



Comprehensive Curriculum

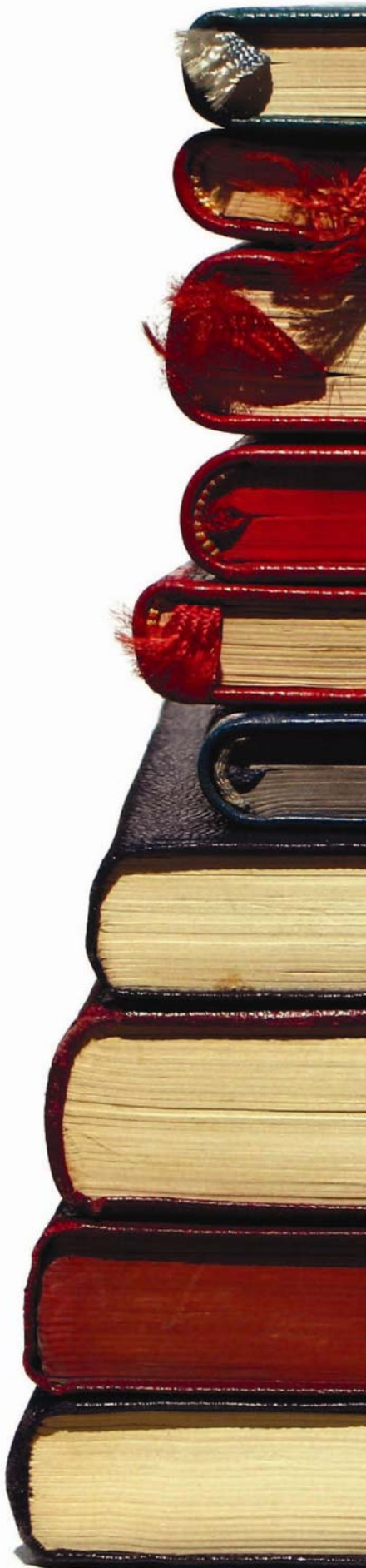
Revised 2008

Kindergarten Mathematics



Louisiana Department of
EDUCATION

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**Kindergarten
Mathematics**

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Louisiana Comprehensive Curriculum, Revised 2008
Course Introduction

The Louisiana Department of Education issued the *Comprehensive Curriculum* in 2005. The curriculum has been revised based on teacher feedback, an external review by a team of content experts from outside the state, and input from course writers. As in the first edition, the *Louisiana Comprehensive Curriculum*, revised 2008 is aligned with state content standards, as defined by Grade-Level Expectations (GLEs), and organized into coherent, time-bound units with sample activities and classroom assessments to guide teaching and learning. The order of the units ensures that all GLEs to be tested are addressed prior to the administration of *iLEAP* assessments.

District Implementation Guidelines

Local districts are responsible for implementation and monitoring of the *Louisiana Comprehensive Curriculum* and have been delegated the responsibility to decide if

- units are to be taught in the order presented
- substitutions of equivalent activities are allowed
- GLEs can be adequately addressed using fewer activities than presented
- permitted changes are to be made at the district, school, or teacher level

Districts have been requested to inform teachers of decisions made.

Implementation of Activities in the Classroom

Incorporation of activities into lesson plans is critical to the successful implementation of the Louisiana Comprehensive Curriculum. Lesson plans should be designed to introduce students to one or more of the activities, to provide background information and follow-up, and to prepare students for success in mastering the Grade-Level Expectations associated with the activities. Lesson plans should address individual needs of students and should include processes for re-teaching concepts or skills for students who need additional instruction. Appropriate accommodations must be made for students with disabilities.

New Features

Content Area Literacy Strategies are an integral part of approximately one-third of the activities. Strategy names are italicized. The link ([view literacy strategy descriptions](#)) opens a document containing detailed descriptions and examples of the literacy strategies. This document can also be accessed directly at <http://www.louisianaschools.net/1de/uploads/11056.doc>.

A *Materials List* is provided for each activity and *Blackline Masters (BLMs)* are provided to assist in the delivery of activities or to assess student learning. A separate Blackline Master document is provided for each course.

The *Access Guide to the Comprehensive Curriculum* is an online database of suggested strategies, accommodations, assistive technology, and assessment options that may provide greater access to the curriculum activities. The *Access Guide* will be piloted during the 2008-2009 school year in Grades 4 and 8, with other grades to be added over time. Click on the *Access Guide* icon found on the first page of each unit or by going directly to the url <http://mconn.doe.state.la.us/accessguide/default.aspx>.



Kindergarten Mathematics

Unit 1: Mathematically Speaking: The Language of Mathematics

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit builds student development of vocabulary for naming shapes and colors and for using relational terms to describe position, place, and adjacency settings. The language should develop in a natural way out of student experience with real-world objects and with manipulatives in classroom settings.

Student Understandings

The essential understandings consist of the development of the language of position and classification including size, shape, and color.

Guiding Questions

1. Can students use comparative and superlative language in measurement settings correctly?
2. Can students use comparative order and equality language for number correctly?
3. Can students use positional language for geometric and spatial relations correctly?
4. Can students use color names correctly?

Unit 1 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Number and Number Relations	
1.	Count by ones to 20 (N-1-E) (N-3-E)
2.	Count a set of 20 or fewer objects by establishing a 1-to-1 correspondence between number names and objects (N-1-E)(N-3-E)(A-1-E)
8.	Compare sets containing 20 or fewer objects using the words <i>same/different</i> and <i>more/less/greater/fewer</i> (N-3-E) (N-1-E)

Algebra	
11.	Use the words <i>same</i> , <i>different</i> , <i>equal</i> , <i>not equal</i> , <i>greater than</i> , and <i>less than</i> while using concrete objects for comparative models (A-1-E)
GLE #	GLE Text and Benchmarks
Measurement	
15.	Use comparative and superlative vocabulary in measurement settings (e.g., <i>longest</i> , <i>shortest</i> , <i>most</i> , <i>hottest</i> , <i>heaviest</i> , <i>biggest</i>) (M-3-E) (M-1-E) (M-2-E)
Geometry	
16.	Name and identify basic shapes using concrete models (e.g., circles, squares, triangles, rectangles, rhombuses, balls, boxes, cans, cones) (G-2-E) (G-1-E) (G-4-E) (G-5-E)
17.	Compare, contrast, and sort objects or shapes according to two attributes (e.g., shape and size, shape and color, thickness and color) (G-2-E)
18.	Use words that indicate direction and position of objects and arrange an object in a specified position and orientation (e.g., between, behind, above) (G-3-E)
20.	Draw circles, squares, rectangles, and triangles (G-4-E)

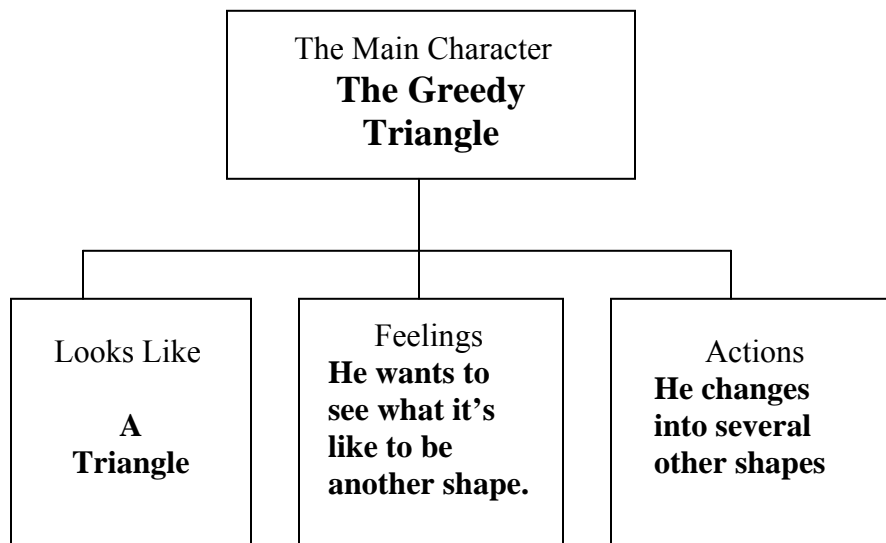
Sample Activities

Some activities provide suggestions for context; however, classroom themes and events will often provide the context in which the activities should be used and may affect the order of the activities.

Activity 1: Colors and Shapes (GLEs: 16, 17)

Materials List: attribute blocks and bags (enough for each student), math learning logs, *The Greedy Triangle*

Whole Group: Read *The Greedy Triangle* by Marilyn Burns. *The Greedy Triangle* is about a busy triangle that spends most of its time holding up roofs and catching wind for sailboats. The triangle gets tired of doing the same old thing so she asks for more sides and angles. After reading the book, the students will assist the teacher in filling out a *graphic organizer* ([view literacy strategy descriptions](#)). A graphic organizer is a visual display that is used to depict the relationships between facts, terms and/or ideas within a learning task. They form a powerful visual picture of the information, and this allows the mind to discover patterns and relationships it otherwise may have missed. It uses visual symbols to convey meaning. The graphic organizer used for this activity is a character map. Make a large chart like the following example of the Greedy Triangle Character Map. This will help students learn to better understand character analysis.



Small Group: Place attribute blocks (circle, square, rectangle, triangle, and rhombus) in bags. Pair students with partners, and provide each pair with a bag of shapes to sort into groups according to a designated attribute. After using the shape, color, and size attributes, allow students the opportunity to sort in different ways on their own. Observe the students, and determine which ones are able to find other ways of sorting the shapes. Point to different shapes, and ask the students to name them.

Independent Work: Have students think about what shape they would like to be and why. They will write or draw in their math *learning log* ([view literacy strategy descriptions](#)). Math *learning logs* record student feelings, responses, and reactions to texts. This strategy encourages students to think deeply about the materials they read and to relate this information to their prior knowledge and experiences. This interaction between reader and text extends the reading experience into the "real life" application of information.

Teacher Note: If attribute blocks are used with a small group of students, the students may sort by thick blocks and thin blocks; thick blue circles and thin blue circles, and so on.

Activity 2: Shaping a Scene (GLEs: 16, 18)

Materials List: colored paper, paper shapes, *Let's Look for Shapes*

Whole Group: Read *Let's Look for Shapes* (or another book that has shapes in its illustrations).

Small Groups or Centers: Have students make a scene by gluing different paper shapes of colored paper and adding details with crayons. Ask students to tell about their shape picture using positional language (i.e., top, middle, bottom, above, below, beside, left,

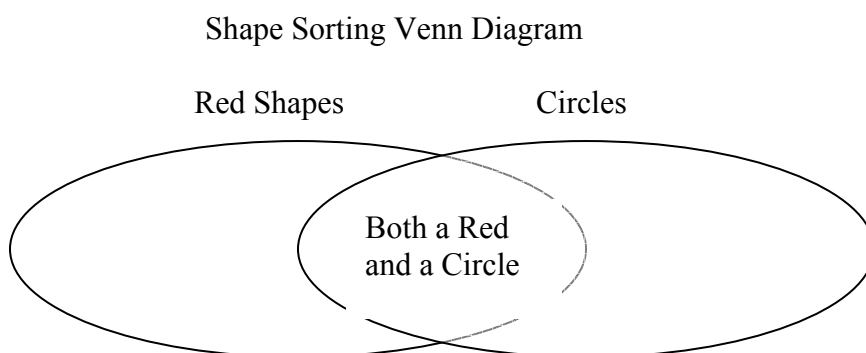
right, over, under) to explain (e.g., I put a triangle *on* the head, I drew a tree *beside* my house. The door is in the *middle* of my house.). Ask questions like, “What shape did you use for your door?”

Activity 3: Position and Shape (GLEs: 16, 18)

Materials List: attribute blocks and bags for each student

Whole Group or Small Groups: Give students a bag of shapes. Have them place specific shapes in the position the teacher states. (e.g. “Put a square in front of you. Put a triangle above the square.”) Next, have the students use Venn diagram *graphic organizer* ([view literacy strategy descriptions](#)) like the sample one below to sort shapes.

Place shapes and Venn Diagram on the floor. The color word can be changed to allow more opportunities for practice. Make sure that there are several shapes of one color (e.g., red) and another pile of shapes (e.g., circles) which are of various colors. The children will put all red shapes that are not circles in one circle of the Venn Diagram, red circles in the middle section of the Venn diagram, and circles that are not red in the other circle of the Venn Diagram. Ask students questions during the activity such as, “Where could we put this shape? Why doesn’t this shape fit here? Could it go in two different places?” After doing the activity several times with different shapes and colors successfully, add a shape or two that will not fit and ask, “Which shape does not fit in anywhere? Why doesn’t it fit?”



Activity 4: Sunflower Measurement (GLEs: 8, 15, 18)

Materials List: green bulletin board paper, yellow construction paper, paper plates, photos of students or sunflower seeds, glue, math learning log

Partners: Give each child a long, thin strip of green bulletin board paper. Working with a partner, each child will lie on top of his/her green strip of paper, and his/her partner will make marks at the bottom of his/her foot and the top of his/her head. Students will cut off extra paper from each end and put their name on their strip.

Whole Group: The class will put strips of paper in order from shortest to longest. The teacher will then hang strips on the wall in order of height. The teacher will use a tape measure to measure each strip and write the actual height of each child on his/her strip. The students will cut out large yellow paper petals to glue around the edges of the paper plate. The teacher can take a photo of each student to put in the center of the student's plate or glue sunflower seeds in the center. Teacher will attach each flower top to each student's paper flower stem. Allow students to help place their flowers on the wall in order from shortest to longest.

Independent Work: Ask students to "write" or draw in their math *learning logs* ([view literacy strategy descriptions](#)) to show what they learned in this lesson. At the beginning of the school year most students will scribble write or use random letters when "writing." The teacher may want to record what students dictate. A math *learning log* is a notebook that students keep in order to record ideas, questions, reactions, and new understandings. Documenting ideas in a log about content being studied forces students to "put into words" what they know or do not know. This process offers a reflection of understanding that can lead to further study and alternative learning paths. It combines writing and reading with content learning. The math *learning log* will be used as a reference to guide further study and to assess progress and understanding. It can also be used as a pre-assessment portfolio, writing sample.

This is a good activity to do before the first open house to decorate the hallway or room.

Activity 5: Comparing Sizes (GLE: 15)

Materials List: sets of objects and shapes, chains or linking cubes, 2 books

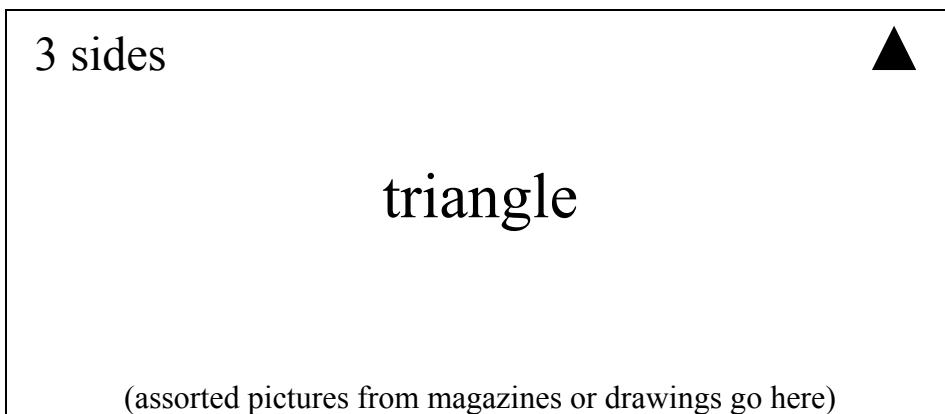
Whole Group, Small Groups, or Centers: Throughout the year and in a variety of situations, take advantage of opportunities to guide students' understanding and correct use of comparative measurement language. Particularly at the beginning of the year, limit discussions about size comparisons to a single comparison (e.g., small/large or long/short). As students become more experienced with comparisons, discuss more than one comparison at a time. Use different sizes of the same shapes (or other sets of objects such as toy farm animals that have a small, medium, and large version of each different animal) to compare big, bigger, biggest and small, smaller, smallest. Ask students to point and tell which shape or object in a set is biggest or smallest. Choose two different sizes of the same animal (car, truck, shape) and ask, "Which is smaller? Which is bigger?" Encourage students to compare chains made with colored links or trains made with linking cubes. Ask, "Which is longer? Which is shorter?" Have students compare towers built with blocks using the words *taller* and *shorter*. Give students two books (one in each hand), and ask them to tell you which is heavier. Ask students to find other objects in the classroom that can be compared in this way.

Activity 6: Make a Shape Book (GLEs: 16, 17, 20)

Materials List: large paper cutouts of shapes, geometric solids or prisms, chart paper, catalogs and magazines, paper or poster board, Vocabulary Card Triangle BLM, Vocabulary Card Circle BLM, Vocabulary Card Square BLM, Vocabulary Card Rectangle BLM

Whole Group: Show the students large paper cutouts of a circle, square, rectangle, triangle, and rhombus. Ask the students to name the shapes. Next, ask students to tell how the shapes are alike and how they are different. Now, show the students the following geometric solids or prisms: sphere, cube, cylinder, and cone. Do not name them. Have the students describe each in their own words. As students describe these shapes, write their descriptions on chart paper. After the students have generated some descriptions, ask the students if they see any similar shapes in the classroom. Go on a shape scavenger hunt (both two- and three-dimensional). Make a list of what the students saw.

Centers or Small Groups: To develop students' knowledge of key vocabulary, have them create a modified version of *vocabulary cards* ([view literacy strategy descriptions](#)). The Vocabulary Cards Triangle BLM, Vocabulary Cards Circle BLM, Vocabulary Cards Square BLM, Vocabulary Cards Rectangle BLM can be used for this activity. When students create vocabulary cards, they see connections between words, examples of the word, and the critical attributes associated with the word. This is modified use of vocabulary cards as cards generally give a term, a definition, some examples, and diagrams. Have students trace the word in the middle of each card and use old catalogs and magazines to find pictures of each shape to glue on the bottom of each vocabulary card.



Students will make a shape book out of their vocabulary cards and take it home so that parents can assist students in finding other pictures and objects for each shape. Students can also make vocabulary cards of two- and three-dimensional shapes— balls (sphere), boxes (cube), cans (cylinder), and party hats (cone). Check students' shape choices before allowing them to glue the shapes in their books. Ask each student to bring

something from home for other students to classify as having the shape of a ball, a box, a can, or a cone.

Activity 7: Comparing Sizes and Weights (GLE: 15)

Materials List: objects of varying sizes and weights, balance scale, sorting mat

Whole Group: Display a collection of objects of varying sizes and weights (e.g., feather, inflated balloon, a roll of coins, key, cork, cotton ball, bolt, nut). Discuss with the students which items they think are heavy and which are light. Encourage students to contrast two or three objects (heavy/light) and to use degrees of comparison (light/lighter/lightest; heavy/heavier/heaviest) to describe the objects. Ask the students to tell why they think that a feather is lighter than a desk or why a dog is heavier than a bird. Set up a center with a balance scale and a collection of small objects that the students have brought from home or found at school. Objects to weigh might include small balls, feathers, corks, keys, or cotton balls. Ask students questions such as, “What do you think is going to happen? Why do you think ___ is heavier/lighter? What will it do to the scale? Why? What else could we put on this end that would give us the same results/different results?” Provide a sorting mat for students to sort objects as heavier or lighter. The sorting mat could be a simple sketch of a balance scale with one side up and one side down. Place heavier items on the side of the scale that is down, and place lighter items on the side of the scale that is up.

