns and symbols.</p> <p>a. Solve equations involving equivalent expressions (e.g., <math>6\times2 = \square \times 3</math> or <math>6 \square = 9 \div 3</math>).</p> <p>b. Use the <math>&lt;</math>, <math>&gt;</math>, <math>=</math> symbols to compare two expressions involving addition, subtraction, multiplication, and division (e.g., <math>5 \times 4 \diamond 9 \div 3</math>).</p> <p>c. Recognize that a given variable maintains the same value throughout an equation or expression (e.g., <math>\square + \square = 8</math>; <math>\square = 4</math>).</p> <p>d. Demonstrate that changing the order of factors does not change the product (e.g., <math>2 \times 3 = 6</math>, <math>3 \times 2 = 6</math>) and that the grouping of three or more factors does not change the product (e.g., <math>(2 \times 3) \times 1 = 6</math>; <math>2 \times (3 \times 1) = 6</math>).</p> <p>e. Demonstrate the distribution of multiplication over addition using a rectangular array (e.g., <math>8 \times 14 = 8</math> rows of 10 plus 8 rows of 4).</p>	<p><b>Objective 2:</b> Represent, solve, and analyze mathematical situations using algebraic symbols.</p> <p>a. Recognize a variety of symbols for multiplication and division including <math>\times</math>, <math>\div</math>, <math>\cdot</math>, and <math>*</math> as symbols for multiplication and <math>\div</math>, <math>\frac{\square}{\square}</math>, and a fraction bar (<math>/</math> or <math>-</math>) as division symbols.</p> <p>b. Recognize that a variable (<math>\diamond</math>, <math>n</math>, <math>x</math>) represents an unknown quantity.</p> <p>c. Solve one-step equations involving whole numbers and a single variable (e.g., <math>n+7=3</math>).</p> <p>d. Recognize that the answer to a multiplication problem involving a factor of zero is equal to zero (e.g., <math>0 \times 45 = 0</math>).</p> <p>e. Use expressions or one-step equations to represent real-world situations.</p> <p>f. Use the associative, commutative, and distributive properties to compute with whole numbers.</p>	<p><b>Objective 2:</b> Represent, solve, and analyze mathematical situations using algebraic symbols.</p> <p>a. Recognize that a number in front of a variable indicates multiplication (e.g., <math>3y</math> means 3 times the quantity <math>y</math>).</p> <p>b. Solve two-step equations involving whole numbers and a single variable (e.g., <math>3x+4=19</math>).</p> <p>c. Recognize that “<math>\approx</math>” indicates a relationship in which the quantities on each side are approximately of equal value (e.g., <math>\pi \approx 3.14</math>).</p> <p>d. Recognize that an exponent can be represented in the following ways: <math>4^3</math> or <math>4 \cdot 3</math>.</p> <p>e. Evaluate expressions and formulas, substituting given values for the variables (e.g., <math>2x+4</math>; <math>x=2</math>; therefore, <math>2(2)+4=8</math>).</p> <p>f. Recognize that if the product is zero, then one or more factors equal zero (i.e., if <math>ab=0</math> then either <math>a=0</math> or <math>b=0</math> or <math>a</math> and <math>b=0</math>).</p>	

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
<p><b>Standard III:</b> Students will identify and create simple geometric shapes and describe spatial relationships.</p> <p><b>Objective 1:</b> Identify and create simple geometric shapes.</p> <ol style="list-style-type: none"> <li>Identify circles, triangles, rectangles, and squares.</li> <li>Combine shapes to create <i>two-dimensional</i> objects.</li> <li>Draw circles, triangles, rectangles, and squares.</li> <li>Recognize circles, triangles, rectangles, and squares in the students' environment.</li> </ol>	<p><b>Standard III:</b> Students will describe, identify, and create and simple geometric shapes and describe spatial relationships.</p> <p><b>Objective 1:</b> Describe, identify, and create simple geometric shapes.</p> <ol style="list-style-type: none"> <li>Identify, name, draw, create, and sort circles, triangles, rectangles, and squares.</li> <li>Identify circles, triangles, rectangles, and squares in the students' environment.</li> <li>Recognize that combining simple geometric shapes can create more complex geometric shapes.</li> </ol>	<p><b>Standard III:</b> Students will describe, identify, and create geometric shapes and describe spatial relationships.</p> <p><b>Objective 1:</b> Describe, identify, and create geometric shapes.</p> <ol style="list-style-type: none"> <li>Identify, name, draw, sort, and compare circles, triangles, and <i>parallelograms</i>.</li> <li>Identify and name spheres, cones, and cylinders.</li> <li>Find and identify familiar geometric shapes in the students' environment.</li> <li>Determine whether a circle, triangle, square, or rectangle has a <i>line of symmetry</i>.</li> </ol>	<p><b>Standard III:</b> Students will use spatial reasoning to describe, identify, and create geometric shapes.</p> <p><b>Objective 1:</b> Describe, identify, and create geometric shapes.</p> <ol style="list-style-type: none"> <li>Identify and draw <i>points, lines, line segments</i>, and <i>endpoints</i>.</li> <li>Identify and draw <i>lines of symmetry</i> on triangles, squares, circles, and rectangles.</li> <li>Determine whether an angle is <i>right, obtuse</i>, or <i>acute</i> by comparing the angle to the corner of a rectangle.</li> <li>Classify polygons (e.g., <i>quadrilaterals</i>, pentagons, hexagons, octagons) by the number of sides and corners.</li> <li>Identify, make, and describe cubes (e.g., a cube has 6 square <i>faces</i>, 8 <i>vertices</i>, and 12 <i>edges</i>).</li> </ol>	<p><b>Standard III:</b> Students will use spatial reasoning to recognize, describe, and identify geometric shapes.</p> <p><b>Objective 1:</b> Describe, identify, and analyze characteristics and properties of geometric shapes.</p> <ol style="list-style-type: none"> <li>Identify and draw <i>parallel lines</i> and <i>intersecting lines</i>.</li> <li>Identify and draw lines of symmetry on a variety of <i>polygons</i>.</li> <li>Identify and describe <i>quadrilaterals</i> (i.e., rectangles, squares, <i>rhombuses</i>, <i>trapezoids</i>, kites).</li> <li>Identify <i>right, obtuse</i>, and <i>acute</i> angles.</li> <li>Compare two polygons to determine whether they are <i>congruent</i> or <i>similar</i>.</li> <li>Identify and describe <i>cylinders</i> and <i>rectangular prisms</i>.</li> </ol>	<p><b>Standard III:</b> Students will use spatial reasoning to recognize, describe, and identify geometric shapes and principles.</p> <p><b>Objective 1:</b> Describe, identify, and analyze characteristics and properties of geometric shapes.</p> <ol style="list-style-type: none"> <li>Identify and draw <i>perpendicular</i> lines.</li> <li>Draw, label, and describe rays and describe an angle as two rays sharing a common endpoint.</li> <li>Label an angle as acute, <i>obtuse</i>, <i>right</i>, or <i>straight</i>.</li> <li>Identify and describe <i>equilateral, isosceles, scalene, right, acute</i>, and <i>obtuse</i> triangles.</li> <li>Identify the <i>vertex</i> of an angle or the <i>vertices</i> of a polygon.</li> <li>Compare <i>corresponding angles</i> of two triangles and determine whether the triangles are <i>similar</i>.</li> <li>Identify and describe <i>pyramids</i> and <i>prisms</i>.</li> </ol>	<p><b>Standard III:</b> Students will use spatial and logical reasoning to recognize, describe, and identify geometric shapes and principles.</p> <p><b>Objective 1:</b> Identify and analyze characteristics and properties of geometric shapes.</p> <ol style="list-style-type: none"> <li>Identify the <i>midpoint</i> of a <i>line segment</i>.</li> <li>Identify concave and <i>convex polygons</i>.</li> <li>Identify the center, <i>radius, diameter</i>, and <i>circumference</i> of a circle.</li> <li>Identify the number of <i>faces, edges</i>, and <i>vertices</i> of <i>pyramids</i> and <i>prisms</i>.</li> </ol>

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

<p><b>Kindergarten</b></p> <p><b>Standard IV:</b> Students will understand and use simple measurement tools and techniques.</p> <p><b>Objective 1:</b> Identify measurable attributes of objects and units of measurement.</p> <p>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.</p>	<p><b>1st Grade</b></p> <p><b>Standard IV:</b> Students will understand and use simple measurement tools and techniques.</p> <p><b>Objective 1:</b> Identify measurable attributes of objects and units of measurement.</p> <p>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?).</p>	<p><b>2nd Grade</b></p> <p><b>Standard IV:</b> Students will understand and use measurement tools and techniques.</p> <p><b>Objective 1:</b> Identify measurable attributes of objects and units of measurement.</p> <p>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.</p>	<p><b>3rd Grade</b></p> <p><b>Standard IV:</b> Students will understand and use measurement tools and techniques.</p> <p><b>Objective 1:</b> Identify and describe measurable attributes of objects and units of measurement.</p> <p>a. Recognize the two systems of measurement: <i>metric</i> and <i>customary</i>. 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).</p> <p>d. Estimate length, capacity, and weight using metric and customary units.</p>	<p><b>4th Grade</b></p> <p><b>Standard IV:</b> Students will understand and use measurement tools and techniques.</p> <p><b>Objective 1:</b> Identify and describe measurable attributes of objects and units of measurement.</p> <p>a. Describe the relationship among <i>metric</i> 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 <i>customary</i> 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.</p>	<p><b>5th Grade</b></p> <p><b>Standard IV:</b> Students will understand and apply measurement tools and techniques.</p> <p><b>Objective 1:</b> Identify and describe measurable attributes of objects and units of measurement.</p> <p>a. Describe the relationship among <i>metric</i> units of length (i.e., millimeter, centimeter, meter, kilometer). b. Describe the relationship among <i>customary</i> units of weight (i.e., ounce, pound). c. Identify the correct units of measurement for <i>volume</i>, <i>area</i>, and <i>perimeter</i> 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.</p>	<p><b>6th Grade</b></p> <p><b>Standard IV:</b> Students will understand and apply measurement tools and techniques.</p> <p><b>Objective 1:</b> Identify and describe measurable attributes of objects and units of measurement.</p> <p>a. Compare a meter to a yard, a liter to a quart, and a kilometer to a mile. b. Identify <i>pi</i> as the ratio of the <i>circumference</i> to <i>diameter</i> 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 <i>metric</i> and customary units.</p>

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

<p><b>Kindergarten</b></p> <p><b>Standard V:</b> Students will collect and draw conclusions from data and understand basic concepts of probability.</p> <p><b>Objective 1:</b> 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, <i>pictographs</i>, bar graphs) and interpret the data (e.g., more people like red than blue).</p>	<p><b>1st Grade</b></p> <p><b>Standard V:</b> Students will collect and draw conclusions from data and understand basic concepts of probability.</p> <p><b>Objective 1:</b> Collect, organize, and display simple data. a. Collect physical objects to use as data. b. Collect, represent, and interpret data using tables, tally marks, <i>pictographs</i>, and bar graphs.</p>	<p><b>2nd Grade</b></p> <p><b>Standard V:</b> Students will collect and draw conclusions from data and understand basic concepts of probability.</p> <p><b>Objective 1:</b> 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 <i>pictographs</i>, tallies, bar graphs, and organized tables. d. Report information from a data display.</p>	<p><b>3rd Grade</b></p> <p><b>Standard V:</b> Students will collect and organize data to make predictions and identify basic concepts of probability.</p> <p><b>Objective 1:</b> Collect, organize, and display data to make predictions. a. Collect, read, represent, and interpret data using tables, graphs, and charts, including keys (e.g., <i>pictographs</i>, bar graphs). b. Make predictions based on a data display.</p>	<p><b>4th Grade</b></p> <p><b>Standard V:</b> Students will collect and organize data to make predictions and use basic concepts of probability.</p> <p><b>Objective 1:</b> 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 <i>clusters</i> and <i>outliers</i> of a data set.</p>	<p><b>5th Grade</b></p> <p><b>Standard V:</b> Students will collect, analyze, and draw conclusions from data and apply basic concepts of probability.</p> <p><b>Objective 1:</b> 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., <i>line plots</i>, bar graphs, <i>pictographs</i>, circle graphs, line graphs). c. Identify minimum and <i>maximum</i> values for a set of data. d. Identify or calculate the <i>mean</i>, <i>mode</i>, and <i>range</i>. e. Propose and justify inferences based on data.</p>	<p><b>6th Grade</b></p> <p><b>Standard V:</b> Students will collect, analyze, and draw conclusions from data and apply basic concepts of probability.</p> <p><b>Objective 1:</b> 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, <i>line plots</i>, 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.</p>

Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade	6th Grade
<p><b>Objective 2:</b>  <b>Determine the likelihood of events.</b>                      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).</p>	<p><b>Objective 2:</b>  <b>Determine the likelihood of an event.</b>                      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).</p>	<p><b>Objective 2:</b>  <b>Determine the likelihood of an event.</b>                      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).</p>	<p><b>Objective 2:</b>  <b>Identify basic concepts of probability.</b>                      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?).</p>	<p><b>Objective 2:</b>  <b>Use basic concepts of probability.</b>                      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.</p>	<p><b>Objective 2:</b>  <b>Apply basic concepts of probability.</b>                      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.</p>	<p><b>Objective 2:</b>  <b>Apply basic concepts of probability.</b>                      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.</p>



# K-2 Mathematics Glossary

addend	Any number being added. In $32+4=36$ , 32 and 4 are <i>addends</i> .
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 <i>parallel</i> and <i>congruent</i> .
difference	The amount that remains after one quantity is subtracted from another.
e.g.	This abbreviation means “for example.” When used in the Core, <i>e.g.</i> 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>i.e.</i> is limited to the specific examples given.
line of symmetry	A line that divides a figure into two <i>congruent</i> 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 $90^\circ$ and less than $180^\circ$ .
obtuse triangle	A triangle with one <i>obtuse angle</i> .
one-to-one correspondence	The relationship between the spoken word and the written symbol.
ordinal number	A <i>whole number</i> that names the position of an object in sequence. First, second, and third are <i>ordinal numbers</i> .
parallelogram	A <i>quadrilateral</i> with two pairs of <i>parallel</i> and <i>congruent</i> 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 <i>sum</i> .
two-dimensional	A figure that has length and width, but not height. Having <i>area</i> , but not <i>volume</i> . The image on a movie screen is <i>two-dimensional</i> .
whole number	Any of the numbers 0, 1, 2, 3, 4, 5, and so on.

# ***Facilitated Activities***



# Target Numbers

## How to Play

Each player creates numbers by rolling cubes and writing the resulting digits in boxes on the *Target Numbers Game Board*. The goal is to make numbers that are closer to the target numbers than your opponent does. (Numbers may be greater or less than the target number.)

1. Each player writes his/her name on the *Target Numbers Game Board*.
2. Player 1 rolls both cubes and writes each of the resulting digits in one of the empty boxes on the left-hand side of the board. (S/he must decide where to write each digit.)
3. Player 2 rolls the cubes and writes the digits in boxes on the right-hand side of the board.
4. Play alternates in this way until all boxes have been filled.
5. To determine the winner, players look at each row in turn, circling the number closer to the target number. The player who ends up with the most circles is the winner.

*Alternate scoring:* Players find the difference between the target number and their scores. The player with the lowest total wins the game.

## Materials

For each pair:

- Target Numbers Game Board*
- Pair of number cubes (one cube 0, 1, 2, 3, 4, 5; the other 0, 5, 6, 7, 8, 9)

# Target Numbers Game Board

Player 1 \_\_\_\_\_ Player 2 \_\_\_\_\_

## Target Numbers

			<b>1</b>		
			<b>10</b>		
			<b>25</b>		
			<b>50</b>		
			<b>100</b>		
			<b>100</b>		
			<b>250</b>		
			<b>500</b>		
			<b>1,000</b>		

# Cube Challenge

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Arrange blocks in four piles so that:

- The first pile has three more blocks than the second pile, and
- The second pile has one more block than the third pile, and
- The fourth pile has twice as many blocks as the second pile.

## Extension Questions

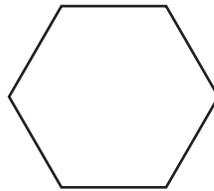
- Does the challenge have more than one solution?
- What is the smallest number of blocks that could be arranged this way?
- Could 32 blocks be arranged this way?

### Materials

- Base ten blocks

## Pattern Block Challenge

Create a design with one line of symmetry that is worth between \$2.00 and \$2.50 if:



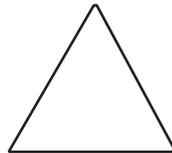
\$.25



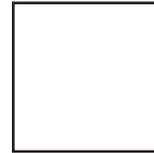
\$.15



\$.10



\$.01



\$.05

1. Determine the value of your design.
2. Can you create a symmetrical design that uses all the shapes and has a value of more than \$2.50?
3. Can you create a symmetrical design that uses all the shapes and has a value of less than \$2.00?
4. Is it possible to create a symmetrical design that has more than one line of symmetry and is less than \$2.00?
5. Between \$2.00 and \$2.50?

## *Meet the Hundreds Chart*

<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>21</b>	<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>	<b>29</b>	<b>30</b>
<b>31</b>	<b>32</b>	<b>33</b>	<b>34</b>	<b>35</b>	<b>36</b>	<b>37</b>	<b>38</b>	<b>39</b>	<b>40</b>
<b>41</b>	<b>42</b>	<b>43</b>	<b>44</b>	<b>45</b>	<b>46</b>	<b>47</b>	<b>48</b>	<b>49</b>	<b>50</b>
<b>51</b>	<b>52</b>	<b>53</b>	<b>54</b>	<b>55</b>	<b>56</b>	<b>57</b>	<b>58</b>	<b>59</b>	<b>60</b>
<b>61</b>	<b>62</b>	<b>63</b>	<b>64</b>	<b>65</b>	<b>66</b>	<b>67</b>	<b>68</b>	<b>69</b>	<b>70</b>
<b>71</b>	<b>72</b>	<b>73</b>	<b>74</b>	<b>75</b>	<b>76</b>	<b>77</b>	<b>78</b>	<b>79</b>	<b>80</b>
<b>81</b>	<b>82</b>	<b>83</b>	<b>84</b>	<b>85</b>	<b>86</b>	<b>87</b>	<b>88</b>	<b>89</b>	<b>90</b>
<b>91</b>	<b>92</b>	<b>93</b>	<b>94</b>	<b>95</b>	<b>96</b>	<b>97</b>	<b>98</b>	<b>99</b>	<b>100</b>

# Number Chunks

1. Write the missing numbers in these “chunks.”

The first puzzle consists of a grid of squares arranged in a cross-like shape. The number 56 is written in the center square. There are empty squares in the following positions: two squares to the left of the center, one square above the center, one square to the right of the center, one square below the center, and one square below the square to the right of the center.

The second puzzle consists of a grid of squares arranged in a cross-like shape. The number 73 is written in the center square. There are empty squares in the following positions: one square above the center, one square to the left of the center, one square to the right of the center, one square below the center, and one square below the square to the right of the center.

2. Write a number in each chunk, but make sure that all the empty spaces can be filled. Ask a partner to write the missing numbers.

The first puzzle is an empty grid of squares arranged in a cross-like shape, identical to the first puzzle in the previous section.

The second puzzle is an empty grid of squares arranged in a cross-like shape, identical to the second puzzle in the previous section.

3. Explain how you knew what number should be written in each square.

# Puzzle Fun!

To solve the following puzzles, replace each letter with a digit to make a true equation. The letters represent different digits in different puzzles.

$$\begin{array}{r} 1. \quad \text{ME} \\ \quad \text{+HE} \\ \hline \quad \text{WE} \end{array}$$

$$\begin{array}{r} 2. \quad \text{AM} \\ \quad \text{+ON} \\ \hline \quad \text{IN} \end{array}$$

$$\begin{array}{r} 3. \quad \text{OF} \\ \quad \text{+IF} \\ \hline \quad \text{HI} \end{array}$$

$$\begin{array}{r} 4. \quad \text{IT} \\ \quad \text{-TO} \\ \hline \quad \text{ON} \end{array}$$

$$\begin{array}{r} 5. \quad \text{SO} \\ \quad \text{-AS} \\ \hline \quad \text{IS} \end{array}$$

$$\begin{array}{r} 6. \quad \text{AB} \\ \quad \text{-BC} \\ \hline \quad \text{BA} \end{array}$$

- Can you find other solutions to the puzzles?
- Make up your own puzzles and have a friend solve them.

Some solutions:

$$\begin{array}{r} 1. \quad 20 \\ \quad \text{+30} \\ \hline \quad 50 \end{array} \quad \begin{array}{r} 2. \quad 20 \\ \quad \text{+39} \\ \hline \quad 29 \end{array} \quad \begin{array}{r} 3. \quad 56 \\ \quad \text{+26} \\ \hline \quad 82 \end{array} \quad \begin{array}{r} 4. \quad 97 \\ \quad \text{-72} \\ \hline \quad 23 \end{array} \quad \begin{array}{r} 5. \quad 48 \\ \quad \text{-14} \\ \hline \quad 34 \end{array} \quad \begin{array}{r} 6. \quad 31 \\ \quad \text{-18} \\ \hline \quad 13 \end{array}$$

## A Look at the Operations

<b>Models of Addition</b>		
	<b>Language</b>	<b>Typical Problem</b>
<b>Joining</b>		Sylvia had 4 goldfish. Her parents gave her 2 more goldfish for her birthday. How many fish does Sylvia have now?
<b>Part-part-whole</b>		There were 5 boys and 6 girls riding the bus. How many children were riding the bus?

<b><i>Models of Subtraction</i></b>		
	<b>Language</b>	<b>Typical Problem</b>
<b>Set Removal</b>	take away... lost... ate...	Larry has 8 balloons. 3 of them blew away. How many does he have now?
<b>Set Comparison</b>	find the difference between... How many more/less are there?	Sally has 12 balloons. Tim has 8 balloons. How many more balloons does Sally have?
<b>Set Completion</b>	missing addend How many more are needed? Count on from...	Randy has 9 balloons. She needs to have 15 balloons so she can give them to all her friends. How many more does she need?

<b><i>Types of Addition and Subtraction Problems</i></b>	
<b><i>Joining Problems</i></b>	
<b>Result</b>	Judy has 5 dolls. Her parents give her 2 more dolls.
<b>Unknown</b>	How many dolls does she have now?
<b>Change</b>	Judy has 5 dolls. Her parents give her some more dolls.
<b>Unknown</b>	Now she has 7 dolls. How many dolls did her parents give her?
<b>Start</b>	Judy had some dolls. Her parents gave her 2 more dolls.
<b>Unknown</b>	Now she has 7 dolls. How many dolls did Judy have to start with?
<b><i>Separating Problems</i></b>	
<b>Result</b>	Ron has 8 kittens. He gives 3 kittens to Jeremy.
<b>Unknown</b>	How many kittens does Ron have left?
<b>Change</b>	Ron has 8 kittens. He gives some kittens to Jeremy. Ron has 5 kittens left.
<b>Unknown</b>	How many kittens did Ron give Jeremy?
<b>Start</b>	Ron had some kittens. He gave 3 kittens to Jeremy. He has 5 kittens left.
<b>Unknown</b>	How many kittens did Ron have to start with?
<b><i>Compare Problems</i></b>	
<b>Result</b>	Arnold has 3 rabbits. Diane has 7 rabbits.
<b>Unknown</b>	How many more rabbits than Arnold does Diane have?
<b>Change</b>	Arnold has 3 rabbits. Diane has 4 more rabbits than Arnold.
<b>Unknown</b>	How many rabbits does Diane have?
<b>Start</b>	Diane has 7 rabbits. She has 4 more rabbits than Arnold.
<b>Unknown</b>	How many rabbits does Arnold have?

Name \_\_\_\_\_

## ***A Look at Operations***

1. Write a problem you think would be solved using addition.
  
2. Write a problem you think would be solved using subtraction.
  
3. Explain how you created the two problems.
  
4. Compare your addition problem with two others.
  - a. How are the three problems different? How are they similar?
  
  
  
  
  
  
  
  
  
  
  - b. How do you know all three problems involve addition?
  
5. Compare your subtraction problems with two others.
  - a. How are the three problems different? How are they similar?
  
  
  
  
  
  
  
  
  
  
  - b. How do you know all three involve subtraction?



***Math  
Standards  
I-3 & II-2  
Activities***



# Let's Balance

**Standard II:**

Students will identify and use patterns and relations to represent mathematical situations.

**Objective 2:**

Recognize and represent relations using mathematical symbols.

**Intended Learning Outcomes:**

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

**Content Connections:**

Language Arts VIII-6

## Math Standard II

### Objective 2

#### Connections

## Background Information

Students need to understand that an equation is a relationship between numbers where both sides of the equation are equal. The mathematical situation is represented by the equal (=) sign. Students also need to understand what it means when a number sentence is not equal on both sides. When a number sentence is not equal on both sides, the not equal ( $\neq$ ) sign is used.

## Research Basis

Carpenter, T. P., Franke, M. L., & Levi, L. (2003). *Thinking Mathematically; Integrating Arithmetic & Algebra in Elementary School*. Portsmouth, NH: Heinemann.

This book documents the widespread misunderstanding of the equal sign by students in grades 2-6. The text includes a series of true/false questions to help students begin to unpack their misunderstandings and help them develop the real meaning of this symbol. (Research was compiled at the Wisconsin Center for Educational Research.)

## Assessment Suggestions

- Observe students while they are participating in any of the activities.
- Have students demonstrate that they can write, illustrate, and solve various problems using the symbols = and  $\neq$ .
- Discussion and journal entries: “What does it mean if something is not equal? What does the word ‘equation’ mean? Why do we need the = sign (or  $\neq$  sign)?”

## Invitation to Learn

Have a student stand with his/her arms out straight (look like a balance scale).

Add one book (novels or basals work best) at a time to each side and observe how the student's arms change with each book that is added. Discuss what happened when we put a book on the balance/student's arm? What would happen if we only put the books on one side?

## Instructional Procedures

### Exploration

1. Have students free explore with the balance and manipulatives.
2. Have a class discussion on what they observed using the balance. They need to build, discuss, and write equations while working with the balance and manipulatives.
3. Have students build various equations using the different manipulatives.

*Example:* 4 red bears + 3 blue bears = 4 blue bears + 3 red bears

When using manipulatives, make sure they are all the same size and weight. (Don't use the family bears.)

2 red dinosaurs + 2 yellow dinosaurs = 3 red dinosaurs + 1 yellow dinosaur

### Balance the Scale

Students play in groups of two to four.

1. Each player is dealt 6 cards. The rest of the cards are placed facedown in a pile.
2. Each player chooses any 4 cards from his/her hand to place on the *Balance the Scale* worksheet.
3. Students need to balance the scale by placing their cards in addition problems that create an equation (equal on both sides). (e.g.,  $2 + 5 = 4 + 3$  or  $1 + 3 = 2 + 2$ ) If using face cards, an ace equals 1 and 0 is shown by leaving a square blank (e.g.,  $6 + 3 = 9 + \square$ ).
4. If the student can create a true equation, they earn 1 point. Each student takes a turn to complete round one. All cards from round one are placed in a discard pile. If the student can't create a problem, they place their cards in the discard pile.

### Materials

For each group:

- Balance
- Manipulatives (bears, cubes, Unifix® cubes, blocks, etc...)

### Materials

For each group:

- Deck of cards, with face cards removed, or number cards (0-10)

For each student:

- Balance the Scale* worksheet

- On every turn, each student is dealt 6 cards from the original pile. If you run out of cards, shuffle the discard pile and continue to play. The game continues until a student reaches the score of 10.

### Number Balance

- Place the balance where all students can see it.
- Place a weight on one side of the scale. Give a student a weight to place on the other side that will balance the scale (e.g.,  $8 = 8$ ). Write the equation on the board. Model other examples as needed.
- Place one weight on the balance and ask a student to place a weight on the other side that will balance the scale without using the same number. Write the statement on the board (e.g.,  $6 \neq 4$ ). Review the not equal symbol and the number statement and ask whether the number statement is true (e.g., yes it is true, 6 does not equal 4). Ask students how we can balance the scale.
- If students don't come up with the idea to add another weight to make an equation, give a weight to another student and ask if s/he can now balance the scale (e.g.,  $6 = 4 + 2$ ). Continue with multiple examples. It is possible to add multiple weights to both sides.

### To Equal or Not to Equal

- Have a class discussion on equations and number sentences using the not equal sign (e.g.,  $6 + 2 = 8$  and  $6 + 2 \neq 10$ ).
- Write several examples until students understand the symbols and how to use them.
- Students play with a partner. The first player spins the spinner and writes his/her number on the recording sheet on any of the four blank spaces. The student spins a total of four times, filling in a blank space each time.
- The student needs to fill in the sign that makes his/her number sentence true (e.g.,  $3 + 1 \neq 1 + 1$  or  $2 + 3 = 2 + 3$ ).
- The partner states, "I agree that  $3 + 1 \neq 1 + 1$ ." If the number sentence is an equation (e.g.,  $2 + 1 = 1 + 2$ ), they earn one point. If the number sentence is not equal (e.g.,  $2 + 1 \neq 3 + 1$ ) they earn two points. If player one made an incorrect number sentence, no points are earned.
- Play moves to the second player and continues until the *To Equal or Not to Equal* worksheet is complete or time runs out.

#### Materials

- Number balance
- Paper
- Pencil

#### Materials

- Spinner with numbers 1, 2, and 3
- To Equal or Not to Equal* worksheet
- Pencil

### ***Curriculum Extensions/Adaptations/Integration***

- Students can also play the games using subtraction.
- Students can use a balance to check their equations. This may be helpful for students who need a reinforcement strategy.
- Math journal
- Write and illustrate equations using the counters. Explain your work.
- Class book: Using stamps, stickers, or small die cut shapes, have students illustrate an equation.
- Using the number of the day, write equations where there are multiple addends on both sides (e.g., If the number of the day is 15, an equation could read  $7 + 7 + 1 = 5 + 5 + 5$ ).

### ***Family Connections***

- Using materials at home, create number sentences that are equal on both sides.
- Students teach the symbols  $=$  and  $\neq$  to a family member.

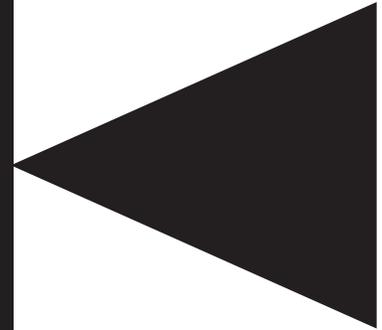
Name \_\_\_\_\_

# Balance the Scale

+

=

+



# To Equal or Not to Equal

Points

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_  \_\_\_\_\_ + \_\_\_\_\_      \_\_\_\_\_

Total \_\_\_\_\_

# Numbers Away

**Standard I:**

Students will acquire number sense and perform operations with whole numbers.

**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.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

**Content Connections:**

Language Arts I-1, II-1, VIII-6

## Math Standard I

### Objective 3

#### Connections

## Background Information

Using subtraction strategies helps children understand and learn the basic facts.

Examples of subtraction strategies:

- Subtracting 0
- Counting back 1, 2, 3
- Subtracting doubles
- Subtracting from 10
- Counting up

These strategies should be taught and re-taught using many different methods and manipulatives. Herein is not a single lesson, but a compilation of activities for several of the strategies that may be used throughout the year.

## Research Basis

Isaacs, A., Carroll, W. (1999). Strategies for Basic Fact Instruction. *Teaching Children Mathematics*, 508-514.

This article includes research about how facts should be taught, common strategies used by children to learn facts, the place of practice in learning basic facts, a sequence for teaching facts, and how fact knowledge should be assessed. (Research was conducted at the University of Chicago School Mathematics Project.)

## ***Assessment Suggestions***

- Have students write and illustrate a story problem.
- Create a short quiz using the counting back strategy.
- Observe students while they are participating in the activities.

## ***Invitation to Learn***

1. Ask the question, “How many more (or less) girls than boys are there in our class?” Other examples may include, “How many students have long sleeves/short sleeves?” “How many students have shoes that lace/don’t lace?” etc.
2. Have the girls in the class stand in a straight line. Have a boy stand beside a girl, becoming her partner. Any student who does not have a partner stands in a separate group. The students can now see which group has more.

## ***Instructional Procedures***

### **Counting Back**

Counting back is a strategy used for subtracting. Students start with the largest number and count back the number being subtracted. This is an efficient strategy when subtracting 1, 2, or 3.

#### *Counting Back 1, 2, 3*

1. Have the class count back from 10 to 0.
2. Say a number. Ask students to tell you what number comes before it. Explain that the number before is 1 *fewer*, or 1 *less*. Use the terms 1 fewer and 1 less interchangeably, as students need to understand both terms.
3. Show multiple subtraction problems using subtract 1 (e.g.,  $10 - 1 = 9$ ,  $5 - 1 = 4$ ).
4. Repeat the activity using subtract 2 and subtract 3.