Activity 8: Cube Towers (GLEs: 1, 2, 8, 11, 15, 18)

Materials List: linking cubes

Small Groups: Using linking cubes, the teacher and the students will each make a stack or tower with 10 cubes. The teacher should then hide the stack behind his/her back. Give the signal to “Break.” Both the teacher and the students should break off a part of the stack or tower and place it in front of them.

Students will take turns holding up stacks next to the teacher’s and verbalize the comparisons using the following vocabulary: *same, different, as many as, more than, less than, greater, fewer, equal to, greater than*. Ask students to use comparative vocabulary for measurement (*longer* or *shorter*). Explain that one comparison is based on the number of objects (cubes) in each stack, and the other is a measurement comparison (one is taller or longer than the other). Encourage appropriate vocabulary use by asking the following questions: What can we do to make these two stacks the same? How many more cubes does your stack have than mine? Which of us has fewer cubes in our stack? If two more cubes are added to this stack, will they be the same length?

Repeat this activity periodically using 10 to 20 cubes.

Activity 9: Spatial Relationships (GLE: 18)

Materials List: three colors of counters, cubes or objects in the classroom

Whole Group, Small Groups, and Centers: Have students use three different colored counters, cubes, or objects to identify spatial relationships and encourage the vocabulary that indicates position and orientation. Ask students to point and say which color cube or object is *before, after, in front of, behind, between* the others. Use objects in the classroom to demonstrate these concepts (e.g., Marcus, please stand *in front of* the bookcase.). This vocabulary can be reinforced when students are lining up to go to lunch, the library, or outside (e.g., Mary, please get in line *between* Joseph and Paul.).

Teacher Note: Whenever possible use real and relevant objects and situations to address all of the concepts represented by the Grade-Level Expectations (GLEs) in this unit.

Activity 10: Top, Middle, and Bottom (GLE: 18)

Materials List: flannel board, masking tape, pictures of body parts: ears, eyes, mouth, elbow, knees, stomach and ankle

Whole Group: Sing *The Grand Old Duke of York* sung to the tune of *A-Hunting We Will Go*. The song can be heard at <http://www.scoutsongs.com/lyrics/grandoldduke.html>.

The Grand old Duke of York,
He had ten thousand men.
He marched them up the hill,
Everyone stands up
And marched them down again.
Everyone sits down
And when you're up, you're up;
Everyone stands up
And when you're down, you're down.
Everyone sits down
And when you're only halfway up,
Everyone half-way up
You're neither up nor down!

Discuss terms: top, middle, bottom, as they relate to the song. Use masking tape create three sections on a flannel board - top, middle, and bottom. Put body part pictures on the appropriate section on the flannel board.

Activity 11: Top, Middle, and Bottom (GLE: 18)

Materials List: flannel board with three columns marked, felt doggy bone, stuffed dog

Whole Group: Use masking tape divide a flannel board into three sections: top, middle, and bottom. Make a felt doggy bone for students to manipulate. Recite *Doggy, Doggy where's your bone?* and place the bone on one section. Have students identify the section as top, middle or bottom.

Make this activity more interesting by letting the students take turns placing the bone and by providing a stuffed dog for students to take turns using to find the bone.

Activity 12: Red, White, and Blue (GLE: 18)

Materials List: red, white and blue linking cubes

Whole or Small Groups: Provide each student with red, white, and blue linking cubes. Have students use the cubes to build three cube towers according to your directions. For example, ask students to make a tower with blue on bottom, red in the middle, and white on top. Have students hold up their towers and check for accuracy. Repeat activity with the colors in different positions.

Activity 13: Left and Right with “Hokey Pokey” (GLE: 18)

Materials List: red yarn or ribbon

Whole Group, Small Groups or Centers: Establish benchmarks for left and right by putting a red yarn or ribbon bracelet on each student's right wrist. Explain to students that the red bracelet will help them remember which is their right side while the side with no bracelet is the left side. Lead the students in a game such as the Hokey Pokey to reinforce the concepts of left and right. Reinforce left and right throughout daily activities.

Activity 14: Left and Right (GLE: 18)

Materials List: paper, pencil, manipulatives

Whole Group or Small Group: Trace students' hands on a piece of paper. Write an L on the left hand and an R on the right hand. Give students manipulatives and have them place a manipulative on the hand called out by the teacher. Another tip to help students remember left versus right is to hold up their hands with their pointer finger and thumb at right angles. The hand that makes the letter L is the left side.

Activity 15: Same and Different (GLE: 11)

Materials List: chart paper, Shape Cards BLM

Whole Group or Small Groups: Make a chart of a modified *word grid* ([view literacy strategy descriptions](#)) to help students relate the terms *same* and *different*. When printing the color words on the chart, it might be helpful to print each word in the color of the word. *Word grids* help students make connections between key terms and features.

	Same	Different	Apples	Hair	Leaves
Red					
Orange					
Yellow					
Green					
Blue					
Purple					

Copy the above *word grid* on chart paper. Print, laminate, and cut out the cards from the Shape Cards BLM prior to the lesson. Display one shape card at a time and have students decide where it needs to go in the first two columns of the *word grid* chart. Once the grid is complete, the teacher should quiz students by asking questions about the similarities and differences of the words.

Next, ask students to provide features of similarity and difference for pairs of terms. “How are apples and leaves alike and different?” Other questions can be asked such as, “Which colors can apples be?” Make check marks in the appropriate boxes. Do the same with the following columns. After grid is complete, ask comparison questions about colors. For example: “What is yellow but not blue?” (*sun* could be an appropriate response).

Teacher note: If a color printer is not available, the BLM can be used as a guide for making the cards on your own out of construction paper or other materials.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Teacher observation, anecdotal notes, and portfolios
- The student will use a divided mat or piece of paper with a line dividing the paper horizontally to indicate where a counter or cube will be placed using special term cards. Spatial term cards may include at the right/left end of the line, in the upper/lower right/left hand corner, next to the line, above/below the line, beside the line, on the right/left side of the line. Give the student 10 counters or cubes to place on the mat corresponding to the location described on the spatial term card. If a student cannot read the words on the cards, the teacher can use the cards to give oral directions for the placement of objects.
- The student will locate objects in the classroom that have been placed in various orientations related to another object. Then the student will use correct vocabulary to tell where the object was placed.

Activity-Specific Assessments

- Activity 6: The student will use old catalogs or magazines to create a poster of two- and three-dimensional shapes. The students will orally name shapes.
- Activity 8: The student will use connecting cubes and number cards to compare *same, different, equal, not equal, greater than, less than*. The teacher will show the students two numeral cards (e.g., 5 and 3) and ask students to use cubes and make a tower/train representing each number. The teacher will ask questions about the towers/trains to generate *same/different, equal/not equal, and greater than/less than* responses. The activity can be extended the activity over time by adding numerals greater than 10 through 20.
- Activity 12: The student will create a three-block tower with teacher specified colors, using the correct colors in the top, middle, and bottom positions.

Resources

Children's Books

Gillham, Bill. *Let's Look for Shapes*
Burns, Marilyn. *The Greedy Triangle*

**Kindergarten
Mathematics
Unit 2: How Many: Numbers and Numerals to 10**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

In this unit, the work is on development of rational counting through 10. In addition, students are involved in modeling such sets, estimating the number of objects in a set, and beginning to use the numbers to represent quantities in simple problem-solving situations.

Student Understandings

Students apply rational counting to equivalences of sets, locating the appropriate numerals for set counts, and determining the numbers that come before and after a given number on the number line.

Guiding Questions

1. Can students count both by rote and rationally to 10?
2. Can students establish 1-to-1 correspondence between objects and number names in counting and comparing the size of sets?
3. Can students compare and use the vocabulary for comparing the number of items in two sets?
4. Can students identify the numerals for recording the number of objects in a given set?
5. Can students give the cardinal number for an object in an ordered list?
6. Can students use counting as a means of determining the count for the number of nonstandard units in measuring objects?

Unit 2 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Number and Number Relations	
1.	Count by ones to 20 (N-1-E) (N-3-E)
2.	Count a set of 20 or fewer objects by establishing a 1-to-1 correspondence between number names and objects (N-1-E) (N-3-E) (A-1-E)

3.	Use the ordinal numerals 1 st through 10 th to discuss positions in ordered lists (N-1-E)
4.	Identify the numerals for the numbers 0 through 20 (N-1-E) (N-3-E)
5.	Using a number line or chart, identify the numbers coming before/after a given number and between 2 given numbers (N-1-E) (N-3-E) (A-1-E)
7.	Count forward and backward from a given number between 1 and 10 (N-3-E)
8.	Compare sets containing 20 or fewer objects using the words <i>same/different</i> and <i>more/less/greater/fewer</i> (N-3-E) (N-1-E)
Algebra	
11.	Use the words <i>same, different, equal, not equal, greater than, and less than</i> while using concrete objects for comparative models (A-1-E)
Measurement	
14.	Measure and estimate length and capacity using non-standard units (e.g., sticks, paper clips, blocks, beans) (M-2-E) (M-3-E)
Data Analysis, Probability, and Discrete Math	
22.	Collect and organize data in a simple bar graph using pictures or objects (D-1-E) (D-2-E)

Sample Activities

Some activities provide suggestions for context; however, classroom themes and events will often provide the context in which the activities should be used and may affect the order of the activities.

Activity 1: Number Rhymes (GLEs: 1, 2)

Materials List: rhyme charts, puppets and/or flannel board pieces

Whole Group, Small Groups, and Centers: Provide students with daily opportunities to sing/chant/recite number rhymes, finger plays, and songs using hand motions, puppets, and/or flannel board pieces to reinforce one-to-one correspondence and rote counting skills.

Activity 2: All In A Row (GLE: 3)

Materials List: none

Whole Group, Small Groups, and Centers: Provide students with daily opportunities to practice ordinal numbers during everyday events such as lining up to leave the classroom or lining up for a turn at the water fountain. Have students identify who is first, second, third, etc. up to the tenth position.

Activity 3: Before or After? (GLE: 5)

Materials List: calendar or 100s chart

Whole Group: Provide students with daily opportunities to use a calendar or 100s chart to pick a date or number, and identify the numbers coming before or after the chosen date or number. Again, use the chart to ask students, “What number comes between ____ and ____?”

Activity 4: Kinder Frogs (GLEs: 1, 2, 4)

Materials List: giant paper log from bulletin board paper, Speckled Log BLM, Frog Count BLM

Whole Group: Sing *Five Green and Speckled Frogs*.

Pick 5 students to pretend to be frogs. Give each “frog” a number card 1 – 5. The “frogs” will act out the story as the class sings the song.

Five green and speckled frogs
Sat on a speckled log
Eating some most delicious bugs
YYYYUUUUMMMM YYYYUUUUMMMM

One jumped into the pool
Where it was nice and cool
Then there were
Four green and speckled frogs
GGGLLLLLUUUBBBB GGGLLLLLUUUBBBB

(Repeat in descending order)

Pick 5 students to pretend to be frogs. Give each “frog” a number card 1 – 5. The “frogs” will act out the story as the class sings the song.

Small Group: Have students put frog manipulatives on a log as the teacher calls out a number using Speckled Log BLM.

Individual Work: Students can write the numbers for groups of frogs using the Frog Count BLM.

Activity 5: Counting with a Number Line to Five (GLEs: 4, 5, 7)

Materials List: number cards, bag, number line, paper links for chains, crayons, 6 duck headbands

Whole Group: Draw 5 ducks on the board. Write the numbers 1 to 5 under each duck. Have children count forward from first duck to the last. Then count backwards from 5 to 1. Choose 6 students to pretend to be ducks. Students can wear duck headbands. One will be the Mama duck and five will be the baby ducks. Students will sing “5 Little Ducks went Out to Play” and one child will walk away with each verse. The Mama duck will shake her finger at the babies when she says, “Quack, quack, quack.” During the last verse the Mama duck will shout, and really shake her finger at the babies, then all five babies will come running back.

Five Little Ducks Went Out to Play

Five little ducks went out to play
Over the hill and far away
Mama duck said "Quack, Quack, Quack"
And four little ducks came waddling back.

Four little ducks went out to play
Over the hill and far away
Mama duck said "Quack, Quack, Quack"
And three little ducks came waddling back.

Three little ducks...

Two little ducks...

One little duck went out to play
Over the hill and far away
Mama duck said "Quack, Quack, Quack"
And no little ducks came waddling back.
No little ducks went out to play
Over the hill and far away
Mama duck said "QUACK, QUACK, QUACK"
And five little ducks came waddling back!

Small Groups or Centers: Ask a student to draw a number out of a bag (1-10). Together, find that number on a number line. Count forward and backward from the given number.

Independent Work: Students will each make a *story chain* ([view literacy strategy descriptions](#)) for each verse of the song. [A story chain is](#) a chain of events used to describe the stages of an event, the actions of character or the steps in a procedure. *Story*

chains are especially useful in teaching math concepts. The process involves a small group of students writing a story problem using the math concepts being learned and then solving the problem. Writing out the problem in a story provides students a reflection of their understanding. The first student initiates the story. The next adds a second line. The next, a third line, etc., until the last student is expected to solve the problem. In this activity, each student will be given five paper links. He/she will draw five ducks on the first link, 4 ducks on the second one, and so on. He/she will glue each link in order from 5 to 1. Students will use the story chain to retell (or re-sing) the story to their families.

Activity 6: Count Out Loud (GLEs: 1, 2, 4)

Materials List: counters, containers, number cards 1-10, (Optional: puppy headbands)

Whole Group: Sing *Ten Little Puppies*. Give each of 10 students card labeled with a number from 1-10. Have all 10 students stand with their numbers in front of them. Allow class to assist in putting them in numeric order 1 to 10. Have 10 students sit down in a row. If desired, students can wear puppy headbands while acting out their story. Headbands can be made by gluing “puppy ears” onto a sentence strip and stapling the sentence strip to fit around each student’s head.

As the class sings the first verse of the song they will stand as their number is sung. During second verse they will sit when their number is sung. Sing song slowly a couple of times then sing faster and faster.

One little, two little, three little puppies
Four little, five little, six little puppies
Seven little, eight little, nine little puppies
Ten little puppy dogs.

Ten little, nine little, eight little puppies
Seven little, six little, five little puppies
Four little, three little, two little puppies
One little puppy dogs.

Small Groups or Centers: Ask students to focus on 1-to-1 correspondence as they count aloud with the teacher. Have students drop counters into containers (such as small baskets or bowls) as they practice counting out loud to a designated number (1–10). Then the teacher or a student says, “dump,” and everyone will empty his or her container. Count the number of counters. Repeat several times. Check for accuracy in counting and pointing to cubes/counters.

Independent work: Ask students to write and draw in their math *learning logs* ([view literacy strategy descriptions](#)) about things they like to count. A math *learning log* is a notebook that students keep in order to record ideas, questions, reactions, and new understandings. Documenting ideas in a log about content being studied forces students

to “put into words” what they know or do not know. This process offers a reflection of understanding that can lead to further study and alternative learning paths. It combines writing and reading with content learning. The math *learning log* will be used as a reference to guide further study and to assess progress and understanding. Kindergarten students can draw or glue pictures of items they like to count and write numbers for the items under each object.

Activity 7: Practice recognizing and writing numbers to 10 (GLE: 2)

Materials List: pencils, paper, Counting Objects from Home BLM, Count and Write Numbers BLM

Small Groups: Have students bring up to 10 objects from home to count at school. Have students line up objects in the top row of boxes on the Count and Write Numbers BLM. Next, write a number under each object on the bottom row of the BLM. The students will trade objects and continue to practice counting and writing numbers.

Individual Work: Students will practice counting and writing numbers for what they count by completing the Count and Write Numbers BLM. The students will count each smiley face and write each number as they count.

Teacher Note: Have extra objects available in case there are children who do not bring items from home.

Activity 8: Roll and Write (GLEs: 1, 2, 4)

Materials List: number dice, objects to count, paper, pencils, Number Stickers BLM, mini-stickers or ink stamps

Partners: One student will roll a number die and then count out the same number of objects from the die roll. Then the partner will do the same. After each student takes his/her turn, both students will write the number that was rolled.

Individual Work: the students will use a modified *split-page note taking* strategy ([view literacy strategy descriptions](#)) to demonstrate a visual representation of numbers to ten. *Split-page notetaking* is a good strategy to use to teach children to better organize notes. This strategy has been modified for use with kindergartners as it uses numbers instead of words. The Number Stickers BLM can be used to allow students to draw, use mini stickers or ink stamps to represent each number. See following example:

1	▽
2	□ □
3	⊗ ⊗ ⊗

Activity 9: Number Detectives- Finding the Missing Number (GLEs: 1, 5, 7)

Materials List: magnets or counting cubes, Number Detectives BLM

Whole or small groups: The teacher will line up objects in a row, leaving out one. Write the numbers in sequence under each object leaving out the number under the missing object. The students will write the number of the missing object. Then, have the students write the numeral before the missing number and then the number after the missing number using Number Detectives BLM.

Activity 10: Practice Counting with Cubes (GLEs: 1, 2, 7)

Materials List: connecting cubes

Small Groups or Centers: Have students practice counting up to a designated number. Direct them to make towers, stacks, or trains with connecting cubes. Say, “Get one cube. How many do you have? Get one more. How many do you have now? Get one more. How many now?” Repeat the activity so students get a lot of practice with sequence counting. Check counting for correct sequence.

Once everyone has a tower of 10, count backward with the students from 10 – 1 as they dismantle the stacks.

Activity 11: Counting Games (GLEs: 1, 2, 4, 8, 11)

Materials List: counters, mats or containers, numeral cards, optional computer programs *Millie’s Math House* and *Jump Start Kindergarten*

Small Groups or Centers: Provide students with counters (beans, cubes, bears) mats or containers (bowls, paper plates) and numeral cards. Ask students to draw a card, identify the numeral on the card, and count out the appropriate number of counters onto the mat or container. Make this game more challenging by asking students to put one more or one

less than the numeral drawn. You can vary the counters and containers to match a theme or just to make the activity more appealing to the students (e.g., baby counters with crib mats or apple counters with small baskets).

Millie's Math House and *Jump Start Kindergarten* are two computer programs with several counting and numeral recognition games that can be used to reinforce many of the skills in this unit.

Activity 12: Teacher, May I? (GLEs: 2, 4)

Materials List: numeral cards

Whole Group: Prepare a large set of numeral cards with the numerals that need to be reinforced. Line the students up on one side of the playground or gym while you stand on the other side. Hold up a numeral card while announcing what type of steps the students should take. For example: Hold up the numeral card 3 and call out giant steps. Students will say, "Teacher, may I?" before moving. Students will move the appropriate number and type of steps. Repeat until students reach the teacher's side of the gym or playground.