*Use Number Line*

1. Have students place a counter on a number on the number line.
2. Have students move their counter down 1 less.
3. Have them say the equation (e.g.,  $8 - 1 = 7$ ).
4. Repeat this activity, subtracting the numbers 1, 2 and 3.

*Fishing for Less—Variation on ‘Go Fish’*

1. Students play in groups of two to four.
2. Each student is dealt 5 cards. The remaining cards are placed facedown in a pile.
3. The first student chooses a card from his/her hand. S/he asks a partner if s/he has a card that is one less (e.g., If the student has a 4, s/he would ask, “Do you have a card that is 1 less than 4?” If player 2 has a 3, s/he gives that card to the first player.). The first player places the match in front of him/her and continues to play until s/he can no longer get a card that is one less than a card in his/her hand. S/he then draws a card from the pile and his/her turn is over.
4. The game is over when all of the draw pile is gone and students can no longer make a match from cards in their hand.

*Count Back the Dots*

The addition version of this game, It’s A Fact!, was introduced during the 2004 Elementary CORE Academy.

1. Students play in groups of three.
2. Before playing the game, students need to spend time rolling the dice (explained in Materials) and counting back. Start with the die marked with the numerals and count back the dots on the other die. After some practice, ask the class to determine the smallest and largest number that can be rolled with these dice. Have them predict which total they think will come up most often if they roll the dice 30 times. Have them explain their thinking.
3. Give each group one set of dice and one *Count Back the Dots* worksheet.
4. One student rolls the dice, another determines the total, and the third marks the tally by the appropriate number and records the roll. After ten rolls, the children rotate duties so that by the end of 30 rolls each student has participated in each task.
5. After 30 rolls, students count the tallies for each number and record it on the bar graph at the bottom of the worksheet.

**Materials**

- Number Line
- Counters or markers

**Materials**

- Deck of cards with face cards removed, or 1-10 number cards

**Materials**

- Two dice (one marked with the numerals 4,5,6,7,8,9; the other marked with, two each of, one dot, two dots, three dots, in the formation of regular dot dice.) If blank dice are not available, use 3” x 5” cards to make two sets of dot cards and numeral cards. Place the numeral cards in one pile and the dot cards in another.
- *Count Back the Dots* worksheet

- Record each team's totals on a class graph. Did any team correctly predict which total would come up most often? Discuss why the graph looks the way it does. Do any of the individual team graphs look like the class graph? Would the graph look the same if the game was played again?

#### *Literature Subtraction*

- Find a book, finger play, or song that counts back one at a time. Some examples include "Ten in a Bed," "Ten Little Monkeys," or *Ten Sly Piranhas*.
- Sing or read for enjoyment first.
- Give each student a piece of paper and sing or read it again.
- Have the students write an equation each time a 1 is taken away.
- Students write the equations in a column so they can easily see the patterns (e.g.,  $10 - 9 = 1$ ,  $9 - 1 = 8$ , etc.).

#### **Subtracting Doubles**

##### *Concentration Game*

- Students play in groups of two to four.
- Place all of the cards face down on a flat surface in a 4 by 6 array.
- The first player turns over an answer card. S/he must tell his/her partner what "subtracting doubles" problem they are looking for.  
*Example:* If a 3 is drawn, they say, "If I double 3, I get 6, or  $3 + 3 = 6$ , so the subtracting doubles problem that I'm looking for is  $6 - 3$ ." A partner states whether s/he agrees or disagrees. If s/he agrees, the player turns over a subtraction problem card. If it is a match, s/he keeps the cards and it is the next player's turn. If it is not a match, the cards are turned back over and play moves to the next person.
- Play continues until all cards have been matched.

##### *Double Toss*

- Students play in groups of two to four.
- The first player tosses a counter onto the *Double Toss Board*. S/he uses that number to create a subtraction sentence using doubles. For example, if s/he lands on the number 12, the student says, " $12 - 6 = 6$ ." (If the student lands on a line, use the number that the counter touches the 'most.')
- If the number sentence is correct, the student places an "X" on the number 12 on his/her *Double Toss Tracking Sheet* or a scratch paper with even numbers 2-18 written down.

#### **Materials**

- Book, song, or finger play
- Paper
- Pencil

#### **Materials**

- Subtraction Doubles Concentration Cards*

#### **Materials**

- Double Toss Board*
- Counter or coin
- Double Toss Tracking Sheet*
- Pencil

- The second student then takes his/her turn and play continues until one player has marked off all the numbers.

### Subtracting from 10

#### *Tic-Tac-Toe*

- Students play in groups of two.
- Draw a Tic-Tac-Toe board and place one number in each space. Use every number 1-9.
- Each player chooses a different color of chips.
- The first player spins the spinner and subtracts that number from 10. After the student has solved the subtraction problem, s/he places a chip on the correct number on the game board. The next player spins the spinner, solves the problem, and places his/her color of chip on the game board. If the number is already covered, the student loses a turn. The game continues until a player has Tic-Tac-Toe—three in a row. If there is no three in a row, the student with the most chips on the board is the winner.

#### **Materials**

- Paper
- Pencil
- Chips/counters (2 different colors)
- Spinner 1-9

#### *Three Strikes*

- Students play in groups of two to four.
- The first player spins the spinner and subtracts that number from 10. That player places a chip on that number on their *Three Strikes* game board. The next player then takes his/her turn. If a student is unable to cover a number because it is already covered, s/he places a chip on a strike. The game continues until all of a student's numbers are covered, or a student has three strikes. The student with the most chips on his/her board wins.
- If the game ends because a student covers three strikes, the player with the most chips wins (not counting the student with the three strikes).

#### **Materials**

- Spinner 1-10
- Three Strikes* game board
- Markers/chips

### Counting Up

#### *Climbing Up the Number Line*

- Give each student a number line.
- Say two numbers and have the students point to them on their number line. Have them determine the smaller of the two numbers.
- Have students count up numbers as they move their left finger to join their right finger. Remind them that this is the difference between the two numbers.
- Repeat with many different pairs of numbers.

#### **Materials**

- Number Line*

**Materials**

- Small objects (cubes, paper clips, beans, etc.)

*Count the Missing Objects*

1. Play with a partner.
2. Have students place a group of small objects in front of them (for this example use 15). One partner counts the objects, then closes his/her eyes.
3. The other player removes some of the objects (e.g., 6). The first player counts up to find the number of missing objects (e.g., 9 are left, start at 9 count up 10, 11, 12, 13, 14, 15. We counted 6 numbers, 6 is the number of missing objects).
4. The second player takes his/her turn.
5. Have them practice many times.

***Curriculum Extensions/Adaptations/Integration***

- Write the directions to one of the games you have learned.
- Write about and describe a favorite strategy for subtraction and why it works for you.
- Give instructions for games, individually or in smaller groups, providing one step at a time.
- When appropriate, use smaller numbers and gradually increase.
- Monitor students at the various games to review directions and rules.

## Resources

### Books

*Subtraction Action*, by Loreen Leedy; ISBN 0-8234-1307-1

*Ten Little Garden Snails*, by Beverley Randell; ISBN 0-4350-4932-1

*Ten Sly Piranhas*, by William Wise; ISBN 0-590-48123-1

*Five Little Sharks Swimming in the Sea*, by Steve Metzger;  
ISBN 0-439-59228-3

*Elevator Magic*, by Stuart Murphy; ISBN 0-644-6709-0

*Tic-Tac-Toe Three in a Row*, by Judith Bauer Stamper;  
ISBN 0-590-39963-2

*Hershey's Kisses Subtraction Book*, by Jerry Pallotta;  
ISBN 0-439-33779-8

*Shark Swimathon*, by Stuart Murphy; ISBN 0-064-46735-X

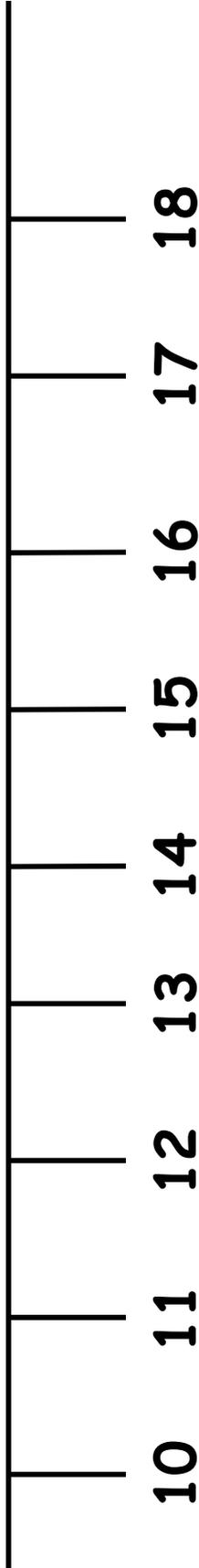
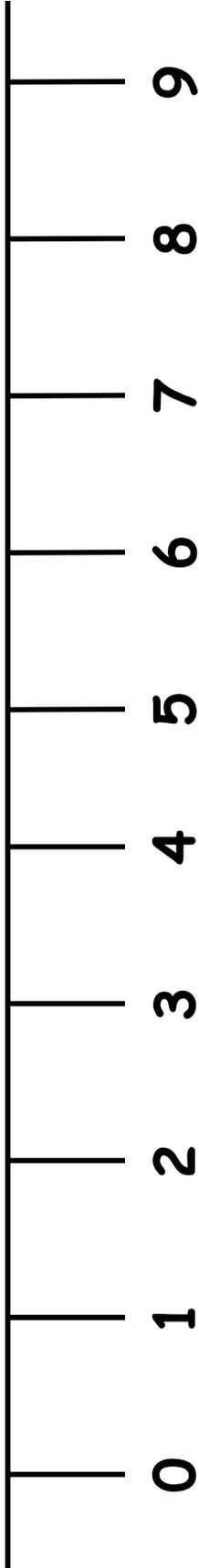
*Monster Musical Chairs*, by Stuart Murphy; ISBN 0-064-46730-9

*Little Number Stories Subtraction*, by Rozanne Lanczak Williams;  
ISBN 1-57471-008-7

## Family Connections

- Teach and play these games with your family.
- Teach a family member these subtraction strategies.

*Number Line*



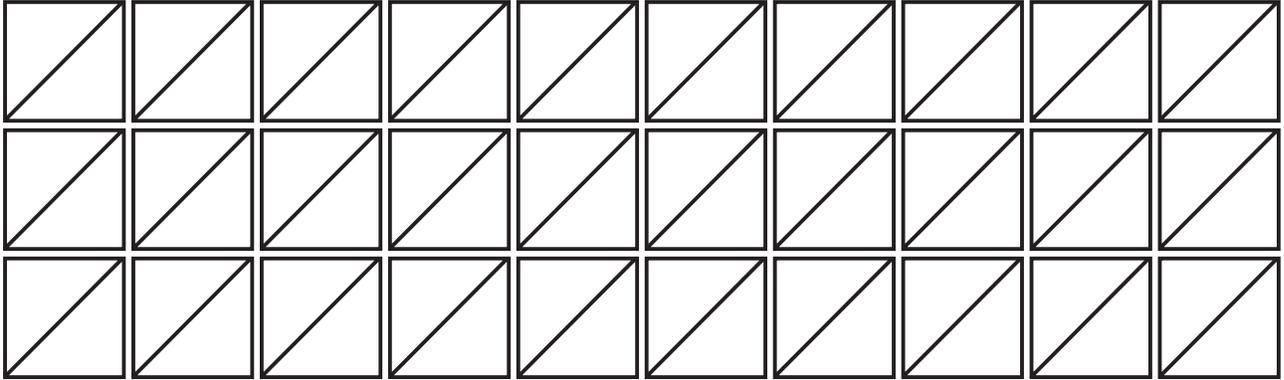
Name \_\_\_\_\_

## Count Back the Dots

Which answer do you predict will happen the most often?

1    2    3    4    5    6    7    8

Record the numbers for each counting back problem.



Tally the answer for each counting back problem.

1. \_\_\_\_\_ 5. \_\_\_\_\_

2. \_\_\_\_\_ 6. \_\_\_\_\_

3. \_\_\_\_\_ 7. \_\_\_\_\_

4. \_\_\_\_\_ 8. \_\_\_\_\_

Graph the answers for the counting back problems.

1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			

## ***Subtracting Doubles Concentration***

<b>1</b>	<b>2</b>	<b>3</b>
<b>4</b>	<b>5</b>	<b>6</b>
<b>7</b>	<b>8</b>	<b>9</b>
<b>10</b>	<b>11</b>	<b>12</b>

## ***Subtracting Doubles Concentration Cards***

Copy these cards onto cardstock, a different color than those on p. 3-18.

<b>2-1=</b>	<b>4-2=</b>	<b>6-3=</b>
<b>8-4=</b>	<b>10-5=</b>	<b>12-6=</b>
<b>14-7=</b>	<b>16-8=</b>	<b>18-9=</b>
<b>20-10=</b>	<b>22-11=</b>	<b>24-12=</b>

## Double Toss Board

<b>18</b>	<b>8</b>	<b>4</b>
<b>16</b>	<b>2</b>	<b>12</b>
<b>6</b>	<b>10</b>	<b>14</b>

## Double Toss Tracking Sheet

<b>2</b>							
<b>4</b>							
<b>6</b>							
<b>8</b>							
<b>10</b>							
<b>12</b>							
<b>14</b>							
<b>16</b>							
<b>18</b>							
<b>2</b>							
<b>4</b>							
<b>6</b>							
<b>8</b>							
<b>10</b>							
<b>12</b>							
<b>14</b>							
<b>16</b>							
<b>18</b>							

*Three Strikes*

0 1 2 3 4 5 6 7 8 9 10  
X X X

*Three Strikes*

0 1 2 3 4 5 6 7 8 9 10  
X X X

# Subtraction Quizzes

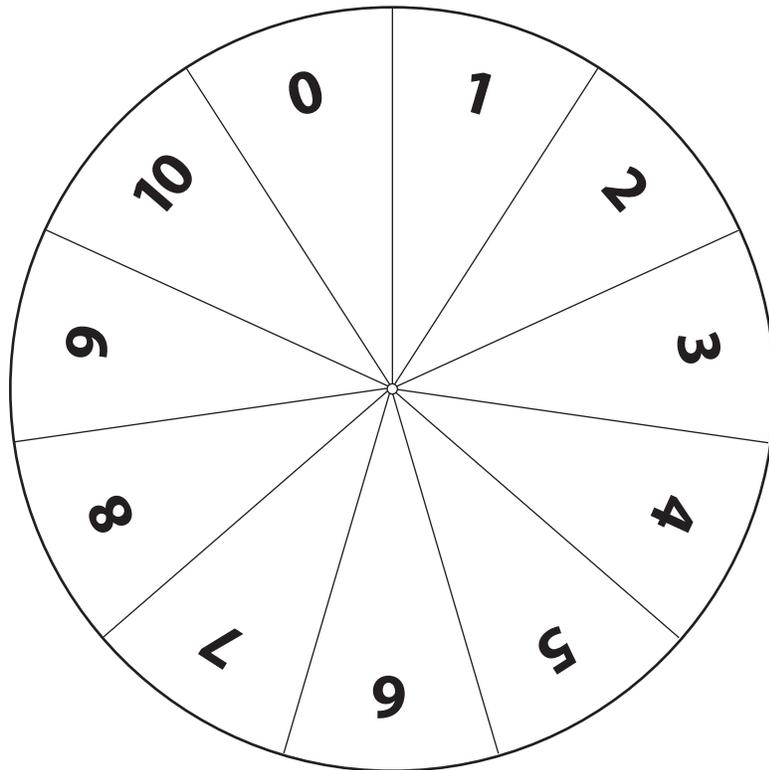
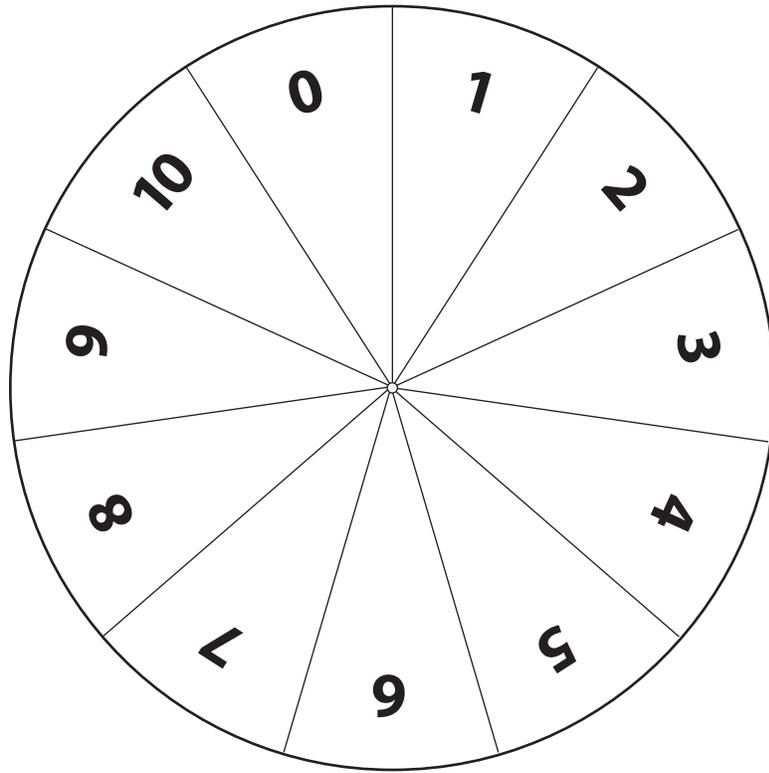
Name:	
<b>-1</b>	
<b>10</b>	
<b>6</b>	
<b>4</b>	
<b>7</b>	
<b>8</b>	
<b>2</b>	
<b>9</b>	
<b>11</b>	
<b>5</b>	
<b>3</b>	
<b>12</b>	

Name:	
<b>Mixed Subtraction</b>	
<b>12 - 3 =</b>	
<b>10 - 1 =</b>	
<b>9 - 2 =</b>	
<b>8 - 3 =</b>	
<b>9 - 1 =</b>	
<b>10 - 3 =</b>	
<b>9 - 2 =</b>	
<b>8 - 1 =</b>	
<b>12 - 2 =</b>	
<b>8 - 2 =</b>	
<b>10 - 2 =</b>	

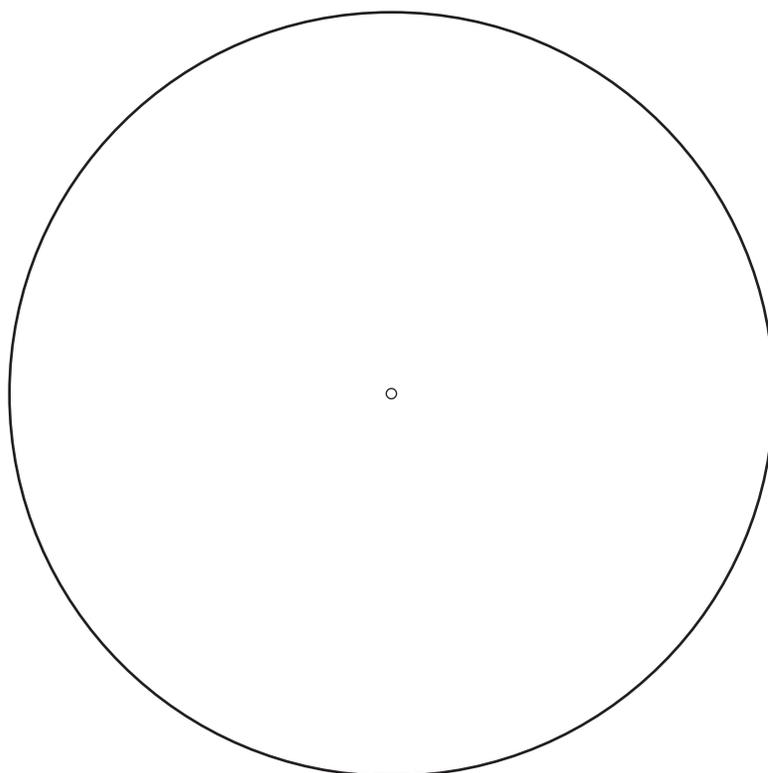
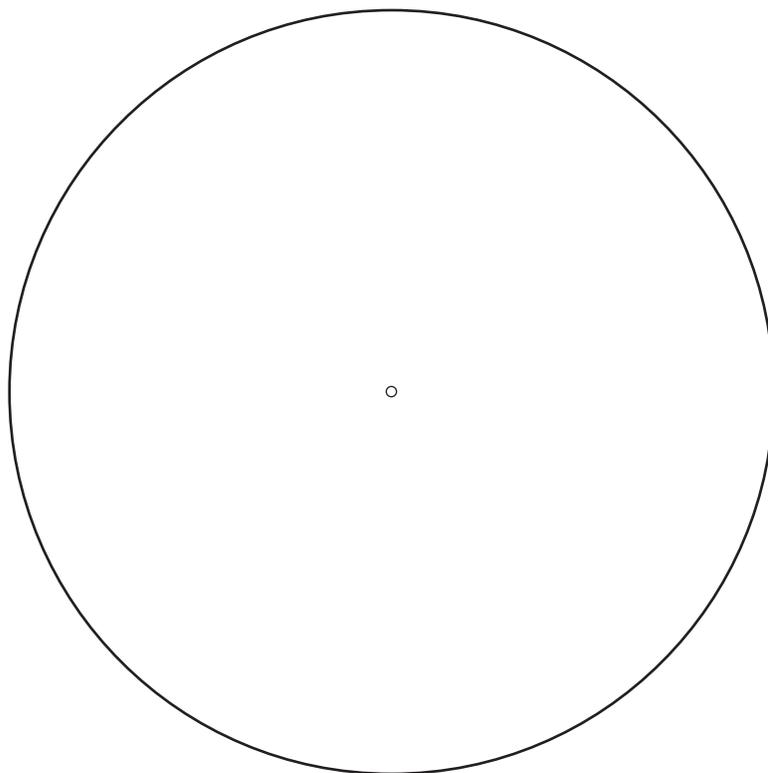
Name:	
<b>-3</b>	
<b>12</b>	
<b>6</b>	
<b>8</b>	
<b>11</b>	
<b>3</b>	
<b>13</b>	
<b>7</b>	
<b>5</b>	
<b>10</b>	
<b>4</b>	
<b>9</b>	

Name:	
<b>-2</b>	
<b>9</b>	
<b>7</b>	
<b>4</b>	
<b>11</b>	
<b>3</b>	
<b>10</b>	
<b>2</b>	
<b>12</b>	
<b>6</b>	
<b>8</b>	
<b>5</b>	

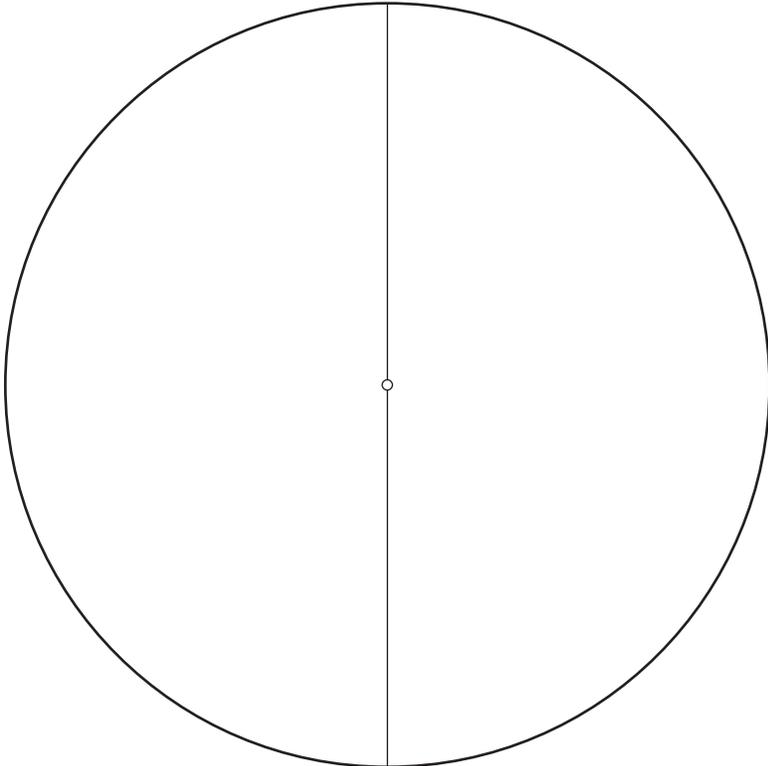
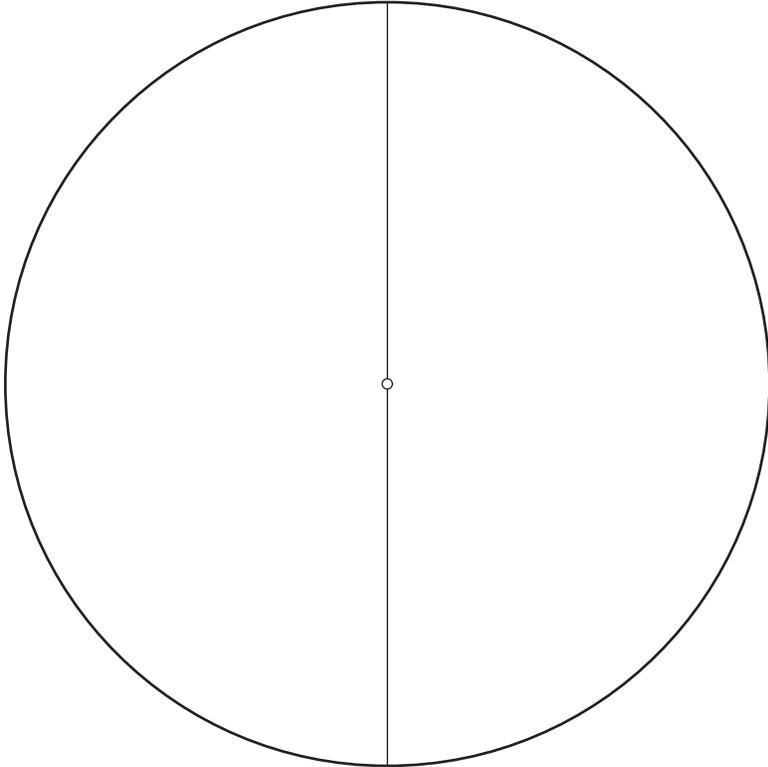
## Three Strikes 0-10 Spinner Bases



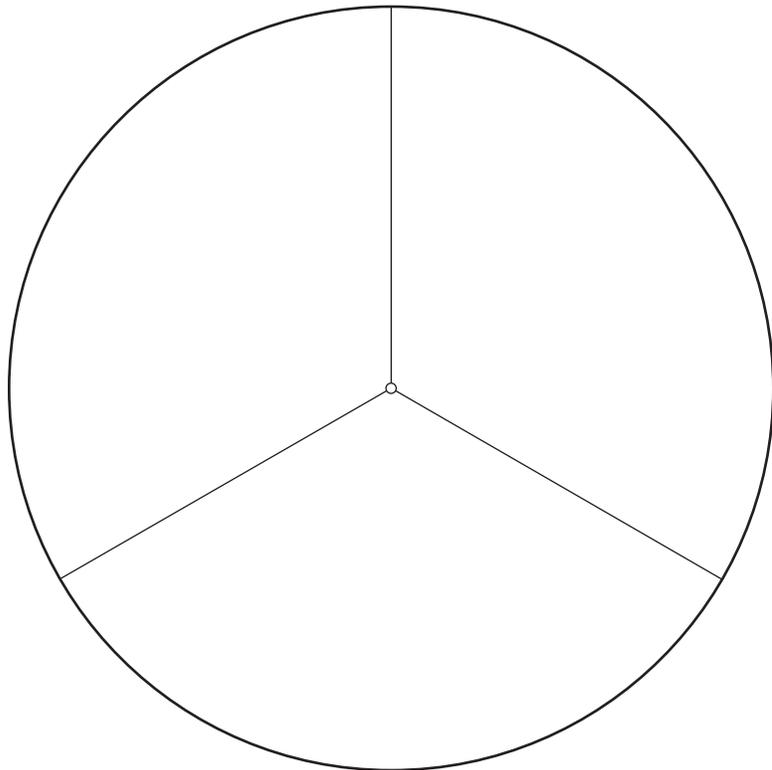
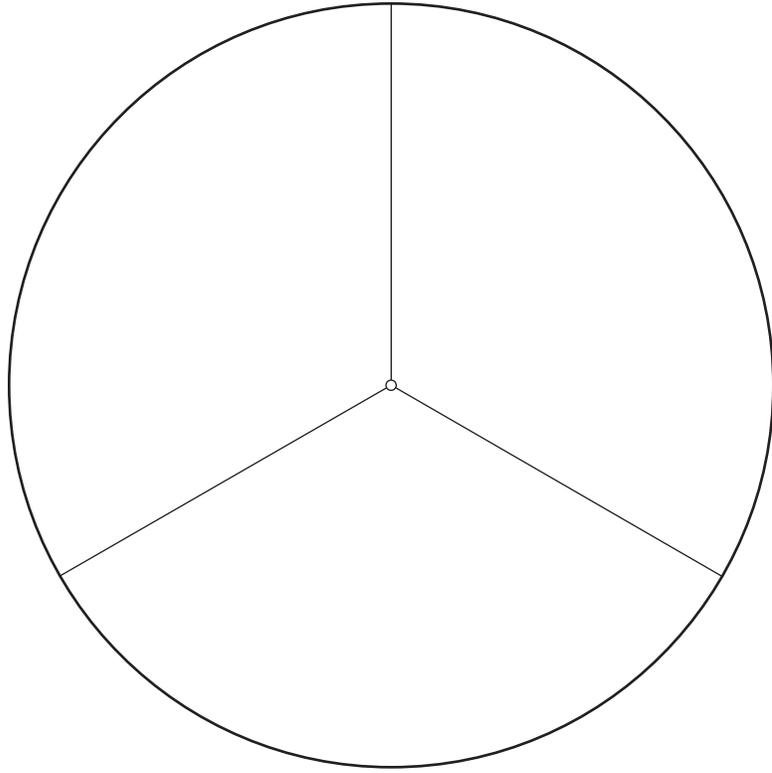
## ***Blank Spinner Bases***



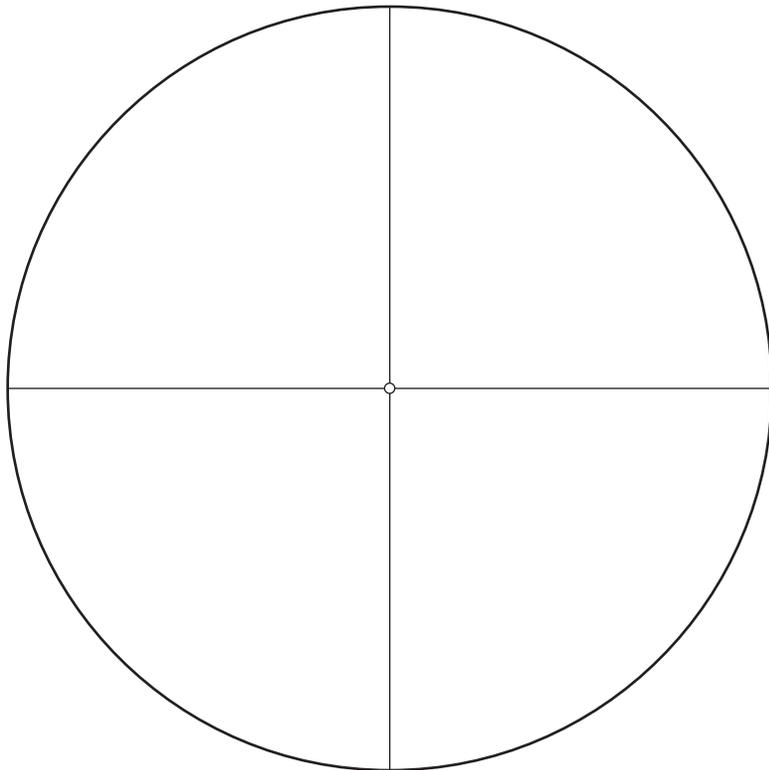
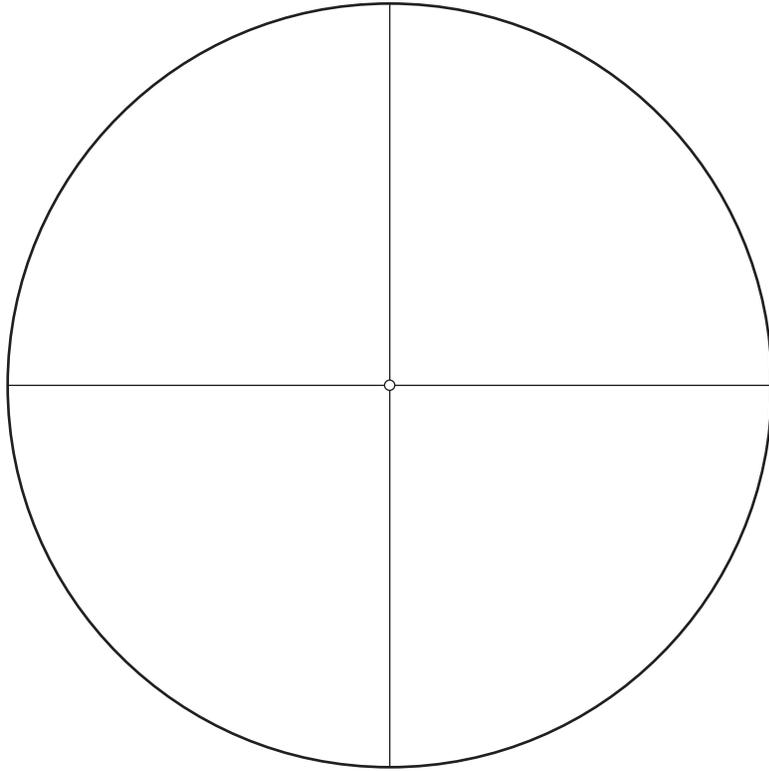
# 2-sector Spinner Bases