Activity 13: Attendance Tower (GLEs: 1, 2, 7, 8, 11)

Materials List: connecting cubes (2 colors), number line, calendar

Whole Group: Make a permanent tower stack of connecting cubes to equal the number of students in the class. Alternate each cube with a different color (e.g., red, blue, red, blue) to make it easier to count and compare. Display the permanent tower stack in the group time area. Each morning, during morning circle, distribute a connecting cube to each student. Once everyone has a cube, one child begins by saying "one" and hands his or her cube to the next student. That student says "two" and adds a cube, and so on, until all cubes have been added. After all students have added their cubes, compare this daily tower to the permanent tower. Ask questions such as, "Are we all here today? How many are here? How many are in our class (permanent tower)?" Use a number line to decide which is more—the total number of students in our class or the number of students here today. How many more are in our class than are here today? Save the daily tower each day for the week. Use a calendar to locate each day. On Friday, line up the stacks and ask comparative questions such as, "Was there a day this week when everyone was here? How do we know? Which day had the most students absent? Which day had only one student absent?"

Activity 14: Numeral Cards (GLEs: 5, 7)

Materials List: numeral cards 1 through 10

Whole Group: Give each student a card with a numeral (1 through 10) printed on it. Ask students to line up in order while holding their numeral card until sets of 1 through 10 are lined up. Call out numbers backward, 10 to 1, and ask students to sit down where they are standing in line. Use the number lines, formed by the students, to ask questions about who is holding the numeral card before, after, or between given numbers.

Activity 15: Number Mats (GLEs: 2, 4)

Materials List: number mats, large number cube, Number Mat BLM

Small Groups: Distribute a copy of Number Mat BLM to each student. Number mats are papers with two rows of dots, five dots in each row, for a total of ten dots on each card.

Ask students to take turns rolling a large number cube for the class to see. Make a number cube by wrapping a square box (whatever size needed) with butcher paper and writing large numerals on each face. Have students cover the corresponding number of dots with a counter or cube. In the beginning use a number cube labeled 0 through 5 and progress to number cubes labeled 4 through 9. Observe to see if the appropriate number of dots is covered for each roll.

This activity could be a whole group activity if the teacher incorporates the use of an overhead projector and has the class follow along.

Activity 16: Counter Pointing (GLEs: 1, 2, 4, 7)

Materials List: counters, a basket, tub or mat

Small Groups or Centers: Start with a set of 10 loose counters. Ask students to count as the teacher (or a student volunteer) points to each counter. Take a few counters (e.g., four) and count or point to them together. Cover the counters with a tub, basket, or mat. Lift the tub slightly and put another counter under it. Use the language, “I am adding one.” Ask students to guess how many are now under the tub (knowing how many cubes are in there and how many you put in, students should say “five” for this example). Lift the tub and let students count to check (1, 2, 3, 4, and 5). Continue the activity by adding counters one at a time until 10 is reached. Then begin taking away one at a time. Use the language, “I am taking one away.” Each time a counter is added or taken away, let the students guess the number and then count to check.

Vary counters, manipulatives, containers, and work mats to keep student interest high. There are many common items that can be found around the home or school to make

counting fun. A few ideas are buttons, keys, erasers, florist marbles, polished rocks, or small seasonal decorations. Just be sure the items are non-toxic and safe for use with children who are still likely to mouth toys.

Activity 17: Thumbs Up—Thumbs Down (GLEs: 8, 11)

Materials List: connecting cubes, paper bag

Small Groups: Make several trains with connecting cubes, using 4–10 cubes each. Hide the prepared trains in a paper bag. Place one of the trains on the table in front of the students. Ask them to put their thumbs up when they think they know how many cubes are in the train. When all thumbs are up, take out another train and place it next to the first. Have the students say, “Thumbs down” when they think they know how many cubes are in this train. Ask, “How did you find out?” Some students will need to touch the cubes in order to count; if so, have the class count together as the teacher or another student points to each cube. When comparing the trains, use the vocabulary—*same, different, more, less, greater*.

Activity 18: Grab Bag Counting (GLE: 4, 8)

Materials List: paper with four hand outlines, counters, bag, number line, paper, pencil, transparency sheets, markers

Whole Group: Explain to students that they will each be grabbing a handful of counters from a bag. Have students *brainstorm* ([view literacy strategy descriptions](#)) whether they think everyone in the class will grab the same number of counters. *Brainstorming* is a technique for generating ideas. It is based upon the belief that when a great number of ideas are generated, the chances of uncovering a good idea or solution are increased. Ground rules are essential for this activity to be effective and successful:

- All critical judgment is suspended. List all ideas without judging them. Passing judgment inhibits creativity and decreases the number of ideas generated;
- Quantity is more important than quality;
- Build on other peoples’ ideas and modify them;
- Ensure that all students participate.

Record each student’s response on a chart. The responses will be revisited after the small group activity.

Small Groups: Prior to beginning the activity, trace each group member’s hand. Write the students’ names above their handprint. Have each student grab a handful of counters from a bag, count the counters, and record the number on his/her hand outline. After each student’s turn, he/she should return the counters to the bag for the next student’s turn.

Students may need to use a number line to help them with their counting and writing the numerals 1–10. Observe students’ strategies for counting and writing the numerals 1–10.

Whole Group: Revisit the chart of *brainstorming* ideas. Discuss why students grabbed different numbers of counters. Students can trace outlines of their hands onto transparency sheets using markers. These tracings can be placed on top of each other to see whose hands were the biggest and whose hands were the smallest. Check to see if larger hands grabbed larger numbers of counters than students who had smaller hands.

Activity 19: Ordinal Number Story (GLE: 3)

Materials List: *The Seven Chinese Brothers*, Character Map BLM, illustration paper, string

Use everyday occurrences (e.g., lining up, calendar activities, finger plays, games, daily schedules) to give students experiences with ordinal numbers and their connection to (and difference from) their cardinal relatives. In addition, read stories that involve ordinal numbers (e.g., *The Seven Chinese Brothers*). Discuss what happens in sequence (each brother possesses amazing powers).

Whole Group: The students will make a *graphic organizer* ([view literacy strategy descriptions](#)) to illustrate each brother and his special power. The graphic organizer used will be a character map. A character map is used to name the characters and identify personality traits of each character. A Character Map BLM is provided for use with this activity.

Small Groups: Divide students into groups. Each group will create an illustration to show one part of the story as assigned by the teacher.

Whole Group: The class will use their illustrations to create a *graphic organizer* ([view literacy strategy descriptions](#)). The graphic organizer used will be a story board. A story board is used to discuss the sequence of events in the story. Ask students questions like, “What happened first? Which group illustrated that part of the story?” The group that illustrated the first event will bring its picture to the front of the room and the teacher will tie a string to the bottom of it. Ask, “What happened second in the story? That group will bring up its illustration, and it will be tied to the bottom of the first picture. Continue until all illustrations are used, and then use the student’s illustration to retell the story.

Activity 20: String Measures (GLEs: 11, 14)

Materials List: string, masking tape

Begin the activity with a *brainstorming* ([view literacy strategy descriptions](#)) activity. Tell students that today they are going to have to figure out a way to find things that are longer and shorter than they are. Ask, “What are some ways that we could do this?” Be sure to review the ground rules before beginning to write the students’ responses.

Have students work in groups of three to cut string lengths to match their heights. Write their names on a piece of masking tape and stick them in any order to the wall, or post them on a large piece of craft or bulletin board paper. Compare their lengths of string and discuss the similarities and differences using the words *same*, *different*, *equal*, *not equal*, *greater than*, and *less than*.

Next, have each student use his/her string to find something in the room that is shorter and taller than he/she is.

Activity 21: How Many Blocks Will It Hold? (GLEs: 2, 8, 11, 14)

Materials List: three different sized containers, blocks

Whole Group: Ask students which of three different sized containers holds the most blocks. Fill the first container with blocks. When the container is full, count the blocks, write the answer on a card, and tape it to the container. Do the same with the other two containers. Ask students which container holds the most and least blocks. Have them put the containers in order by capacity.

Variation: Using the different sized containers, a scoop, and beans, fill the smallest container with beans as the students count each scoop. Then let them estimate how many scoops it will take to fill the medium container. Scoop and count. Do the same for the largest container. Substitute larger and smaller scoops and larger and smaller beans (or other objects) and allow the students to experiment with capacity as a center activity.

Activity 22: Ten in the Bed (GLEs: 4, 7)

Materials List: teddy bear counters, plastic tub container

Whole Group: Begin the lesson by reading the nursery rhyme, *There are Ten in the Bed*. Encourage children to start with ten fingers on their hands to match how many are in the bed as the story is being read. Next, use teddy bear counters and a plastic tub container turned upside down. All the teddy counters could be placed on top of the container and as each teddy ‘falls out,’ this can be role-played with the counters falling off the top of the container. Ask predictive questions of children: “If one more falls out, how many will be left in the bed? Show me on your fingers. How many more need to fall out so that there will be 5 in the bed?”

Small Group: Role-play and being able to ‘Act it Out’ is a problem solving strategy that lends itself nicely to this context. Have ten students lie on a rug or mat. Have one of the students roll off as indicated in the telling of the nursery rhyme.

Ten In A Bed

There were ten in a bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out.

There were nine in the bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out....

There were eight in the bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out....

There were seven in the bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out....

There were six in the bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out....

There were five in the bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out....

There were four in the bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out....

There were three in the bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out....

There were two in the bed and the little one said,
"Roll over, roll over." *rolling motion*
So they all rolled over and one fell out....

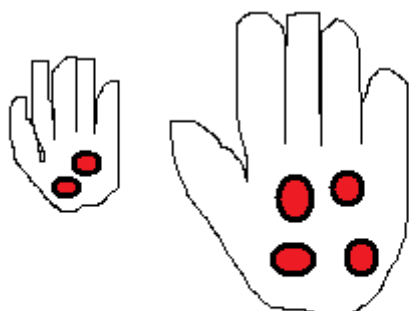
There was one in the bed and the little one said,
"Good night!"

Activity 23: Grab and Graph (GLEs: 2, 4, 22)

Materials List: container, counters, sticky notes, pencils

Whole Group: Write the numbers 0 – 10 on separate sticky notes and line them up on the floor in numeric order. Fill the container with 10 counters. Have the first student grab a fistful of counters. Refill container with counters to equal 10 again, and let second student do the same thing. Keep repeating until all students have grabbed counters. Have each student count the counters that they grabbed and write the number on a post-it note. Students will then take turns placing their sticky note with the number of counters they counted, above the sticky note on the floor that has the same number as theirs. This sticky note bar graph can be used to ask comparison questions. Ask questions such as, “Which number of counters did most people grab? Which number did the least people grab? Why do you think this happened? Were there any numbers that the same number of people grabbed? Why do you think some people grabbed more than other people did?”

Independent work: Ask students to write and draw in their math *learning logs* ([view literacy strategy descriptions](#)) to show what they learned in this lesson. The math *learning log* will be used as a reference to guide further study and to assess progress and understanding. Remember that writing of kindergarteners may be limited so it may be necessary to let the student dictate what he/she learned for the teacher to write. Remember, there is no one correct response. Responses should vary. An example of a math *learning log* sample might look as follows:



'Kids with bigger hands grabbed more things.'

Activity 24: You Be The Teacher (GLEs: 1, 2, 4)

Materials List: number cards, objects to count

Small Groups: Allow the students to play a modified version of *professor know-it-all* ([view literacy strategy descriptions](#)). The *professor know-it-all* strategy is appropriate to use after information is learned. The student will be given the opportunity to be the “expert” or the “teacher.” In the *professor know-it-all* strategy students are put into groups to generate questions about the content learned. Then the students are given time to review the content and called on randomly to come to the front of the room to provide

“expert” answers to questions from their peers. In a modified form of *professor know-it-all*, each kindergartner will have a chance to pretend to be the teacher for his/her group. The student pretending to be the teacher will hold up a number card and tell group members to count out that many objects. The classroom teacher may want to pretend to be a student and make mistakes counting out objects to see if the “teacher” can explain the correct way to do it.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Teacher observation, anecdotal notes, and portfolios
- Use number cards 1–10 and connecting cubes and ask the student to place the cards in order, then connect cubes and count starting with 1.
- Show the student a pile of loose counters (more than 10) and ask the student to count as many cubes as possible.

Activity-Specific Assessments

- Activity 10: Present the student with a number card from 1–10 and ask the student to show the same number of connecting cubes. This task will be repeated at least four times. Include the numbers 11-20 for particular students if appropriate.
- Activity 11: Use several cards with up to 10 shapes or dots on them. Tell the students to use counters (cubes, tiles, or bears) to show the same number as there are shapes or dots on the card. The student will count how many counters (cubes, tiles, or bears) he/she used. (There may be a need to demonstrate the task with one card before asking the student to do the activity.)
- Activity 19: Before beginning this assessment, construct a train of 10 different colored and connected cubes and place it horizontally in front of the student. The student will look at the cubes and determine what color cube is in the (first, second, fourth, tenth. . .) position and will point to that cube. The teacher will ask the student to tell what ordinal position a particular cube is in; for example, “In what position is the red cube?”

- Activity 21: Observe the student measuring length and capacity with nonstandard units. Determine if the student can tell which container would hold more or less of a specified unit and whether he/she can explain why. Given a unit for measurement, the student can tell which of two objects would need more of the units to measure it (e.g., the book would need more colored links than the crayon) and why.

Resources

Children's Books

Mahy, Margaret. *The Seven Chinese Brothers*.

Computer Software Programs

Millie's Math House

Jump Start Kindergarten

**Kindergarten
Mathematics
Unit 3: Seeing and Extending Patterns**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit builds development of pattern concepts and unites patterns with work on reviewing counting and classification. A major focus of the unit is getting students to examine data and make comparisons.

Student Understandings

Students recognize and extend patterns and, at the same time, interpret simple bar graphs containing data about small sets of materials or objects. Students look for common ABAB patterns as well as patterns in graphs and tables as they engage in a wide variety of experiences. Students identify patterns represented by sounds, symbols, numbers, words, colors, and shapes.

Guiding Questions

1. Can students recognize, verbally describe, and extend a visual or number sequence pattern to show three more terms?
2. Can students correctly use ordinal numbers in counting situations involving ordered lists?
3. Can students classify and count small sets of objects (5–10) and use them to make a simple tally or bar graph?
4. Can students use information from a bar graph to talk about patterns in the comparisons they note?

Unit 3 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Number and Number Relations	
2.	Count a set of 20 or fewer objects by establishing a 1-to-1 correspondence between number names and objects (N-1-E) (N-3-E) (A-1-E)
3.	Use the ordinal numerals 1 st through 10 th to discuss positions in ordered lists (N-1-E)
GLE #	
GLE Text and Benchmarks	
4.	Identify the numerals for the numbers 0 through 20 (N-1-E) (N-3-E)
8.	Compare sets containing 20 or fewer objects using the words <i>same/different</i> and <i>more/less/greater/fewer</i> (N-3-E) (N-1-E)
Measurement	
15.	Use comparative and superlative vocabulary in measurement settings (e.g., <i>longest, shortest, most, hottest, heaviest, biggest</i>) (M-3-E) (M-1-E) (M-2-E)
Geometry	
16.	Name and identify basic shapes using concrete models (e.g., circles, squares, triangles, rectangles, rhombuses, balls, boxes, cans, cones) (G-2-E) (G-1-E) (G-4-E) (G-5-E)
17.	Compare, contrast, and sort objects or shapes according to two attributes (e.g., shape and size, shape and color, thickness and color) (G-2-E)
18.	Use words that indicate direction and position of objects and arrange an object in a specified position and orientation (e.g. between, behind, above) (G-3-E)
Data Analysis, Probability, and Discrete Math	
21.	Collect and organize concrete data using tally mark charts (D-1-E)
22.	Collect and organize data in a simple bar graph using pictures or objects (D-1-E) (D-2-E)
23.	Sort, represent, and use information in simple tables and bar/picture graphs (D-2-E) (D-3-E)
Patterns, Relations, and Functions	
24.	Recognize, copy, name, create, and extend repeating patterns (e.g., ABAB, AABB, ABBA) using concrete objects, shapes, pictures, numbers, and sounds (P-1-E)

Sample Activities

Some activities provide suggestions for context; however, classroom themes and events will often provide the context in which the activities should be used and may affect the order of the activities.

Activity 1: Sound Patterns (GLE: 24)

Materials List: none

Whole Group: Clap a pattern (e.g., clap, snap, clap, snap) and ask students to join in. Ask students for other suggestions. Change the pattern once students know the clapping pattern. Continue to ask students for new ideas until students have experienced more than five different ways to interpret a pattern. Repeat this activity many times a day and daily throughout the unit, changing the original pattern used each day. Remember, any motion repeated a particular number of times results in a pattern. Keep it simple (ABAB, AABB, AABAAB).

Activity 2: Guess Our Pattern (GLE: 24)

Materials List: none

Whole Group: Use student volunteers to demonstrate to the class how to make “people patterns.” For example, ask students to line up in an AB pattern (e.g., stand, sit, stand, sit or boy, girl, boy girl) while the rest of the class guesses what comes next in the pattern. Challenge the rest of the class to guess the pattern. After several teacher led demonstrations, divide the class into small groups. Have each group of students create a pattern for the rest of the class to guess what comes next.

Activity 3: See and Sound a Pattern (GLEs: 16, 24)

Materials List: connecting cubes or pattern blocks

Whole Group or Small Groups: Begin with an ABAB (snap, clap) pattern. Model the pattern, and have students repeat it. Ask them to make the same pattern with connecting cubes or pattern blocks. Use connecting cubes or pattern blocks to make alternating patterns (blue, red, blue, red . . .). Point to each block in a student’s finished pattern, one at a time, and ask students to snap, clap the pattern. Check a few more in this manner, and then say the colors as you point to the blocks and the students snap, clap.

Continue verbalizing the ABAB patterns in different ways (e.g., 1, 2, 1, 2 . . . dog, cat, dog, cat . . .) until the ABAB patterns have been renamed about five times. Discuss how students know what comes next. Repeat this activity throughout the unit, changing the

original snap, clap pattern each time (AABB, AAAA, ABBA, and so on). When students are confident performing snap, clap patterns, continue to verbalize patterns beyond the last cube. Point into the air five or six additional times to reinforce the idea that the pattern could continue indefinitely. Substitute shapes (triangle, square), objects (tree, sun), and positions (up, down, sideways). Repeat the activity, allowing students to create new patterns.

Activity 4: Create and Extend the Pattern (GLEs: 16, 24)

Materials List: shapes, objects, pattern strips

Whole Group or Small Groups: Give students a variety of shapes. Don't forget to include objects and pictures for the three-dimensional shapes represented by balls, boxes, cans, and cones. Tell the students that they will create and extend a pattern based on your directions. As you name a shape, have students find it in their pile and place it in front of them. Begin by naming one shape (e.g., triangle). After the students have found it, name another (e.g., square). Continue until the students have a triangle, square, triangle, square . . . pattern started. Tell the students to continue the pattern until they have six triangles and six squares. Repeat with different shapes. When the students have mastered ABAB patterns, try this same activity for AABAAB patterns, and others. At some point, allow students to give the directions for creating patterns. This will be good practice for them in naming the shapes.

Divide the students into small groups of three or four. Give each student in a group a different set of objects (shapes, small toys, blocks, tiles). As you demonstrate a pattern (ABAB, AABAAB) using sound (e.g., snap, clap or snap, snap, clap), ask each student in a group to demonstrate the pattern using his/her objects. Discuss with the students so that they understand that the same pattern can be represented in a variety of ways.