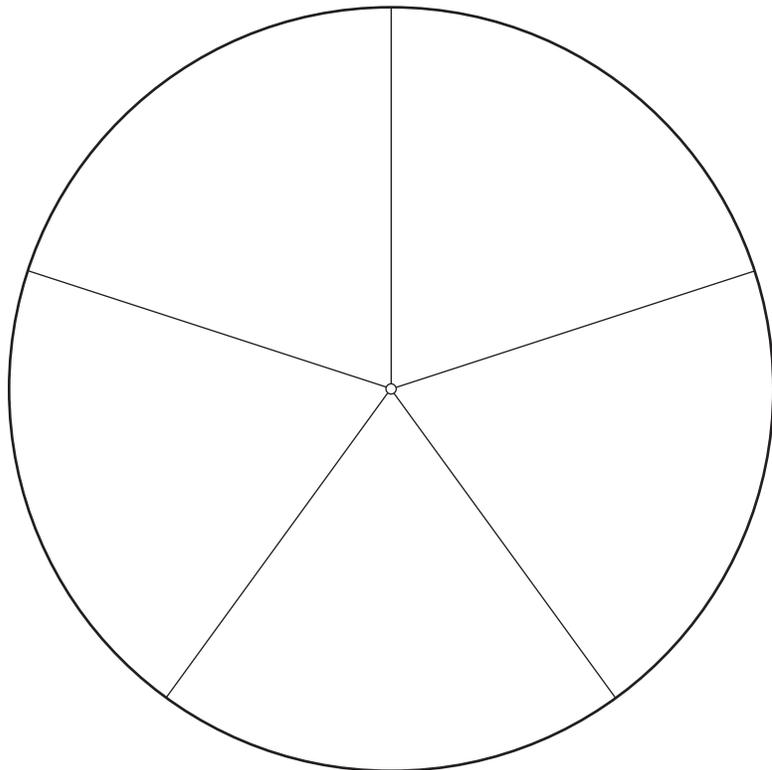
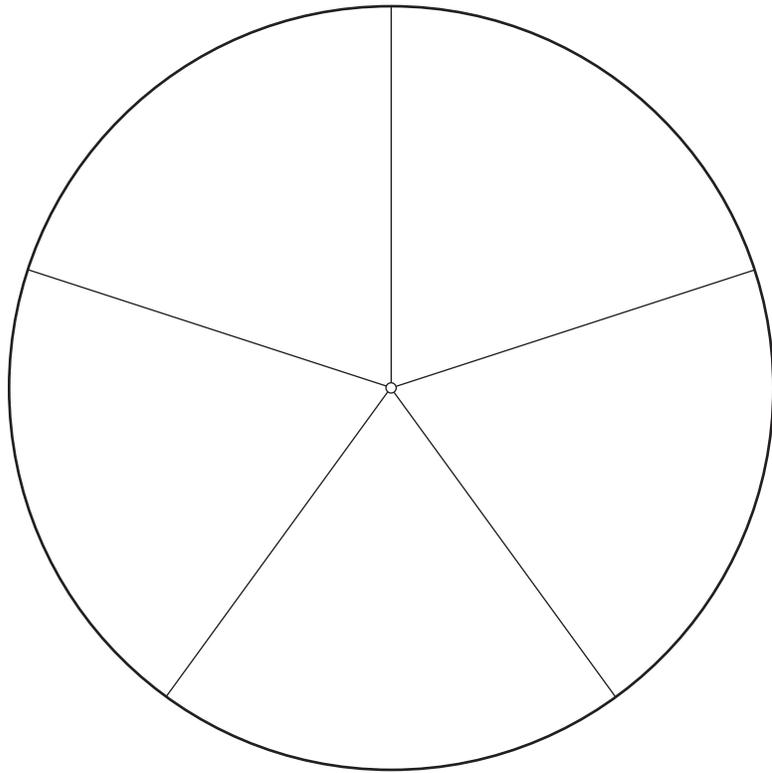
## ***3-sector Spinner Bases***



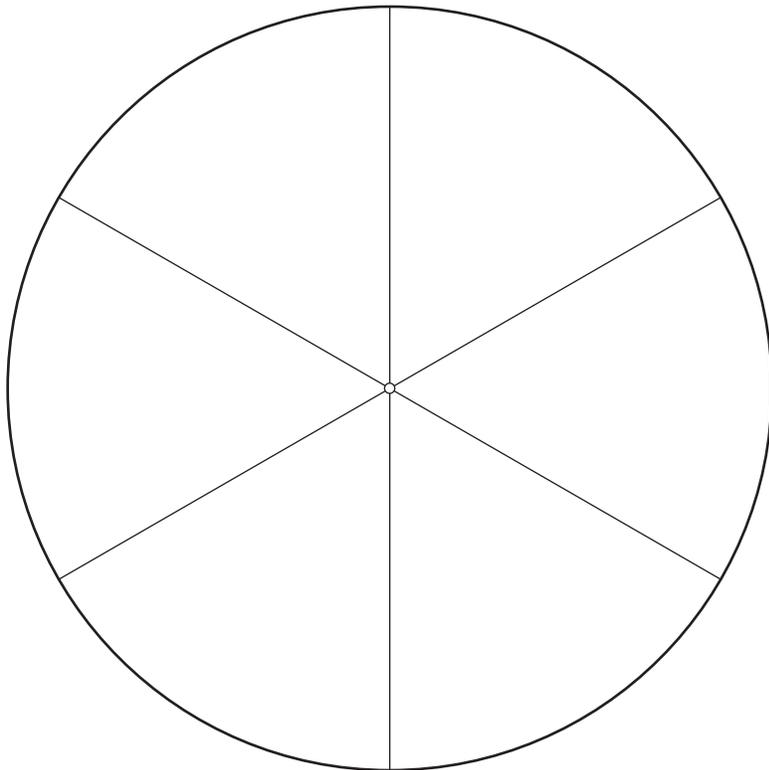
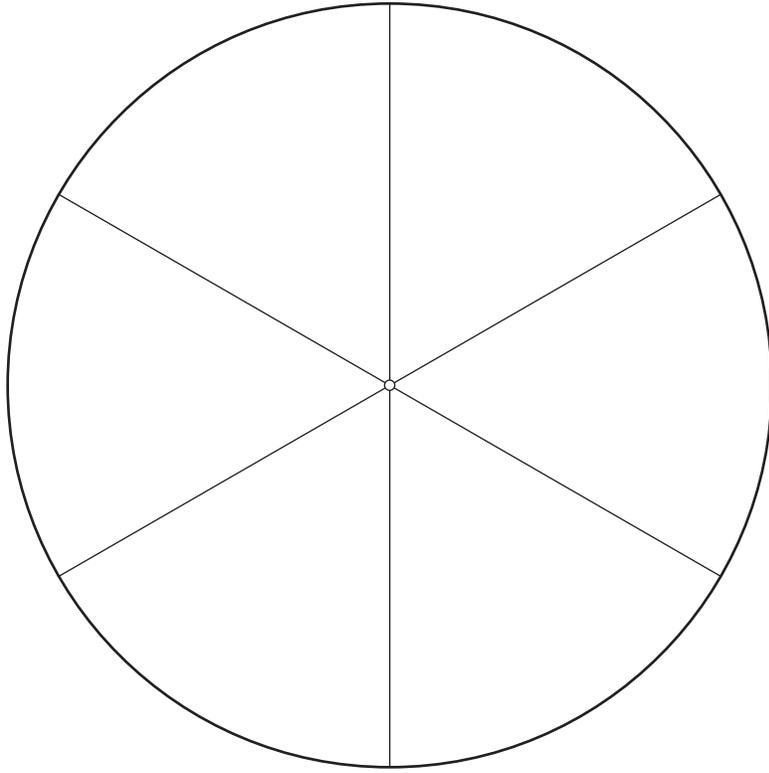
## ***4-sector Spinner Bases***



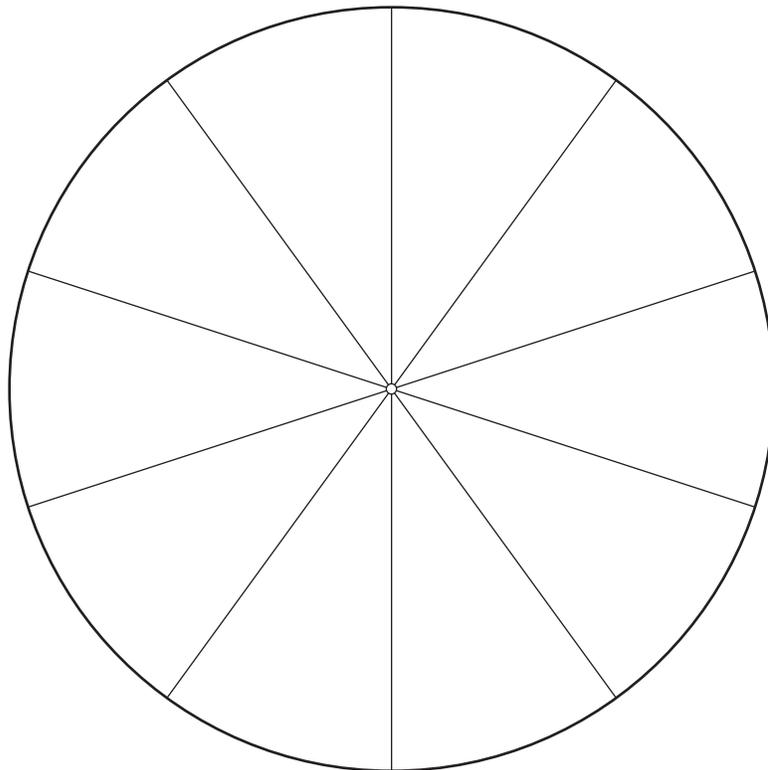
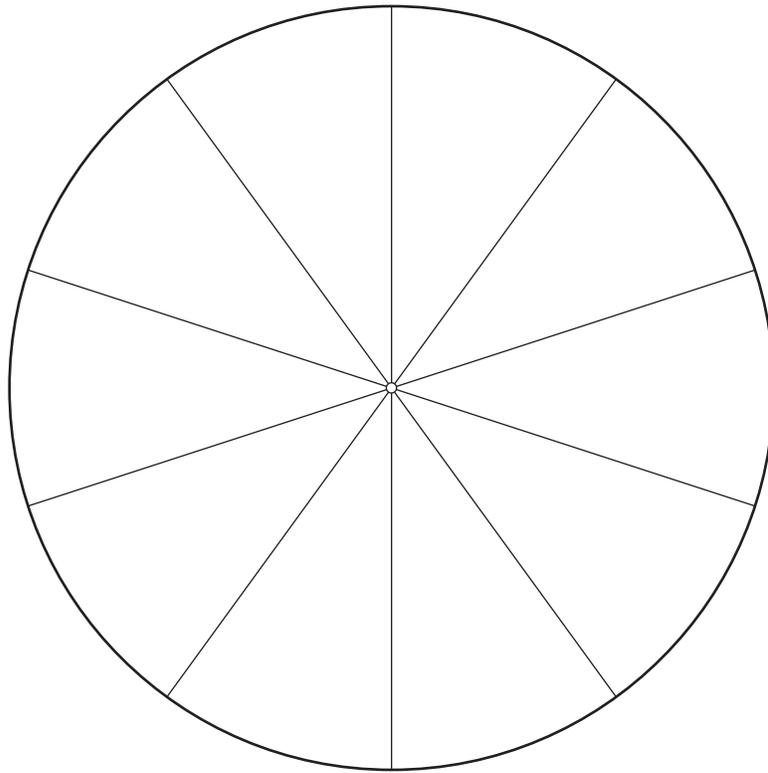
## 5-sector Spinner Bases



## ***6-sector Spinner Bases***



# 10-sector Spinner Bases





***Content  
Standards  
I-1 & II-1  
Activities***



# What Did I Touch Today?

<b>Standard I:</b> Students will develop a sense of self.
<b>Objective 1:</b> Describe and adopt behaviors for health and safety.
<b>Intended Learning Outcomes:</b> 1. Demonstrate a positive learning attitude. 2. Develop social skills and ethical responsibility.
<b>Content Connections:</b> Math V-1

**Content  
Standard  
I**  
Objective  
1

Connections

## Background Information

Students should be aware that germs/bacteria travel from one person to another.

## Research Basis

Haury, D.L. (1993). Teaching Science through Inquiry. ERIC Clearinghouse for Science Mathematics and Environmental Education (ERIC Identifier ED359048). Retrieved February 22, 2005, from <http://www.eric.ed.gov>

Indeed, research findings indicate that, “students are likely to begin to understand the natural world if they work directly with natural phenomena, using their senses to observe and using instruments to extend the power of their senses.”

## Assessment Suggestions

- Each student draws a picture of the correct ways to avoid spreading diseases (e.g., covering mouth with tissue or coughing into sleeve, washing hands, not putting things in their mouths, not sharing cups or utensils with others, throwing away their tissues, etc.).

## Invitation to Learn

Ask students to hold out their hands. Move from student to student making comments such as, “Yuck,” “Gross,” and “Eew!” making certain to comment on each student, not only those who have dirty hands. “There are ‘THINGS’ on you!” Look at own hands and say, “OH NO! There are THINGS on me TOO! What are these things?”

## Instructional Procedures

### Materials

- ❑ Small stickers or sticky notes (6 per student)
- ❑ *What Have Our Hands Touched Today?* worksheet

### Germes Everywhere

1. These “things” on our hands are everywhere.
2. Give each student six stickers. Have them walk around the room and CAREFULLY place a sticker on six things they have touched today (e.g., doorknob, pencil sharpener, chair, computer keyboard, desk, tables, etc.). (We will be taking the stickers off, so don’t push them down too hard.)
3. After each student has finished, invite them to look around and see where most of the stickers have been placed. What does this tell you?
4. Graph where they put the stickers to see what has been touched most often on the *What Have Our Hands Touched Today?* worksheet. Which five places have had the most contact? You may have students put a sticker on the doorknob if they have touched it during the day, and continue with other objects that would receive the most contact in a day’s time. This allows for more controlled results.

Many people have touched the same things in the room. By doing this, germs are passed to others by our hands.

Where do some of these germs come from (e.g., sneezing, noses, coughing, bathroom hygiene, animals, dirt, etc.)? When we touch something, the germs come onto our hands. Does this mean we shouldn’t ever touch anything again? Should we wear gloves? Should we stay in our homes so we never come in contact with germs again? (No. Germs are part of life.)

There are germs that are harmless and there are germs that can make us sick if they get inside of our bodies. They get inside our bodies through our mouths, noses, and eyes.

What can we do to stop sharing a lot of germs with others?

- Wash our hands and wash them thoroughly. Even drying them with a paper towel removes some of the germs that are on our hands.
- Throwing away tissues, bandages, and other items we have used and not leaving them for others to pick up. Coughing and sneezing in a tissue or on our arms instead of in our hands.
- Keeping our rooms, desks, and other areas clean helps prevent germs from spreading.
- Don’t put things in your mouths.

## Spreading Diseases

1. Divide the chalkboard into two sections, labeling one side with the number 1 and the other side number 2.
2. List a few different illnesses people have (e.g., strep throat, colds, chicken pox, measles, cancer, diabetes, epilepsy, hay fever, etc.). List all communicable diseases under #1 and noncommunicable diseases under #2 without telling the students why.
3. Choose five diseases from each side.
  - a. If the disease is under the #1, write the name of it on your paper towel using a marker that has #1 on it.
  - b. If the disease is under the #2, write the name of it on your paper towel using a marker that has #2 on it.
  - c. Place your paper towel on a piece of wax paper. Fill your pipette with water. Very carefully squeeze one drop of water on each initial and watch what happens. Allow students time to experiment. You may want to limit them to a certain number of drops on each letter.
  - d. The ink on the communicable disease initials will spread when the water is dropped on the letters.
  - e. Students should come to the conclusion that communicable diseases will spread from one person to another, while noncommunicable diseases cannot be passed from one person to another.

Some diseases are called *communicable* diseases. This means they spread to others. Other diseases are called *noncommunicable*. You can't catch a noncommunicable disease from other people.

4. Change the numbers on the chalkboard from #1 to the word *communicable* and from #2 to *noncommunicable*.

We can help limit communicable diseases simply by washing our hands, coughing and sneezing away from people, and practicing good hygiene habits, but we can't control noncommunicable diseases or catch them from others.

## Curriculum Extensions/Adaptations/Integration

- Create and laminate flyers to hang in the restrooms encouraging handwashing.
- Write a story from a germs point of view, either letting it live and being transferred from one person to another, or being washed down the drain.

### Materials

- Heavy duty paper towels or coffee filters
- Variety of water-based markers labeled with #1
- Variety of permanent markers labeled with #2
- Spray bottle filled with water
- Water containers
- Pipettes or eyedroppers
- Old newspapers

## **Resources**

### **Books**

*Wash Your Hands*, by Tony Ross; ISBN 1923132018

*Mr. Putter and Tabby Catch the Cold*, by Cynthia Rylant;  
ISBN 0152047603

*Morris Has a Cold*, by Bernrad Wiseman; ISBN 0590434292

*Ebenezer Sneezer*, by Fred Penner, Barbara Hicks;  
ISBN 0920534376

### **Web sites**

[www.uen.org/Lessonplan](http://www.uen.org/Lessonplan)

<http://www.amnh.org/nationalcenter/infection>

## **Family Connections**

- Encourage healthy habits to prevent the spread of communicable diseases.
- Share stories and poetry with family members.
- Write a poem about what to do with germs and put it in a booklet to take home and share with family members.

Name \_\_\_\_\_

# *What Have Our Hands Touched Today?*

20										
19										
18										
17										
16										
15										
14										
13										
12										
11										
10										
9										
8										
7										
6										
5										
4										
3										
2										
1										

# Choices Have Consequences

## Content Standard II

### Objective 1

#### Connections

**Standard II:**

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

**Objective 1:**

Describe behaviors that influence relationships with family and friends.

**Intended Learning Outcomes:**

1. Demonstrate a positive learning attitude.
2. Develop social skills and ethical responsibility.
3. Demonstrate responsible emotional and cognitive behaviors.

**Content Connections:**

Language Arts VII-1; Content I-1, II-2

## Background Information

Students should realize that the choices they make in their lives affect others. They should understand that relationships need strong values, and that there are other ways to handle grievances besides being angry or using violence.

## Research Basis

Gentner, D., Markman, A.B. (1994). Structural alignment in comparison: No difference without similarity. *Psychological Science*, 5(3), 152-158.

Researchers have found identifying similarities and differences to be basic to human thought. Indeed, they might be considered the “core” of all learning.

Potts, B. (1994). Strategies for Teaching Critical Thinking. ERIC Clearinghouse on Assessment and Evaluation (ERIC Identifier ED385606). Retrieved February 24, 2005, from <http://www.eric.ed.gov>

Problem-finding is an excellent group activity, particularly if two or more groups work on the same task independently and then come together to compare strategies. In this way, each student has the benefit of exposure to several ways of solving the problem.

## Assessment Suggestions

- Write a Pirate’s Code of Conduct listing rules and consequences, both positive and negative. Compare the lists from each group and compile them into one final document.
- Write a Classroom Code of Conduct. Display these rules on a poster in the classroom and print a smaller copy to send home with students.

- Give students situations that happen in daily life and ask them to write the correct response to solve each problem (e.g., What should you do if you find a wallet on the ground outside a store? What should you do if your parents ask you to clean your room? What should you do if someone is making fun of another person?). Type these up and display them.
- Have students design a brochure encouraging people to come and live in or visit their real or imaginary community. They should focus on the positive strengths of their area.
- List reasons why solving problems calmly is an effective way to work through conflicts.

## ***Invitation to Learn***

Would you like to be in charge and make important decisions? How would you like to be rich? Would you like to have great adventures? Would you like to be powerful and a strong leader? Today we are going to do all these things in a pirate activity.

## ***Instructional Procedures***

1. Divide the class into groups of six to eight. (Situations may include Pirate’s ship, cowboys, pioneers, pilgrims, settlers, trappers, astronauts, space station, or an underwater city.)
2. Give each group a container filled with gold coins, *Character Cards*, a deck of *Water and Food Cards*, a deck of *Situation Cards*, a deck of *Plunder Cards*, a deck of *Code of Conduct Cards*, and a deck of *Curse You Cards*.
3. Each student selects a *Character Card*. This card tells them who they are and what their characteristic traits are. (Always include the Captain card when playing. Other character cards may be set aside depending on the number of players.)
4. Each student is given five gold coins, three *Water Cards* and three *Food Cards* to begin the game. Gold coins may be exchanged for two *Water* or *Food Cards*.
5. Place the *Character Card* in front of you.
6. The Captain draws the first *Situation Card* and follows the instructions on that card.
7. Players only pay other players when instructed on the card. All other “bounty” is put back into the container.

### ***Materials***

For each group:

- Gold coins
- Character Cards*
- Water Cards* or blue buttons
- Food Cards* or orange buttons
- Situation Cards*
- Plunder Cards*
- Code of Conduct Cards*
- Curse You Cards*
- Teacher treasure map
- Manila envelope
- Small containers
- Content Venn Diagram*, *Content Web*, *Content Flow Chart*, or other chart
- Paper and writing utensils

8. Play continues to the Captain's left until all cards have been turned over, or until time expires.
9. After the game has ended, each player counts their coins and *Food and Water Cards*.
10. Compare what the other players have to your own "bounty."
11. The teacher instructs the Captains to take all the treasure from each player.
12. Captains then either keep it all for themselves, or divide it however they'd like.
13. After each team is finished, the teacher opens the Treasure Map and reads:
  - If the captain kept all the treasure for himself, everyone on the ship died, including the Captain, because he can't sail the ship by himself.
  - If the Captain shared part of the bounty, the crew didn't have enough strength to get the treasure back to the ship. They made it half way back and then couldn't row anymore. The rowboat was too heavy to move, so they had to tip the treasure out of the rowboat into the depths of the ocean.
  - If the treasure was divided equally, everyone wins because each person had enough strength to find the treasure and bring it back. They split it equally and then were able to buy an island and build a lovely community where they all lived happily ever after.
14. Using the *Content Venn Diagram*, *Content Flow Chart*, or *Content Web*, lead a class discussion highlighting the objectives of this Content Standard.
  - How living on a pirate ship is similar to living in a community and how it is different.
  - Why rules are important in a community and what would happen if there were no laws.
  - How cooperation and sharing play an important part in working with others.
  - How the Captain's choice affected each player.
  - How to handle conflict and come to a peaceful resolution.

## **Curriculum Extensions/Adaptations/Integration**

- The teacher may need to assist students who require assistance in reading the cards. It may be necessary to place the students in close proximity or have parent helpers, aides, or a peer tutor help.
- Play this game by first giving no instruction and no cards. Explain there is gold, food, and water in the middle of the table and students may do whatever they like. After the initial confusion, stop and explain why rules are important. We need guidelines in our schools, families, and communities, or all we have is chaos.
- Make a list of qualities you want in a friend and then a list of your own qualities that are valuable in a friendship. Read *Listen Buddy*.
- Create a character charm booklet. On each page write a character trait you feel is important in a family setting.
- Show how a community has grown by designing a flow chart showing the student's grandparents, parents, and children in each family. Discuss what changes would need to be made if all of these people stayed in one community (e.g., more homes, more water needed, more stores, wider roads, larger landfill, etc.).

## **Resources**

### **Books**

*Listen Buddy*, by Helen Lester; ISBN 0-590-21236-2

*Me First*, by Helen Lester; ISBN 0-590-87923-5

*Somebody Loves You, Mr. Hatch*, by Eileen Spinelli;  
ISBN 0-590-29995-6

*Bootsie Barker Bites*, by Barbara Bottner; ISBN 0-440-83070-2

*Timothy Goes to School*, by Rosemary Wells; ISBN 0-440-84053

*Nosey Mrs. Rat*, by Jeffrey Allen/James Marshall;  
ISBN 0-14-050665-9

*Hooway for Wodney Wat*, by Helen Lester; ISBN 0-590-212356-2

### **Web sites**

<http://www.lessonplanspage.com>

<http://www.edhelper.com>

## ***Family Connections***

- As a family, discuss ways that each member can help make the family unit stronger and make a Family Code of Conduct.
- Visit areas of the community and find older buildings and compare them with newer structures.

## Character Cards

<p style="text-align: center;"><b>Pegleg Pete</b></p> <p>Pegleg Pete is a fearsome fighter. The only time he lost was when he fought with an crocodile.</p>	<p style="text-align: center;"><b>Slim Jim Bird</b></p> <p>Slim Jim runs everywhere, so fast it sometimes looks like he is flying. He loves to eat bananas, find treasures, and knit.</p>
<p style="text-align: center;"><b>One-Eyed Walter</b></p> <p>One-Eyed Walter was in a fight with the Captain’s parrot. He tried to take its crackers for a snack. One-eyed Walter likes to climb coconut trees, fight with swords and build sandcastles.</p>	<p style="text-align: center;"><b>Blacktooth Willy</b></p> <p>Blacktooth Willy hates to take a bath and refuses to brush his teeth. He likes to steal from others, carve toy boats with his sword and do dishes.</p>
<p style="text-align: center;"><b>Lazy Lawrence</b></p> <p>Lazy Lawrence likes to get others to do his work, but he doesn’t want to give anyone money for helping. He likes to watch the stars, sleep, play games and dive off the bow of the ship.</p>	<p style="text-align: center;"><b>Greedy Gus Smith</b></p> <p>Greedy Gus Smith is a greedy pirate. He doesn’t like to share and won’t cooperate. He takes things that belong to others and hides them under his cot. He likes to fish, fight, and takes violin lessons.</p>
<p style="text-align: center;"><b>Dirty Dog Dan</b></p> <p>Dirty Dog Dan hasn’t changed clothes in 3 years. He hates to be clean and would prefer to dig for treasure. He enjoys reading treasure maps, singing, and planting seeds whenever he can.</p>	<p style="text-align: center;"><b>Sir Sinbad</b></p> <p>One of the meanest pirates sailing the high seas. He trains dolphins to follow the ship, so when he is forced to walk the plank, he can catch a ride to the nearest island. He likes to juggle cannonballs, cross swords, and do crossword puzzles.</p>
<p style="text-align: center;"><b>Captain James Drake</b></p> <p>A good Captain. He is fair to his crew, leads them to many treasure spots and sometimes will let one of the crew members steer the ship. He knows the ocean, knows the islands and loves gold.</p>	

## Water Cards

**WATER**

## *Food Cards*

<b>FOOD</b>	<b>FOOD</b>

## Situation Cards

<p>1. Steal the captain's hat. Swab the decks. Lose one turn.</p>	<p>2. You discover an island with orange trees. You and each player receive 2 food cards and you can take another turn.</p>
<p>3. Your ship strikes an underwater reef. Fix the hull of the ship by yourself. Take another turn and 1 gold coin.</p>	<p>4. Find the Captain's spyglass. Collect one gold coin.</p>
<p>5. You were showing off and fell off the crow's nest. Spend your next turn in the doctor's quarters. Everyone else has to do your jobs. Give them all 1 gold piece.</p>	<p>6. Steal your neighbor's grub. Lose 2 food cards.</p>
<p>7. Use the Captain's parrot to get feathers for your hat. Pay the Captain 3 gold coins for a new parrot.</p>	<p>8. Find treasure chest filled with 10 gold coins. Keep the treasure for yourself, until your neighbor finds out and takes it from you.</p>
<p>9. Find a treasure chest with enough gold coins for each person to have 5 coins each. Share with the entire crew.</p>	<p>10. Steal Pegleg Pete's wooden leg and use it for firewood. Give 2 gold coins to pay for a new one.</p>

## *Situation Cards, cont.*

<p>11. You didn't do a good job when you swabbed deck and left puddles. The Captain slipped in one of the puddles. You lose one turn.</p>	<p>12. You get seasick. Lose one turn.</p>
<p>13. Spot land from the crow's nest. Take 2 water cards from each player.</p>	<p>14. You help get your crew shipshape. Take another turn.</p>
<p>15. Congratulations! You sank an enemy ship. Get 3 gold coins and 3 food cards.</p>	<p>16. You get in a fight with the sailor on your left. Knock him off gangplank. Lose one turn</p>
<p>17. Knock the pet monkey into the sea. Lose one turn.</p>	<p>18. You have fair winds on your journey. You followed the captain's orders and set the sails correctly. Take another turn and 2 gold coins.</p>
<p>19. You use ships sails to make new clothes. Lose one turn.</p>	<p>20. The Captain hears you call him a "Land Lubber". Spend the next turn locked up. Pay 1 gold coin.</p>

## Situation Cards, cont.

<p>21. You lose the treasure map. Pay everyone 1 gold coin.</p>	<p>22. You steal your neighbor's gold. Lose your next turn.</p>
<p>23. Sudden storm at sea. You batten down the hatches and ride out the storm. Everyone is frightened, but you tell jokes and make them feel better. Take 2 gold coins.</p>	<p>24. You and your fellow sailors use cannonballs for bowling and they go overboard. Lose one turn. Pay 1 gold coin to buy new cannonballs.</p>
<p>25. You didn't follow the captain's orders and sailed into the middle of a hurricane. Lose 1 food card, 1 water card, and 2 gold coins.</p>	<p>26. Accidentally light cannon. Lose one food card. Pay 2 gold coins to repair ship.</p>
<p>27. Weigh anchor too soon and leave Swashbuckler Sam on the island. Go back and get him. Lose one turn and pay 1 food card.</p>	<p>28. Get caught making fun of the cook's food. Lose one food card.</p>
<p>29. Lose compass overboard. Lose your next turn figuring out directions.</p>	<p>30. Accidentally lit barrel of gunpowder. Lose one water card to put out the fire.</p>

## *Situation Cards, cont.*

<p>31. You get caught in fishnet and have to cut the net to get out. Buy a new net with 1 gold coin.</p>	<p>32. Spill orange juice all over treasure map. Pay everyone 1 gold coin.</p>
<p>33. Steal oranges from all the crew. Everyone is sick and you have to do all the work. Lose one turn.</p>	<p>34. You polished the plank without being asked. Take 2 gold coins.</p>
<p>35. You found one crew mate's missing sword. Take 3 gold coins.</p>	<p>36. You catch the biggest fish and share with the crew. Take 2 gold coins.</p>
<p>37. You take a bath. Take 2 gold coins.</p>	<p>38. You stop and help a broken down ship without plundering. Take 2 gold coins.</p>
<p>39. The cook is ill so you fix dinner. Take one food card and 1 gold coin.</p>	<p>40. You find someone's missing treasure chest on the floor. You give it back to them. Take 4 gold coins.</p>

## Situation Cards, cont.

<p>41. You try to start a mutiny, but lose. The entire crew is angry with you. Lose 1 turn and pay 5 gold coins.</p>	<p>42. You find a well of fresh water for all the crew. Take 2 gold coins and all players get 2 water cards.</p>
<p>43. You repaired the Jolly Roger flag and hoist it back up the pole. Take 1 gold coin.</p>	<p>44. You cut out new sails to replace the ones that are tattered. Take 2 gold coins.</p>
<p>45. You stop a fight between 2 sailors. Take 2 gold coins.</p>	<p>46. You take the monkey for a walk. Take 1 gold coin.</p>
<p>47. You sharpen the swords for the other crew. Take one gold coin.</p>	<p>48. You clean the captain's spyglass. Take 2 gold coins.</p>
<p>49. You stand watch late at night so the other sailors can sleep. Take 1 gold coin.</p>	<p>50. You untangle the ropes after the monkey was playing with them. Take 3 gold coins.</p>

## *Situation Cards, cont.*

<p>51. You didn't set the forks on the table and another crew member had to get them. Lose 1 food card.</p>	<p>52. You forgot to bring back coconuts from the island and everyone really wanted coconut pie for dessert. Lose 2 food cards.</p>
<p>53. You ate the last piece of chocolate cake and it was for the captain. Lose 1 food card and bake another cake.</p>	<p>54. You went to the market on the island and didn't pay for your food. Lose 1 turn and 2 food cards.</p>
<p>55. You didn't get up to fix breakfast on time so now everyone is hungry. Lose 1 food card.</p>	<p>56. You did the dishes using dirty ocean water and now everyone is sick. Lose 1 food card.</p>
<p>57. You spent the afternoon eating all the apples on board. Lose a turn because you are sick and 1 food card.</p>	<p>58. You took the captain's breakfast to him in his cabin because he had a sore foot. Take 1 food card.</p>
<p>59. You kept the rats out of the cheese. Take 2 food cards.</p>	<p>60. You clean the galley. Take 3 food cards.</p>

## ***Situation Cards, cont.***

<p>61. During a storm you closed the hatch before the water went below deck. Take 2 water cards and 1 food card.</p>	<p>62. You fix a great dinner with things from all the food groups. The crew is so happy. Take 2 food cards.</p>
<p>63. You find eggs on an island and fix pancakes for everyone. Take 1 food card.</p>	<p>64. You shine the Captain's boots after he spilled ketchup on them. Take 3 food cards.</p>
<p>65. You catch rainwater in a barrel and share with everyone. Take 2 water cards.</p>	<p>66. You wash the sails. Take 2 water cards.</p>
<p>67. You wash the monkey with the Captain's water. Lose 1 water card.</p>	<p>68. You get into a water fight with other crew members. Lose 2 water cards.</p>
<p>69. You discover a new island that has clean running water. Take 3 water cards.</p>	<p>70. You wash out the Captain's socks. Take 2 water cards.</p>

# Plunder Cards

<p style="text-align: center;"><b>Plunder Card</b></p> <p>You may take 3 items from any player on each of your turns until someone puts a Code of Conduct Card on top of your Plunder Card.</p>	<p style="text-align: center;"><b>Plunder Card</b></p> <p>You may take 3 items from any player on each of your turns until someone puts a Code of Conduct Card on top of your Plunder Card.</p>
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## Code of Conduct Cards

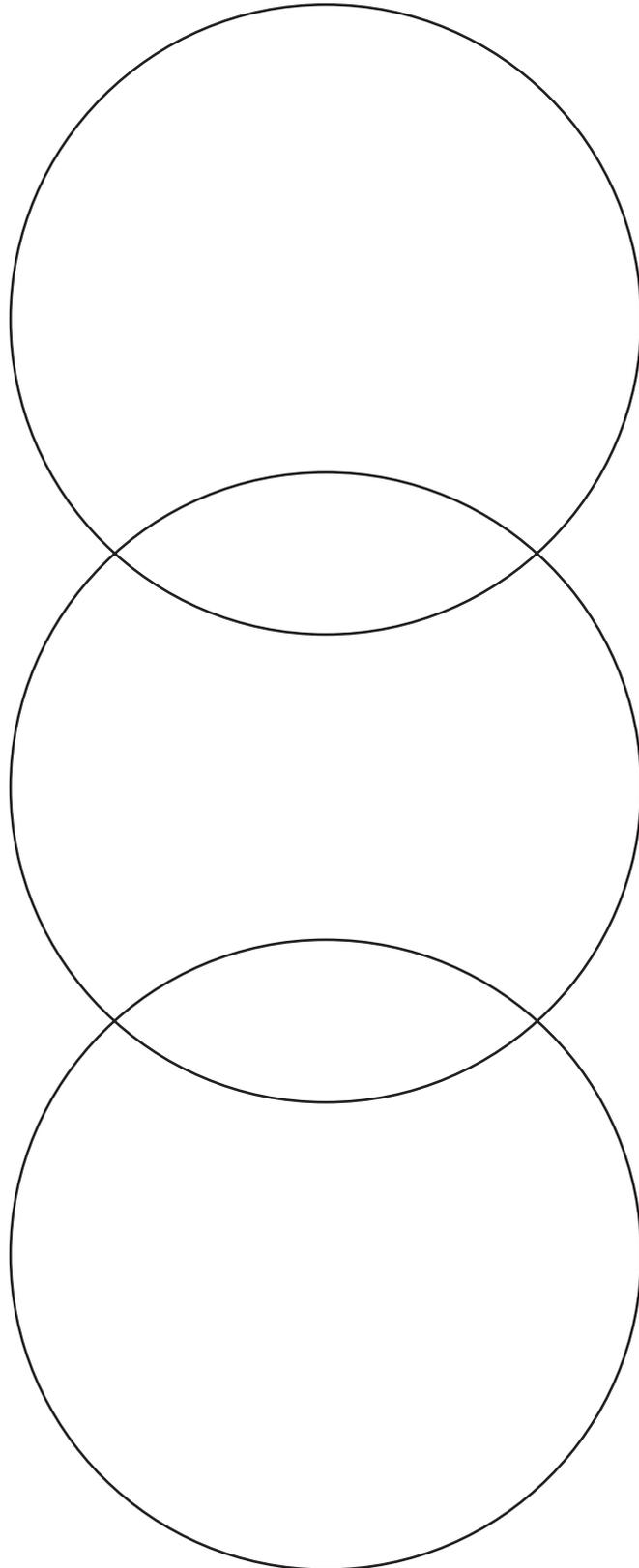
<p><b>Code of Conduct Card</b></p> <p>You may play this on top of any Plunder Card to stop that person from taking items.</p>	<p><b>Code of Conduct Card</b></p> <p>You may play this on top of any Plunder Card to stop that person from taking items.</p>
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## Curse You Cards

<p><b>Curse You Card</b></p> <p>Every time someone reads the word Captain, you have to say “Arrrgh!” until your next turn.</p>	<p><b>Curse You Card</b></p> <p>When you hear the word “gold” you say, “Ahh!! Treasure” until you get a gold coin.</p>
<p><b>Curse You Card</b></p> <p>When someone reads the word “ship” you say, “Ahoy Mates” until someone gives you a water card.</p>	<p><b>Curse You Card</b></p> <p>When someone reads the word “food” you stand and say, “Ye Scurvy Dogs!” until you get a food card.</p>
<p><b>Curse You Card</b></p> <p>When someone reads the word “lose” hold out your hand and say, “Sorry mate!” until your next turn.</p>	<p><b>Curse You Card</b></p> <p>When someone reads the word “monkey” stand up, turn around and sit down until your next turn.</p>
<p><b>Curse You Card</b></p> <p>You are tired of all the stealing. Whenever anyone takes anything, you must respond, “Aye Avast!” until your next turn.</p>	<p><b>Curse You Card</b></p> <p>When you hear the word ‘island’ you put your hand to your eyes and say, “Land Ho!”</p>

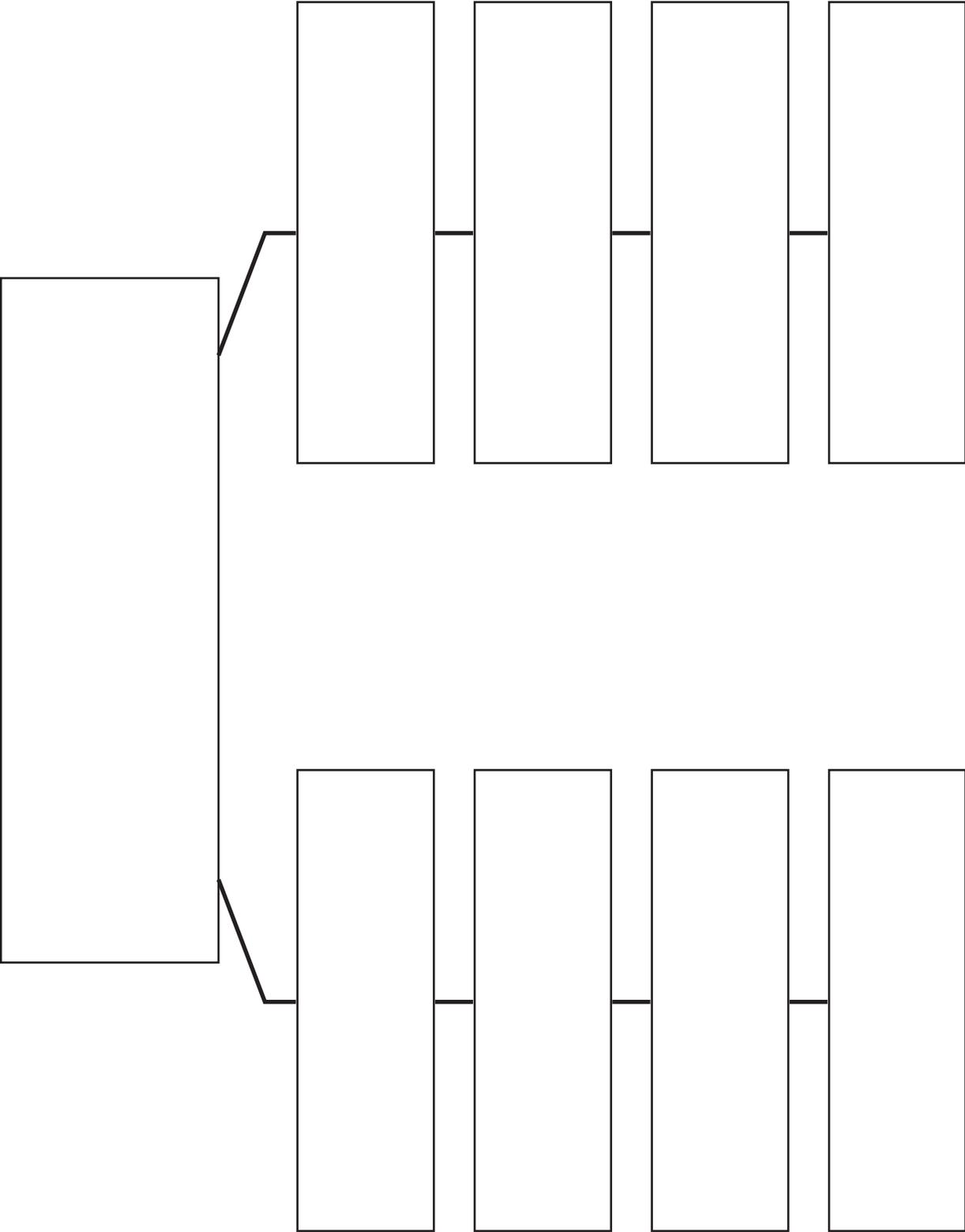
Name \_\_\_\_\_

# Content Venn Diagram

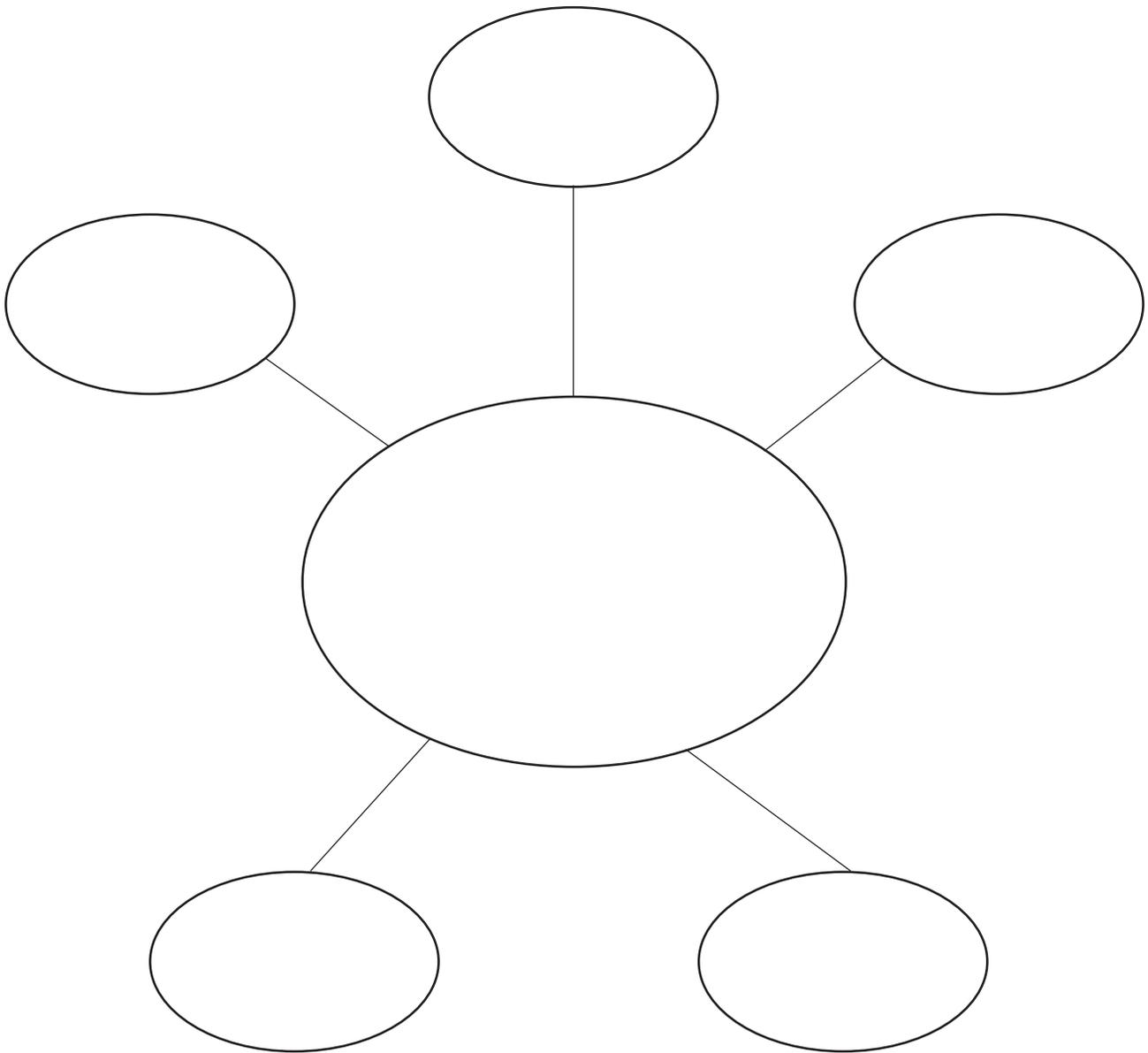


Name \_\_\_\_\_

# Content Flow Chart



# Content Web



***Math  
Standard  
V-2  
Activities***



# When Pigs Fly

**Standard V:**

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

**Objective 2:**

Determine the likelihood of an event.

**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-1; Language Arts VII-2; Social Studies II-2

## Math Standard V

## Objective 2

### Connections

## Background Information

Probability helps you decide how often something is likely to happen.

Every day we make judgments based on probability:

- There is a 90% chance the Giants will win the game.
- We have a 50-50 chance of choosing the quickest check-out lane.
- There is a 20% chance of thunderstorms today.

When an event has only two possible outcomes, the outcome can be described as possible/impossible or more likely/less likely/equally likely. This is the language of probability that needs to be developed in second grade.

*More likely:* Night will turn to day

*Equally likely:* It will rain tomorrow

*Less likely:* Pigs will fly

In order to make wise predictions, we must base them on data collected, checking new ideas against what we already know.

## Research Basis

Kamii, C., & Lewis, B. (1990). Constructivism and First Grade Arithmetic. *Arithmetic Teacher*, pgs. 36-37

Games are traditionally used as a reward for pupils yet are very effective as an instructional tool. Students are more likely to remember math concepts as they construct strategies through playing games and exchanging points of view than when they write in workbooks to satisfy the teacher.

Frykholm, J. (2001). Building on Intuitive Notions of Chance. *Teaching Children Mathematics*, pgs.112-118

Research indicates that students bring an intuitive (but unstructured) understanding of chance to the primary school classroom. Students should study probability through lessons that give them experience. Their intuitions must be developed as they explore context, investigate, make predictions, and engage in probabilistic thinking through the use of hands-on models such as spinners, dice, and coins.

## Assessment Suggestions

- Pre-assessment *Flap Book*
- Observation of students during the *When Pigs “Fly”* activity, looking for the ability to predict an outcome when there are two possible outcomes.
- Journal entry at the end of days three and four describing the cotton balls that are in the bag and the individual outcomes compared to the class outcomes.

## Invitation to Learn

Bring in a box filled with pink helium balloons that have been made to look like pigs. Before opening the box, ask the class if they think pigs could fly? Once they have responded, open the box and let the pigs (balloons) fly.

Alternate activity: Hang paper flying pigs from the ceiling and hide behind the class map or screen.

Question the students on whether pigs can really fly.

## Instructional Procedures

### Day 1

1. Start with a pre-assessment *Flap Book* activity to determine what students think is possible or not possible.
2. Read and discuss *Cloudy, With A Chance of Meatballs*. When you get to a part in the story that tells about things that are not possible to have happen, have the class call out, “When Pigs Fly!”
3. Make a classroom chart recording Possible/Not Possible events from the story. Generate other ideas that are possible/not possible.

### Materials

- Box of pink helium balloon pigs

### Materials

- Cloudy, With a Chance of Meatballs*
- Chart paper
- Flap Book

**Day 2**

1. Give each student a small paper bag with four pink cotton balls (pigs) inside.
2. Let the students look into the bag.
3. Ask what possible outcomes there are when drawing a pig from the bag.
4. Have students close their bag and predict what color they think they will likely pull out.
5. Have the students justify their answers.

*When Pigs “Fly” Instructions*

1. Students close their bag of four pink pigs and shake the bag.
2. Let the students draw and put the cotton ball (pig) back 10 times. As they draw, have them graph their results in the appropriate column on the *When Pigs “Fly”* graph sheet.
3. Ask the students to predict what their data would look like if they drew 20 times.

**Day 3**

1. Have students make a bag containing four pink and four white cotton balls (pigs).
2. Discuss the probability of pulling out a pink pig. Is it more likely, less likely or equally likely, and why?
3. Have them draw and graph their results on the horizontal graph on the *When Pigs “Fly”* graph sheet. Label the strip pink on one side and white on the other. Students start graphing on the ends of the strip and work toward the middle. Tell them to stop when both sides meet.
4. Discuss the individual data.
5. Have students cut their strips apart to separate the pink and white and collect the strips to make a class graph.
6. Discuss the class data.
7. Ask what they could do to make it more likely that they would pull out a pink pig
8. Ask what would need to be in the bag to be less likely that they would pull out a pink pig?

**Materials**

For each student:

- A small paper bag
- 4 pink cotton balls
- When Pigs “Fly”* graph sheet
- Student math journal

**Materials**

For each student:

- A small paper bag
- 4 pink and 4 white cotton balls
- When Pigs Fly* graph sheet
- Student math journal

### Day 4

1. Have students load their bags with one pink and four white pigs.
2. Repeat the procedures from day 3.
3. Compare and contrast the data from days 3 and 4.
4. Discuss how the data you collected and information you already know helps you to know if something is more likely, less likely, or equally likely to happen.

## ***Curriculum Extensions/Adaptations/Integration***

### **Materials**

- ☐ *The Raindrop Song*

- *The Raindrop Song* is a fun song about things that couldn't happen.
- Students write agendas or schedules of things they know will happen at school each day. Encourage them to make a weekly schedule listing things they are certain need to be done. Follow the schedule to get in the habit of getting things done on time.
- Students with special needs could have a teacher-made agenda or schedule that the student checks-off when things are done.
- When discussing rural, suburban, and urban communities, students can predict and compare different events that would happen each day in each of the communities.

## ***Resources***

### **Books**

*Cloudy, With a Chance of Meatballs*, by Judi Barrett;  
ISBN 0590303848

*Probably Pistachio*, by Stuart J. Murphy; ISBN 0064467341

*If You Give a Mouse a Cookie*, by Laura Joffe Numeroff;  
ISBN 0060245867

## ***Family Connections***

- Design a probability game that family members could play at home using forks and spoons.

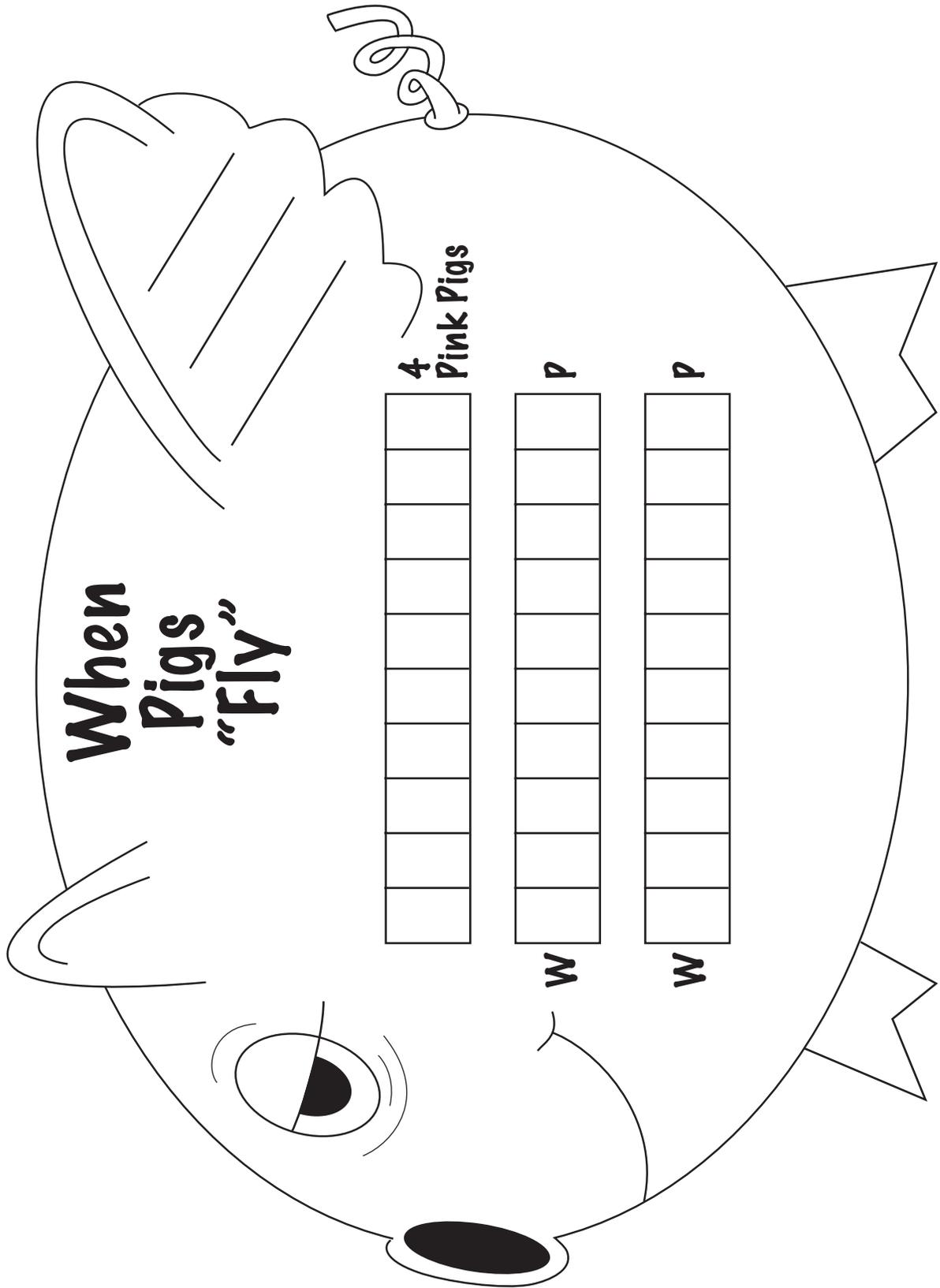
# Flap Book

Name \_\_\_\_\_

**Not  
Possible**

**Possible**

Name \_\_\_\_\_



## ***The Raindrop Song***

\* Traditional campfire song.

If all the raindrops were lemon drops and gumdrops, oh what a life I would lead.

Standing outside with my mouth open wide.

Eh eh eh eh eh eh eh eh eh eh

If all the raindrops were lemon drops and gumdrops, oh what a life I would lead.

If all the snowflakes were candy bars and milk shakes, oh what a life I would lead.

Standing outside with my mouth open wide.

Eh eh eh eh eh eh eh eh eh eh

If all the snowflakes were candy bars and milkshakes, oh what I life I would lead.

If all the sun beams were bubble gum and ice cream, oh what a life I would lead.

Standing outside with my mouth open wide.

Eh eh eh eh eh eh eh eh eh eh

If all the sun beams were bubble gum and ice cream, oh what a life I would lead.

# Probability Through the Year

## Math Standard V

### Objective 2

#### Connections

**Standard V:**

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

**Objective 2:**

Determine the likelihood of an event.

**Intended Learning Outcomes:**

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

**Content Connections:**

Math I-3, V-1; Social Studies II-2

## Background Information

The study of probability helps us determine the likelihood of something happening.

Second graders come to the classroom with an intuitive sense of chance and fairness. By developing their ability to respond to probability situations, they start to acquire the ability to make everyday judgments based on probability.

In any probability problem, it is important to identify all the different outcomes that could occur (e.g., if tossing a coin, you must figure out all the different ways it could land).

Because of randomness, individual outcomes in a game of chance are uncertain. However, a large number of repetitions can give a very even distribution of frequencies. For example, after a coin has been tossed a significant number of times, students can see that about half the time the coin lands on heads and half the time it lands on tails. By increasing the number of trials, students can make more accurate predictions.

These activities and games are meant to be used as mini-lessons throughout the year. By giving students opportunities to study and practice probability through games, students learn to predict outcomes and enhance their ability to work through probability situations.

## Research Basis

Kamii, C., & Lewis, B. (1990). Constructivism and First Grade Arithmetic. *Arithmetic Teacher*, pgs. 36-37

Games are traditionally used as a reward for pupils, yet are very effective as an instructional tool. Students are more likely to remember math concepts as they construct strategies through playing games and

exchanging points of view than when they write in workbooks to satisfy the teacher.

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Research indicates that students bring an intuitive (but unstructured) understanding of chance to the primary-school classroom. Students should study probability through lessons that give them experience. Their intuitions must be developed as they explore context, investigate, make predictions, and engage in probabilistic thinking through the use of hands-on models such as spinners, dice, and coins.

## Assessment Suggestions

- Teacher observations as students participate in the probability activities. Look for the ease or difficulty for the student to answer questions and play the game correctly.
- Some of the activities have recording sheets and journal entries that may be used as assessments.
- One-on-one interviews with each student. Watch for reasonable predictions.

## Invitation to Learn

Hold out a deck of cards so that the students cannot see what is on the card. The cards are all marked the same way. Ask a student to “Pick a card, any card.” Tell the class you are magic and can tell them which card the student picked without looking at it. Tell the student to keep the card hidden and not let you see the card. Tell the class what card was chosen. Ask them how they think you knew, leading into a conversation on probability and how to be sure to get the right answer.

## Instructional Procedures

Each *Probability Activity Card* explains the procedure for the activity.

## Curriculum Extensions/Adaptations/Integration

- Struggling students could be paired up with more knowledgeable students who are willing to help.
- Observe struggling students as play begins to be sure instructions are understood. It may be possible to explain instructions in a way that is more effective for them.

### Materials

- Monthly Probability Activity Cards*

- Discuss probability in lessons dealing with goods and services in the community.
- Discuss the role of probability when the media entices people to buy products by offering a chance to win something or get a special prize, such as prizes in cereal boxes.

## ***Resources***

### **Books**

*About Teaching Mathematics*, by Marilyn Burns;  
ISBN 9780941355056

*Math to Know*, by Mary C, Cavanagh; ISBN 0669471534

## ***Family Connections***

- The *Probability Activity Cards* may be modified and made available for students to take home and play with their families.

## September—School Supplies

**2 players**

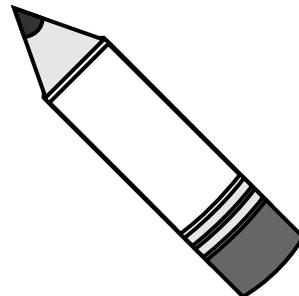
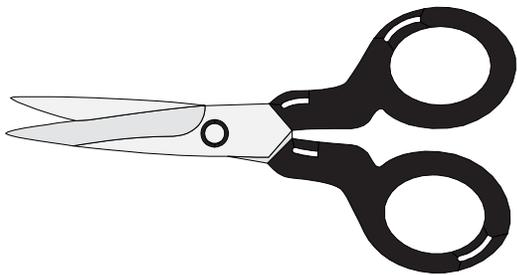
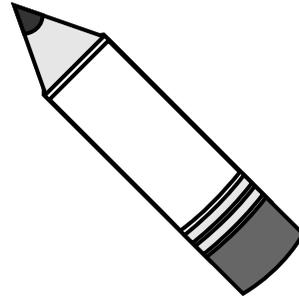
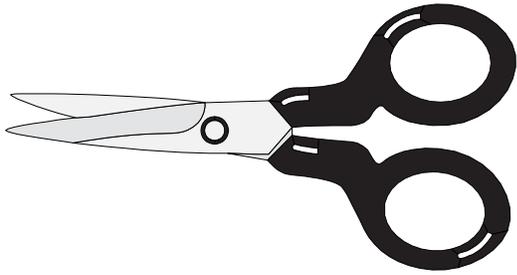
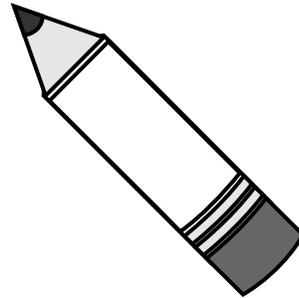
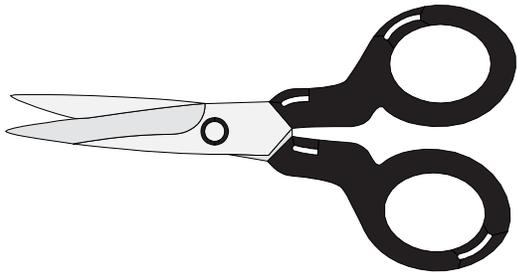
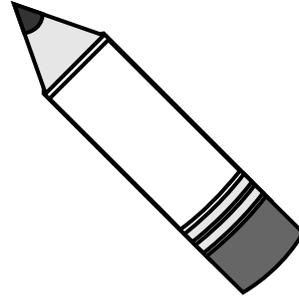
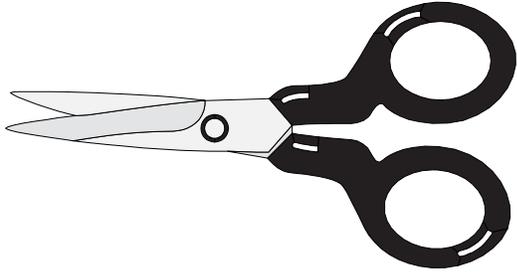
*Before play begins, make up bags containing 4 pencil cards and 1 scissor card each (hold the other scissor cards for later in the game).*

1. Tell the students there are pencil cards and scissors cards in each bag, but don't tell them how many.
  2. Ask them to describe what they might pull out of the bag.
  3. Have students take turns drawing a card, returning the card to the bag, and recording it with tallies for a specified amount of time.
  4. Discuss individual data as a class. How many of you had more scissors than pencils and why?
  5. Have the students predict what combinations of cards might be in the bag and why. Then have them look in the bag.
  6. Ask, "Would you change your prediction knowing what is in the bag?"
  7. Ask, "What could you do to make it not possible to pull out an item?"
  8. If time permits, experiment with different combinations. This is where the extra scissor cards could be used.
- \* At the end of play, ask, "What is the probability of pulling out a card with a crayon on it?"

### Materials

- Paper lunch bags (1 per pair of students)
- 4 Pencil cards
- 4 Scissor cards
- Blank paper for each player for tallying

# School Supplies



## ***October—Colored Leaf Shake Up***

This game is played in pairs.

1. Discuss the possibilities of rolling an odd or even number on the die before playing the game.
2. Predict which color leaf will receive the most tallies when there are two possible outcomes.
3. Students take turns rolling the die. If the number is even, put a tally mark on the red leaf. If the number is odd, tally the yellow leaf.
4. Roll the die for a specified amount of time.
5. Discuss the individual data.
6. Record the results of each group on a class graph.
7. Have students predict what their individual data would be if they rolled the dice twice as long. Predict what the class graph would look like.
8. If time permits, roll the die the same amount of time again, then record and discuss the data.

*Extension:* Students roll two dice and record odd or even sums.