Centers: Provide students with pattern strips that show ABAB patterns using common objects such as pattern blocks or theme-related pictures such as apples. Also provide paper or real objects for students to copy and/or extend each of the pattern strips. This center activity can be changed throughout the year to match any theme depending on the objects used. To add interest, provide a light table or overhead projector for students to practice copying, extending, and creating patterns.

Activity 5: Pattern Necklaces (GLEs: 24)

Materials List: lacing beads, yarn, beads or pasta

Small Groups or Centers: After giving students many opportunities to use lacing beads in free exploration, model how to create a pattern necklace. Encourage students to copy the pattern you demonstrated for them. After several experiences with copying and extending given patterns, students should be ready to create a pattern necklace. Give each student a

length of yarn and a scoop of colored beads or dyed rigatoni pasta. Ask students to create a pattern necklace by stringing the beads or pasta in a pattern. Have students tell you the pattern they made.

Activity 6: Shape Pictures (GLEs: 4, 16)

Materials List: shapes, shape cards, spinner divided into five sections

Small Groups: Provide students with a set of teacher or commercially-made shapes. Create a set of cards that have one shape on each card. Also create a spinner divided into five sections, which have been numbered 1 through 5.

With the students in a circle, place the stack of shape cards and the spinner in the middle, and ask a student to pick a card. Next, ask the student to spin the spinner. If the student picked a “circle” card and the spinner landed on three, have the student pick three circles from a pile of shapes. Ask another student to repeat the process. If the second student picked a triangle card and the spinner landed on two, the student chooses two triangles from the pile. Ask a third student to use these shapes to make a picture. Repeat the process several times.

Place the cards or spinners in a center and provide paper cutouts for students to use in creating their own pictures, following this same procedure. Display pictures and invite students to describe their creations using shape and position words.

Teacher Note: For variety, make a spinner for the shapes instead of using cards, and have a student roll a number cube for determining how many to use.

Millie’s Math House computer program has several activities to reinforce shape recognition and can be used with the activity.

Activity 7: Practice Counting (GLE: 2)

Materials List: counters, xylophone (or other instrument)

Small Groups or Centers: Announce that the class will practice counting to a certain number together. Ask students to take counters from a pile and slide them toward themselves, one at a time, as they practice counting out loud. Use a xylophone or other instrument to emphasize counting motion.

After the designated number is reached, say, “check” and have students recount silently. Push all counters back into the pile each time and repeat with different numbers to 10. Gradually increase the number of objects until students are counting objects to 20.

Activity 8: Predicting Answers (GLEs: 2, 3, 21)

Materials List: stories about addition, subtraction, and number concepts (e.g., *Rooster's Off to See the World* by Eric Carle), connecting cubes

Small Groups: Read *Rooster's Off to See the World* or a similar story about addition, subtraction, and number concepts. After each animal addition, ask students to tell how many animals there are altogether. After an animal is subtracted, ask how many are left.

Give the students connecting cubes and reread the story. When Rooster sees the first animal, tell the students to place one cube in front of them. Explain to the students that each time an animal enters the story, they are to add a cube. As each animal enters the story, the teacher will make a tally mark on the board. At the end of the story, ask how many students have the correct number of cubes in front of them for how many animals Rooster saw. Ask students to make tally marks for each of their cubes. Also, point out that they should draw a line across their tally marks for every fifth number in the groups of tally marks.

This is a good story for making the connection between cardinal and ordinal numbers by asking which animal was first, second, third, and so on.

Activity 9: Connecting Cubes (GLEs: 2, 3, 15)

Materials List: numeral cards 1-10, paper bag, connecting cubes

Small Groups: While in the math circle, ask students to take turns picking a numeral card (1–10) from a paper bag. In the beginning, use cards that have picture representations for the number (e.g., the number 9 would have 9 dots or apples on the card.). After everyone has picked a number, ask students to use connecting cubes to build a stack, tower, or train to match the number they picked from the bag. Ask students to compare their stacks to those of the person on their right and left using vocabulary such as *shortest*, *longest*, *most*.

Next, have the students place their stacks in order from longest to shortest or vice versa. Ask questions about the positions of certain stacks that will allow students to use the ordinal numbers (first through tenth).

Activity 10: Foxy Bar Graph (GLEs: 21, 22, 23)

Materials List: *Hattie and the Fox* by Mem Fox and Patricia Mullins, overhead projector, sticky notes, a transparency made from the Opinionnaire Chart BLM

Whole or Small Groups: Before reading *Hattie and the Fox*, have students look at the illustrations on the first few pages of the book. Tell students that Hattie thinks she sees something dangerous and tried to warn her friends. Ask students if they would believe

Hattie if she were their friend. Mark students' responses on the transparency of the Opinionnaire Chart BLM. As students answer *yes* or *no*, give them a sticky note with their response written on it.

Opinionnaires ([view literacy strategy descriptions](#)) are used to show student ideas prior to receiving instruction or other information about a topic. *Opinionnaires* are highly beneficial in promoting deeper understandings of content area topics by activating and building relevant prior knowledge. The emphasis is on the students' points of view and not the "correctness" of their opinions.

After the Opinionnaire Chart BLM is created, count the number of *yes* and *no* votes. Make a tally mark for each response under the appropriate category. Discuss the numbers. How many *yes* votes? How many *no* votes? Ask students to tell why they voted in the way that they did. Ask the students if they can think of another way to show how the class responded. After discussion, create a class bar graph using the sticky notes to show the number of *yes* and *no* responses.

Compare the bar graph to the *opinionnaire* chart. Read the story *Hattie and the Fox*, and ask each student if he/she would still vote the same way.

Reread and ask students to tell how many parts Hattie sees each time she notices the fox in the bushes.

Activity 11: Name Sort (GLEs: 2, 15, 18, 22)

Materials List: paper strips, large squares, pencils, tape

Whole or Small Groups: Use paper strips with large squares to create a name sort. Have students write their first names on the paper strip putting one letter in each box. Assist those who are still learning to write their names. Tape two strips together, if needed, for longer names. Cut off any excessive paper.

Ask students to bring their strips to a math circle and count the letters in their first names. Ask them to help you put all of the paper strip names in order from shortest to longest. Tape them to a wall or to the chalkboard. When a name has the same number of letters as one already taped to the wall, ask the students where it should go. (One response may be that it should be taped above the name already there.) If so, a bar graph will be created that will yield additional discussion.

Ask: Which names have the fewest and most letters? How many other names have the same number of letters as yours? Which number of letters in a name is most common? Are most names long or short?

Activity 12: Tally by 5s (GLEs: 2, 21)

Materials List: craft sticks, clay

Small Groups: Distribute 20 craft sticks and a small lump of clay to stick to each student. Have the students stick the clay on a small tray or the table/desk in front of each student.

Clap some rhythms and tell students to stick one craft stick in the clay each time they hear a clap. After each round of claps, ask students to count the number of craft sticks they used and to tally them using tally marks. See whether their tallies are correct each time.

Collect the clay and repeat the activity. This time, let students find their own way to keep count using the craft sticks. Discuss the methods students come up with. Explain how mathematicians group by 5s to make counting easier. Demonstrate how to lay four craft sticks down and place the fifth one across to signal a bundle of five. Practice and repeat the rhythm activity. Have small groups or partners take turns clapping or snapping for others and tally using the five-bundle method. Circulate and assist students in making correct bundles of five with their craft sticks. Demonstrate on the board or overhead how to use tallies to represent five (four vertical marks and one diagonal).

Activity 13: Teddy Bear Graph (GLEs: 2, 22, 23)

Materials List: *Goldilocks and the Three Bears* by Jan Brett, teddy bears brought from home

Whole Group: Read one of the many versions of *Goldilocks and the Three Bears*, such as the one by Jan Brett. Create a bear graph using teddy bears brought from home (be sure to have a few extra bears on hand for those who forget bears). Categorize by some attribute (such as size). Place bears in rows on the floor—large bears in one row, medium bears on another row, and small bears on a third row. Discuss graph results. Ask, “Which size do we see most? Least? How can you tell? How many bears would we need to add to our shortest row to make it equal to our longest row?” Subtract from the longest row to make it equal to the medium row.

Reorganize bears to illustrate another attribute and discuss results. Ask students how they could make a paper representation of their “real” teddy bear graph.

Activity 14: Arrange the Bears (GLEs: 2, 3, 17)

Materials List: teddy bears brought from home

Whole or Small Groups: Using teddy bears, ask students to hold their bears and arrange themselves in one long row or semicircle according to the size of their bear (e.g., smallest to largest). Ask, “Whose bear is fifth? Whose bear is second from Maria’s? What position

is your bear?” Also, have students compare, contrast, or sort the bears according to two attributes (e.g., texture and size, color and size, or color and texture).

Activity 15: Spider’s Patterns (GLEs: 24)

Materials List: *The Very Busy Spider* by Eric Carle, sentence strips

Whole Group: Read *The Very Busy Spider* to the class. The *QtA* (*questioning the author*) ([view literacy strategy descriptions](#)) strategy will be used in this activity. The goals of *QtA* are to construct meaning of text, to help students go beyond the words on the page, and to relate outside experiences to the texts being read. *QtA* involves the teacher and the class in a collaborative process of building understanding during reading. Participate in *QtA* as a facilitator, guide, initiator, and responder. Strive to elicit readers’ thinking while keeping them focused in their discussion. The *QtA* strategy helps students to learn to ask questions as they read. Model asking questions, but the students should be encouraged to ask their own.

QtA questions for *The Very Busy Spider*:

Goal	Query
Initiate discussion	Why do spiders spin webs? Have you ever let someone talk you into doing something when you were supposed to do something else?
Focus the spider	Was the spider only concerned about how pretty her web was? Was the spider a hard worker?
Link information	What is the same about each of the animals?
Identify the way the information is presented	Does that make sense? What patterns do you hear in the words of the story? What did we learn from this story?
Encourage students to refer to the text because they have misinterpreted, or to help them recognize that they have made an inference	What makes you think that? Did the words in the book actually say that?

Small Groups: Prior to the lesson, write repetitive sentences from the story on sentence strips. Have students help to put sentence strips in order based on the pattern from the

story. Relate this pattern to number patterns. Have students repeat the same pattern by clapping hands. They can also repeat the same pattern using objects, letters and numbers.

Activity 16: Recreating Patterns (GLEs: 2, 3, 8, 16, 24)

Materials List: *The Patchwork Quilt* by Valerie Flourney and Jerry Pinkney, pattern blocks

Whole Group: Read *The Patchwork Quilt*. This picture book is about the relationship between Tanya and her grandmother. Tanya's grandmother begins making a special quilt from pieces of worn out clothes that have belonged to various family members. Tanya's mother and grandmother spend many evenings working on the quilt. Tanya's grandmother becomes ill, too ill for even Tanya to see her. Tanya works on the quilt with her mother while her grandmother lies in bed ill. After a couple of months Tanya's grandmother gets better and was able to help complete the quilt that she then gives to Tanya as a gift. Have students discuss the sequence of events in the story.

Small Groups: Have students recreate the patterns in the quilts, using pattern blocks. Discuss which pieces are placed first and last; which pattern has the bigger/smaller, same/different, more/less/fewer pieces; and which ones have more/less color patterns. These comparisons will lead to an understanding of one-to-one correspondence. Have students produce two different patterns that will demonstrate the vocabulary you request.

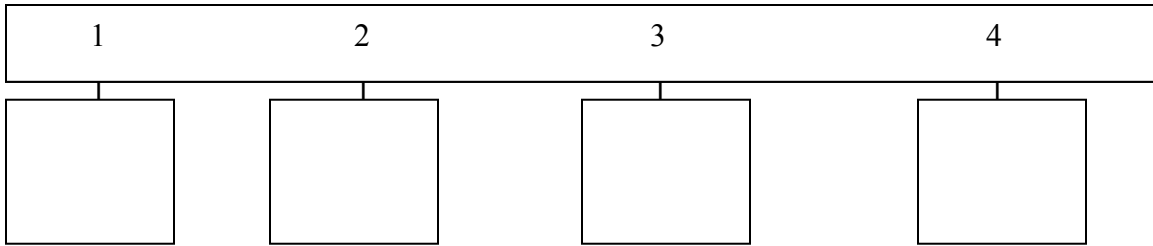
Activity 17: Story Order (GLEs: 3)

Materials List: *The Patchwork Quilt* by Valerie Flourney and Jerry Pinkney, sentence strips, paper squares, string, crayons

Whole Group: Reread *The Patchwork Quilt*. As the story is read, focus on order of events in the story.

Small Groups: Students will create a *graphic organizer* ([view literacy strategy descriptions](#)) about the story. The graphic organizer used will be the *storyboard*. A storyboard is a graphic, sequential depiction of a narrative. Students recall major events of the story, and then illustrate the events in the squares provided. Each student will draw events of the story on separate squares of papers. When drawings are complete, the students will put them in story order.

Review ordinal numbers and time related vocabulary such as first, next and last as students put events in order. Tie a string to the top of each drawing, and then tie them in order to a sentence strip. Students will write numbers above each to show order of event as shown in the sketch below.



Activity 18: Comparing Stories (GLEs: 3)

Materials List: *Something From Nothing* by Phoebe Gilman, sentence strips, story paper, crayons

Whole Group: Read *Something From Nothing*. This is a Jewish folk tale about a boy named Joseph and his grandfather. Joseph's grandfather made him a blanket when he was a little boy. As Joseph grows the blanket becomes worn. Joseph's mother tells him to throw it out. The grandfather transforms the blanket into a jacket, a vest, a Sabbath tie, a handkerchief, and finally a button. Joseph loses the button and becomes sad because his grandfather can't make something from nothing. Joseph writes a story at the end to remember his grandfather and the blanket.

Next, have students identify the steps the grandfather took to make the clothing for Joseph, and illustrate these steps on a sentence strip. Ask them to tell what happened first, second, and so on, in the story. This will help students become familiar with steps in a process and will help prepare them for the following small group activity.

Small Groups: The students will create a *story chain* ([view literacy strategy descriptions](#)) to show the steps in preparing a favorite recipe. Tell students that families take care of each other. Discuss how Joseph's grandfather made him clothing, and relate that to how their parents cook meals for them. Ask students to think about a favorite meal that their parent cooks. The group will vote to determine which recipe they will use.

A *story chain* is a group-created literacy strategy. The first person in the group will write or dictate the first step in preparing the recipe. The second student will write or dictate the second step, the third student will do the third, the fourth student will do the last step, and the fifth student will write an opinion statement. Have students illustrate their statement. Discuss ordinal numbers first through fifth, and time related vocabulary such as first, next and last. These "recipes" can be put together to produce a class cookbook.

Spaghetti and Meatballs
First, you put the noodles in the microwave.
Then you cook them for one hour.

Then you pour some red stuff on top.

You roll some meatloaf into little balls and put in the red stuff.

Spaghitti and meatballs is fun to eat because you get to suck it into your mouth through your lips.

Activity 19: Button Patterns (GLEs: 17, 24)

Materials List: *Something From Nothing*, Venn Diagram BLM, buttons, math learning logs

Whole Group: Review the book *Something From Nothing*.

Small Group: The class will create a *graphic organizer* ([view literacy strategy descriptions](#)) to assist students in developing a deeper understanding of the story. As a whole group, the class will use a Venn Diagram *graphic organizer* to sort buttons. A Venn Diagram is beneficial for examining similarities and differences between stories. A Venn Diagram BLM is provided for use in this activity.

Place a pile of buttons on the center table. Have students sort the buttons using the Venn Diagram BLM. Ask if there might be another way they could sort the buttons. Have students make patterns with the buttons. Have them discuss their pattern with the group.

Individual Work: Students will write in their math *learning log* ([view literacy strategy descriptions](#)). Math *learning logs* are used to record students' feelings and reactions to the lesson. This strategy encourages students to think deeply about what they have learned and to relate this information to their prior knowledge and experiences. The interaction between reader and text, in this case, extends the reading experiences into the "real-life" application of information. Have students write about something they would like to remember about a special person in their family. Students who are not developmentally ready for independent writing can illustrate or dictate what they would like to communicate.

Activity 20: Patterns in Verse (GLE: 24)

Materials List: children's poetry books, I Can poem page with blanks, pencils, chart paper

Whole Group: Read several poems to students. Help them to "hear" the patterns in the verses by allowing them to tap pencils to the beat as the poem is read. Next, read several poems that have repetitive text. Have the poem example below on chart paper, and point out the patterns in wording.

Small Group: Assist students in filling in the blanks for the poem below. These pages can be put together into a class booklet.

I Can
by _____

I can _____.

I can _____.

I can _____ _____ too.

I can _____.

I can _____

Just as well as you

Example:

I can swim.

I can skate.

I can run fast too.

I can dance.

I can read,

Just as well as you.

Activity 21: Patterns in the Real World (GLEs: 24)

Materials List: fabric, wallpaper, gift wrap samples, glue, crayons

Whole Group: Students will look for patterns in fabrics, wallpaper or gift wrap samples.

Small Groups: Students will glue a piece of the fabric, wallpaper, or gift wrap onto a paper. They will then color and match the pattern on the other side of the fabric.

Individual Work: Students will write in their math *learning log* ([view literacy strategy descriptions](#)) their observations about the pattern found in the fabric, wall paper or gift page used in the small group activity. Math *learning logs* are used to record students' feelings and reactions to the lesson. This strategy encourages students to think deeply about what they have learned and to relate this information to their prior knowledge and experiences. Students not developmentally ready for independent writing can demonstrate understanding of patterns by using drawings to illustrate a pattern or having the teacher record their ideas.

Activity 22: Using a Number Chart to Find Patterns (GLEs: 3, 24)

Materials List: a number line per student, 100s Chart BLM

Whole Group: Demonstrate using a number line to show how to count by fives. Then demonstrate how to mark each fifth number on a 100s chart using the 100s Chart BLM.

Small Groups: Have students demonstrate using a number line to count by twos by jumping two places. Students will then circle even numbers on the 100s Chart BLM. Then have students color every fifth number yellow and every 10th number orange. Use the number chart to show patterns to the students on how to write to 100. Show the students the numbers 0-9. Tell them that you ran out of numbers so now you have to put a one in front of all the numbers 0-9 for 10-19, then 2 for 20-29, and so on.

Activity 23: Using Hands to Count by Fives (GLEs: 21)

Materials List: long, thin strip of bulletin board paper, paint, chart paper, marker

Whole Group: Each student will paint his/her hand and print a handprint in a row on a long, thin strip of bulletin board paper. After everyone has made a handprint, demonstrate that each hand has 5 fingers on it. Class will *brainstorm* ([view literacy strategy descriptions](#)) how they could figure out how many fingers are in the class.

Brainstorming is a technique for generating ideas. It is based upon the belief that when a great number of ideas are generated, the chances of uncovering a good idea or solution are increased. Ground rules are essential for this activity to be effective and successful:

- All critical judgment is suspended. List all ideas without judging them. Passing judgment inhibits creativity and decreases the number of ideas generated.
- Quantity is more important than quality.
- Build on other peoples' ideas and modify them. Write their ideas on a chart.
- Ensure that all students participate.