### ***Materials***

For each pair:

- Numbered die (1-6)
- Red leaf tally sheet
- Yellow leaf tally sheet

## November–Turkey Feathers

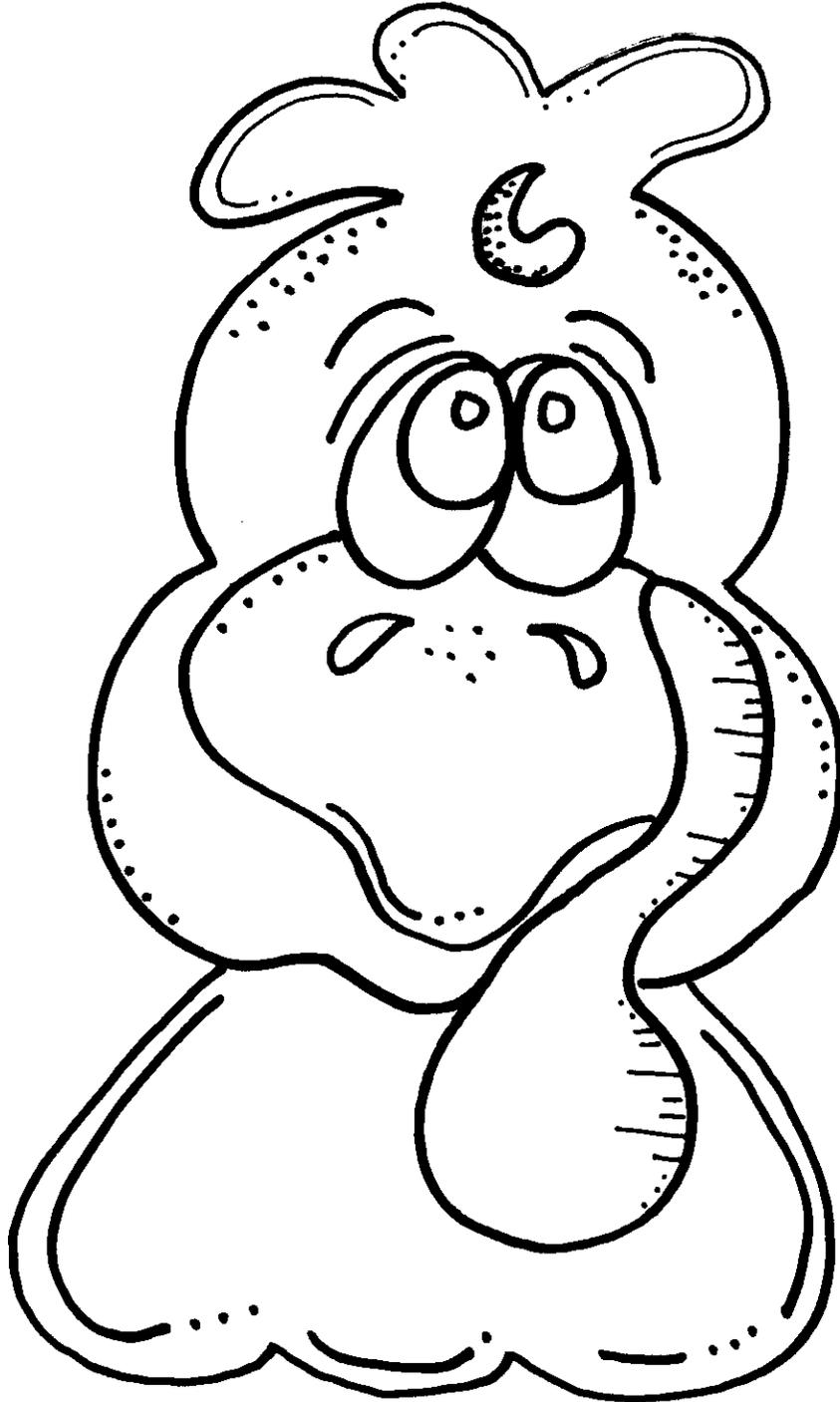
### Materials

- Small paper sack with 4 each of 2 different colors of feathers per small group
- Paper *Turkey Feathers* to match the colors of the feathers in the sack
- Turkey Windsock* pattern
- Wordstrips
- Scissors
- Glue stick
- Strips of crepe paper streamers matching the turkey feathers

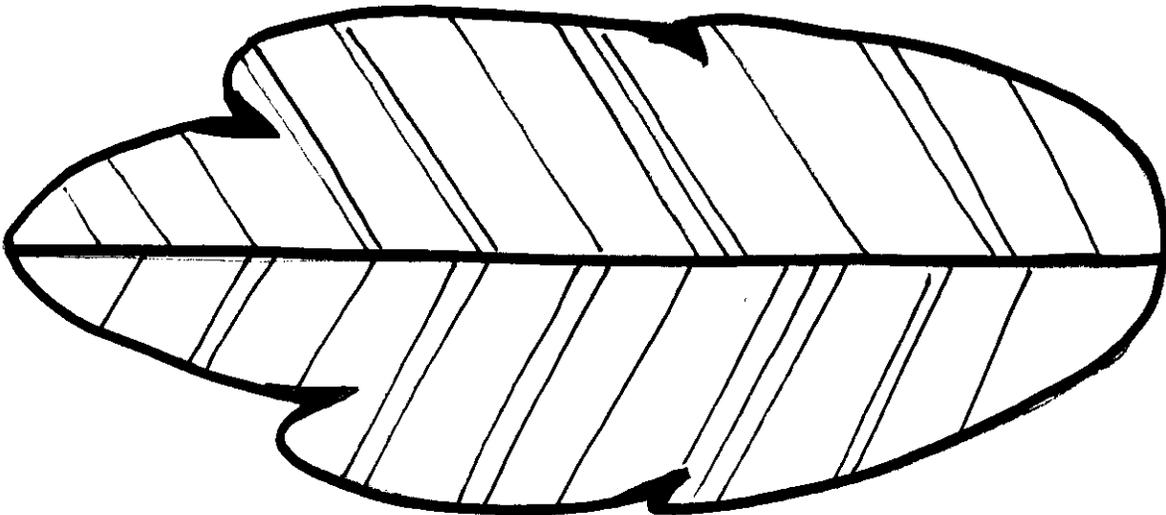
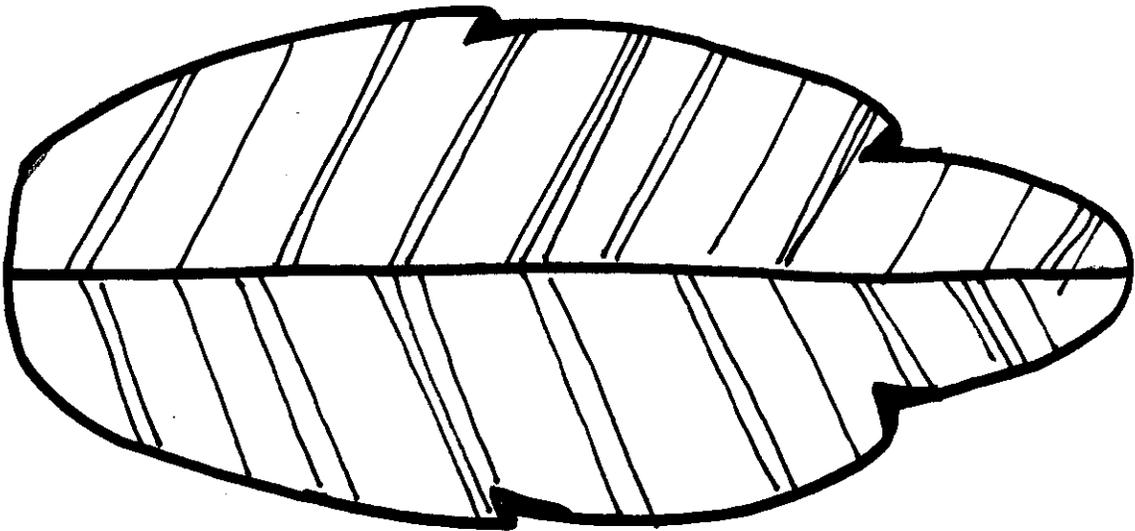
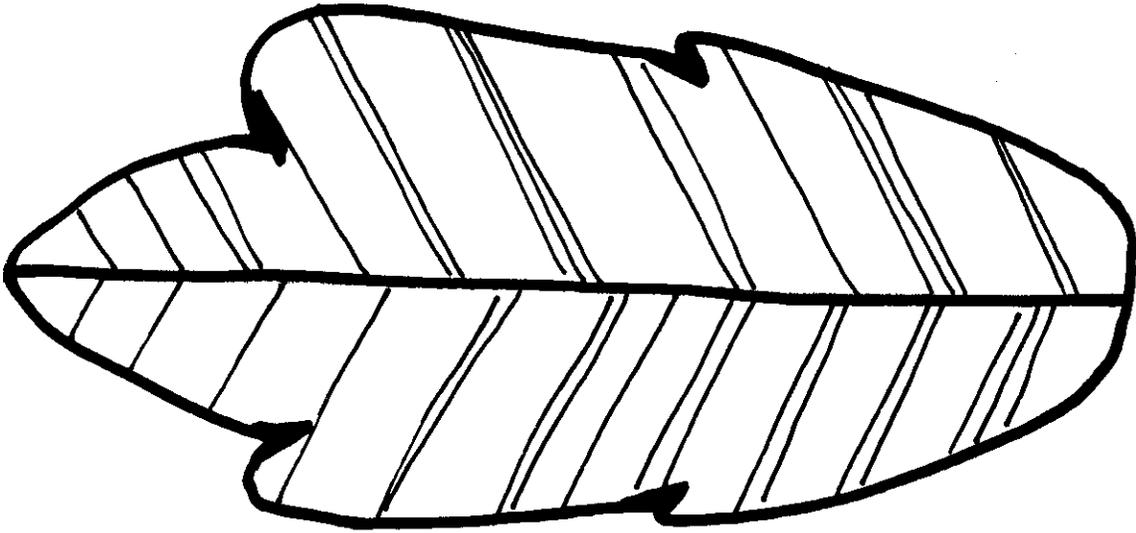
### Small Group (about 8)

1. Students first color and cut out the *Turkey Windsock* and put together the band of the windsock using wordstrips.
2. Give each small group a sack of feathers.
3. Tell students to look at the feathers in their sacks and determine the possible outcomes of the colors of turkey feathers in their windsock.
4. Each member of the group takes a turn drawing a feather and placing it back into the sack. As the next person draws, the first person glues a paper feather of the drawn color onto their windsock band.
5. Continue drawing and gluing until each windsock has five feathers.
6. Complete the windsock by adding matching streamers.
7. Ask: What are the chances of pulling out a different color than the two colors in your sack?
8. Ask: What could we do to make a more colorful windsock?

# Turkey Windsock



# Turkey Feathers



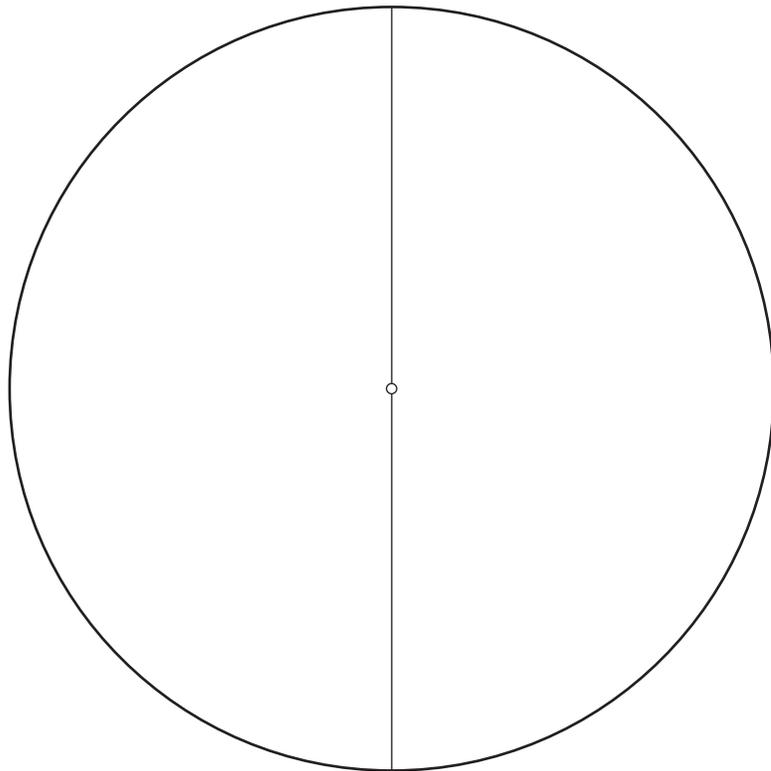
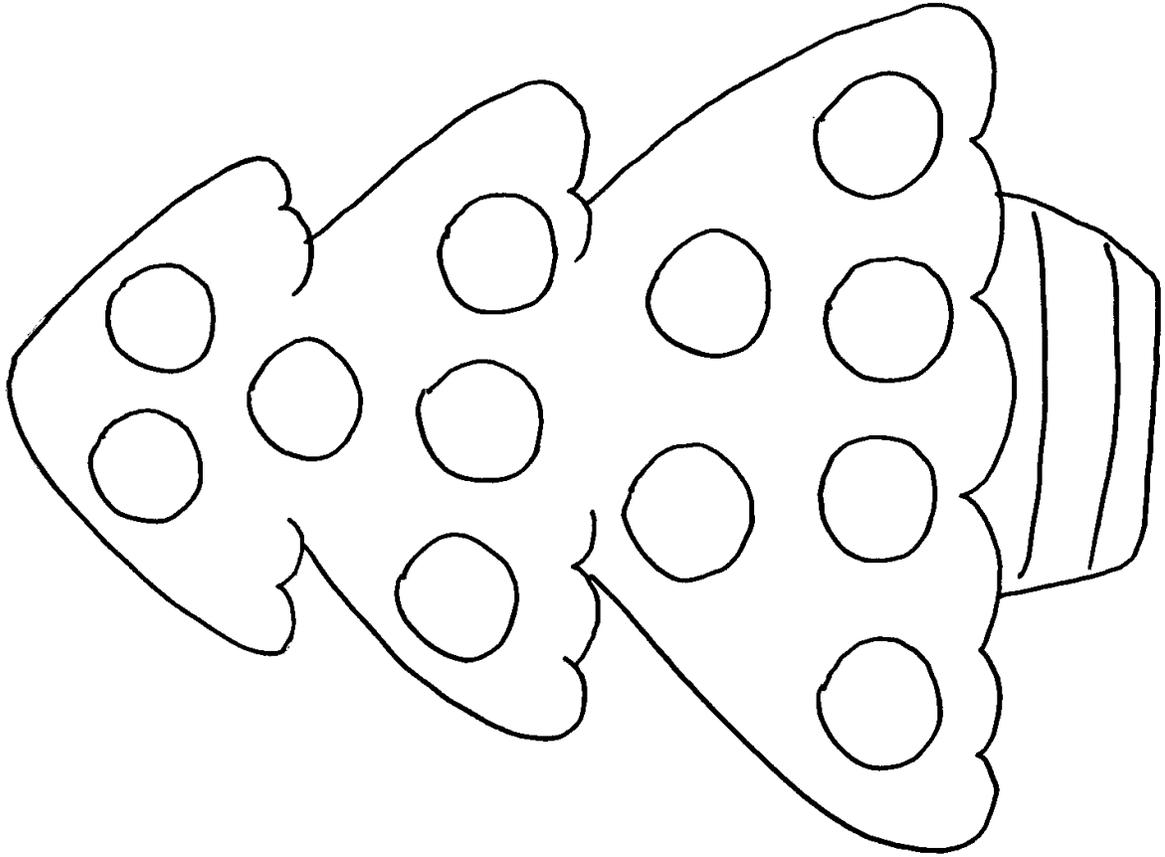
## ***December—Decorate the Tree***

1. Discuss the chances of having the most or least of one color decoration on the tree. Have students predict what their tree will have the most of and color their 2-sectioned spinner red and green.
2. Students spin to see what color of decoration to put on the tree. Continue playing until all circles are covered.
3. What could we do to have a greater chance of having more green decorations than red?
4. What are the chances that we would have a yellow decoration on our tree?

### ***Materials***

- 2-sectioned *Spinner*
- Christmas Tree* pattern
- Red and green bingo chips or colored crayons

***Spinner and Christmas Tree***



## *January—Build a Snowman*

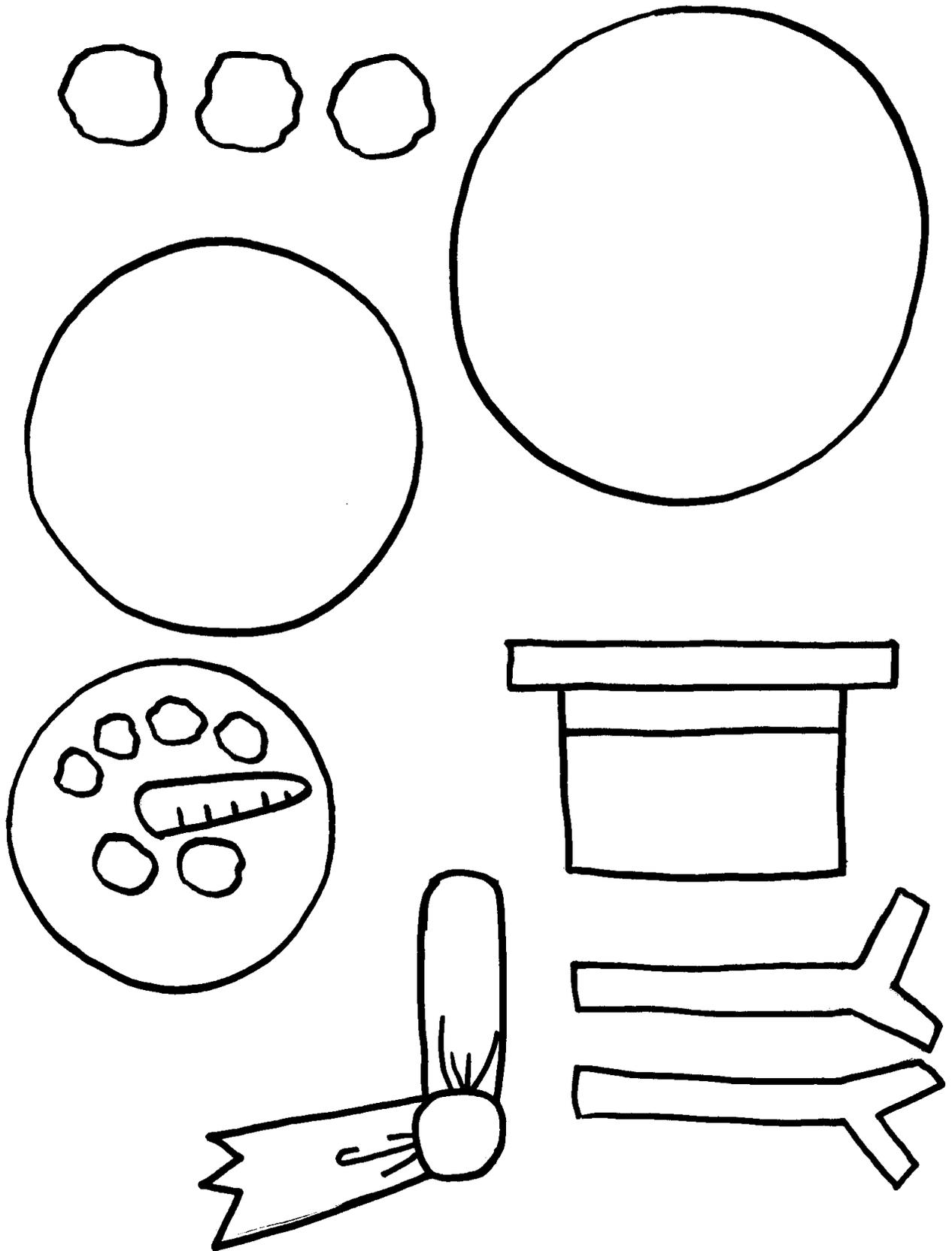
### **Small group**

1. The goal of this game is to be the first person to complete a snowman.
2. Before play, students color and cut out the parts of the snowman. They will build their snowman on the blue construction paper, but be sure to remind them not to glue any parts until the game is over.
3. Discuss the outcomes of the roll of the dice and predict which numbers they are more likely to roll and which they are less likely to roll.
4. On each player's turn, s/he rolls the dice as many times as s/he likes. Add a part to the snowman for each roll. When a player decides to stop rolling, s/he gets to keep the part of the snowman that has been built to this point. The next player rolls the dice to build his/her snowman. If a player rolls a 1, s/he has to take his/her snowman apart and start over.
5. When the game is over, have students glue their snowman parts to the paper and write a strategy that worked for them, or they think would work for them, on the back.

### **Materials**

- Snowman Parts
- Light blue construction paper
- A weighted numbered dice (four 2's and two 1's) per small group

# Snowman Parts



## ***February—Flipping the Presidents***

**1 player**

1. Before starting, have each student cut and paste his/her graph paper to make a long strip of two columns. Label the columns “Heads” and “Tails.”
2. Discuss the different outcomes that could occur when tossing a coin.
3. Students predict which side of the coin is more likely to come up when tossing the coin.
4. Students flip their coins for a specified amount of time, recording the results of each flip on a graph.
5. At the end of play, discuss the individual data and make a class graph. Compare and contrast the individual data and the class data.

### ***Materials***

- Coin
- Graph paper

## ***March—Go Fly a Kite!***

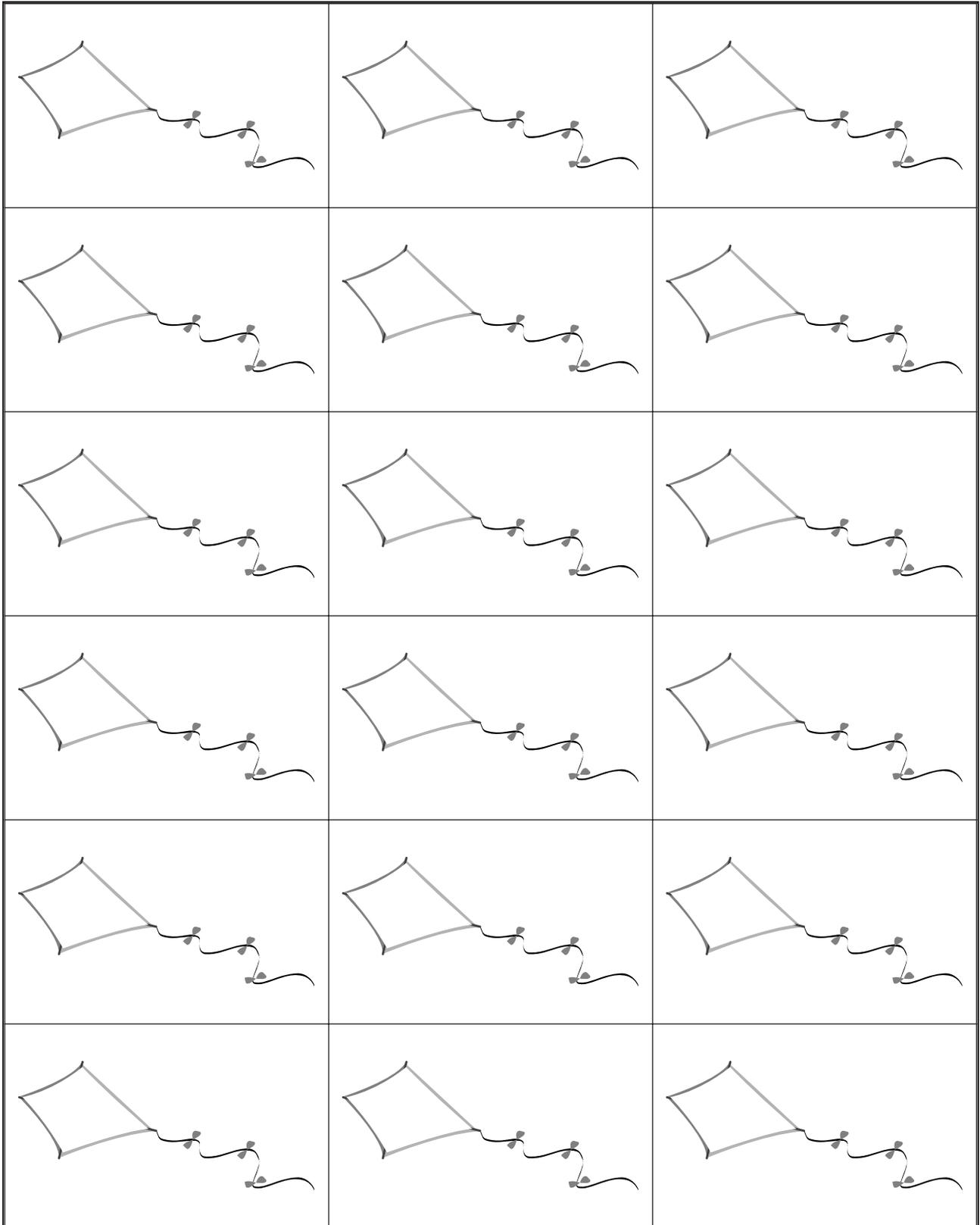
### ***Materials***

- Set of *Kite Cards*  
(2 colors)
- Blank art paper
- Crayons to match the kite colors

### **2 players**

1. Students look and sort the kite cards to determine the possible outcomes of drawing the cards.
2. Students determine whether there is a color that is more likely/less likely to be drawn, or whether the colors are equally likely to be drawn.
3. Shuffle the cards and place them face down between the two players.
4. Each player makes a prediction of what kite color the next card drawn will be.
5. Take turns drawing the cards.
6. If the prediction was correct, the student with the correct prediction draws a kite that is the color of the one drawn.
7. At the end of the specified playing time, the student with the most kites in the sky is the winner.
8. What made it difficult or easy to predict which color would come up next?

# Kite Cards



## April–“Eggs”-traordinary Predicting

### Materials

For each student:

- Small paper bag
- 4 purple eggs
- 4 green eggs
- “Eggs”-traordinary Predicting Graphing Sheet

### 1 player

1. Give each student a small paper bag with four purple eggs inside. Do not let the students look in the bag.
2. With bag closed, have students predict what color they think they will pull out and justify their answers.
3. Students draw and put the egg back 10 times. As they draw, have them graph their results in the appropriate column on the graphing sheet. Discuss individual data.
4. Have students predict what is most likely to be inside the bag.
5. Make a bag containing four purple and four green eggs. Discuss the probability of pulling out a purple egg. Is it more likely, less likely, or equally likely, and why?
6. Students draw and graph the results on a horizontal graph strip. Label the strip “purple” on one side and “green” on the other. Start graphing on the ends of the strip, work toward the middle, and stop when both sides meet. Discuss the individual data.
7. Students cut their strips apart to separate the purple and green. Collect the strips to make a class graph. Discuss the class data.
8. What could we do to make it more likely that we would pull out a purple egg?
9. What would need to be in the bag for it to be less likely that we would pull out a purple egg?
10. Load the bags with one purple and four green eggs.
11. Repeat the procedure from above.
12. Compare and contrast the data from each drawing.

# “Eggs”-traordinary Predicting Graphing Sheet

All 1  
Color

## *May–May Bouquet*

### **Materials**

- Clear Spinner
- May Bouquet Recording Sheet*
- Crayons

### **2 players**

1. Remind students to make wise predictions by using information they know and choosing a spinner that makes it more likely for them to get the answer they need to color the flower.
2. Play the game by taking turns choosing a spinner that gives them the best chance of answering the questions on the flowers. The flowers do not need to be colored in any particular order. The first student with his/her bouquet of flowers colored is the winner.
3. At the bottom of the *May Bouquet Recording Sheet*, have each student write down the best strategy for winning the game.
4. Discuss the strategies as a class.

# May Bouquet Recording Sheet

**1**

**2**

**2**

**1**

Number of legs on a bird

How many noses on your face

greater than 1

1 + 1

even number

odd number

less than 2

My Strategy \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

## *June–Something’s Fishy*

### **Materials**

- Cup of 12 goldfish crackers (per student)
- Deck of playing cards (per group) with face cards removed

### **4 players**

1. Discuss the probable outcomes of drawing even or odd numbers and how shuffling adds randomness to the game.
2. Shuffle the deck and place the cards face down. One player draws the first card, which determines whether that player goes for odd or even numbers. Take turns drawing the top card. If the card (odd or even) chosen at the beginning of the game is drawn, the player gets to eat a goldfish. The card is put in a discard pile for later use (if needed).
3. The first player to eat all of his/her fish is the winner.
4. How could you make it more likely that your numbers drawn would be even?

***Content  
Standard  
II-2  
Activities***



# Tonight's Homework—Watch Cartoons

**Standard II:**

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

**Objective 2:**

Examine important aspects of the community and culture that strengthen relationships.

**Intended Learning Outcomes:**

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

**Content Connections:**

Math V-1; Language Arts I-2; Content I-3

## Content Standard II

### Objective 2

#### Connections

## Background Information

Students need to understand the meaning of the term “media” according to this definition:

“All the means of communication, such as newspapers, radio, and television that provide the public with news, entertainment, etc., usually containing advertising.”

## Research Basis

Hurst, J.B. (1972). Discovery teaching and increased student motivation. ERIC #ED088807

Abstract of research pointing out that significant differences were found between initial and post instructional student interest in a subject when discovery learning was used.

Levy, Yiftach. (n.d.). The effects of background music on learning: a review of recent literature. Education 690 Syllabus: San Diego State University. San Diego, CA  
(Available at <http://edweb.sdsu.edu/courses/ED690MJ/Examples/LitRev/Levy.htm>)

An online article citing research confirming that loud, cacophonous music impedes learning, while some music may be helpful in the learning process.

Roberts, D.F., (1999). Kids and Media @ the New Millennium: A Kaiser Family Foundation Report. A Comprehensive National Analysis of Children's Media Use  
ERIC #ED445369

This study examined media use patterns among a large, nationally representative sample of children ages 2-18, and explored how children choose and interact with the whole array of media available to them, including television, movies, computers, music, video games, radio, magazines, books, and newspapers.

## Assessment Suggestions

- *Journal:* What types of media are there and how does it affect me?
- Students write down what media means and give several examples.
- Day 6 activity
- *Homework:* Before beginning this unit, assign each student to watch 30 minutes of a cartoon show and 30 minutes of news. Have the student make two lists of the commercials, one from each program. (To be used in day 2.)

## Invitation to Learn

In small groups, complete the sheet *What Product Am I?*

### Materials

- What Product Am I?* worksheet

## Instructional Procedures

### Day 1

1. Put a concept you are teaching to music and teach it to them. Discuss how simple it was to remember the concept taught. Talk about why music is used in media and connect to the invitation to learn.
2. Listen to clips taken from the CD. Talk about how each music clip makes students feel. Talk about how different advertisers use music to promote their product. Example: slow music for selling a relaxing vacation, lively for a cruise, fast for sports equipment, etc.

### Day 2

1. Create a list of commercials from the homework for each program. Discuss the similarities and differences. Talk about why they are different.

### Day 3

1. Have two cereals for students to taste; one name brand and one generic brand (e.g., Froot Loops and Fruity O's OR Cinnamon Toast Crunch and Cinnamon Toasties).
  - a. Have students choose which cereal they think they will like the best just by looking at the containers. Don't taste yet! Make a "skewer" graph. Discuss results.

### Materials

- CD of variety of music styles

### Materials

- 2 kinds of cereal
- Food pyramid
- Froot Loop Ingredient* slips
- Plastic glove
- Skewer graphs

- b. Give each student a plastic glove and have him/her take a small handful of each brand of cereal (labeled A or B), not knowing which is which. Students taste the cereal and write down A or B for the cereal they preferred. Make a second skewer graph. Discuss the differences between the two graphs. Why? Point out that we frequently purchase products that we are familiar with, whether they are better tasting or not. That is one reason advertising is successful.
2. Place a large paper cutout of the FDA Food Pyramid on the floor. Have the class predict what they think is in Froot Loops and write it on the board. Then pass out the *Froot Loop Ingredient* slips and have them place them under the correct section of the pyramid. They will be amazed that Froot Loops contain lots of sugar and oil, but do not contain fruit! Does the title imply that they do? Again, discuss how the media has influenced our thinking.

#### Day 4

1. From the Day 2 homework list, select the commercials that advertise food.
2. Sort those commercials onto the food pyramid. Talk about how the media can negatively affects food choices.

#### Day 5

1. Go through a current newspaper. List the kinds of information that can be found in a newspaper. Share with them several interesting articles.

*Example:* weather forecast, sports scores, informational advertising, etc.

Discuss what was learned and how that information could be used. Discuss how media can affect us in a positive way.

#### Day 6

1. Create a commercial or an advertisement to persuade others to buy your product. Use the *Product List* (e.g., jingle, poster, video, brochure, magazine advertisement, etc.).

#### Materials

- Newspaper

#### Materials

- Product List*

## ***Curriculum Extensions/Adaptations/Integration***

- Discuss with students what they want for their birthday or Christmas. Students draw picture and/or write a list. Did they learn about any of these objects from watching television commercials? Commercials are a type of media that can be very appealing and convincing.
- Use *Getting the News* to facilitate a discussion about how media has changed over time.
- Use PBS or ITV stations to teach concepts. Discuss how television can be a very positive form of media.

## ***Resources***

### **Book**

*Getting the News*, (Newbridge, Read to Learn: Social Studies—Communities Series, Item #821956), available from [www.newbridgeonline.com](http://www.newbridgeonline.com)

### **Web site**

[www.NASA.gov](http://www.NASA.gov)

[www.nebo.edu](http://www.nebo.edu) google safe search

### **Additional Media**

*We All Live Together Volumes 1-4*, by Greg and Steve  
([http://gregandsteve.com/cds\\_videos.php](http://gregandsteve.com/cds_videos.php))

*Something Good, Be A Builder, and Take a Stand*, by Steve James (Utah's Safe and Drug-Free Schools and Communities Music Collections), available from <http://www.utahpd.org/music.htm> or <http://www.somethinggood.org>

*Kids Fun, More Kids Fun, Kids Party Fun*, DJ's Choice,  
1-877-777-7523

## ***Family Connections***

- Watch a program together as a family and discuss how the media affects our buying habits.
- As a family, research a topic of interest on the Internet. Show students how to avoid negative sites.

Name \_\_\_\_\_

## What Product Am I?

1. There's no wrong way to eat a \_\_\_\_\_.
2. I betcha' can't eat just one. \_\_\_\_\_
3. Once you pop, you can't stop. \_\_\_\_\_
4. \_\_\_\_\_ knows.
5. Zoom, zoom, zoom. \_\_\_\_\_
6. They're GGRREEAATT!! \_\_\_\_\_
7. Silly rabbit, \_\_\_\_\_ are for kids!
8. Save the cows, eat more chicken. \_\_\_\_\_
9. We love to see you smile. \_\_\_\_\_
10. Don't get mad, get \_\_\_\_\_.
11. They're dangerously cheesy. \_\_\_\_\_
12. Taste the rainbow. \_\_\_\_\_
13. Built \_\_\_\_\_ tough.
14. They're magically delicious. \_\_\_\_\_
15. Like a rock. \_\_\_\_\_
16. Grab life by the horns. \_\_\_\_\_
17. Wanta' get away? \_\_\_\_\_
18. Just do it! \_\_\_\_\_
19. Shift! \_\_\_\_\_
20. Is it in you? \_\_\_\_\_
21. It really is. \_\_\_\_\_
22. \_\_\_\_\_ Pizza delivers.
23. Pizza, pizza. \_\_\_\_\_

## ***What Product Am I? Answer Key***

1. Reese's
2. Lay's
3. Pringles
4. Dex Yellow Pages
5. Mazda
6. Kellogg's Corn Flakes
7. Trix
8. Chick-fil-A
9. McDonald's
10. Glad bags
11. Cheetos
12. Skittles
13. Ford
14. Lucky Charms
15. Chevy
16. Dodge
17. Snickers
18. Nike
19. Nissan
20. Gatorade
21. Taco Time
22. Dominoes
23. Little Caesars

## *Froot Loop Ingredients*

<b>Corn Flour</b>	<b>Wheat Flour</b>	<b>Oat Flour</b>	<b>Sugar</b>
-------------------	--------------------	------------------	--------------

**Vegetable Oil**

**Coconut Oil**

**Cottonseed Oil**

**Soybean Oil**

**Salt**

**Orange Flavoring**

**Lemon Flavoring**

**Cherry Flavoring**

**Raspberry Flavoring**

**Blueberry Flavoring**

**Lime Flavoring**

## ***Product List***

Bike	Flowers
Book	Soda Pop
Diapers	Cow
Pet	Car
School	Medicine
Grocery store	Hair spray
Candy bar	Vegetable
Airplane	Turtle
Computer	Glue
Ice cream	Fertilizer
Shoes	Band-aid
Board game	Toilet paper
Socks	Cookies
Soap	Toothpaste
Bananas	Watch

# Give and Take

## Content Standard II

### Objective 2

#### Connections

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

**Objective 2:**  
Examine important aspects of the community and culture that strengthen relationships.

**Intended Learning Outcomes:**

2. Develop social skills and ethical responsibility.
3. Demonstrate responsible emotional and cognitive behaviors.
5. Understand and use basic concepts and skills.

**Content Connections:**  
Language Arts VI-1, VII-3, VIII-6; Math III-2, V-1; Content II-1

## Background Information

Students need to understand the concepts of *goods*, *services*, and *community* according to these definitions:

*Goods*—Merchandise; wares (freight, fabric, etc.). To do or produce the thing required.

*Services*—Work done or a duty performed for another or others.

*Community*—All the people living in a particular district or city. A group of people living together as a smaller social unit within a larger one, and having interests, work, etc. in common.

## Research Basis

Cobine, G. (1995). Effective use of student journal writing, ERIC Digest #378587.

Student journal writing can connect reading, writing, and discussing through activities that accommodate diverse learning styles and that further students' linguistic development. The various uses of journal writing can be incorporated into one compact student notebook as discussed in this digest article.

Strangman, N., Hall, T. & Meyer, A. (n.d.) Graphic organizers and implications for Universal design for learning: curriculum enhancement report. The Access Center (Available at [http://www.k8accesscenter.org/training\\_resources/udl/GraphicOrganizersHTML.asp](http://www.k8accesscenter.org/training_resources/udl/GraphicOrganizersHTML.asp))

This paper examines the research on educational applications of graphic organizers in grades K-12. Graphic organizers come in many types, and have been widely researched for their effectiveness in improving learning outcomes for students with and without disabilities.

Scraper, K. (2002). Word study through sorting. Educators Publishing Service. (Available at [www.epsbooks.com/downloads/articles/Word\\_Study\\_through\\_Sorting.pdf](http://www.epsbooks.com/downloads/articles/Word_Study_through_Sorting.pdf))

As a method of word study, word sorting addresses a wide developmental range and a variety of needs. Research continues to show that this ability to recognize that written words are made up of letters that represent sounds is one of the strongest predictors of successful reading.

## Assessment Suggestions

- Tell the difference in goods and services and list three of each. Explain why they are both important in a community or reflect on your service projects/fieldtrip.
- Students complete an interactive or shared writing activity about the community, including how different jobs help to meet the needs of members of your community.
- Day 5 activity.
- Using the *Goods and Services Acrostic Poem* handout, students create a cinquain or acrostic poem on an occupation, including how that job helps the community and whether it is a good or a service.

### Materials

- Goods and Services Acrostic Poem* handout

## Invitation to Learn

Have the class generate a list of all the places in the community they have visited this past week.

## Instructional Procedures

### Day 1

1. Build background for the words you feel your class may need (e.g., shear, spinning wheel, lingonberries, weaver, garnet, tailor, porcelain, etc.).

Read *Anna Needs A New Coat*.

2. Discuss how Anna's mom had to trade goods for services that she needed. (A gold watch for wool from the farmer, a lamp for the woman to spin the wool into yarn, a garnet necklace to the woman to weave the yarn into cloth, a porcelain teapot for the tailor to make the coat.)
3. From the story, create a chart listing the goods and services mentioned.
4. From the chart, generate a definition for goods and a definition for services and tell how they are different.

### Materials

- A New Coat For Anna*
- Chart paper

*Homework:* Interview an adult about his/her job. Two questions to be included in the interview are, “What do you do at your job?” and “How does it contribute to the community?”

**Day 2**

1. Students share information they obtained from their interview about occupations.
2. As a class, decide whether each job provides a good, service, or both.
3. Add each job to the class chart in the appropriate column.

**Day 3**

1. Prior to this activity, assemble an Occupation Chest using items on the *Occupation Chest Contents List*. To support struggling readers, attach a 3-D object that could be used in each occupation. Give each student a slip of paper/3D object with either a good or a service listed. In small groups, have the students decide whether each occupation provides a good, a service, or both and tell why it belongs there.
2. As a class, have students place their slip/object in the proper category and justify their thinking. Decide whether the class agrees or disagrees.

**Day 4**

1. Take a walk around the community and take pictures of some of the businesses that are found there OR get copies of the logos from as many businesses as possible that are located within your community.
2. Create a Venn Diagram and sort logos or pictures into proper categories.

**Day 5**

1. Read books from the *Kids Career Library* or *Our Community* book sets. These books are great expository texts that may be used to add additional occupations to the list already created and tell what each occupation does to aid a community.
2. Each student will create one page for a class book by selecting an occupation, drawing a picture, and responding to the following:
  - What will you do at your job?
  - Tell whether you will be providing a good, a service, or both.
  - Explain why your job is important to the community.

**Materials**

- Occupation Chest
- Occupation Chest Contents List*

**Materials**

- Pictures or logos of businesses in your community
- Venn Diagram Circles

**Materials**

- Blank paper for class book, journaling, poetry
- Kids Career Library* or *Our Community* set of books on jobs

## ***Curriculum Extensions/Adaptations/Integration***

- Write thank you letters to people in your community who provide needed goods and services. Allow special needs students to dictate what they would like to say, and you be the scribe. They can draw a picture to accompany it.
- Invite parents in to discuss their occupation with the class and tell how it contributes to the community. Consider having a translator available to accommodate ELL students/parents if needed.
- After interviewing an adult about his/her occupation, students create a brochure that includes the following information:
  - What work is done at the job?
  - Tell whether it provides a good, a service, or both.
  - Tell why that job is important to the community.
- As a class or a grade level, do a service project for someone in your community (e.g., tie quilts, send letters to soldiers, sing at a rest home, make books and read them to a Kindergarten class, work with local police to create a kids' safety program, adopt a local park or monument, set up a food or toy drive, etc.).
- Go on a service field trip to clean parks, plant flowers, etc. Take pictures of your service projects/field trip and use them as part of a presentation/program for parents on serving others.
- Make a map (or a 3-D diorama) of a downtown block in your community. Label businesses and tell whether they provide a good, a service, or both. (You could use a grid system to tie this activity to the math concept of coordinates.)

## ***Resources***

### **Books**

*Pancakes, Pancakes*, by Eric Carle; ISBN 0-590-44453-0

*The Oxcart Man*, by Donald Hall; ISBN 0-590-42242-1

*Make Me a Peanut Butter Sandwich*, by Ken Robbins;  
ISBN 0-590-43551-5

*Kids Career Library*, by Newbridge (available from  
<http://www.newbridgeonline.com/>); Item #810256 (6-book set)

*Our Community*, by Newbridge (available from  
<http://www.newbridgeonline.com/>); Item #810255 (6-book set)

*Community Helpers From A to Z*, by Bobbie Kalman;  
ISBN 0865054045

*What Is A Community From A to Z*, by Bobbie Kalman;  
ISBN 0865054142

*On The Town: A Community Adventure*, by Judith Casely;  
ISBN 0060295848

*Chicken Sunday*, by Patricia Polacco; ISBN 0-590-46244-X

*The Quiltmakers Gift*, by Jeff Brumbeau; ISBN 0-439-30910-7

*Miss Rumphius*, by Barbara Cooney; ISBN 0140505393

*City Green*, by DyAnne Di Salvo-Ryan; ISBN 068812786X

### ***Family Connections***

- Students discuss with family members what they have learned about goods and services, and bartering and trading.
- Have parents take children on a family field trip around the community, pointing out goods and services found there.

# *Goods and Services Acrostic Poem*

---

Title  
(One Word/Occupation)

---

Adjectives (2)

---

Verbs ending in 'ing' (3)

---

Sentence with 4 words (tell how occupation helps community)

---

One word (is it a good or service?)

(Samples)

Teacher  
Busy, happy  
Writing, modeling, reading  
Teachers help other people  
Service

Baker  
Clean, sweet  
Mixing, baking, decorating  
Making things to sell  
Good

## **Occupation Chest Contents List**

Author-sloppy copy book/pencil  
Painter-paint brush  
Postman-letters in bag  
Carpenter-hard hat  
Candy maker-candy  
Pizza maker-pizza cutter/ingredients  
Apple farmer-straw hat/apples  
Storekeeper-cash register/money/items to sell  
Chicken farmer-eggs/chicken hat  
Pizza deliverer-pizza box  
Dentist-puppet  
Publishing co.-magazine  
Gas attendant-small gas can  
Illustrator-crayons/paint/chalks  
Tailor-fabric tape measure  
Policeman-puppet or hat  
Fireman-puppet or hat  
Manufacturer-Tools  
Pilot-puppet or hat  
Bus driver-toy bus  
Librarian-books/library card  
Babysitter-doll  
Repair man-tools in tool belt  
Teacher-pointer/chalk & eraser  
Chef-puppet or hat  
Weaver-yarn  
Miller-flour sack  
Horse rancher-toy horse  
Lifeguard-swimming goggles  
Actress-feather boa and microphone  
Baker-rolling pin

***Math  
Standard  
I-3 & 5  
Activities***



# How Much is a Name Worth?

**Standard I:**

Students will acquire number sense and perform operations with whole numbers.

**Objective 3:**

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

**Intended Learning Outcomes:**

5. Understand and use basic concepts and skills.

**Content Connections:**

Math IV-2, V-1; Content II-2

## Math Standard I

### Objective 3

#### Connections

## Background Information

Student names are powerful teaching resources. Names can be used to demonstrate phonemic features and spelling patterns. They can also provide opportunities to explore student differences and individual heritage. In addition to language and content connections, there are many opportunities to explore names in a mathematical sense. One of the most effective behavior reinforcement techniques is to say a student's name and use it in a positive way.

During this activity, students use simple addition facts to compute a value for their name. Next, they add larger numbers to compute the combined value of all the names in their group. Finally, they use the group totals to compute the combined value of all the names in the class. It is not necessary for students to know how to add using the common regrouping algorithm, nor is it necessary for them to know how to add coins. The activity is designed to allow students to explore combining strategies on their own and in small groups. Teachers may use this activity as a diagnostic tool for future regrouping lessons.

## Research Basis

Snow, M.A. & Brinton, D.M. (1997). *The Content Based Classroom*. White Plains, NY: Longman/Addison-Wesley Publishing Company. pgs. 5-21.

This selection discusses how content-based instruction, cooperative learning groups, and scaffolding are effective techniques for teaching English Language Learners as well as students with learning disabilities. These methods are supported using research from Vygotsky, Slavin, and Cummins.

Hornick, L.M. (2004). Multicultural Literature: What's in a Name, *Book Links*, pgs. 39-42.

Hornick provides a bibliography of grade specific books that teachers can use when planning thematic name units. Student names often provide excellent resources when teaching multicultural awareness. The author also suggests several follow up activities that coincide with the literature.

Huinker, D.A. (2002). Calculators as Learning Tools for Young Children's Explorations of Number, *Teaching Children Mathematics*, pgs. 316-321.

This article explores ways students and teachers use calculators to expand number sense and number relationships. "Using calculators as learning tools can empower young children with the capacity to investigate number ideas in ways that were previously inaccessible to them."

## Assessment Suggestions

- Because there are multiple answers and multiple solutions involved, a scoring rubric (see p. 7-8) is helpful when assessing a problem like this.
- This assessment may be repeated whenever the seating chart is altered or a new student is added to the class. Encourage students to try a new strategy or attempt a different combining method. Teachers should take note of students' abilities to combine numbers in tens, explain their answers, and organize information.
- A sample worksheet could be provided with made-up names for students to repeat the activity independently.

## Invitation to Learn

Read *The Name Jar*. Discuss some of the events that helped Unhei learn to value her name. Define value. What would happen if names had monetary value? How much money would each student's name be worth?

## Instructional Procedures

1. Using your name as an example, model how you would write it out and find the value that goes with each letter. Ask students to help you identify letter values from the *Letter Values Chart*. Write a number sentence from that information. Ask for possible suggestions as to how you might solve the problem (e.g., Use counters, draw tens and ones, group numbers into doubles, find

### Materials

- The Name Jar*

### Materials

- Letter Values Chart*
- How much is my name worth?* worksheet
- Assorted counters
- Calculators

tens, count on, use 100s board, use the number line, use tally marks, draw it out, use coins). Get as many suggestions as time allows.

2. Ask students to estimate how much their name would be worth based on your example. Record the estimate.
3. Explain the scoring rubric and encourage students to use any math tool they think might help them.
4. Ask students to find out how much their name is worth using one of the strategies discussed, or one they develop on their own.
5. Once students have successfully found out how much their name is worth, put them in small groups to determine the combined value. Model a sample strategy using a small group. Can they use the same strategy they used to find out the value of their name? Do they need to alter their strategy?
6. Combine groups once again until you have three or four groups.
7. As a class, use calculators to determine the final total.

### ***Curriculum Extensions/Adaptations/Integration***

- Make a vowel consonant graph. Write out your name on 1” graph paper, one letter per square. Color the vowels red and the consonants yellow. Cut out each square and mount on an individual graph. Write three facts about your graph.
- How much are your spelling words worth? Vowels are 10¢ letters, B-L are worth 1¢, and letters M-Z are worth 5¢. Using money stamps, students stamp the coins next to their spelling words, then add up the total value of each word.
- Make a class alphabet book using the names of the students in your class. Model it after the style of *From Anne to Zach* or *Matthew A.B.C.*
- Make a graph based on how many letters are in your name. After counting the letters in your name, make a physical model to represent name length. Compare it with other students in your group. Compare it to a very long name, such as *Rumpelstiltskin* or *Chrysanthemum*.

- If students have a hard time organizing their work, provide the template for them to work from. If they are struggling with drawing their representations, allow them to use sticker dots or mini stamps to record their solutions. If students are not understanding one-to-one correspondence, encourage them to complete one letter at a time. Breaking the problem into smaller units (scaffolding) can be effective for students who have difficulty processing language.

## **Resources**

### **Books**

*A Perfect Name*, by Charlene Costanzo; ISBN 0-8037-2614-7

*A Porcupine Named Fluffy*, by Helen Lester; ISBN 0-395-52018-5

*Chrysanthemum*, by Kevin Henkes; ISBN 0-688-09699-9

*From Anne to Zach*, by Mary Jane Martin; ISBN 1563975734

*Heart of a Tiger*, by Marsha Diane Arnold; ISBN 0-8037-1695-8

*Hope*, by Janice Lee Porter; ISBN 1-57505-230-X

*I Named the Baby*, by Linda Shute; ISBN 0-8075-3417-X

*Josephina Hates Her Name*, by Diana Engel; ISBN 1-55861-218-1

*Matthew A.B.C.*, by Peter Catalanotto; ISBN 0-689-84582-0

*My Name is Yoon*, by Helen Recorvits; ISBN 0-374-35114-7

*Rumpelstiltskin*, by Paul Zelinsky; ISBN 0-14-055864-0

*The Day of Ahmed's Secret*, by Florence Parry Heide and Judith Heide Gilliland; ISBN 0-688-14023-8

*The First Thing My Mama Told Me*, by Susan Marie Swanson; ISBN 0-15-201075-0

*The Name Jar*, by Yangsook Choi; ISBN 0440-41799-6

### **Web sites**

[www.behindthename.com](http://www.behindthename.com)

[www.babynamesorigins.com](http://www.babynamesorigins.com)

[www.scandinavious.com/sweden/seconnections/namesday/senamesday.html](http://www.scandinavious.com/sweden/seconnections/namesday/senamesday.html)

## ***Family Connections***

- Conduct a name interview. Ask students to find out where their name comes from. Does it have a special story behind it? Were they named after someone special? Does anyone famous share their name?
- Research name origins to discover the meaning of your name at [www.behindthename.com](http://www.behindthename.com) or [www.babynamesorigins.com](http://www.babynamesorigins.com).
- Find out your Name Day. People in Sweden celebrate their name days just like birthdays. You can find it at [www.scandinavius.com/sweden/seconnections/namesday/senamesday.html](http://www.scandinavius.com/sweden/seconnections/namesday/senamesday.html).

## Letter Values Chart

<b>How Much Is It Worth?</b>				
<b>1¢</b>	<b>2¢</b>	<b>3¢</b>	<b>4¢</b>	<b>5¢</b>
A	B	C	D	E
F	G	H	I	J
K	L	M	N	O
P	Q	R	S	T
U	V	W	X	Y
Z				

<b>Scoring Rubric:</b> _____	
<b>Organization:</b> Name is written with the letter values. Be sure to use numbers and pictures.	
<b>Neat work:</b> Written work is neat. If mistakes are made they are crossed out or erased.	
<b>Complete:</b> Problem is solved. Final answer is circled.	
<b>TOTAL:</b>	

Name \_\_\_\_\_

***How much is my name worth?***

Name	Value	Hundreds	Tens	Ones
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
<b>Totals:</b>				
<b>My name is worth:</b>				

# Mathematical Roadmaps

## Math Standard I

### Objective 5

#### Connections

**Standard I:**  
Students will acquire number sense and perform operations with whole numbers.

**Objective 5:**  
Solve whole number problems using addition and subtraction in vertical and horizontal notation.

**Intended Learning Outcomes:**  
5. Understand and use basic concepts and skills.

**Content Connections:**  
Math I-3; Content III-4

## Background Information

When students add multi-digit numbers there are three main types of invented strategies, *sequential*, *combining tens and ones*, and *compensating*. The problem  $38 + 26$  is used to illustrate these strategies.

*Sequential:*  $38 + 20 = 58$  and  $58 + 6 = 64$

*Combining tens and ones:*  $30 + 20 = 50$  and  $8 + 6 = 14$ .

The 10 from the 14 makes 60 ( $10 + 50 = 60$ ), so it's 64.

*Compensating:*  $38 + 26$  is like 40 and 24 and that's 64 ( $40 + 24 = 64$ ).

In addition to *invented* strategies, there are also many *alternative* addition and subtraction algorithms that teachers can use to help solidify a student's understanding of these operations. A sampling of the algorithms include partial-sum algorithms and the equal-additions method of subtraction.

Before completing this activity, students should have extensive practice using single-digit addition and subtraction strategies such as counting on, doubles, doubles + 1, adding 10, and in between. A solid understanding of place value enables students to decompose numbers and experiment with new strategies.

## Research Basis

Behrend, J.L. (2001). Are Rules Interfering with Children's Mathematical Understanding? *Teaching Children Mathematics*, pgs. 36-40.

"Rules learned without understanding interfere with students' abilities to see mathematical relationships. Repetition may help students learn the rules, but it does not guarantee that they will understand the meaning behind the rules or be able to apply the rules appropriately."

Randolph, T. A. & Sherman, H.J. (2001). Alternative Algorithms: Increasing Options, Reducing Errors, *Teaching Children Mathematics*, pgs. 480-484.

The article looks at a variety of alternative algorithms teachers can use to enhance understanding of place value and improve computation. “Students skilled in using a variety of computational techniques have at their command the power and efficiency of mathematics.”

Carpenter, T.P., Frank, M.L., Jacobs, V.R., Fennema, E., & Empson, S.B. (1998). A Longitudinal Study of Invention and Understanding in Children’s Multidigit Addition and Subtraction, *Journal for Research in Mathematics Education*, pgs. 3-20.

“Students who [use] invented strategies before they learn standard algorithms demonstrate better knowledge of base-ten number concepts and [are] more successful in extending their knowledge to new situations than were students who initially learned standard algorithms.”

## Assessment Suggestions

- Assign groups to present their solutions orally to the class. Highlight effective strategies and help students identify ineffective strategies.
- Complete one of the worksheets independently.
- Students create a physical model of their solution. Take a digital photo and put it into a slide show or class book.
- Students illustrate solutions in the computer lab. Print out and compile a class book or include samples in a portfolio.
- Keep an informal record of strategies/algorithms that students use. Encourage them to experiment with other strategies/algorithms.

## Invitation to Learn

Show an overhead map of your school and the surrounding neighborhood. Ask a few students to come and trace the route they take to school. Compare this process to math problem solving. Everyone has the same final destination (school: right answer), but there are many roads you can take to get there.

## Instructional Procedures

1. Write a sample problem on the board or overhead (e.g.,  $19 + 17$ ). Model one way to solve the problem (Some possible solutions might be  $10 + 10 = 20$  and  $9 + 7 = 16$  so  $20 + 16 = 36$ ; Draw out two tens, 9 ones, and 7 ones. Combine the ones to make another ten and 6 remaining ones;  $29 + 7 = 30, 31, 32, 33, 34, 35, 36$ ; Use

### Materials

- Large map of Utah
- Overhead map of the school boundaries or local community

### **Materials**

- Chart paper
- String or yarn
- Assorted counters
- Math Map* worksheet
- Math Journal*
- Solve It!* worksheet
- Strategy Math* worksheet

a hundreds board to solve it. Add  $20 + 16$ .) Ask a few students to describe another way. Draw their solutions on the *Math Map* worksheet.

2. Write a sample problem on the board (e.g.,  $26 + 25$ ). Students can work in small groups to develop a strategy for solving the problem. Provide a variety of counters as well as a large sheet of paper for them to explain their answer. Students should use numbers, pictures, and words. When they are finished, ask students to mount their solution on a large math map. Use yarn to connect their answer to the initial problem.
3. After modeling the problem and working in groups, give students a similar problem and ask them to develop some of their own strategies for solving the problem. Ask them to record their answers in their *Math Journal* or on their individual *Math Map* worksheet.
4. Once students have had practice using a variety of strategies/algorithms, ask students to show their work using the *Solve It!* worksheet or the *Strategy Math* worksheet. Be sure to model possible ways to solve the problem using a similar problem.

### **Curriculum Extensions/Adaptations/Integration**

- Ask students to draw a map of how they get to school. Write out the steps during writing workshop.
- Using a reading map, brainstorm solutions posed during read-aloud activities. Some stories that work well using this format are *Tyrone the Horrible* and *Stone Fox*.
- When you teach students with learning disabilities, be sure to scaffold problems. Start with smaller numbers so they will not need to use as many steps to solve the problems. Provide counters to enable students to make connections using concrete scenarios.
- English Language Learners need additional support with key vocabulary (e.g., add, combine, strategy, solve, answer, etc.). Group work and repetition helps students succeed. Use of the graphic organizer also reinforces understanding.

## **Resources**

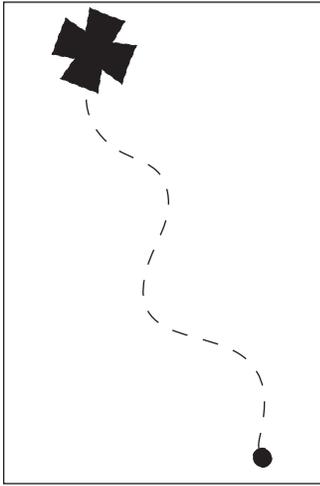
### **Books**

*Tyrone the Horrible*, by Hans Wilhelm; ISBN 0-590-41472-0

*Stone Fox*, by John Reynolds Gardiner; ISBN 0-06-440132-4

## **Family Connections**

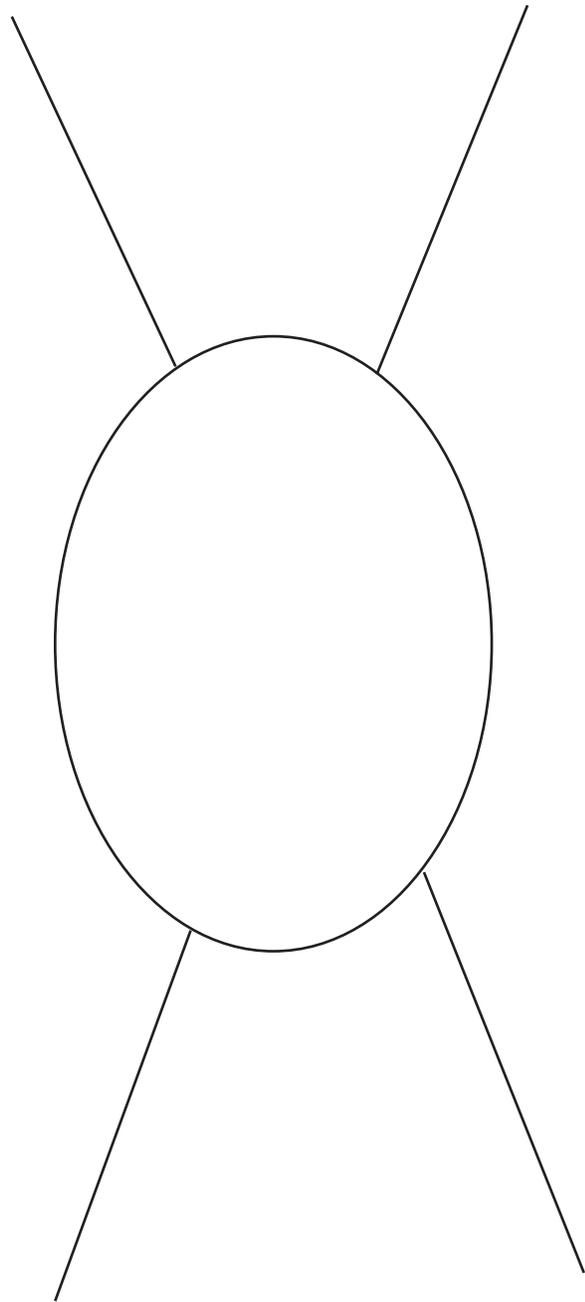
- Ask students to complete a mini math journal with family members. Write three word problems based on household scenarios. Solve the problems using two different strategies.
- Encourage students to “teach” their new strategy to family members.
- Using a problem-solving map, ask students to brainstorm solutions to problems they may encounter at home or school. Suggestions include dealing with a bully, completing homework and chores, television viewing, etc.



Name \_\_\_\_\_

## ***Math Map***

Solve the problem using pictures, numbers, and words.



# Math Journal

## Official Passport

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Mathematician

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Classroom: \_\_\_\_\_

This passport entitles the bearer to unlimited travels in the mathematical world. Prepare to investigate, explore, and invent. While you embark on your journey, you will encounter many numbers and a few problems. In order to continue down the road, you will need to open your mind to new places, opportunities, and experiences. Have fun and enjoy your travels.



# Solve It!

Solve the problem using numbers, pictures, and words. Check each box that you use. Be sure to write your final answer in the box.

<input type="checkbox"/> <b>Numbers</b>	<input type="checkbox"/> <b>Pictures</b>	<input type="checkbox"/> <b>Words</b>
<b>Strategies I used:</b>	<b>The final answer is:</b>	

Name \_\_\_\_\_

# Strategy Math

<b>One Answer—Two Solutions</b>	
<input type="checkbox"/>	<input type="checkbox"/>



***Content  
Standard  
III-2  
Activities***



# Weather Whys

**Standard III:**

Students will develop an understanding of their environment.

**Objective 2:**

Observe and describe weather.

**Intended Learning Outcomes:**

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

**Content Connections:**

Language Arts I-1 & 2, VI-1, VII-2 & 3, VIII-1, 5 & 6; Math II-1, IV-2, V-1

## Content Standard III

### Objective 2

#### Connections

## Background Information

The purpose of this lesson is to heighten students' awareness of weather by allowing them to observe weather conditions and to discover weather-related phenomena in their immediate environment. These investigations should be fun and exciting, thus opening doors of inquiry and the desire to know more.

We are especially conscious of the change of seasons when we are deciding what to wear and what to do. What do we wear in the summer? We wear light-colored fabrics because they reflect the light of the sun away from us. Thus, heat is also reflected away from us. When the weather becomes cool, we put on heavier, darker clothing. Heat from our bodies does not escape as easily from heavy clothing as from light clothing. Heat from the sun is not reflected away from us by dark clothing.

## Research Basis

Davenport, M.R., Jaeger, M., & Lauritzen, C. (1997). Integrating Curriculum. *The Reading Teacher*, 50(4).

This article views curriculum in three aspects: curriculum in action provides a rich context for inquiry and exploration, beliefs into action emphasizes that teachers do not simply transmit information to learners; they take on the role of facilitating students' construction of their own knowledge, caring communicates to students that their background, experience, interests, and inquiries are worth exploring.

Marzano, R.J., Pickering, D.J., Pollock, J.E. (2001). Nonlinguistic Representations. *Classroom Instruction That Works: Research Based Strategies for Increasing Student Achievement*, pages 72-83.

The more we use linguistic and nonlinguistic representations, the better we are able to think about and recall knowledge. Explicitly engaging students in the creation of nonlinguistic representations stimulates and increases activity in the brain.

## Assessment Suggestions

- Science Journal/Foldables/Graphic Organizers:
    - Students define weather vocabulary.
    - Students make graphs showing temperature comparisons and precipitation totals using tally and nonstandard measure.
    - Students develop a K-W-H-L or K-W-L chart.
    - Writing Activity:
      - Hot (or Cold) Smells Like \_\_\_\_\_
      - Hot Feels Like \_\_\_\_\_
      - Hot Tastes Like \_\_\_\_\_
      - Hot Sounds Like \_\_\_\_\_
      - Hot Looks Like \_\_\_\_\_
- Students draw a picture of what they look like at 90° and 32°.

## Invitation to Learn

### Materials

- Suitcase of seasonal clothing

1. Prepare a suitcase of clothing.  
Say: “It is \_\_\_\_\_ degrees outside. What will I wear?”  
Invite students to select and dress in clothing.  
*Variation:* Pack a suitcase of clothing. Have students predict where you might be traveling to by what is packed.  
Somewhere warm? Somewhere cold? Why?
2. Who Cares About the Weather?
  - Brainstorm as a class who would care about the weather and why.
  - Make a mural of pictures of how weather conditions affect us.
  - Make a class book (possibly ABC book) about “Who Cares About the Weather?”