Record each student's response on a chart. Lead students to the discussion of counting by fives, or tally mark fingers on each hand and then count by fives.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Teacher observation, anecdotal notes, and portfolios
- Show students color/object pattern cards, and ask students to replicate the pattern, add to the pattern, or make their own patterns different from the example, explaining and/or naming the pattern created.
The teacher will prepare the following patterns with connecting cubes:
 - blue, white, blue, white . . .
 - green, red, yellow, green, red, yellow . . .
 - orange, orange, brown, brown, orange, orange . . .
 - burgundy, blue, blue, burgundy, blue, blue . . .
- The student will look at the color patterns and show what the next three cubes will be if each pattern is continued. After patterns are extended, the student will tell what color patterns are seen. Ask the student to continue the pattern (to about three more cubes), then make his or her own color pattern using the cubes and explaining the pattern that was chosen.

Activity-Specific Assessments

- Activity 4: Provide students with paper cut-out shapes, three patterns to extend and a fourth space for the student to create a pattern of his/her own using the paper shapes. The students will be asked to extend an existing pattern by at least 3 more shapes and to create and read an ABAB pattern.
- Activity 8: Provide students with pictures of the animals from the story. The student will place the pictures in order (i.e., first, second, third, and so on) as they appeared in the story.
- Activity 13: The students will tally how many teddies there are of specified attributes (color, size) and enter the information on a bar graph. The student will interpret the graph to tell which type of teddy there are more or fewer of in the classroom.

Resources

Children's Books

Carle, Eric. *Rooster's Off to See the World*

Fox, Mem. *Hattie and the Fox*

Brett, Jan. *Goldilocks and the Three Bears*

Carle, Eric. *The Very Busy Spider*

Flournoy, Valerie and Pinkney, Jerry. *The Patchwork Quilt*

Gillman, Phoebe. *Something From Nothing*

**Kindergarten
Mathematics
Unit 4: Numbers and Numerals 10 to 20**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit continues the work begun in Unit 2. As in the previous unit, the focus is on rational counting, comparing sets with respect to number, and identifying and selecting the appropriate numeral for a given count. More emphasis is placed on estimating the number of objects in a group at this level, with group sizes anywhere between 2 and 20. Also, greater emphasis is placed on the use of the number line as a representative tool at this point. As part of the unit, some nonstandard measurement might be done, but the associated counting related to the work is the main focus of this unit. Instructional activities for this unit assume that the student mastered the skills for dealing with the numbers 1–10 in the previous unit.

Student Understandings

Students can count sets with 10 to 20 members and apply rational counting, note equivalences of sets of numbers of objects, identify the appropriate numerals for counts, and determine the numbers that come before and after a given number on the number line.

Guiding Questions

1. Can students both rote and rationally count to 20?
2. Can students establish 1-to-1 correspondence between objects and number names in counting and comparing size of sets?
3. Can students compare and use the vocabulary for comparing the number of items in two sets?
4. Can students identify the numerals for recording the number of objects in a given set?
5. Can students use counting as a means of determining the count for the number of nonstandard units in measuring objects?
6. Can students count forward and backward from a given number?
7. Can students identify the numbers coming before, after, or between given numbers on a chart or number line?

Unit 4 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Number and Number Relations	
1.	Count by ones to 20 (N-1-E) (N-3-E)
2.	Count a set of 20 or fewer objects by establishing a 1-to-1 correspondence between number names and objects (N-1-E) (N-3-E) (A-1-E)
3.	Use the ordinal numerals 1 st through 10 th to discuss positions in ordered lists (N-1-E)
4.	Identify the numerals for the numbers 0 through 20 (N-1-E) (N-3-E)
5.	Using a number line or chart, identify the numbers coming before/after a given number and between 2 given numbers (N-1-E) (N-3-E) (A-1-E)
7.	Count forward and backward from a given number between 1 and 10 (N-3-E)
8.	Compare sets containing 20 or fewer objects using the words <i>same/different</i> and <i>more/less/greater/fewer</i> (N-3-E) (N-1-E)
10.	Use operational vocabulary (<i>add, subtract, join, remove, take away, put together</i>) to explore sets of objects (N-5-E)
Algebra	
11.	Use the words <i>same, different, equal, not equal, greater than, and less than</i> while using concrete objects for comparative models (A-1-E)
Measurement	
14.	Measure and estimate length and capacity using non-standard units (e.g., sticks, paper clips, blocks, beans) (M-2-E) (M-3-E)

Sample Activities

Some activities provide suggestions for context; however, classroom themes and events will often provide the context in which the activities should be used and may affect the order of the activities. Prior to this unit, ask students to bring bags of 20 small things to count.

Activity 1: Counter Grab Bag (GLEs: 1, 2, 8, 11)

Materials List: paper bag, 10 counters per student in a group

Small Groups: Have students sit in a circle on the floor. Ask the students to take turns grabbing a handful of counters from a paper bag. Each time a handful is taken, ask the student to place the counters in front of him or herself so everyone can see how many were grabbed. After each student grabs a handful, ask if there are more or less than the last student's handful. Then count and compare the piles of counters. Introduce the words *equal, not equal, greater than, and less than*. Check for understanding and use of comparative vocabulary and the accuracy of counting with 1-to-1 correspondence.

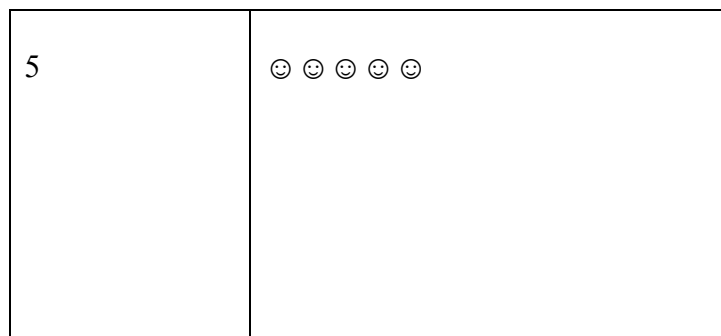
Teacher Note: To maintain high student interest, the teacher should vary the counters with other types of objects that can be easily counted. Examples may include: florist marbles, acorns, small erasers, or shells.

Activity 2: Grid Counting (GLEs: 1, 2)

Materials List: Grid Paper BLM, counters, numeral cards 11 – 20, overhead projector, paper, stickers/stampers with stamp pads, crayons

Small Groups: Make a copy of the Grid Paper BLM for each student. Have students practice one-to-one correspondence by having them count and place one counter in each square of the grid. After allowing students to practice using the counting grids, show them a numeral card (11–20) and ask students to show the correct number of counters on the grid. Repeat with other numeral cards until all numerals through 20 have been shown on the grid. In a whole group situation, use an overhead projector to model and help the students check their work.

Centers: Students will use a modified version of the *split page note taking* ([view literacy strategy descriptions](#)) technique to create a book of numbers from 1 to 20. *Split-page notetaking* is an organized way to take notes. A sheet of paper is folded vertically so that one-third of the width of the paper is to the left of the fold.. Terms are written in the section to the left and definitions are written to the right of the fold.



In this modified version, the students will write a number on the left side of the paper, and stamp, draw or place stickers to equal that number on the right side of the paper. Students can use these notes to help them review material in an organized way. Show students how to cover the number in the left column and use the stamps, drawings, or stickers in the right to recall the number. Students can quiz each other with their notes, too.

Activity 3: Number Line (GLEs: 1, 4, 5, 7)

Materials List: number line

Whole Group: Display a number line from 0 to 20 in a prominent place in the classroom. At least once daily, have students chorally recite the numbers on the line while you or a student point to each numeral. Cover one number and ask students which number is missing. Count backwards from a given number. Ask questions such as, “What number comes before ___? What number comes after ___?”

Activity 4: Hidden Counters (GLEs: 1, 2, 4, 5, 8)

Materials List: counters, plastic tubs, number cards

Small Groups: Hide sets of counters (up to 20) under several plastic bowls. Tell students that they will have to find the tub covering a specified number of counters.

Show a number and ask students to take turns lifting the tubs so all can see whether they have uncovered the number named. When there is a match, remove the bowl and the matching number card. Count together to see if they have found the set of counters that matches the number named. If they think they have not, they should tell whether there are more or fewer counters than the desired number.

Variation: Using the same bowl technique, have students roll a number cube to determine the desired number to “hunt” for. Also, using the number line, have them take turns identifying the number(s) found between two given numbers.

Teacher Note: Vary this activity by changing the containers and the counters. Other types of manipulatives/counters might include small plastic toys, buttons, seasonal items such as small Christmas ornaments, or natural items such as stones, acorns, or shells. Other types of containers might be small baskets or bowls.

Activity 5: Dot Cards (GLEs: 2, 4, 8)

Materials List: dot cards, small counters, plastic bowls

Small Groups or Centers: Use dot cards (like dominoes) representing the numbers from 11–20 and small counters to create a concentration game. Hide the dot cards under half of the plastic bowls, and hide the matching sets of counters under the other half. Ask students to take turns looking for the matches. Students who find a match may remove the pair of matching bowls and counters. If there is no match, replace counters and cards under the tubs in their original positions. Observe and assist students who need extra help counting larger numbers.

Variation: Use the plastic bowls in a concentration game, but change dot cards to numeral cards (11–20). At times, use number names instead of numeral cards. Change out the cards and counters or use all four (dot, numeral, number word, and counters) variations in the game.

Activity 6: Connecting Cubes (GLEs: 1, 2, 4, 5, 7)

Materials List: linking cubes, number line, chart, number cards 1 - 20

Small Groups: Give students a certain number of linking cubes. Students will count and recount the linking cubes. Show a numeral card for numbers up to 20 and have students build a tower, stack, or train to represent it. Then have them announce, “Separate.”

Have students separate or break the cubes apart and estimate the total number of cubes they now have. Some students may believe that there will be a different total number of cubes when the cubes are separated. Ask students to count (aloud) together to check for accuracy. Once everyone has counted forward to the total number of cubes and then backward, repeat with different numbers and observe the students counting forward and backward with accuracy. Also, ask students to use a number line to identify the number(s) found between two given numbers and to identify numbers coming before and after a given number.

Independent Work: Ask students to write and draw in their math *learning logs* ([view literacy strategy descriptions](#)) when they have needed to count objects up to 20 in real-life situations. Students who are not developmentally ready to write may illustrate or dictate their responses. A math *learning log* is a notebook that students keep in order to record ideas, questions, reactions, and new understandings. Documenting ideas in a log about content being studied forces students to “put into words” what they know or do not know. This process offers a reflection of understanding that can lead to further study and alternative learning paths. It combines writing and reading with content learning. The math *learning log* will be used as a reference to guide further study and to assess progress and understanding.

Activity 7: Cube Stacks and Trains (GLEs: 7, 10)

Materials List: 20 linking cubes per student (10 each of two colors)

Small Groups: Challenge students to name a number that is one more or one less than a number called out by the teacher, without counting. Each student will have 20 linking cubes (10 of one color and 10 of another). Make a train using one set of same colored cubes (10). Announce that everyone should add one cube of the second color.

Ask, “How many are there now?” Count and check. Add another. Ask, “How many there are now?” Continue to add cubes. Once you reach 20 cubes in all, begin to go

backward and subtract one cube each time, asking how many there are. Ask students to guess, and then count together each time. Check students' responses and their cube stacks or trains each time a cube is added or taken away.

Activity 8: Counting with Beans (GLEs: 2, 5, 7, 10)

Materials List: beans (or other small objects), bowl, paper, pencil or individual chalkboards, number line, overhead projector

Small Group or Whole Group: Display 10 beans or other small objects and then quickly cover them with a bowl. Ask students to write the number for how many beans they think are under the bowl. Lift the bowl and ask the students to count aloud to check.

Begin to take away one or two beans at a time, telling students the number of beans being removed. Ask, "How many are under the bowl now?"

Show students how to use a number line to locate the number of beans under the bowl and how to count back one or two when beans are taken away. Provide the same explanation when adding beans. The number line will also help the students in writing the numerals. Count together each time beans are added or removed and check for correct responses (written and auditory). When using this activity in a whole group setting, use an overhead projector to show the students the beans.

Each time beans are removed, ask students to write the answer on a piece of paper or an individual chalkboard. After taking beans away for several minutes, begin adding the beans. Each time you add beans or take them away, have students tell you how many you took away or added.

Activity 9: What Position? (GLE: 3)

Materials List: 10 different colors of linking cubes

Whole Group: Students will participate in a *brainstorming* ([view literacy strategy descriptions](#)) activity where they will give opinions about whether or not it is always best to be first in line. When would it be better to be last in line?

Small Groups: Use 10 different colored linking cubes or counters to make one cube train for each student in the group. All trains should be the same (i.e., same color order).

Place a cube train horizontally in front of each student. Begin asking questions about the positions of certain cubes in the train. Pose different questions to the students such as, "What color is the cube that is in the fifth position?" or "What is the position of the yellow cube?" The purpose is to see if students can understand and use ordinal number words both receptively and expressively.

Teacher Note: Ordinal position can be addressed in many daily routines: lining up, order for games, order for performing tasks, and so on.

Activity 10: How Many in the Tub (GLEs: 2, 4, 14)

Materials List: 5 containers of various sizes, counters, record sheet, marker, Tub Recording Sheet BLM

Small Groups or Centers: Using different sized containers that will hold 11–20 counters (tiles, cubes, or beans), completely fill each of 4 or 5 different-sized containers with the counters. For each set of containers, use the same kind of counter. Label each container with letters A-E.

Place the containers in the center of a table, and give each student a copy of the Tub Recording Sheet BLM. Have students estimate how many counters are in a container and then count to find out. Write this number on the recording sheet next to the picture of a tub that has the same label (A-G) as the real tub. Students should continue until they have estimated and counted the cubes in all of the containers.

Activity 11: One More and One Less (GLEs: 2, 4, 10)

Materials List: 21 linking cubes per student, number cards 11 – 20 one card per student

Small Groups: Distribute at least 21 linking cubes to the students and place a card showing a number between 11 and 20 in front of each student. Ask the students to show how many cubes correspond to *one more than* the number on the card. Repeat at least four more times using different number cards. Repeat the activity for *one less than* using the number card given. Repeat four more times so that all of the number cards are shown.

Activity 12: Cookie Countdown (GLEs: 1, 2, 4)

Materials List: Cookie Jar BLM, mini chocolate chip cookies, number cards 1 –10, Cookie Cards BLM

Large Groups: Have students sit in a circle on the floor and place the cookie jar drawing from the Cookie Jar BLM in the middle of the circle. Put 10 mini chocolate chip cookies on the drawing. The class will count the cookies.

Ask students to hide their eyes and take a cookie from the “jar.” Have students look and say, “Who took the cookie from the cookie jar?” Point to a student to accuse him/her of taking the cookie from the cookie jar and the rest of the group will say, “(Student's name) took the cookie from the cookie jar” Then the student accused will say, “Who me?” and

the group will say, "Yes, you!" Then the student accused will say, "Couldn't be!" and the group will say, "Then who?"

Students will hide their eyes again and another cookie will be taken from the jar. The class will count the cookies in the "cookie jar," and the student accused in the first round will pick another student and say his/her name. Start over with "(Student's name) took the cookie from the cookie jar" and continue the game until all cookies are gone.

Small Groups or Centers: Students can match cookie cards to number cards using the Cookie Cards BLM.

Activity 13: Ordinal Number Roller Coaster (GLEs: 3)

Materials List: computer, Ordinal Circles BLM

Whole Group: Have students practice lining up by ordinal numbers. Students will complete Ordinal Circles BLM as the teacher reads the direction.

Small Groups or Centers: Play the ordinal number game, "Count Us In" found at <http://www.abc.net.au/countusin/games/game4.htm>. This game allows students to put children in roller coaster cars by ordinal numbers.

Activity 14: Frequent Flyer Measurement (GLEs: 8, 14)

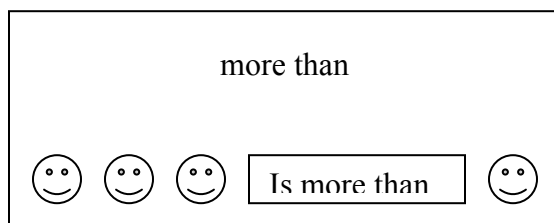
Materials List: book: *Ladybug on the Move* by Richard Fowler, yarn, Vocabulary Cards BLM, Lady Bug Ruler BLM, tape, chart paper/poster board

Whole Group: Read the book *Ladybug on the Move*. The book is designed to be interactive and involves the adventures of a ladybug as she travels in search of a new home. Unfortunately, every place she finds is already occupied. The book comes with a ladybug that moves from page to page throughout the story to engage student interest. The book provides a great opportunity for measuring short increments of distance on each page.

After reading the story to students, turn back through the book and allow students to estimate which page shows the longest trip the ladybug made. Measure the trip on three or four pages using precut yarn. Tape each piece of outstretched yarn to chart paper or poster board in front of the class, and record which path it represents (for example, "leaf to stone"). This exercise illustrates measuring distance with yarn (a nonstandard measure). Ask students to compare the lengths. This activity will give students the chance to compare length and discuss such concepts as shorter, longer, and more than, less than.

Small Groups or Centers: Have students make a modified version of *vocabulary cards* ([view literacy strategy descriptions](#)) for the terms shorter, longer, and more than or less

than. *Vocabulary cards* are designed to present a term, examples and definition of the term, and the critical attributes associated with the term. These *vocabulary cards* are modified as students will only illustrate the terms using the Vocabulary Cards BLM.



These vocabulary cards can be used to study throughout the year. They may also be taken home for parents to use as review for their child.

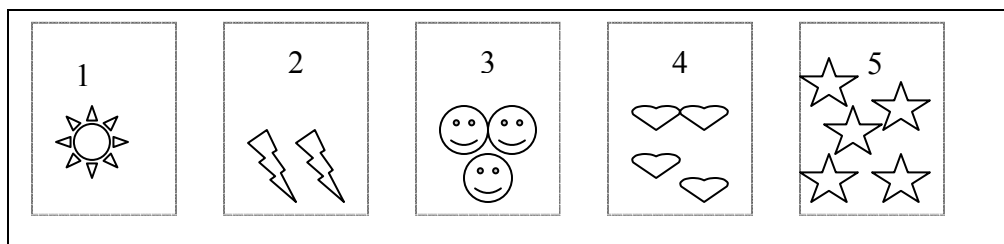
Independent or partner groups: Allow students to measure objects found in the room using the lady bug rulers from Lady Bug Ruler BLM. Have students look at two objects and estimate which one would be longer. Then, have students check their estimation by checking with the ladybug rulers.

Activity 15: Number Board (GLEs: 1, 2, 4)

Materials List: 20 large index cards; a strip of bulletin board paper cut the same height (or slightly larger) as the index cards; glue; crayons, stamps, or stickers

Individual Work: Students will each make a number card for a number 1-20. Have them use crayons, stamps, or stickers to illustrate the same number of objects that the number on their card represents.

Whole Group: Have the class create a modified version of a storyboard *graphic organizer* ([view literacy strategy descriptions](#)) using the cards made from individual work above. Each student will glue his/her card in the correct order to a long piece of bulletin board paper. A storyboard is a graphic, sequential depiction of a narrative. Story boards illustrate the order of events, but this activity sequences numeric order.



Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Teacher observation, anecdotal notes, and portfolios
- Use number cards 1–20 and connecting cubes to determine if the student can place the cards in order, connect cubes and count starting with 1.
- Show the student a pile of loose counters (more than 20), and ask the student to count as many cubes as possible.
- Show the student, numeral cards (11 – 20), and ask the student to count out the same number of counters for each card.

Activity-Specific Assessments

- Activity 1: Show the student a pile of beans (or any nonstandard unit) and ask the student to count and remove 20 beans from the pile. The student will split the pile of beans into two groups, comparing the two piles as *same*, *different*, *equal*, *not equal*, *greater than*, and *less than*. After students split the piles several times, the teacher will give specific directions. For example, “Can you make two piles so that they have the same number? Can you make one pile greater than the other pile?”

Teacher Note: The pile may have to be adjusted each time in order to make certain comparisons. Have the student identify the pile each time it is changed (same, different, equal, not equal, greater than, and less than).

- Activity 3: Ask the student to roll a number cube with dots or numerals marked on each side from 2–10 and to name the number on top. Since the cube only has six sides, six dots or numerals will be placed on each of the sides. The student will keep the same number and use a number line to identify the numbers coming before/after that number and to count forward and backward from that number.

- Activity 5: Use several cards with shapes or dots representing any of the numbers from 1 to 20, and ask the student to use nonstandard units (beans, sticks, or blocks) to show the same number of cubes as there are shapes or dots on the card. The student will count how many cubes are used. There may be a need to demonstrate the task with one card.
- Activity 9: Line up 10 color cubes, and ask a series of questions regarding ordinal positions (e.g., Which color is in the third position?) Assess the student's knowledge of first through tenth positions.
- Activity 12: Provide the student with at least 21 counters, and show a card with a numeral (11–20) on it. The students will then count out one more than the numeral shown. Repeat this activity, but ask the student to count out one less than the numeral shown.

Resources

Children's Books

Fowler, Richard. *Ladybug on the Move*

**Kindergarten
Mathematics
Unit 5: Measurement and Comparisons**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

In this unit, students expand their concepts of measurement with focused exercises and activities, explicitly working on the nature of measure and comparison. Students should practice both the comparative and superlative language that accompanies measurement and the geometric contexts in which they take place. In a like manner, the teaching of time begins with introduction to calendar math, along with the needed vocabulary.

Student Understandings

Students should be able to use measurement language, measure length in nonstandard units, compare capacities, and talk about the measurement of time by discussing calendars and clocks.

Guiding Questions

1. Can students find the nonstandard measure of the length of the object and compare capacities or volumes of containers?
2. Can students use appropriate measurement and comparative language?
3. Can students describe the measurement of time, sequence activities by time of day, and show rudimentary knowledge of a calendar?

Unit 5 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Number and Number Relations	
2.	Count a set of 20 or fewer objects by establishing a 1-to-1 correspondence between number names and objects (N-1-E) (N-3-E) (A-1-E)
3.	Use the ordinal numerals 1 st through 10 th to discuss positions in ordered lists (N-1-E)
Algebra	
11.	Use the words <i>same</i> , <i>different</i> , <i>equal</i> , <i>not equal</i> , <i>greater than</i> , and <i>less than</i> while using concrete objects for comparative models (A-1-E)

GLE #	GLE Text and Benchmarks
Measurement	
13.	Use vocabulary such as: <i>yesterday, today, tomorrow, hours, weeks</i> , names of days, names of months; sequence events; and identify calendars and clocks as objects that measure time (M-1-E) (M-2-E) (M-5-E)
14.	Measure and estimate length and capacity using non-standard units (e.g., sticks, paper clips, blocks, beans) (M-2-E) (M-3-E)
15.	Use comparative and superlative vocabulary in measurement settings (e.g., <i>longest, shortest, most, hottest, heaviest, biggest</i>) (M-3-E) (M-1-E) (M-2-E)
Geometry	
18.	Use words that indicate direction and position of objects and arrange an object in a specified position and orientation (e.g., <i>between, behind, above</i>) (G-3-E)

Sample Activities

Some activities provide suggestions for context; however, classroom themes and events will often provide the context in which the activities should be used and may affect the order of the activities.

Activity 1: Measuring with String (GLEs: 11, 15)

Materials List: string, yarn or ribbon, plastic eggs or film canisters

Whole Group: Cut a piece of string, yarn, or ribbon into different lengths (e.g., 2", 4", 4", 8", 8", 9", 10", 12") and place each ribbon in a plastic egg or film canister. Ask a student to open an egg or canister and show the class the ribbon. Open another egg or canister. Ask if the second ribbon is shorter, longer, or the same as the first. Decide the best way to compare length. Repeat opening eggs or canisters and comparing lengths. Make sure that students know that one of the ends of the two ribbons must start in the same place to compare their lengths. If short on eggs or canisters, put ribbons back in eggs or canisters to allow all students a chance to open and compare ribbon lengths. Make these materials available to students during center time so they can compare and order the ribbons from shortest to longest as an exploration activity.

Activity 2: Cubes and Strings (GLEs: 2, 14, 15)

Materials List: string, yarn, or ribbon, *Inch By Inch* by Leo Lionni, linking cubes, other objects to use for nonstandard measurement.

Whole Group or Small Groups and Centers: Cut two sets of string, yarn, or ribbon into various lengths. One set should be in lengths no longer than ten connecting cubes (7 ½ inches) and the other set in lengths no longer than 20 connecting cubes (15 inches). Introduce the materials to students in a whole group or small group setting by reading

Inch By Inch. Discuss how the inchworm measured things in the story. Demonstrate to students how to use the materials to measure the ribbons before placing them in a center. Have students measure to see how many units linking cubes can be lined up along the string.

Variation: Give students a length of string, yarn, or ribbon, and ask them to measure the item using different units (links, tiles, paper clips). Have them compare the number of each kind of unit required to measure the same object. This will help them to make the connection for themselves that the larger the unit, the fewer it takes.

Activity 3: How Many Feet? (GLEs: 2, 14, 15)

Materials List: picture list of objects to measure, envelope, paper feet, plastic storage bags

Whole Group: Group students into partners or cooperative groups. Provide each group with a picture list of objects in the classroom to measure and a baggie of foot shapes cut from paper. Have each group measure the items on the list using the paper feet. After all groups have measured, have students share what they found out.

A follow-up home learning activity would be to have students take home an envelope of paper feet and a list of things to measure at home. Possible measuring tasks might include the length of the top of the kitchen/dining table, the distance from your bed to the door, or the length of the sofa.

Activity 4: Lighter and Heavier (GLE: 15)

Materials List: items to weigh, large paper bag, balance scale, What I Know About Weight BLMs (Parts A and B), pencil

Independent Work: Students will fill out an *anticipation guide* ([view literacy strategy descriptions](#)) to determine any misconceptions about the concept of weight. The What I Know About Weight BLMs (Part A and B) can be used for this activity. Copy the chart on a large sheet of chart paper, and have students sign their name under the “yes” and “no” columns of each question. An *anticipation guide* is used to draw on prior knowledge. They also allow the student to use their own point of view in formulating interpretations. The students will revisit the *anticipation guide* after the following group activity.

Whole Group or Small Groups: Use 5–10 common household/classroom items of varying weight (e.g., wooden block, tennis ball, box of pencils). Place all items in a large paper bag. Choose two students to reach in and pull out one object each. Ask which one they think weighs more and why. Predict what will happen when the heavier object is placed

on the scale. Check estimates using a balance scale. Repeat questions for each object using such vocabulary as *heavy, heavier, light, lighter*.

Follow the group lesson by placing materials in a center for students to weigh on a balance scale. To maintain interest in the activity, change out the objects to be weighed and encourage students to bring objects from home, the playground, or around the classroom to the center to be weighed.

Students will return to the *anticipation guide* and, if necessary, make changes to their initial response to the two statements. Have a discussion about their responses to make sure students are clear about the concept of lighter and heavier.

Activity 5: Do They Balance? (GLEs: 11, 15)

Materials List: small objects to weigh, balance scale, Sorting Chart for Weights BLM, math learning logs

Small Groups and Centers: Provide students with a copy of the Sorting Chart for Weights BLM, a collection of small items to weigh, and a balance scale. Students will use the Sorting Chart for Weights BLM to sort items into categories: heavier, lighter, equal. Demonstrate for students how to choose two items from the collection. Place one item in each pan, and determine which one is heavier, which is lighter, or if the items weighed are about equal. Show students where to place items on the Sorting Chart for Weights BLM.

Variation: Instead of a sorting chart, have students draw the items on individual sorting mat worksheets.

Independent Work: Ask students to write and draw in their math *learning logs* ([view literacy strategy descriptions](#)) about other places they have seen scales to weigh things. A math *learning log* is a notebook that students keep in order to record ideas, questions, reactions, and new understandings. Documenting ideas in a log about content being studied forces students to “put into words” what they know or do not know. This process offers a reflection of understanding that can lead to further study and alternative learning paths. It combines writing and reading with content learning. The math *learning log* will be used as a reference to guide further study and to assess progress and understanding.

Activity 6: Jars of Rice (GLEs: 11, 14, 15)

Materials List: different sized plastic jars, rice, measuring cup

Small Groups and Centers: Fill a jar with rice. Show students a measuring cup. Ask students whether the measuring cup will hold the *same or a different* amount of rice as

the jar. Next, ask students if the cup would hold amounts *equal to* or *not equal to* the amount of rice in the jar. Accept all answers.

Pour rice from the jar to the measuring cup. Ask which holds more or less rice and why. Discuss what would happen if different-sized jars were used with the same measuring cup. Allow students to experiment with different-sized plastic jars and the same amount of rice. Identify which jars hold the *same*, *different*, *equal*, and *not equal* the amount held in the measuring cup. Following the lesson, add the materials to a center such as the sand and water, sensory, or discovery center so that students can further explore the concepts.

Activity 7: Calendar Counting (GLEs: 2, 13)

Materials List: number cards, paper bag, calendar

Whole Group: Place number cards in a bag (1–30 or 31, depending on the month). Choose 4 to 5 students each day during “calendar time” to pull a number card from a bag, say the number, and then match the number card to the number date on the calendar and name corresponding day. When all dates on the calendar are matched to number cards, say them in order together (1, 2, 3, and so on). Name a date (number) and ask students to find the date on the calendar. While pointing to the date, move pointer or finger straight up to identify the day of the week (Monday through Sunday). Continue to ask students to identify on which day of the week their number card is located.

Activity 8: Days of the Week (GLE: 13)

Materials List: Days of the Week Cards BLM, Months of the Year Cards BLM, card stock

Teacher Note: Prior to the lesson, the Days of the Week Cards BLM and the Months of the Year Cards BLM should be printed on card stock, and then cards should be cut apart.

Small Groups: Spread out all of the Days of the Week Cards BLM face down. Have students turn over two cards at a time and read them out loud. If the cards match, they keep the pair; if not, they will turn them back over.

Have students lay out days-of-the-week cards in the correct order, starting with Sunday and ending with Saturday. Have students sing a “Days of the Week” song pointing to each day in order as the song is sung so that non-reading students can practice saying and “reading” the days of the weeks.

Variation: Make up another concentration activity using the Months of the Year Cards BLM instead of days.

Activity 9: Picture Your Day (GLE: 13)

Materials List: paper, crayons, glue, book: *All in a Day* by Mitsumasa Anno

Whole Group: Read *All in a Day*. Have students draw three separate pictures showing something they do in the morning, during the day, and at night. Glue the pictures on a piece of paper in the order they occur, and number each picture with 1st, 2nd, 3rd (or morning, midday, and night).

Small Groups: Students will each make a *story chain* ([view literacy strategy descriptions](#)). Give each student three paper links. They will draw what happened first, next and last in the story, on the links and glue them in order. They will use the story chain to retell the story to their families.

Activity 10: Daily Schedule (GLE: 13)

Materials List: book: *The Grouchy Ladybug* by Eric Carle, pictures of daily classroom activities

On a day prior to this lesson, take photos of classroom activities throughout a day. These photos will be used in the small group activity below.

Whole Group: Read *The Grouchy Ladybug*. Discuss the purpose of the long hand and short hand (hour and minute) on a clock. Point out the classroom daily schedule.

Questions to help the students relate the daily schedule to time include:

- Who knows what time we'll go to lunch today?
- What will our class be doing at 10:00?
- What is the second thing that will happen after lunch today?
- What do we do before lunch? What do we do after lunch?

Small Groups: Students will use a modified version of the *split-page notetaking* ([view literacy strategy descriptions](#)) technique to create a classroom schedule. *Split-page notetaking* is an organized way to take notes. In this modified version the teacher will write numbers in the left column to signify which activity will happen during the 1st hour, 2nd hour, and so on. The students will organize photos of classroom activities in the order that they occur throughout a day. For example:

1.	Photo of teacher taking roll
2.	Photo of students doing morning centers

These “notes” are used to create a record of learning and can be used to review material by covering one column and using information in the other to recall the covered information. For example, the right column could be covered and students could be asked what happens first each day.

Allow students to *brainstorm* ([view literacy strategy descriptions](#)) about times that we might need to use a clock.

Brainstorming is a technique for generating ideas. It is based upon the belief that when a great number of ideas are generated, the chances of uncovering a good idea or solution are increased. Ground rules are essential for this activity to be effective and successful:

- All critical judgment is suspended. List all ideas without judging them. Passing judgment inhibits creativity and decreases the number of ideas generated;
- Quantity is more important than quality;
- Build on other peoples' ideas and modify them. Write their ideas on a chart.
- Ensure that all students participate.

For example:

We might need to use a clock when . . .

Activity 11: Before and After (GLE: 13)

Materials List: none

Whole Group: As part of the daily routine, discuss with students what happens *before* and *after* certain events. Answers and discussion will vary.

- What do you do before you eat breakfast?
- What happens after you leave school?
- What do you do before you go to bed?
- What do you do after you eat supper?

Vary questions to suit your students. Encourage students to use the words *before* and *after* in reference to time sequence throughout daily activities.

Activity 12: What’s Next? (GLE: 3, 13)

Materials List: sequence pictures, familiar stories or nursery rhymes

Whole Group or Small Groups: Use familiar stories or nursery rhymes to help students practice sequencing events. Using a nursery rhyme such as *Little Miss Muffett*, have students tell what happened first, next, and last. Provide students with visual cues such as pictures of the story events, flannel board figures, or hand motions to help them recall the sequence of events in the story.

Variation: Provide students with picture cards with a sequence of 3 or 4 related events and ask them to put the pictures in order.

Activity 13: Comparing and Sorting Pencils (GLEs: 15, 18)

Materials List: pencils of varying lengths and colors, Comparing Lengths Paper Mat BLM

Small Groups and Centers: Distribute different lengths and colors of pencils to each student and have them compare lengths (same, longer, shorter). Once students have compared the lengths, have students put the shortest pencils between two other pencils that you specify. Use other words that help students learn about positions and orientations of objects. For example, using the Comparing Lengths Paper Mat BLM with a horizontal line across it, ask students to sort the pencils, as directed, into groups above and below the line. For example, put the shortest blue pencil above the line or place the red pencil across the blue pencil.

Partners: Allow the students to play a modified version of *professor-know-it-all* ([view literacy strategy descriptions](#)). The *professor know-it-all* strategy is appropriate after information is learned. One student will be given the opportunity to be the “expert” or “the teacher.” Each student in the pair will take turns being the teacher. “The teacher” will put a group of items in order of length, then partners will switch places. The “teacher” will ask the “student” questions such as, “Which is longer?” Simple props may be used, such as ties, mortar boards, and clip boards, to give the know-it-alls the look of experts.

Variation: Using blocks and small animal figures, place the animals in various positions or locations relative to the blocks, and ask the student to tell where the object is, using appropriate vocabulary (e.g., *between, above, behind*).

Activity 14: When Time Flies (GLE: 13)

Materials List: timer, paper, pencil

Whole Group: Set a timer for one minute so that students can see how long a minute is. When one minute is up, set the timer for one hour. When the timer goes off, set timer for one minute. See how many times students can write their names in one minute. Continue this pattern throughout the day (i.e., at the end of each hour students will do various activities for one minute such as hop, see if they can say the entire alphabet, and so on). Students will resume daily activities while waiting for the timer to go off between hours.

Small Groups or Centers: Students will be divided into two groups. One half of the students will do one activity, and the other half of the class will do another. Students will compare the two activities to see which takes longer. Sample activities could be tying shoes or buckling a belt, eating an M & M or eating a cookie.

Activity 15: Yesterday, Today, and Tomorrow (GLE: 13)

Materials List: calendar used in Daily Math Activities

Whole Group: Review calendar daily and discuss what day *today* is. Then, review what day of the week *yesterday* was and what day of the week *tomorrow* will be. Teach students the *Yesterday, Today, Tomorrow* song by Ron Brown. The tune for the song can be heard on the following web site:

<http://www.songsforteaching.com/intellitunes/yesterdaytodaytomorrow.htm>

Yesterday is the day before today,
Day before today,
It happened already.

Yesterday is the day before today,
Day before today,
It happened already.

Today is today.
It's what's going on.
It's what's going on.
It's just what's happening.

Today is today.
It's what's going on.
It's what's going on.
It's just what's happening.

Tomorrow is the day after today.
After today,
I wonder what will happen.

Tomorrow is the day after today.
After today,
I wonder what will happen.

Yesterday, Today, Tomorrow!

Independent Work: Ask students to write and draw in their math learning logs ([view literacy strategy descriptions](#)) about what they did yesterday at recess, and what they plan to do tomorrow at recess.

Activity 16: What Comes Next? (GLE: 3, 13)

Materials List: objects to use to make sounds

Whole Group: Develop the students sequencing skills with simple activities such as sequencing sounds. For example, make two sounds (blow a whistle, and snap fingers). Ask students to tell which sound they heard first and which they heard next. As students show increased abilities add a third sound, and introduce the word: *last*.

Extension Activity: Have families create a timeline of daily events at their home using pictures or photographs. Students will bring these projects to school to share.

Activity 17: Story “Time” (GLE: 13)

Materials List: paper, pencil, crayons, a book to show a sequence of events

Whole Group: Read a simple story about an event taking place over time (e.g., building a snowman or planting a seed). Show in sequence three pictures of that event which take place from beginning to end.

Small Groups: Students will fold a piece of paper into three sections. They will draw a picture of events that happened first, next, and last in the story in each section of the paper.

Activity 18: Yesterday, Today, and Tomorrow (GLE: 13)

Materials List: calendar, cards for yesterday, today, and tomorrow, cards for days of the week

Whole Group: Throughout the year, the calendar should be used to teach students concepts of time. Cards for yesterday, today, and tomorrow should be placed beneath the calendar and have students place days of the week cards beneath each card daily. The terms *yesterday*, *today*, and *tomorrow* should be used in daily conversations with the students.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Make student observations, anecdotal notes, and portfolios
- The student will use the class calendar to find all of the dates on a particular day of the week.
- The student will identify a clock as a means of telling time.
- The student will compare concrete sets of objects relating to quantity and size (e.g., *same*, *different*, *greater than*).
- The student will be given a set of objects and one or two attributes to sort into two sets.

Activity-Specific Assessments

- Activity 1: The student will use manipulatives to measure the length of certain objects (pencil, book, block, string) and tell how long each object is.
- Activity 5: The students will weigh two different items on a balance scale and identify the heavier and lighter item. The activity will be repeated at least three times with different items.
- Activity 8: The student will lay out all days-of-the-week cards in the correct order, starting with Sunday and ending with Saturday.

- Activity 9: The student will arrange a series of three pictures in correct sequence from morning, midday, and night.
- Activity 12: The students will arrange a series of three pictures depicting a sequence of events: first, next, and last.

Resources

Children's Books

Carle, Eric. *The Grouchy Ladybug*.

Leoni, Leo. *Inch By Inch*.

Mitsumasa, Anno. *All in a Day*.

**Kindergarten
Mathematics
Unit 6: Shapes, Sizes, and Solids**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

This unit focuses on the further development of students' recognition of shape and size of two- and three-dimensional objects. Students are encouraged to develop the more formal names of rectangular solids, cylinders, cones, spheres, and so on, but this terminology is not a requirement.

Student Understandings

The essential understandings that students should develop are identification and attribute characterization of the basic shapes of circles, squares, rectangles, triangles, rhombuses, balls, boxes, cans, and cones. Some care should be taken to see that students see the connections between two-dimensional and three-dimensional counterparts. Also, students should develop the language skills that parallel their concept development.

Guiding Questions

1. Can students identify the basic two-dimensional geometric figures and discuss their attributes?
2. Can students identify balls, boxes, cans, and cones?
3. Can students compare and contrast the shapes with respect to one or two attributes?
4. Can students complete shape puzzles and arrange pieces to match given shape patterns?
5. Can students draw the basic two-dimensional figures with some accuracy?

Unit 6 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Number and Number Relations	
2.	Count a set of 20 or fewer objects by establishing a 1-to-1 correspondence between number names and objects (N-1-E) (N-3-E) (A-1-E)
Geometry	
16.	Name and identify basic shapes using concrete models (e.g., circles, squares,

GLE #	GLE Text and Benchmarks
	triangles, rectangles, rhombuses, balls, boxes, cans, cones) (G-2-E) (G-1-E) (G-4-E) (G-5-E)
17.	Compare, contrast, and sort objects or shapes according to two attributes (e.g., shape and size, shape and color, thickness and color) (G-2-E)
18.	Use words that indicate direction and position of objects and arrange an object in a specified position and orientation (e.g., between, behind, and above) (G-3-E)
19.	Investigate the results of combining shapes (using paper shapes, pattern blocks, tangrams, etc.) (G-3-E) (G-1-E)
20.	Draw circles, squares, rectangles, and triangles (G-4-E)
Data Analysis	
22.	Collect and organize data in a simple bar graph using pictures or objects (D-1-E) (D-3-E)

Sample Activities

Some activities provide suggestions for context; however, classroom themes and events will often provide the context in which the activities should be used and may affect the order of the activities.

Activity 1: Shapes All Around Us (GLEs: 16, 17, 18, 20)

Materials List: *Shapes, Shapes, Shapes* by Tana Hoban, items of various shapes, chart paper

Whole Group: Students will provide information for teacher to write on a *graphic organizer* ([view literacy strategy descriptions](#)) prior to beginning this unit. The *graphic organizer* used for this purpose will be a KWL. The KWL teaching technique is a good method to help students activate prior knowledge. It serves as way to model active thinking.

K – stands for what students think they already know about shapes.

W – stands for what the students want to know about shapes.

L – stands for what the students learned about shapes after instruction.

The class can complete the L portion of the chart in their math *learning log* at the conclusion of the unit.

K – What I think I know	W – What I want to know.	L – What I learned
<ul style="list-style-type: none"> A window is a triangle A triangle has points 	<ul style="list-style-type: none"> I want to know the names of shapes. I want to know which is a rectangle and which is a triangle. 	

After the K and W portion of the chart are complete, read the book *Shapes, Shapes, Shapes*. Have students point out and name shapes they see in the book. Ask students to point out similar shapes in the classroom. Provide an assortment of items in various shapes. Lead students in a discussion of shapes.

Independent Work: Have students draw their favorite shape and tell why they like it best in their math *learning log* ([view literacy strategy descriptions](#)). A math *learning log* is a notebook that students keep in order to record ideas, questions, reactions, and new understandings. Documenting ideas in a log about content being studied forces students to “put into words” what they know or do not know. This process offers a reflection of understanding that can lead to further study and alternative learning paths. It combines writing and reading with content learning. The math *learning log* will be used as a reference to guide further study and to assess progress and understanding.

Activity 2: Rubber Band Shapes (GLEs: 16, 17, 20)

Materials List: geoboards, rubber bands, shape cards, paper, writing tool

Small Groups: Using geoboards and rubber bands, have students work in twos, threes, or fours to answer the following questions: Can you work together and make a shape with your rubber bands? How many corners will your shape need? How many sides? Will the sides be different? Can you look around the room and find a shape that is the same shape as yours? Check students’ rubber-band shapes; discuss answers to the previous questions.

Variation: Assign a specific shape for students to create on the geoboards.

Centers: Add the geoboards and shape cards to centers for students to explore and create shapes on their own. Include paper and writing tools for students to draw the shapes they create on the geoboards.

Activity 3: Cookie Shapes (GLEs: 16, 17, 20)

Materials List: margarine, salt, light corn syrup, confectioner’s sugar, small cup or bowl, large spoon

Small Groups: Review the characteristics of circles, squares, and triangles with students. Explain that they are going to make a cookie and mold it into one of the shapes discussed. Use the recipe below to give students a chance to measure ingredients, mix the dough, and form a circle, square, or triangle.

- One-third cup of margarine
- One-third cup of light corn syrup

- One half teaspoon of salt

After these ingredients are well blended, add one and a half cups of confectioner's sugar, and knead the dough until it reaches the right consistency. This dough can be combined with any flavor extract to match any color desired.

Assist each student as he/she measures and mixes the ingredients in a small cup or bowl. Show students a circle, a square and a triangle, each cut from construction paper or cardboard. Discuss how many sides and the lengths of the sides for each shape. Ask students to work quickly to form a triangle, a square, or a circle cookie. When all cookies are formed, put them on a small plate or napkin, and lay them out on a graph. Discuss and compare the number of cookies with each shape. Also have student identify differences/similarities in the cookies for each shape (e.g., all triangular cookies have the same number of sides, but are not the same size). Record student observations. Have volunteers reflect and retell steps of making their cookies using ordinal numbers (first, second, third). Eat cookies and enjoy!

Activity 4: Chalkboard Drawing (GLEs: 16, 17, 20)

Materials List: chart paper, drawing paper or individual chalkboards, writing tools/chalk, pipe cleaners

Whole Group: Draw a large shape on the chalkboard. Discuss its attributes with the class. Are the edges straight or curved? Does it have any corners? How many? How long are the sides? Are the sides the same length or different? Record answers to the questions on chart paper. Cover the chalkboard drawing with the chart paper, and ask students to help each other draw the same shape on their individual chalkboards or drawing paper. When all drawings are finished, take a peek at the original again and check it, one part at a time, to see how many of its attributes they were able to draw correctly.

Small Groups: Each student will be given an opportunity to be *professor know-it-all* ([view literacy strategy descriptions](#)). The *professor know-it-all* strategy is appropriate to use after information is learned. Assign a shape to each student. He/she will be expected to model the shape with a pipe cleaner, and tell how many sides and corners their shape has. To create the impression of expertise, the know-it-alls may use simple props, such as clipboards or graduation hats. They should also be prepared to answer questions from the other students.

Activity 5: Tracing Shapes (GLEs: 16, 20)

Materials List: cardboard templates for shapes, drawing paper or paper on easel, paint, paint brushes, writing tools

Centers: Using large cardboard templates of various shapes, have each student trace around the cardboard template onto drawing paper or paper on an easel. Encourage the students to help each other as they figure out how to trace around the template to complete the figure. Allow students paint the inside of their shapes as they wish. Check student drawings to see if the shapes are complete and accurate.

Activity 6: Comparing Shapes (GLEs: 16, 17)

Materials List: pattern blocks, beads or other manipulatives, trays or box lids

Small Groups or Centers: Place various sizes of pattern blocks, beads, or other shape manipulatives of different shapes and sizes on a tray or box lid. Ask students to hold a particular kind of block (e.g., a square). Count the sides. Count the corners. Compare it to another shape (for example, a triangle). How are the shapes the same? How are the shapes different?

Pour out all the blocks and sort them with the students. How many ways can they find to sort them? Check the sorts made by each group, and observe the attributes used in each sort.

Activity 7: What Can a Circle Be? (GLEs: 16, 20, 22)

Materials List: individual chalkboards or drawing paper, magazines, paper, glue, writing tools/chalk

Small Groups or Centers: Ask students to draw a circle on individual chalkboards or drawing paper. Ask them then to turn it into something (e.g., sun, face, button, wheel, and so on). Discuss the various items that the students made with the circles. Classify and graph the findings.

Variation: Ask students to search for things in magazines that are circles and cut them out. Make a big book or poster with the circle items. Be sure each page includes a descriptive sentence, either written by the students or recorded by an adult. Together, count the number of items found. Classify and graph the findings.

Activity 8: Slice It Your Way (GLEs: 16)

Materials List: three slices of bread, knife, brown paper squares, glue, small plates

Whole Group or Small Groups: Using three slices of bread, ask students how they like to cut their bread in half. Demonstrate how to cut horizontally, vertically, and corner to corner using the pieces of bread. Distribute brown squares for students to cut in one of the three ways. Have students glue paper “bread” slices onto a small plate and graph

them according to how they cut the bread. Count or tally how many students cut horizontally to make rectangles, vertically for rectangles, or corner to corner for triangles.

Activity 9: Shape Designs (GLE: 19)

Materials List: Tangrams BLM, paper, colored paper, glue, pattern blocks (optional)

Small Groups and/or Centers: The teacher will need to cut sets of the tangram shapes for the children prior to the activity. Allow students to create pictures and designs using Tangrams BLM. Give them a limit as to how many shapes they can use (e.g., 4, 5, or 6) in their picture. It is sometimes advantageous to limit their creation to a certain number of a single shape (e.g., all triangles). Tell them that each shape must touch at least one other shape in the design. Ask questions regarding the different shapes that may result when combining two or more shapes. Are the shapes the same or different? Have the students exchange pictures. Ask the students to look at the picture that they have and tell if they could make the same picture or design using different tangram shapes.

Note: This activity can also be done with pattern blocks.

Activity 10: Shape Walk (GLEs: 2, 16, 18, 20)

Materials List: paper, pencil

Whole Group or Small Groups: Pick a shape that students are studying to be used in this activity. Explain to students that they will go on a shape walk. Lead the class around the school as they search for the designated shape. Ask students questions about the location of the shapes (e.g., Is the rectangle in front of or behind that circle?) Once students have returned to the classroom, ask the students to draw one of the shapes they saw on the walk. Ask students to describe their shape and record what they say on their drawings. Create a shape book or poster using their drawings and recorded descriptions. Have students count the number of shape drawings on each page or poster.

Activity 11: Tangram Shapes (GLEs: 16, 18, 19)

Materials List: Tangrams BLM, Tangram Cat Activity Pattern BLM, Tangram Bunny Activity Pattern BLM, overhead projector, overhead transparency sheets

Whole Group: Use the tangram sets made in Activity 9. Also duplicate copies of the cat and bunny tangram BLM patterns, and give them to students or make transparencies of the patterns to display on the overhead.

Students will try to make the cat and bunny shown on the tangram BLMS, but they should first experiment with shape formations. Check student progress and have them verbally tell what they do to make certain shapes. Do the students recognize congruent and similar shapes within the designs? Do students recognize when a shape has been flipped or turned? Ask students to use words that describe the orientation of the tangrams,

as well as words that show position (i.e., the triangle is pointing down, or the larger triangle is between the square and the small rectangle).

Have students use tangram pieces to build the bunny and/or cat tangrams pictured. It may be necessary to model the process for students on the overhead. Be sure that they understand that it may be necessary to combine some of the tangram pieces to form some of the shapes needed. They may also need to turn or flip some of the pieces to get them in the proper position.

Centers: Provide students with tangrams made from Tangram BLM to practice creating patterns and filling shapes on their own during center time.

Activity 12: What I Know – Solid Awareness (GLE: 16)

Materials List: Vocabulary Self-Awareness Form BLM, writing tool

Small Groups: Have students complete a *vocabulary self-awareness* chart ([view literacy strategy descriptions](#)). Use the Vocabulary Self-Awareness Form BLM. This list of vocabulary includes the following words: rectangular solids, cylinders, cones, and spheres. Provide this list of words to students at the beginning of the activity, and have them complete a self-assessment of their knowledge of the words. Do not give students definitions or examples at this stage. Ask students to rate their understanding of each word with either a “+” (understand well) or a “√” (limited understanding or unsure), or a “-” (don’t know).

The students will revisit their vocabulary charts to revise their growing understanding of key terms as they complete the remaining activities in this unit.

Activity 13: Exploring Solids (GLEs: 16, 17)

Materials List: geometric solids

Whole Group: During circle time, provide geometric solids for students to explore. Have students pass around the solids and talk about them. Ask students to compare one solid to a different one (e.g., cone to a rectangular prism). Encourage language such as flat, round, smooth, pointed, edge, or corner as students describe the shapes. Have students name items in the classroom that are similar to the geometric solids (e.g., ball = sphere, box = rectangular prism, can = cylinder). Repeat this activity as needed until all geometric solids have been discussed and handled by all students.

Centers: Provide students with geometric solids and examples of these solids found in the real world (e.g., a party hat and a cone, a tennis ball and a sphere, a shoe box and a rectangular prism) in the math center. Encourage students to add real-life examples of geometric solids to the display. One task can be to sort solids by their shapes.

Activity 14: What Is It? (GLE: 16)

Materials List: geometric solids, real life examples of geometric samples, feely box

Small Groups: Display various geometric solids. Begin lesson with a *brainstorming* ([view literacy strategy descriptions](#)) activity by having students find words to describe each solid. Write students' words on the board or chart paper under the name of each solid.

Put a real life example of a geometric solid into a feely box. Have students reach into the box, feel the shape, and describe what they feel to the class. Be sure students use their words from the *brainstorming* activity. Have other students guess what the solid is from the descriptions. It may be necessary to provide prompts to guide the description such as these: Does it have round sides? Does it have a point? Repeat as desired, changing the solid each time.

Revisit *brainstorming* chart to see if students would like to change or add any information.

Activity 15: Sorting Solids (GLEs: 16, 17)

Materials List: items shaped like boxes, cans, balls, and cones

Small Groups and Centers: Provide a collection of boxes, cans, balls, and cones. Ask students to sort the items according to shape. Extend by asking students if they can think of a way to sort each set into smaller groups (e.g., sort the can collection by color).

Activity 16: Scavenger Hunt (GLEs: 16, 17, 18)

Materials List: geometric solids

Whole and Small Groups: Organize small groups or partners to go on a scavenger hunt for geometric solids. Give each group a solid to hunt for in the classroom. After a short time, reassemble the groups to see what they found. Ask each group to share with the class what they found in the classroom that is the same shape as their assigned solid.

Activity 17: Making Solids (GLE: 16)

Materials List: geometric solids, play dough

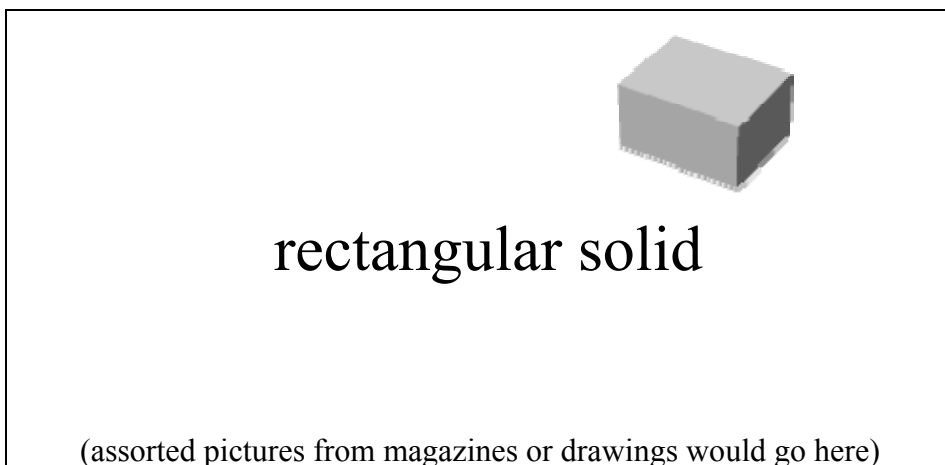
Small Groups and Centers: Provide students with examples of geometric solids and play dough in the art center. Invite students to use the clay to make one or more of the solids. Encourage students to feel the examples before attempting to make their own solid.

Encourage students to orally describe the solid. Students making several solids may then sort them by matching what they made with the examples provided.

Activity 18: (GLE: 16)

Materials List: Vocabulary Card – Rectangular Solid and Cylinder BLM, Vocabulary Card – Cone and Sphere BLM, pencils, magazines, glue

Centers or Small Groups: To develop students' knowledge of key vocabulary, have them create a modified version of *vocabulary cards* ([view literacy strategy descriptions](#)) by filling out Vocabulary Card – Rectangular Solid and Cylinder BLM, Vocabulary Card – Cone and Sphere BLM. When students create *vocabulary cards* they see connections between words, examples of the word, and the critical attributes associated with the word. Students will trace the word in the middle of each card. This activity is modified in that the students will use old catalogs and magazines to find pictures of each shape. Students will cut out the pictures and glue them to the bottom of each vocabulary card rather than writing the definition on the card.



Students will make a shape book out of their *vocabulary cards*. This book can be taken home to share with parents and to review for study.

Activity 19: (GLEs: 16, 20)

Materials List: *Sea Shapes* by Suse MacDonald, geometric solids, paint, brushes, paper, paper plates, blue bulletin board paper

Whole Group: Read the book *Sea Shapes*. The book shows geometric shapes that are transformed into things found in the sea.

Small Groups or Centers: Have students dip one face of a shape solid into a small amount of paint which has been placed on a paper plate. They will stamp that face onto paper and

then paint around it to make a sea creature. Students will name the solid shape they used and discuss their sea creature with other students in the center. These sea creatures can be glued onto a blue background. Students will dictate to the teacher what they want to say about the picture, and the teacher will write the response on the painting. Decorate the room or hallway with the paintings.

Activity 20: Overhead Identification (GLEs: 16, 17)

Materials List: overhead, Shape Transparencies –Rectangular Solid, Cylinder, Cone, and Sphere BLM, Shape Transparencies – Square, Circle, Triangle, and Rectangle BLM, objects from classroom for each shape, KWL chart from Activity 1

Small Groups: Display one set of objects of the stated shapes, and have students say the name of each shape. Cut the transparency BLMs into four cards and place each shape on the overhead. Have students take turns matching shapes shown on the overhead to the objects displayed.

Whole Group: Students will fill out the L portion of the KWL *graphic organizer* ([view literacy strategy descriptions](#)) filled out in Activity 1 of this unit.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Teacher observations and anecdotal notes
- Place in the student's portfolio work products or pictures of student products to measure progress of the student.