## Instructional Procedures

### Thermometer Practice

Most students are interested in watching the daily temperature. They hear about it on the radio and television. They feel it when they are walking to school. Temperature determines whether they can go ice skating or swimming. Can your students individually read a thermometer?

1. Place the thermometer in a bowl of ice. What happens? (If the thermometer is accurate, it should register close to 32° F. Crushed ice works best to reduce the amount of air surrounding the ice.) Place it in the warm water. Observe the temperature difference. Try the same experiment by placing the thermometer outdoors on a cool day and then in the warm classroom.
2. Place identical thermometers in four different parts of the room. Make a chart. Record the temperatures every hour during the school day. Are they always in the same relationship? Discuss factors affecting the changes, such as an open classroom door, the position of the sun, and the heat from the heater. Does having students in the room tend to lower or raise the temperature?

### People and the Seasons

1. From observation and previous experience, develop a chart showing different temperature, weather conditions, and appropriate clothing. Use symbols and words (e.g., one entry might say 90 degrees-very hot; wear light-weight clothing).
2. Place the wooden board in a sunny place. Lay both a black paper and a white one on it. Touch the papers fifteen minutes later. Do they feel the same? Why or why not? Lift the papers and touch the board under each. The part of the board under the white paper is cool, but it is warmer where the dark paper rested. Why?

*Variation:* Experiment with different colors of paper.

3. Fill two bottles with hot water and put the caps on them. Wrap one with a woolen cloth. Place both bottles in a cool place. After an hour, check the temperature of the bottles. Which bottle is warmer? Why?

#### Materials

- Large weather thermometer
- Bowl of crushed ice
- Bowl of warm water
- 4 student thermometers

#### Materials

- Wooden board
- White paper
- Black paper
- Pan of hot water
- Woolen cloth
- 2 unbreakable bottles with caps

**Materials**

- Snow
- Clear cups
- Paper clips, toothpicks, or other nonstandard tools of measurement
- Marker

**Investigating Snow**

1. Most children living in Utah have experienced snow. If you live in a location that doesn't receive snow, adapt this activity to more discussion.

Children love snow, so make the most of it. At the first sign of snow, have your students classify it as wet or dry. (Wet snow is sticky or partially melted. Dry snow is firmly frozen.) Can your students find out why the snow is wet or dry? (Wet snow occurs when the temperature outside is near or a little above freezing and the temperature in the upper atmosphere is at the freezing point. When the snow falls and hits the warmer air it begins to melt. Dry snow occurs when the temperature outside is at or below the freezing point.) Have students classify the beautiful white substance as powdery snow or pellet snow (snow in hard, little balls similar to hail).

2. This is an appropriate time to discuss the difference in the types of snow storms. What is a blizzard as opposed to a snowfall? (A blizzard is an intensely strong cold wind filled with fine snow.) What kind of storm would be more likely to form snowdrifts? What causes a snowdrift? (Snowdrifts can occur during any type of snow storm, and they are caused by the wind. You usually get much bigger drifts formed during a blizzard because of the strong winds.)
3. How much water does snow contain? Mark the side of a clear cup using nonstandard measures (e.g., paper clips, toothpicks, etc.). Ask the students to gather enough snow in the cup to equal one nonstandard measure when melted.
4. How clean is the snow? Collect two cups of snow while it is still falling or right after it stops. Let it melt. Put a clean paper towel over your collecting can. Pour the snow water into the glass through the towel. How clean is the towel?

**Curriculum Extensions/Adaptations/Integration**

• **Comparing Weather**

1. Write to a person (or an entire class) in a town 300 miles to the east or west of your town. (Try to choose a town that is at nearly the same latitude.) Arrange with the person or class to keep a chart for two weeks. Make sure that you agree on a starting day.

2. Each person or class should fill in the chart once in the morning and once in the afternoon. After two weeks, make a copy of your weather chart and mail it to the other person or class.
3. After you receive their chart, compare the two. Did both towns have the same weather at the same time? Did one town get the same kind of weather after the other town? Did both towns never receive the same weather? From this information, can you see which direction air masses tend to move? Which direction is it? How could you use this information to predict local weather?

- **Reflections of Weather**

Sunglasses are worn in all seasons to reflect the sun's bright rays. They may also be worn in the winter to reflect the bright snow.

1. Make copies of the *Sun Pattern* for each student.
2. Students color then cut along the dotted lines in the sunglasses.
3. Pictures are drawn on a strip of paper 1" x 12" that slides through the sunglasses showing what would be seen in hot weather.

## Resources

### Books

*Who Cares About the Weather?*, by Melvin Berger;  
ISBN 1-56784-029-9

*The How and Why Wonder Book of Beginning Science*,  
by Jerome J. Notkin; ISBN 0843130407

*Weather*, by Lisa Miller Molengraft; ISBN 0-88012-902-6

## Family Connections

- Help a family member sort your clothes in piles for hot weather, cold, or in-between. Make a list of your clothing using those categories.
- *Scavenger Hunt*: In this activity, students go outside and collect, list, or sketch things that are weather related. This activity is best done on a sunny day. Some clues can be collected in bags; most can be drawn or described on paper.

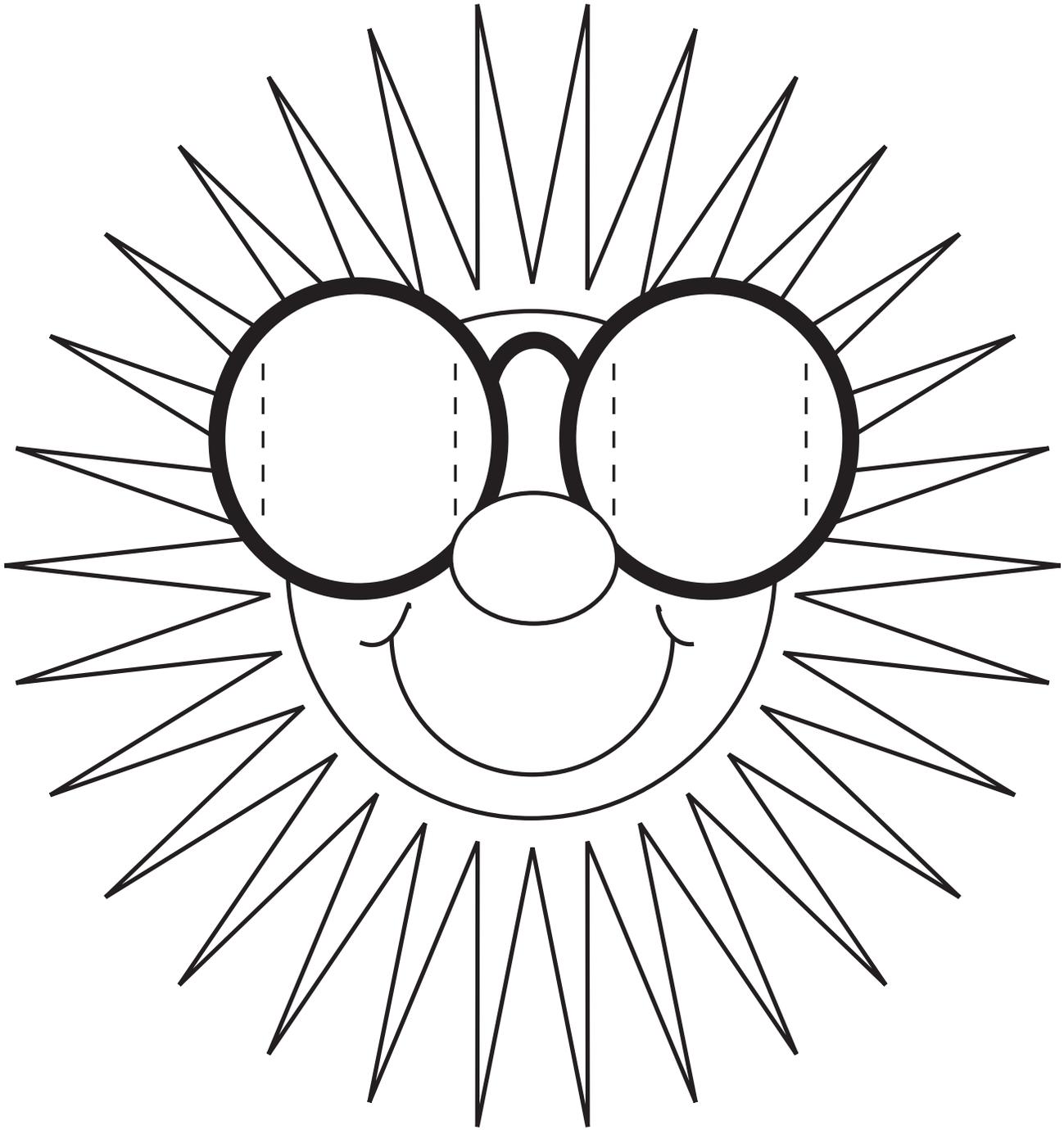
### Materials

- Sun Pattern*

### Materials

- Scavenger Hunt Clues*
- Paper/notebook
- Pencil
- Collection bag

# Sun Pattern



Name \_\_\_\_\_

## ***Scavenger Hunt Clues***

Locate and collect/record the following items:

1. Something that needs sun.
2. Something that is blowing in the wind.
3. Something that is bending in the wind.
4. Something that cannot bend in the wind.
5. Something that could protect you from the rain.
6. A place that gets no, or very little, sunshine.
7. Something that reflects the sunlight.
8. A cloud.
9. Something the color of a cloud.
10. Something that is the color of the sky on a sunny day.
11. Something that is a sign of the season (leaves turning color, plant shoots, bird nests, tree blossoms, acorns, insects, etc.).
12. Something that the wind has moved from place to place.
13. A shadow of a living thing.
14. A shadow of a nonliving thing.
15. Something that has been damaged or changed by the weather.
16. A piece of clothing that has something to do with the weather.
17. Something that could soak up the rain.
18. A puddle.
19. Something that feels warm from the sun.
20. Something that is damp.

Junior Scientist's Name \_\_\_\_\_

# *My Science Journal*

# How Weather Affects Animals

**Standard III:**

Students will develop an understanding of their environment.

**Objective 2:**

Observe and describe weather.

**Intended Learning Outcomes:**

1. Demonstrate a positive learning attitude.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

**Content Connections:**

Language Arts VI-I, VII-3, VIII-1 & 6; Content II-3

## Content Standard III

### Objective 2

#### Connections

## Background Information

Observing nature can give us clues about changing weather. Insects, plants, animals, and birds react to changes in the air. How do animals respond when the temperature changes? This activity is designed to help students discover the answer in their own way and, through active observation, make connections to what they already know.

## Research Basis

Marzano, R.J., Gaddy, B.B., & Dean, C. (2000). What works in classroom instruction. ERIC #ED468434.

K-12 educators are provided with strategies for instruction. Research has shown that these strategies have the greatest likelihood of positively affecting student learning. They include similarities and differences, summarizing, and graphic organizers.

Regional LaboratoryNetwork. (1994). Improving science and mathematics education – a toolkit for professional developers: Alternative assessment. U.S. Department of Education. ERIC #381360.

The learner is active, personally constructing meaning from experience and gathered information. The learner then uses pre-existing knowledge (schema) to create a link to new understanding.

Lim, C., & Wang, K.. (2001). Effects of Project Activities Based on Multiple Intelligences to Elementary School Children's Science Achievement. *Journal of the Korean Association for Research in Science Education*. 21(1). pp13-21. ERIC #EJ656424

This article examines the influence of projects and activities on science achievement in elementary school. The article compares the variance of science achievement by “General Intelligence” and investigates science activities that influence the various aspects of “Multiple Intelligences.”

## ***Assessment Suggestions***

- Performance assessment
- Journaling

## ***Invitation to Learn***

### **True/false weather questions:**

1. It can't rain cats and dogs, but it can rain frogs and fishes. (True. Frogs fell in Tennessee in October 1946 and in Arkansas in January 1973. Fish fell in Wales in 1859, Australia in 1935, and on Louisiana in 1947. How? The animals were swept up by wind in rainstorms and fell down again with the rain.)
2. Temperature on Earth changes because of distance from the sun. (False. The tilt of Earth changes the angle of the sun's rays, thus affecting the amount of heat we get from the sun. When our part of Earth is tilted toward the sun we receive more direct light, creating more heat. When it is tilted away, we get less.)
3. When frogs feel a drop in air pressure, they croak more. They are often referred to as "living barometers." (True. According to a Chinese study, frogs are very accurate in predicating falling air pressure.)
4. We can smell a rainstorm coming. (True. As air pressure drops, the air picks up traces of plant oils and damp soil.)
5. Snow is always white. (False. In 1755, red snow fell in Switzerland. Red sand from the Sahara Desert caused the color change. In 1925, gray snow fell in Japan, caused by dust from an erupting volcano. No one knows why black snow fell in France in 1926.)
6. Lightening can cure baldness. (Maybe. This was a trick question, but here's a fun fact. Edwin Robinson, age 53, had been bald for a number of years when he was struck by lightening and knocked unconscious for about 20 minutes. Two months later, his hair started growing again.)

## ***Instructional Procedures***

### **Frigid Fish and Chilly Crickets**

1. Place the goldfish in the water. Gradually add ice to slowly lower the temperature of the water. The goldfish should become less active as its body temperature drops nearer to that of the water. When the goldfish becomes quite still, take out the ice and place the tank or bowl where it will warm up slowly.
2. Put an observation journal near the warming goldfish. Have students record their observations.
3. Place the cricket in the bottle and put the cap on.
4. Students predict what will happen to the cricket when the bottle is placed in the ice water for a long time.
5. Lower the bottle into the ice water and leave it for some time. Does the insect respond as the goldfish did to the lower temperature? It should.
6. Have students create a Venn Diagram using circle tracers to compare the reactions of the goldfish and the cricket to the lower temperatures.
7. When the cricket becomes still, take the bottle out of the water and place it where it will warm up slowly.
8. Put an observation journal near the warming insect. Have students record their observations.
9. What did students conclude following this activity?

#### **Materials**

- Aquarium or deep container of water
- Live goldfish
- Ice
- Live crickets—one per student
- Empty, dry plastic water bottle
- Weather observation journal (nature notebook)

### **Beat a Bush or Tap a Tree**

This activity should be repeated three or four times during different seasons. Discussion should reflect how temperature affects animal behavior. Why are there more living things in spring than in winter?

1. Have students bring their observation journals outside for this activity.
2. Weather permitting, have students lay on their backs under a tree or bush and look up. What do they see? Ask students to draw a picture of their observation in their journal.
3. Ask each student to look at a bush carefully and see what animal life they can see on the leaves or stems. Ask them to sketch their observations in their journal.

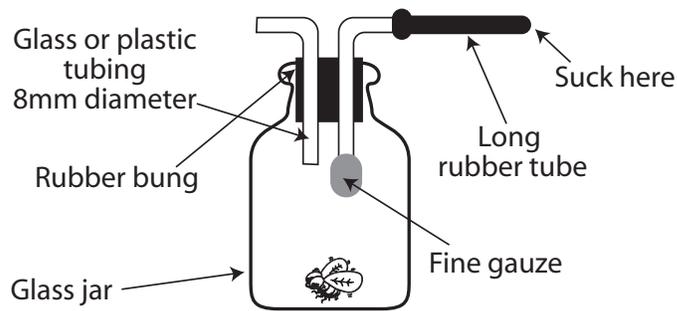
#### **Materials**

- Weather observation journal (nature notebook)
- Small, clear deli containers with lids
- Umbrella
- Stick about the size of a walking stick
- 1/4" plastic aquarium tubing
- Fine gauze
- #3 rubber stopper with two holes

4. Try collecting insects and other living things from trees or bushes by hitting a branch sharply with a stick and catching the creatures as they are shaken loose.
5. Use an upturned umbrella as a collection tray.
6. Pooter up your catch for examination.
7. These insects can be placed in the small deli containers and located in a variety of places around the classroom for observation. Try to create cold and warm environments. Release the insects at the end of class.

### Making and Using a Pooter

How can you catch an insect without touching it? Try making a pooter! Pooters are ideal for vacuuming up small insects. Try vacuuming an insect from your beating tray umbrella. Be sure to suck on the correct end!

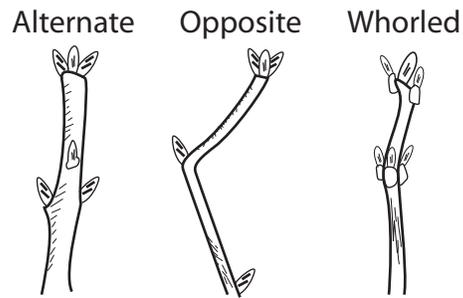


### Twig Observations

This activity should be repeated three or four times during different seasons. Discussion should reflect how temperature affects plant growth.

It is helpful to try this simple collection/observation before attempting it with a class. An abbreviated version for students follows.

1. During the winter, locate a tree from which twigs can be cut and observed.
2. Choose twigs with a bud at the very end. This terminal bud is always bigger than the other buds. Make all the twigs in your collection the same length. Cut off the twigs at a slant so that the inside of the wood is visible. Mount the twigs on index cards with tape.
3. Look at one twig. Buds on twigs are arranged in three main patterns.



4. Buds on the sides of the twigs are called auxiliary buds. They began growing the previous spring. During the summer they were at the base of each leaf. The mark left by each leaf falling off is called the leaf scar. Draw a picture of the leaf scar on an index card. Now look at the leaf scar with the magnifying glass. The small dots on the scar are called bundle scars. These spots show where tubes entered the leaf bringing water and where other tubes left the leaf carrying food to be stored in the tree's trunk.
5. Use the magnifying glass to help you find tiny dots on the twig's bark. These are like the pores in your skin and are called lenticels. Air enters the twig through the tiny lenticel's holes and extra moisture leaves through them.
6. Look down the twig from the terminal bud until you find rings that encircle the twig. These show where the terminal bud was a year ago. Measure from the rings to the base of the new terminal bud to find out how much the twig grew last year.

**Student twig observation activity:**

1. Each student should have a nature notebook, a pencil, and a magnifying glass.
2. Place students in pairs or groups.
3. Each group needs measuring tape, clear tape, and index cards.
4. Lead the class to the pre-determined twig collection site.
5. Allow students to explore the tree environment with their magnifying glasses while you collect the twigs.
6. Give each group one or two twigs to examine.
7. Have each student make a sketch in his/her nature notebook. Be sure they include the location and date of their sketch.
8. Show students how to determine how much their twig grew last year.
9. Point out other spots on the twig that might change by the next observation.

**Materials**

- Weather observation journal (nature notebook) – one per student
- Pocket knife
- 3" x 5" index cards
- 6 rolls of clear tape
- Magnifying glasses - one per student
- 6 measuring tapes
- Charcoal or crayons
- Sheets of plain white paper

10. Ask the groups to mount their twigs on the index cards using the clear tape. They should date their card, note the location, and label it with the group's name.
11. Collect the cards and save them for comparison the next time you do this activity.
12. Repeat this activity as the seasons change to show how temperature affects plant growth.

## **Resources**

### **Books**

- Can It Rain Cats and Dogs?*, by Melvin and Gilda Berger;  
ISBN 0-439-08573-X
- Sun, Snow, Stars, Sky*, by Catherine and Laurence Anbolt;  
ISBN 0670861960
- Chicken Soup with Rice*, by Maurice Sendak; ISBN 0881034061
- It's Raining, It's Pouring*, by Kin Eagle; ISBN 1879088712
- The Big Snow*, by Berta and Elmer Hader; ISBN 0-689-8726-5
- Stranger in The Woods A Photographic Fantasy*, by Carl R. Small;  
ISBN 0-9671748-0-5
- Little Cloud*, by Eric Carle; ISBN 0-698-11830-8
- CLICK!*, by Shutta Crum and Joen Beder; ISBN 1-55005-079-6
- Science Verse*, by Jon Scieszka and Lane Smith; ISBN 0-670-91057-0
- Down Comes The Rain*, by Franklyn Branley; ISBN 0-06-445166-6
- What Will The Weather Be?*, by Lynda DeWitt; ISBN 0-06-445113-5
- The Kid's Book of Clouds and Sky*, by Frank Staub;  
ISBN B-8069-7879-1
- The National Audubon Society Field Guide to Weather*,  
ISBN 0-590-05488-0
- Night Science for Kids: Exploring the World After Dark*,  
by Terry Krautwurst; ISBN 1579904114

### **Web Sites**

National Weather Service

<http://nws.noaa.gov/om/reachout/kidspage.shtml>

The Weather Dude

[www.wxduke.com](http://www.wxduke.com)

Web Weather for Kids

[www.ucar.edu/40th/webweather](http://www.ucar.edu/40th/webweather)

Storm Prediction Center

[www.spc.noaa.gov](http://www.spc.noaa.gov)

The Weather Channel

[www.weather.com](http://www.weather.com)

Creatures of the Night

<http://www.42explore.com/night.htm>

### ***Family Connections***

- *Animal Activities* worksheet

## ***Animal Activities***

Complete one or more of the following activities with a family member.

### ***Animals in the Soil***

Look closely at some damp soil with your hand lens. Lift up rocks, look under bark, and make a list of the living things you find. Draw and label your observations.

### ***Flashlight Quest***

Ask a family member to go with you on a flashlight quest. Look around your yard and under rocks after dark. What living things did you find? Why do you think some animals are more active at night? Record your observations in your journal.

Draw a picture of animals in the soil, including rocks, logs, grass, weeds, and any of the living creatures you discovered in either of the activities above.

### ***Cricket Thermometers***

A snowy tree cricket's chirping will speed up in hot or warm weather and slow down in cool or cold weather. These insects are sometimes called "thermometer crickets" because their chirping can tell you the temperature. With help from a family member, search the Internet to find images of the snowy tree cricket and listen to online recordings of its song at different temperatures.

Now you are ready to look in your own backyard! Once you have identified a snowy cricket, listen and count the number of chirps your cricket makes in one minute. Ask for help to divide that number by four, and then add 40. Check to see if your answer is close to the actual temperature.

# Chirps per minute: \_\_\_\_\_

Predicted temperature (according to cricket chirps): \_\_\_\_\_

Actual temperature: \_\_\_\_\_

# ***Appendix***



# Target Numbers Game Board

Player 1 \_\_\_\_\_ Player 2 \_\_\_\_\_

## Target Numbers

			<b>1</b>		
			<b>10</b>		
			<b>25</b>		
			<b>50</b>		
			<b>100</b>		
			<b>100</b>		
			<b>250</b>		
			<b>500</b>		
			<b>1,000</b>		

# Number Chunks

1. Write the missing numbers in these “chunks.”

The first puzzle consists of a grid of squares arranged in a cross-like shape. The number 56 is written in the center square. There are empty squares in the following positions: two squares to the left of the 56, one square above the 56, one square to the right of the 56, one square below the 56, and one square below the square to the right of the 56.

The second puzzle consists of a grid of squares arranged in a cross-like shape. The number 73 is written in the center square. There are empty squares in the following positions: one square above the 73, one square to the left of the 73, one square to the right of the 73, one square below the 73, and one square below the square to the right of the 73.

2. Write a number in each chunk, but make sure that all the empty spaces can be filled. Ask a partner to write the missing numbers.

The first puzzle is an empty grid of squares arranged in a cross-like shape, identical to the first puzzle in the previous section.

The second puzzle is an empty grid of squares arranged in a cross-like shape, identical to the second puzzle in the previous section.

3. Explain how you knew what number should be written in each square.

Name \_\_\_\_\_

## *To Equal or Not to Equal*

Points

_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____
_____	+	_____	<input style="width: 100%; height: 40px; border: 1px solid black;" type="text"/>	+	_____	_____

Total \_\_\_\_\_

# Count Back the Dots

Which answer do you predict will happen the most often?

1    2    3    4    5    6    7    8

Record the numbers for each counting back problem.


Tally the answer for each counting back problem.

1. _____	5. _____
2. _____	6. _____
3. _____	7. _____
4. _____	8. _____

Graph the answers for the counting back problems.

1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			

## *Double Toss Board*

<b>18</b>	<b>8</b>	<b>4</b>
<b>16</b>	<b>2</b>	<b>12</b>
<b>6</b>	<b>10</b>	<b>14</b>

## Double Toss Tracking Sheet

<b>2</b>							
<b>4</b>							
<b>6</b>							
<b>8</b>							
<b>10</b>							
<b>12</b>							
<b>14</b>							
<b>16</b>							
<b>18</b>							
<b>2</b>							
<b>4</b>							
<b>6</b>							
<b>8</b>							
<b>10</b>							
<b>12</b>							
<b>14</b>							
<b>16</b>							
<b>18</b>							

*Three Strikes*

**0 1 2 3 4 5 6 7 8 9 10**  
**X X X**

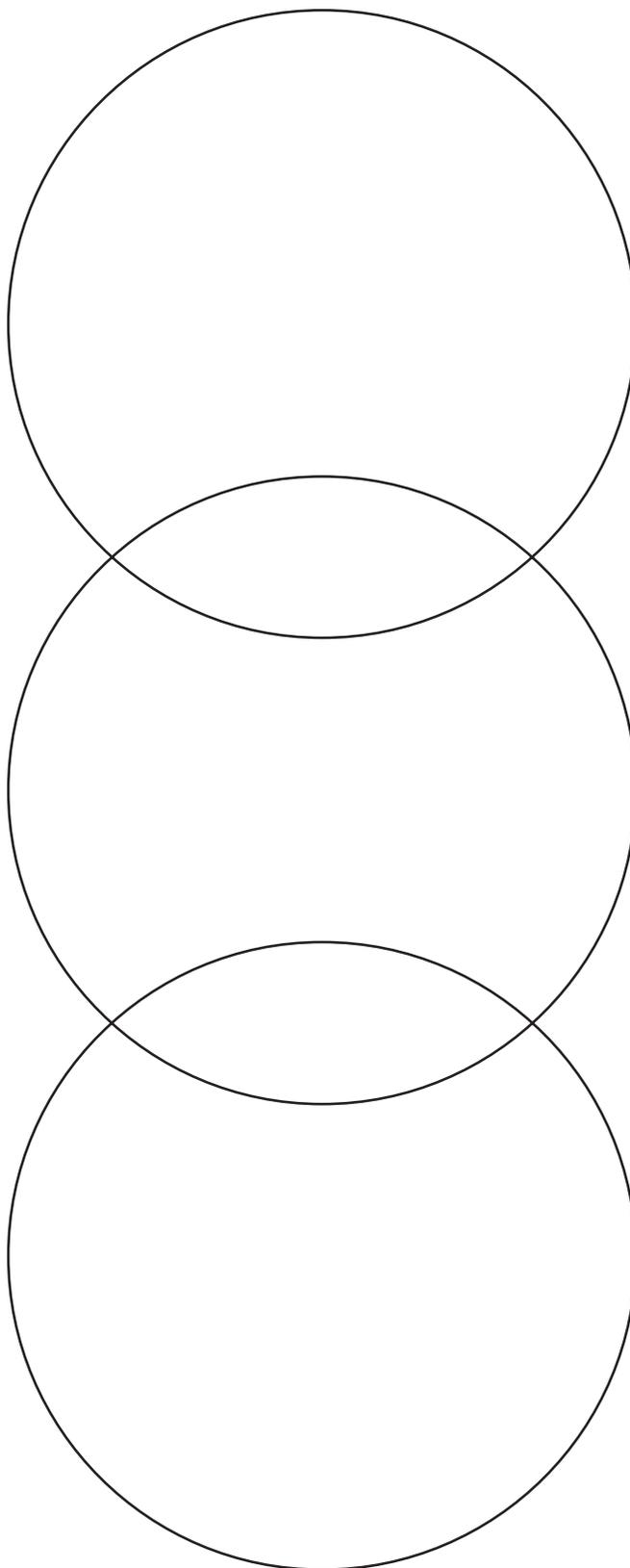
*Three Strikes*

**0 1 2 3 4 5 6 7 8 9 10**  
**X X X**



Name \_\_\_\_\_

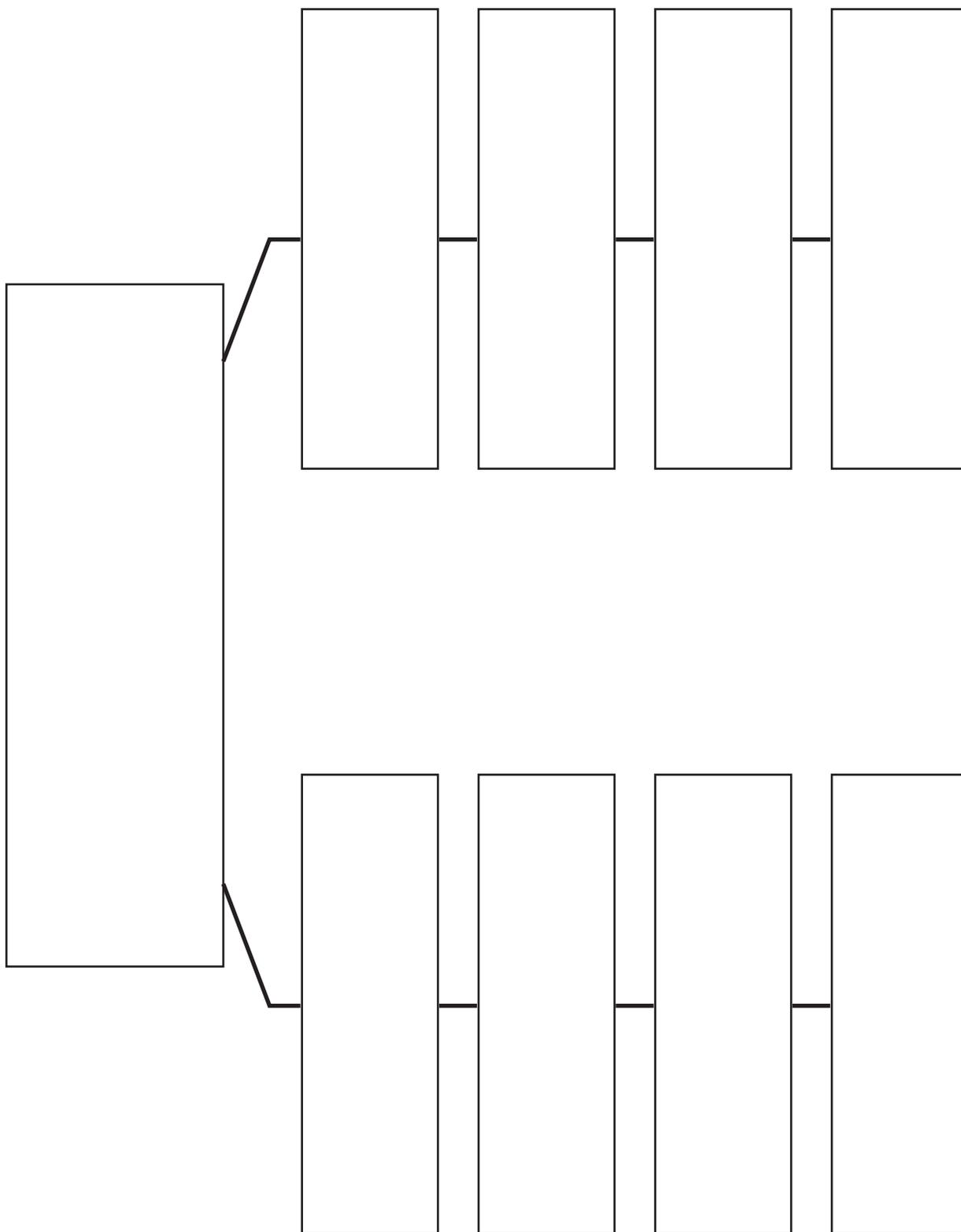
# ***Content Venn Diagram***





Name \_\_\_\_\_

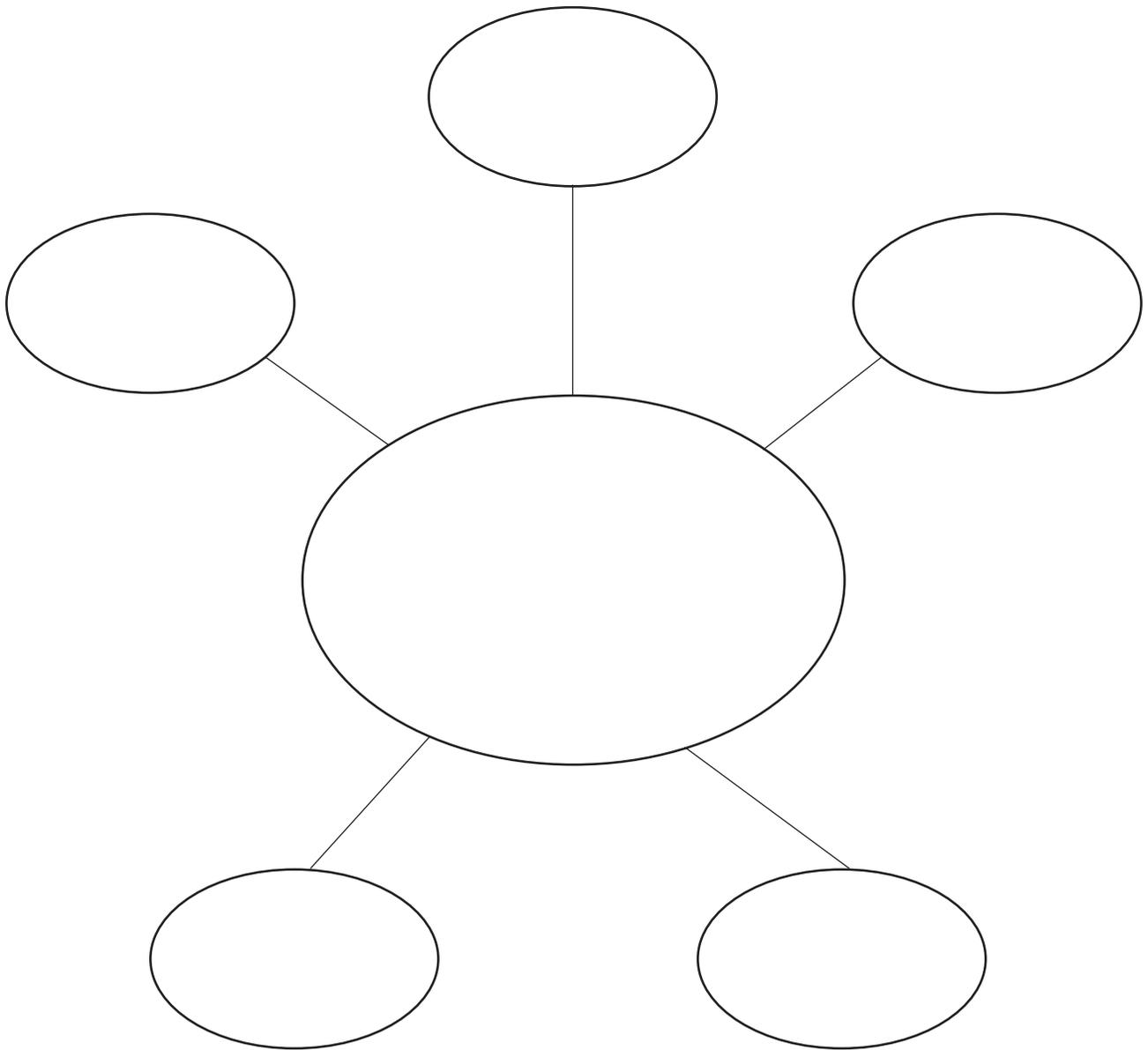
# Content Flow Chart





Name \_\_\_\_\_

# Content Web





# Flap Book

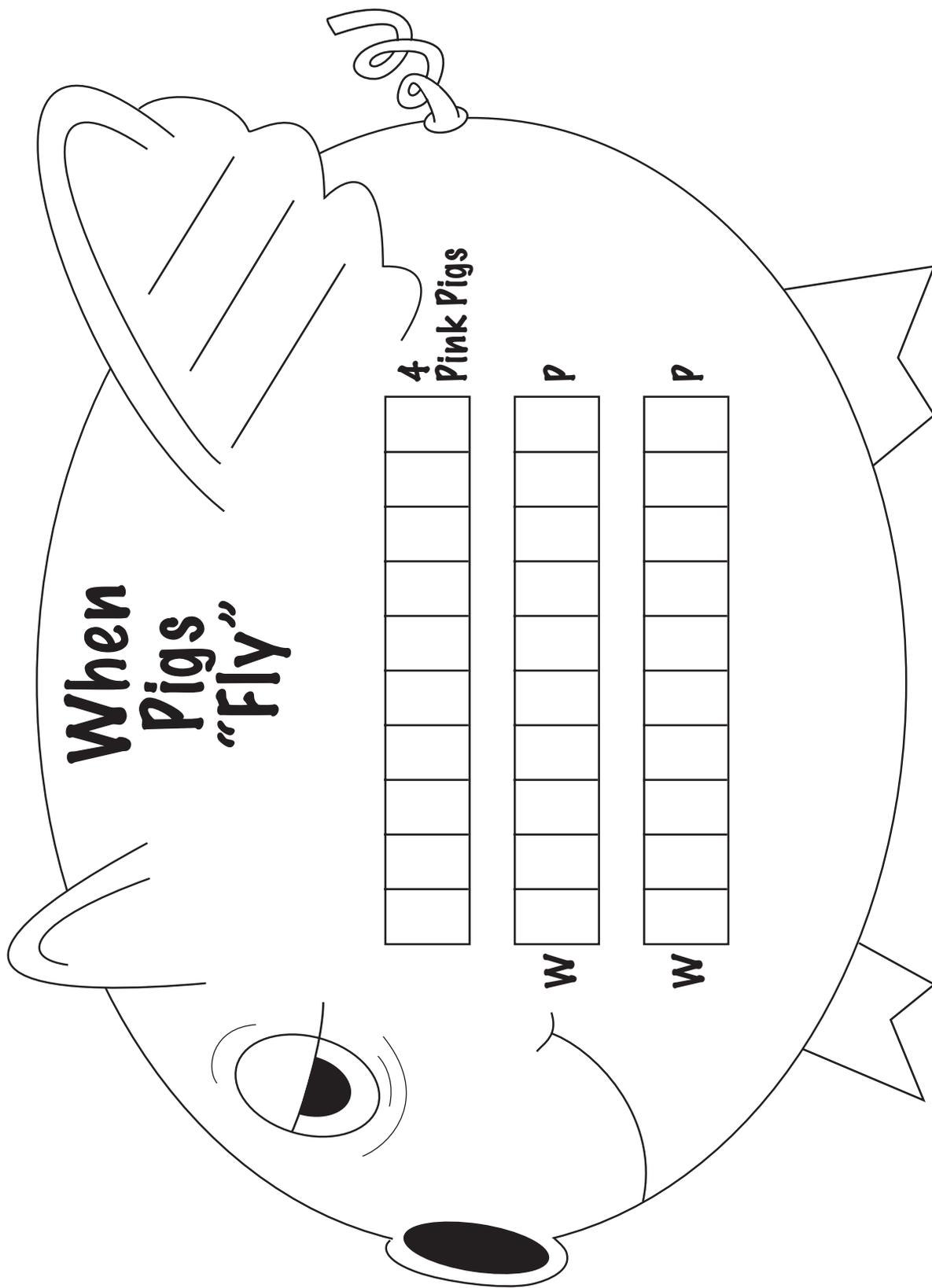
Name \_\_\_\_\_

**Not  
Possible**

**Possible**

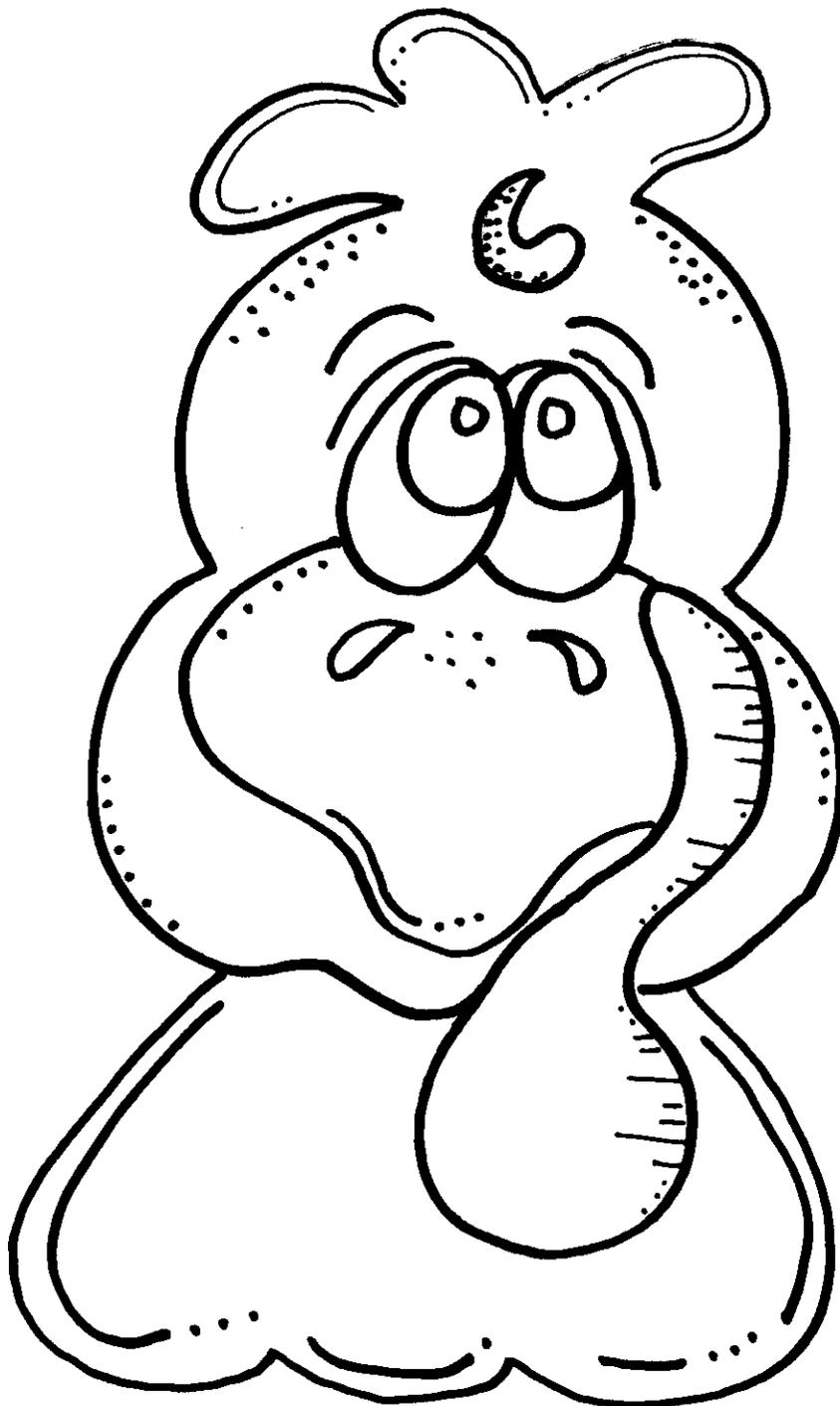


Name \_\_\_\_\_



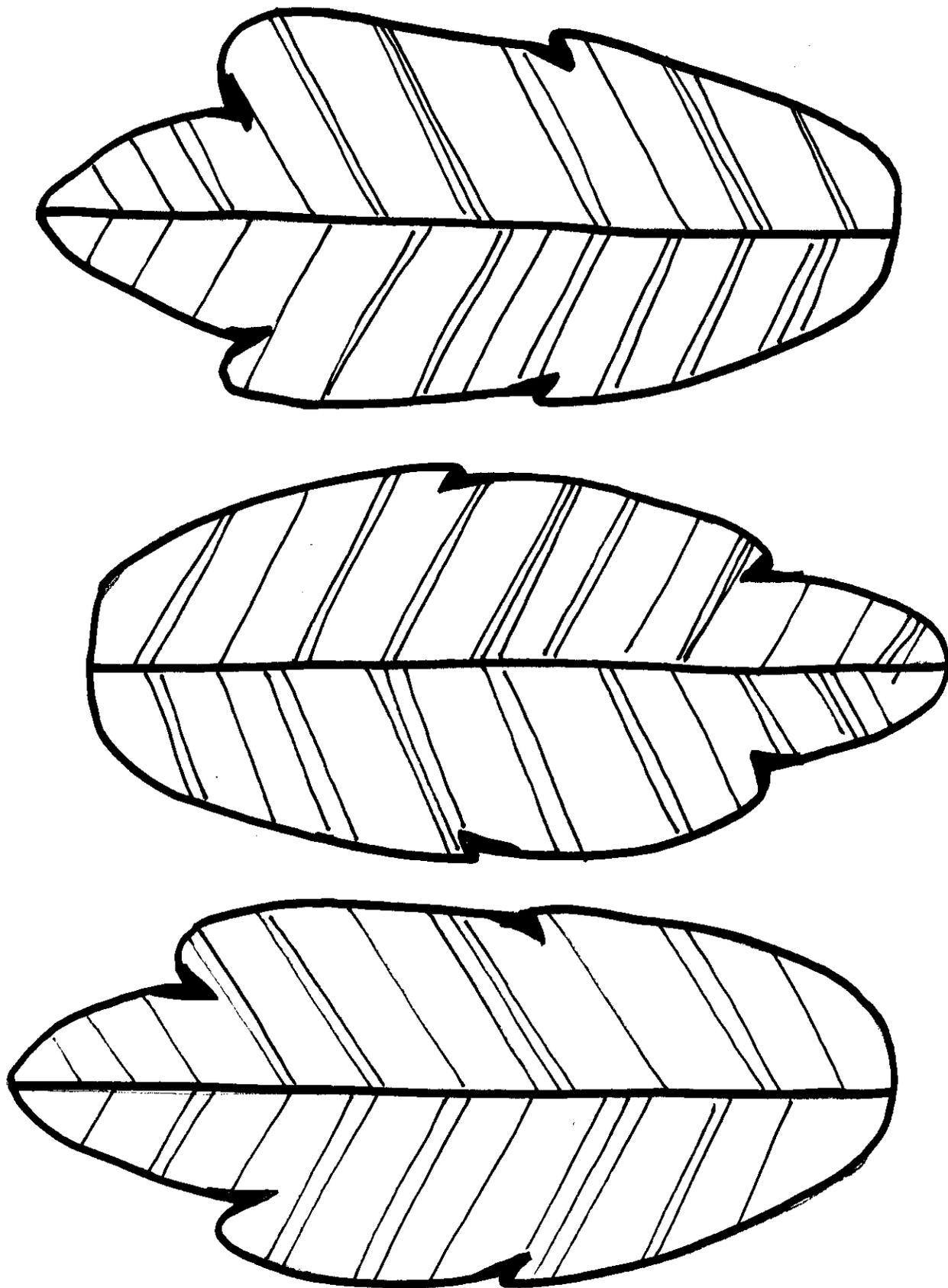


# Turkey Windsock



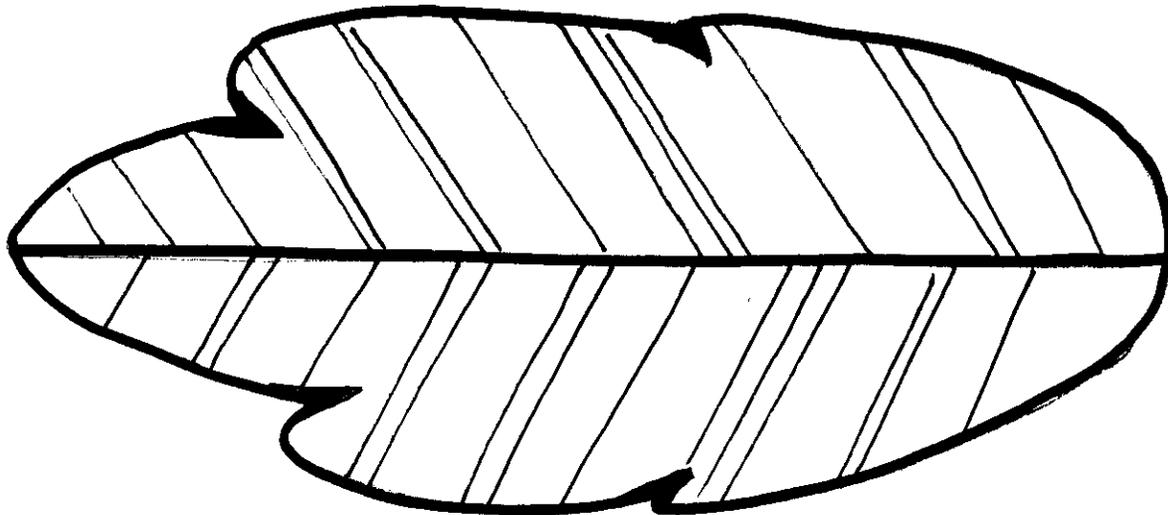
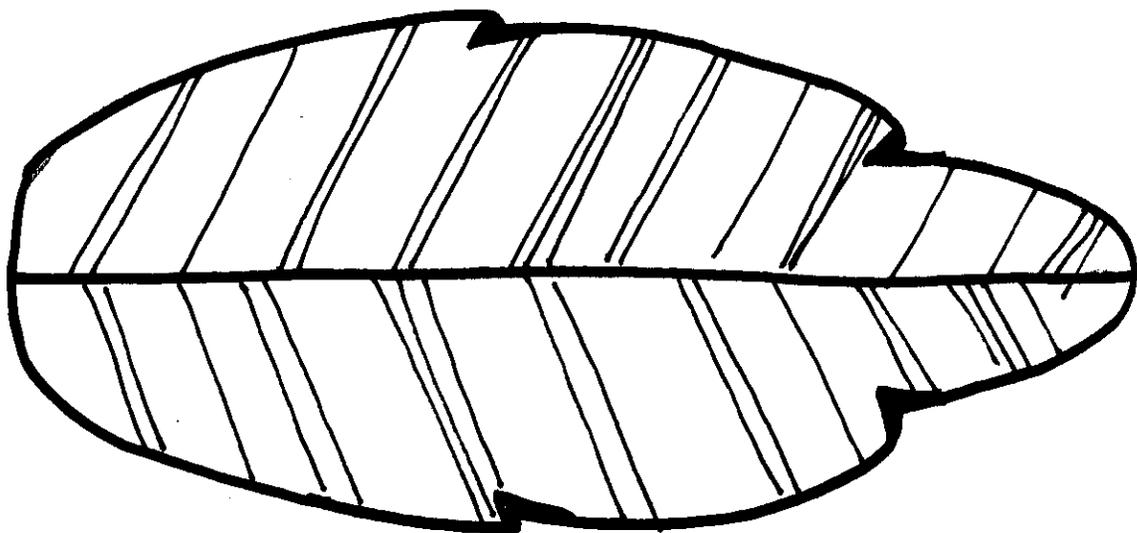
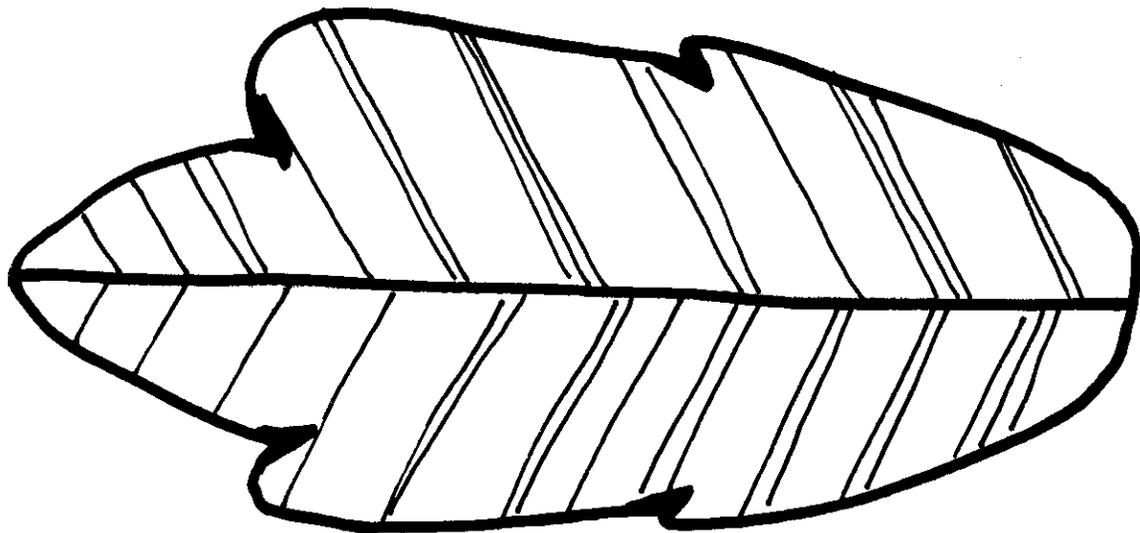


# Turkey Feathers



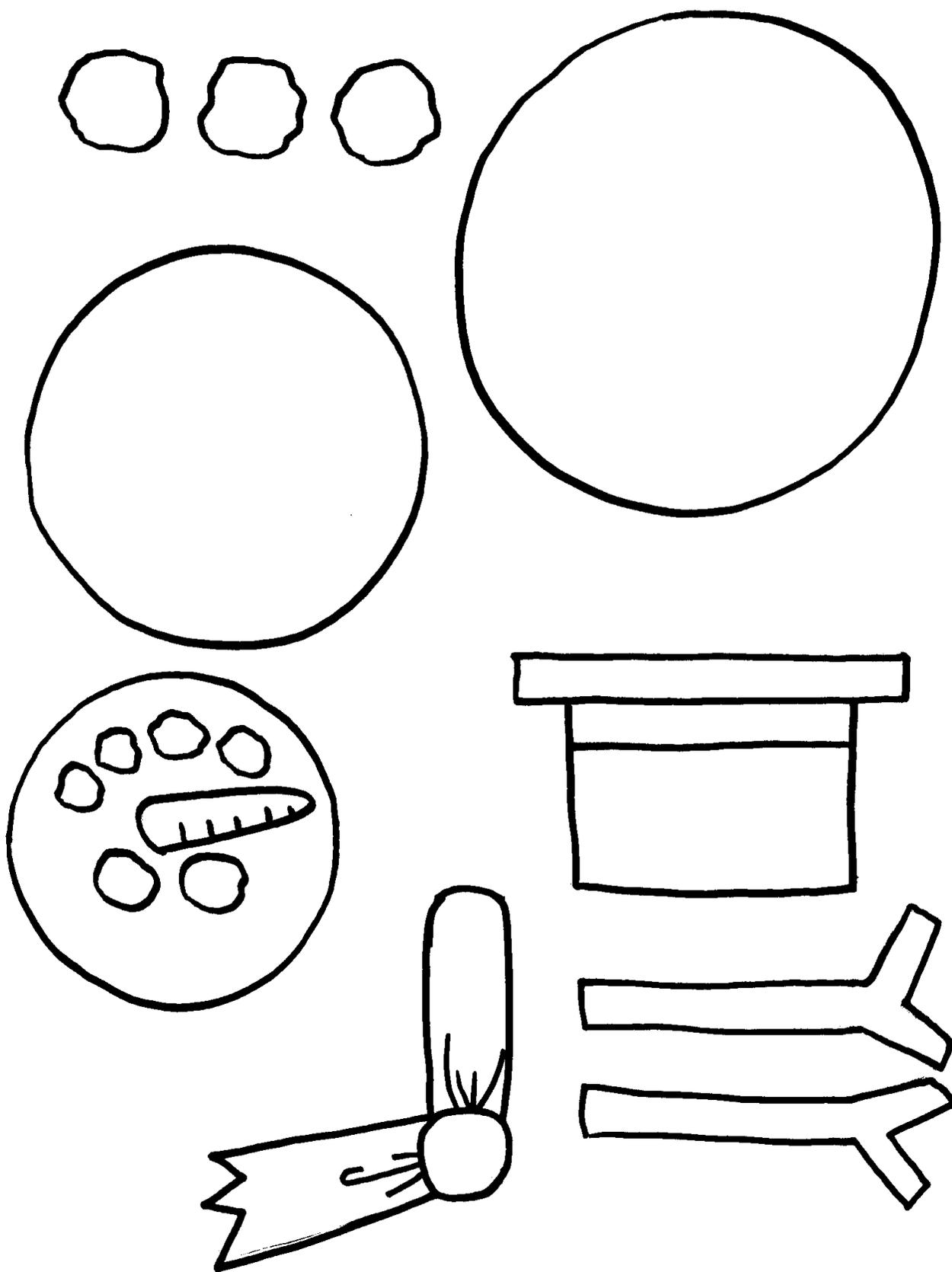


## Turkey Feathers





# Snowman Parts





# May Bouquet Recording Sheet

**1**

**2**

**2**

**1**

Number of legs on a bird

How many noses on your face

greater than 1

1 + 1

even number

odd number

less than 2

My Strategy \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

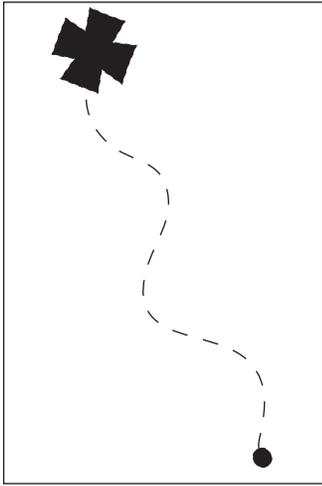
# What Product Am I?

1. There's no wrong way to eat a \_\_\_\_\_.
2. I betcha' can't eat just one. \_\_\_\_\_
3. Once you pop, you can't stop. \_\_\_\_\_
4. \_\_\_\_\_ knows.
5. Zoom, zoom, zoom. \_\_\_\_\_
6. They're GGRREEAATT!! \_\_\_\_\_
7. Silly rabbit, \_\_\_\_\_ are for kids!
8. Save the cows, eat more chicken. \_\_\_\_\_
9. We love to see you smile. \_\_\_\_\_
10. Don't get mad, get \_\_\_\_\_.
11. They're dangerously cheesy. \_\_\_\_\_
12. Taste the rainbow. \_\_\_\_\_
13. Built \_\_\_\_\_ tough.
14. They're magically delicious. \_\_\_\_\_
15. Like a rock. \_\_\_\_\_
16. Grab life by the horns. \_\_\_\_\_
17. Wanta' get away? \_\_\_\_\_
18. Just do it! \_\_\_\_\_
19. Shift! \_\_\_\_\_
20. Is it in you? \_\_\_\_\_
21. It really is. \_\_\_\_\_
22. \_\_\_\_\_ Pizza delivers.
23. Pizza, pizza. \_\_\_\_\_

Name \_\_\_\_\_

***How much is my name worth?***

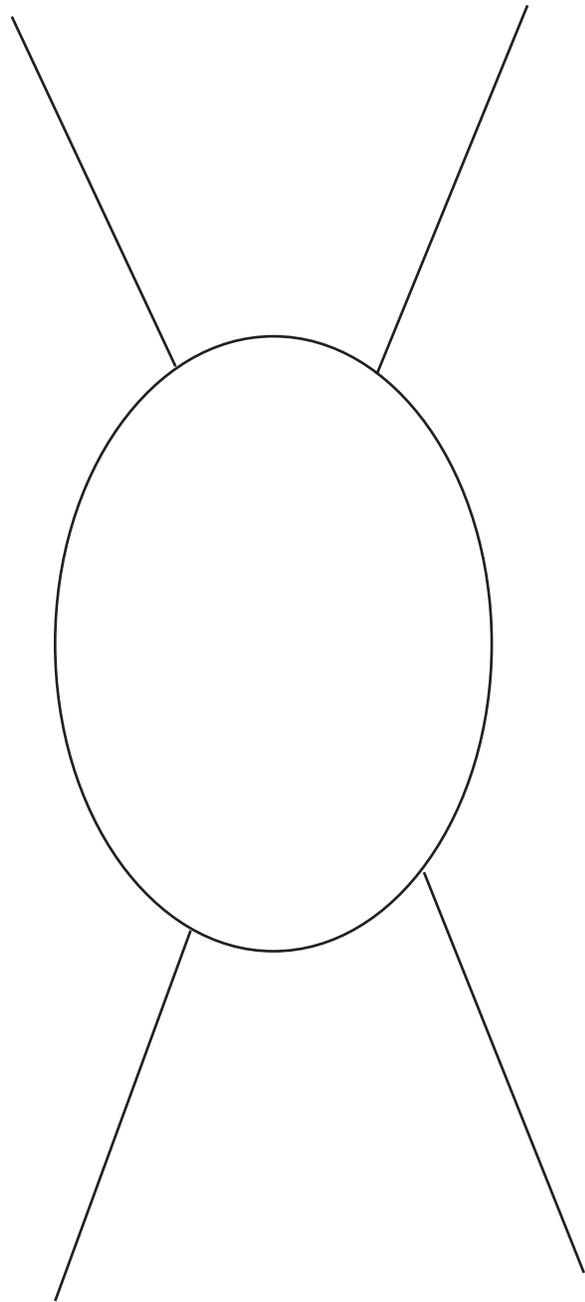
Name	Value	Hundreds	Tens	Ones
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
<b>Totals:</b>				
<b>My name is worth:</b>				



Name \_\_\_\_\_

## ***Math Map***

Solve the problem using pictures, numbers, and words.



Name \_\_\_\_\_



## ***Solve It!***

Solve the problem using numbers, pictures, and words. Check each box that you use. Be sure to write your final answer in the box.

<input type="checkbox"/> <b>Numbers</b>	<input type="checkbox"/> <b>Pictures</b>	<input type="checkbox"/> <b>Words</b>
<b>Strategies I used:</b>	<b>The final answer is:</b>	

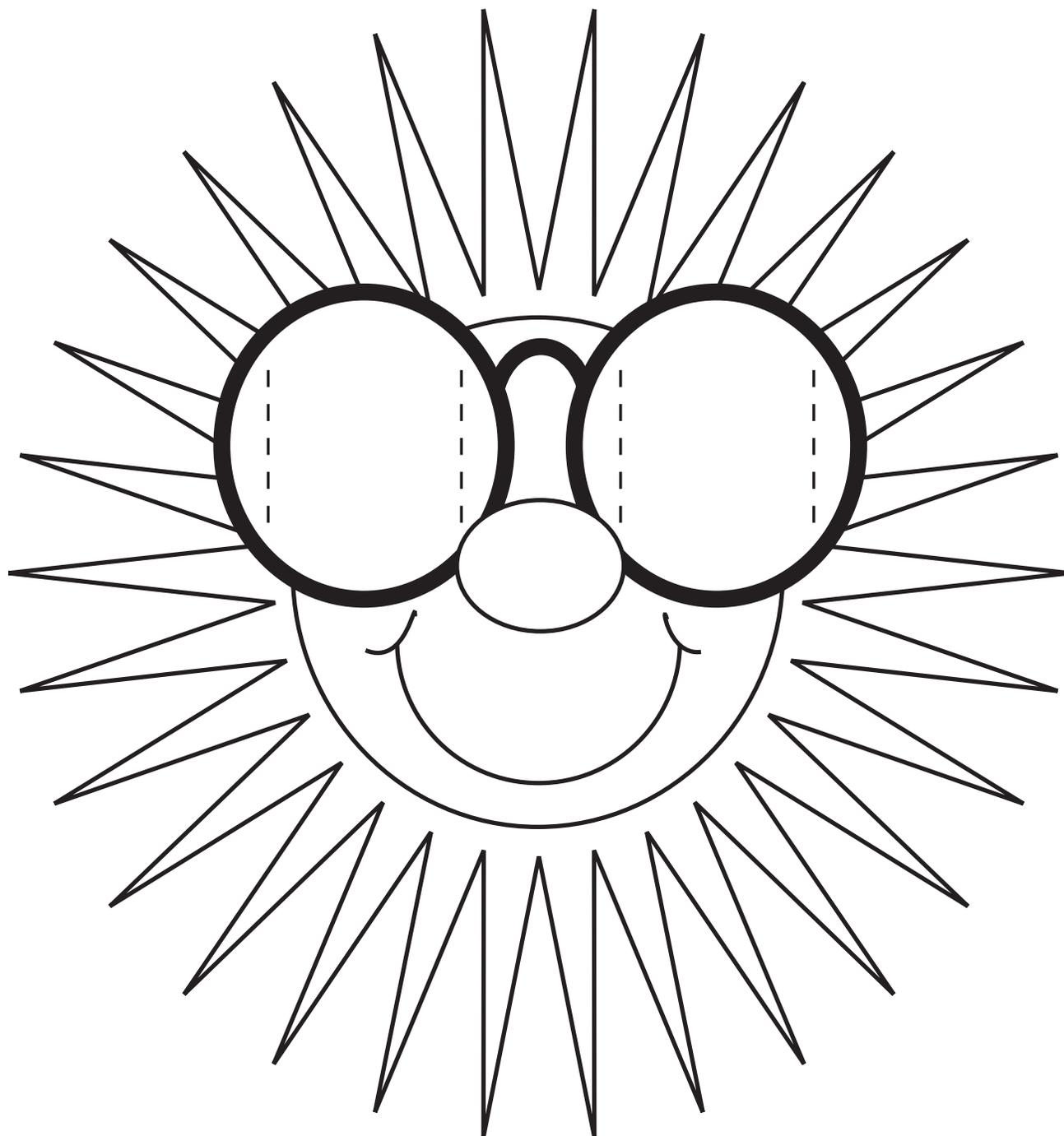
# Strategy Math

## One Answer – Two Solutions



Name \_\_\_\_\_

# Sun Pattern





Junior Scientist's Name \_\_\_\_\_

# *My Science Journal*