Activity-Specific Assessments

- Activity 1: Ask the student to draw his/her favorite shape and tell why he/she likes it.
- Activity 6: Ask the student to discuss shapes (rectangles, circles, squares, triangles, and rhombuses) and sort them according to shape, number of corners, and number of sides.

- Activity 9: Ask the student to use pattern blocks (circle, square, rectangle, rhombus, etc.) to make designs and then to trace around the blocks used on drawing paper. The student will then discuss sides and points of shapes.
- Activity 15: Ask the student to sort 3 dimensional objects by shape (geometric solids: box, cylinder, cone, ball) and identify the geometric solids represented.
- Activity 20: Ask students to name shapes shown on the overhead and to match the shapes to objects displayed.

Resources

Children's Books

Hoban, Tana. *Shapes, Shapes, Shapes*.

MacDonald, Suse. *Sea Shapes*.

**Kindergarten
Mathematics
Unit 7: Number Operations**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



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Unit Description

This unit expands number meanings and operations. The opening of the unit consolidates student understanding of the number names, sequences, and numeral recognition for numbers from 1 to 10. The major focus of the unit is the development of basic understandings of addition and subtraction as joining (part + part = whole) and separating (whole – part = part) situations.

Student Understandings

Students will work on the development of basic models for addition and subtraction (with some work done on fair-sharing). Students should model and act out number situations and settings through group set sizes of 10. They should be able to work from verbal or numerical sentences for the operations.

Guiding Questions

1. Can students recognize addition and subtraction settings and model them?
2. Can students model and solve given addition, subtraction, or sharing situations?
3. Can students model and act out the solutions to whole number equations and inequalities when group sizes are less than 10?

Unit 7 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Number and Number Relations	
1.	Count by ones to 20
2.	Count a set of 20 or fewer objects by establishing a 1-to-1 correspondence between number names and objects (N-1-E) (N-3-E) (A-1-E)
4.	Identify the numerals for the numbers 0-20
5.	Using a number line or chart, identify the numbers coming before/after a given number and between 2 given numbers
9.	Use concrete objects to model simple real-life addition and subtraction

GLE #	GLE Text and Benchmarks
	problems (N-4-E)
10.	Use operational vocabulary (<i>add, subtract, join, remove, take away, put together</i>) to explore sets of objects (N-5-E)
Algebra	
12.	Model and act out story problems, physically or with objects, to solve whole number sentences with sums less than or equal to 6 (A-2-E)

Sample Activities

Some activities provide suggestions for context; however, classroom themes and events will often provide the context in which the activities should be used and may affect the order of the activities.

Activity 1: Number Review (GLEs: 1, 2, 4)

Materials List: cups, paper plates, objects to count, pencil

Small Groups: Prior to the lesson, count out various objects to equal sums less than 10. Mix up the objects and place a variety of objects in a cup for each child. Have students group like objects into sets and put each set of objects on a plate. When all objects are placed on plates, each student will be given a plate of objects to count. The students will write the number of the amount of objects on the plate. Students will check each other's answers.

Activity 2: Sets to Ten (GLEs: 1, 2, 4)

Materials List: paper, crayons, objects to sort, two plates, two kinds of cookies, chart paper, pen

Whole Group: Place two plates of cookies on the table. Each plate should have different kinds of cookies. Ask students to *brainstorm* ([view literacy strategy descriptions](#)) ideas about how they figure out if there are enough cookies for each of them to have one. *Brainstorming* is a technique for generating ideas. It is based upon the belief that when a great number of ideas are generated, the chances of uncovering a good idea or solution are increased. Ground rules are essential for this activity to be effective and successful:

- All critical judgment is suspended. List all ideas without judging them. Passing judgment inhibits creativity and decreases the number of ideas generated.
- Quantity is more important than quality.
- Build on other peoples' ideas and modify them. Write their ideas on a chart with the title: Cookies for You and Me?
- Ensure that all students participate.

Small Groups: Give each student a piece of paper and objects to sort into like sets on top of the paper. After the students have sorted the objects, have them circle each set of objects and write the number of objects under each circle.

Activity 3: Froggy Hop Forward (GLEs: 4, 5)

Materials List: Number Line BLM, Frog Manipulatives BLM or plastic frog manipulatives, craft sticks, Counting Up BLM, dry erase markers

Teacher Note: Prior to this lesson, cut out a frog from the Frogs BLM for each student and glue each frog to the end of a craft stick. (These can be saved for Activities 10 and 17.)

Small Groups: The teacher will make a copy of the Number Line BLM and a frog from the Frog Manipulatives BLM. Have students place their frog on a given number, and count up from there as the frog hops forward from number to number. Small plastic frog manipulatives can also be used.

Centers: Place dry erase markers and laminated copies of the Counting Up BLM in the math center. Have students use dry erase markers and practice counting up on laminated copies of the Counting Up BLM. They can use a copy of the number line and their frog from the small group activity.

Activity 4: Adding Bears in the Cave (GLEs: 9, 10)

Materials List: bowl, teddy bear counters, other manipulatives to count

Small Groups: Start with a set of 10 teddy bear counters. Select a handful and count out loud, pointing to each bear as you count. Cover the bears with a cave (bowl). Without uncovering the bears, have the students watch as you lift up the cave slightly and put another bear under it. Use the operational vocabulary to explain that you are “adding one.” Ask the students to guess how many bears are now in the cave. Lift the cave and have the students count to check. Continue the activity by adding bears to those in the cave, one at a time and then two at a time. Each time a bear is added, have the students guess the number and then count to check. Vary the type of manipulatives and covers to maintain student interest. Ideas include the following: ants in a basket, babies under a blanket, dogs in a dog house, zoo animals in a cage (berry basket). To help students focus on the lesson concepts, always provide students with opportunities to play with the materials being used beforehand.

Activity 5: Number Sentences (GLEs: 9, 10)

Materials List: two number cubes, counters, Addition Mat BLM, pencils

Small Groups: Model rolling two number cubes and placing counters (any type) to match the numbers you rolled. Place the counters on the Addition Mat BLM. Place counters for one cube on the left side of the + sign, and place counters for the other number cube on the right side of the + sign. Add the counters together. Repeat several times.

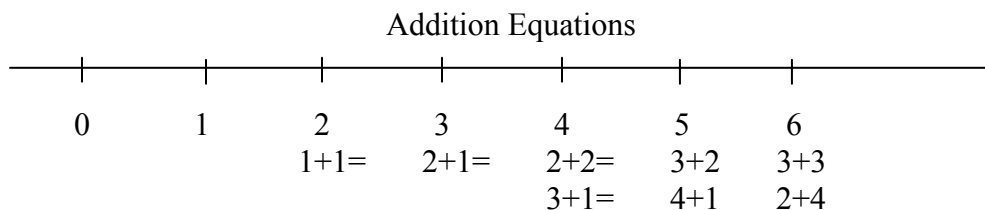
Activity 6: Addition Bean Bag Toss (GLEs: 9, 10, 12)

Materials List: hoop, 6 bean bags, paper, glue

Small Groups: Provide students with a hoop and beanbags (students will be given a different number of bean bags). Set a tossing boundary far enough away that some beanbags will land in the hoop and some beanbags will land out of the hoop. Invite each student to toss his/her beanbags toward the hoop. Ask students to count how many beanbags landed inside the hoop. Ask how many landed outside the hoop. Ask students to tell how many beanbags were *put together* when both groups of beanbags were joined. Encourage students to use addition sentences such as when you *join* the 3 inside the hoop with the 2 outside the hoop, you will get 5 bean bags all together. Write the equation for each student's toss on a piece of paper. The sticky notes will be added to a tree map *graphic organizer* ([view literacy strategy descriptions](#)) when all students have had a turn. This *graphic organizer* will be used by students for classifying addition equations by sums.

Whole Group: Each student will add his/her sticky note from the small group activity to a tree map drawn on the board. When tree map is complete, a graph will be created to show the different combinations of sums for numbers up to six.

Example:



Activity 7: Adding with Cubes (GLEs: 9, 10, 12)

Materials List: 2 colors of connecting cubes,

Small Groups: Ask students to join connecting cubes to show adding. Start with a tower or train of 5 solid-color cubes; get one other colored cube and join or add it to the tower. Ask, “How many do you have? Get one more. Count on.” Repeat until all students reach 10.

Variation: Use other manipulatives and cups or storyboards to model addition stories.

Activity 8: Making 6 (GLEs: 9, 10, 12)

Materials List: cups, two-color counters, Two-Sided Counters BLM, math *learning logs*, pencils, red and yellow dry erase markers

Small Groups: Give students a cup with 6 two-color counters inside, a laminated copy of the Two-Sided Counters BLM, a red and yellow dry erase marker. Have the student dump the counters from the cup. Ask the students to count how many counters landed red side up and how many counters landed yellow side up. They will draw the number of red counters on the red side of the BLM and the number of yellow counters on the yellow side of the BLM. Ask the student to count how many counters there are in all. Ask the student to read his/her addition sentence (e.g., 4 red plus 2 yellow equals 6).

Centers: The above small group activity can be added to a center for repeated practice.

Independent Work: Ask students to write or draw in their math *learning logs* ([view literacy strategy descriptions](#)) what they have learned about addition. A math *learning log* is a notebook that students keep in order to record ideas, questions, reactions, and new understandings. Documenting ideas in a *learning log* about content being studied forces students to “put into words” what they know or do not know. This process offers a reflection of understanding that can lead to further study and alternative learning paths. It combines writing and reading with content learning. Students that are not capable of independent writing can use drawings, stickers, or stamps to illustrate what they have learned. The math *learning log* will be used to check for understanding or misconceptions.

Activity 9: Number Stories (GLEs: 9, 10, 12)

Materials List: large piece of bulletin board paper, Cars for Road Background BLM or small toy cars, Vocabulary Card Booklet – Part 1 BLM (one copy for each student)

Teacher Note: Prior to the lesson, cover a table with bulletin board paper. Draw a road going down the middle of the paper.

Small Groups: Tell number stories using the theme of vehicles on the road, and let the students act them out, using a road created on bulletin board paper and Cars Card for the Road Background BLM. Have students put the cars on their road background to represent the setting for the story. (For example, two trucks are driving on the road. Three cars pass them. Count the trucks and cars to find the total [sum] number of vehicles that are now on the road.)

Centers: The students will make a modified version of *vocabulary cards* ([view literacy strategy descriptions](#)) for the terms: add and sum. *Vocabulary cards* allow students to see connections between words, examples of the word, and the critical attributes associated with the word. These *vocabulary cards* will be modified, as students will make vocabulary pages instead of cards. These pages will be made into a booklet, and the students will illustrate the terms using Vocabulary Card Booklet – Part 1 BLM. These pages will be added to more pages that will be made in Activity 12. When all pages are complete, they will be put together into a booklet. The booklet can be taken home or used in centers as a study aid to review vocabulary.

Activity 10: Froggy Hop Backwards (GLEs: 4, 5)

Materials List: Number Line BLM, Frogs BLM or plastic frog manipulatives, craft sticks, Counting Back BLM, dry erase markers

Teacher Note: Use number lines and frogs made in activity 3. Save these for use in Activity 17.

Small Groups: The teacher will make copies of the Number Line BLM and frogs from the Frog Manipulatives BLM. Have students place their frogs on a given number and count back from there as the frog hops backward from number to number. Small frog-shaped manipulatives can be substituted.

Independent Work: Students will complete the Counting Back BLM worksheet to show which numbers come before a given number.

Centers: Place dry erase markers and laminated copies of the Counting Up BLM in the math center. Have students use dry erase markers and practice counting backward on laminated copies of the Counting Up BLM. They can use a copy of the number line and their frogs from the small group activity.

Activity 11: Subtracting Bears in the Cave (GLEs: 9, 10)

Materials List: bowl, teddy bear counters, other manipulatives to count

Small Groups: Start with a set of 10 teddy bear counters. Select a handful and count out loud, pointing to each bear as you go. Cover the bears with a cave (bowl). Without uncovering the bears, have the students watch as you lift up the cave slightly and take away a bear from under it. Use the operational vocabulary to explain that you are “subtracting one.” Ask the students to guess how many bears are now in the cave. Lift the cave and have the students count to check. Continue the activity by subtracting bears from those in the cave, one at a time and then two at a time. Each time a bear is taken away, have the students guess the number and then count to check. Vary the type of manipulatives and covers to maintain student interest. Ideas include the following: ants in a basket, babies under a blanket, dogs in a dog house, zoo animals in a cage (berry basket). To help students focus on the lesson concepts, always provide students with opportunities to play with the materials being used beforehand.

Activity 12: Hide and Seek (GLE: 10)

Materials List: bowl, counters (such as beans, links, cubes, and so on), Vocabulary Card Booklet – Part 2 BLM (one copy for each student), pencil

Small Groups: Begin with 10 counters (beans, links, cubes, and so on). Students will take turns hiding any number of the counters under a bowl while the other students close their eyes. Whoever hides the counters then says, “Peek.” Ask students then to try to figure out how many are hidden under the bowl by counting the ones that were not hidden. To determine how many counters are hidden, discuss how many counters would have to be added to get the total number (10) or how many were subtracted (hidden) from the 10. Discuss how the two groups were separated (difference) but that the two groups can be joined and counted to find the total (sum).

Centers: The students will make a modified version of *vocabulary cards* ([view literacy strategy descriptions](#)) for the terms: subtract and difference using Vocabulary Card Booklet – Part 2 BLM. These pages will be added to the pages made in Activity 8. When all pages are complete, they will be put together into a booklet. The booklet can be taken home or used in centers as a study aid to review vocabulary.

Activity 13: Subtraction Bean Bag Toss (GLEs: 9, 10, 12)

Materials List: hoop, five bean bags

Small Groups: Provide students with a hoop and five beanbags. Set a tossing boundary far enough away that some beanbags will land in the hoop and some beanbags will land out of the hoop. Invite each student to toss three beanbags toward the hoop. Ask students

to count how many beanbags are left. Give the subtraction sentence: You had five beanbags. You threw 3 beanbags. You have 2 beanbags left. Five take away 3 equals 2.

Activity 14: Subtracting with Cubes (GLEs: 9, 10, 12)

Materials List: connecting cubes, math *learning logs*, pencils




Small Groups: Ask students to separate connecting cubes to show subtracting. Start with a tower or train of 10 solid-color cubes; separate one colored cube from the tower. Ask, “How many do you have left? Take away one more.” Repeat until students reach 5.

Small Groups: The students will write or draw a subtraction *story chain* ([view literacy strategy descriptions](#)) to demonstrate a subtraction story problem. Students who are not capable of independent writing can use drawings, stickers or stamp pads to illustrate the story problem. The first student will decide what they will subtract and decide on the beginning sentence of the story problem. In groups of five, the next student will decide what to subtract and decide on the beginning sentence of the story problem. The next student will decide how many to subtract and the sentence to go with that. The third student will write the final statement to show the answer. A fourth student can show the problem using stickers or drawings. A fifth student can write the number sentence for the story problem. The *story chain* is used to describe the stages of an event, the actions of a character, or the steps in a procedure. The *story chain* can be used to retell the story problem to a partner or their parent.

Five lions playing. 

Three go away. 

Two lions stay. 

 -  = 
5 3 2

$5 - 3 = 2$

Variation: Use other manipulatives and cups or storyboards to model subtraction stories.

Activity 15: How Many Seeds? (GLEs: 9, 10)

Materials List: *The Empty Pot*, 10 large seeds, a paper cup for each student, linking cubes

Whole Group: Read *The Empty Pot*. Discuss addition and subtraction as well as the concept of zero. Use 10 large seeds (pumpkin seeds are good) and a paper cup for each pair of students. Ask the first student to close his or her eyes while the other child hides some of the seeds under the paper cup. The first student opens his or her eyes, looks at the seeds still in view, and tries to figure out how many seeds are under the paper cup. Have partners take turns hiding the seeds and guessing.

Small Groups: Allow the students to play a modified version of *professor know-it-all* ([view literacy strategy descriptions](#)) to demonstrate what they have learned about addition and subtraction. The *professor know-it-all* strategy is appropriate to use after information is learned. The student will be given the opportunity to be the “expert” or “the teacher.” In the *professor know-it-all* strategy students are put into groups to generate questions about the content learned. The students are given time to review the content and then call on students randomly to come to the front of the room to provide “expert” answers to questions from their peers. In a modified form of *professor know-it-all*, each kindergartner will have a chance to pretend to be the teacher for his/her group. The student pretending to be the teacher will use a flannel board and put up felt objects and use these to explain about addition and subtraction.

Activity 16: Ten in the Bed (GLEs: 9, 10, 12)

Materials List: bed sheet

Whole Group or Small Groups: Invite 10 students to lie across a bed sheet spread across the floor. Sing the song *Ten in the Bed* and encourage students to act out the song. At the end of each verse one child rolls out of the bed. This continues until the last child is left and he says “Good Night!”

Variation: The last child rolls off the bed and leaves zero in the bed.

Teacher Note: There are many variations on this song. It can be found in many early childhood resource books or at <http://www.kididdles.com/mouseum/t003.html>.

Activity 17: Birdie Math (GLEs: 9, 12)

Materials List: Tree Background for Problem Solving BLM, Birds for Tree Background BLM

Small Groups: Tell number stories using the theme of birds in a tree, and let the students act them out, using the Tree Background for Problem Solving BLM and Birds for Tree Background BLM. Have students put the birds on the tree background to represent the setting for the story. (For example, six birds are in a tree. Three birds fly to the ground. Count the birds and find the number of birds left in the tree.) Switch between addition and subtraction stories.

Activity 18: Number Line Hop (GLEs: 4, 5)

Materials List: Number Line BLM, Frog Manipulatives BLM or plastic frog manipulatives, craft sticks, Counting Up BLM, Counting Back BLM, dry erase markers

Teacher Note: Use number lines and frogs made in Activities 3 and 10.

Small Groups: Give each student a copy of a number line from the Number Line BLM and a frog from Frogs BLM. Have students place their frog on a given number and count either forward or backward as the frog hops from number to number.

Centers: Students will practice counting forward and backward using laminated number strips from Activities 3 and 10 (Counting Up BLM, and Counting Back BLM) to show which numbers come before and after a given number.

Activity 19: Lily Pad Math (GLEs: 9, 10, 12)

Materials List: Frog Manipulatives BLM or plastic frog manipulatives, Lilly Pad BLM, Subtraction Mat BLM

Small Group or Centers: Give students addition and subtraction word problems using the subject of frogs jumping on and off a lily pad. The students will manipulate frogs on their lily pad mat to match the wording of the problem. Students can use frogs from the Frog Manipulatives BLM from Activity 3. Allow students to take turns showing the problems using Frog Manipulatives BLM and Subtraction Mat BLM.

Activity 20: Show Me the Answer (GLE: 10)

Materials List: Addition and Subtraction Answer Paddles BLM, craft sticks, card stock, Addition Mat BLM, Subtraction Mat BLM, manipulatives

Teacher Note: The + and – sign paddles will need to be cut out and stapled to the craft stick prior to the lesson.

Whole Group: Tell number stories and students will hold up + or – signs to represent the operation needed to solve problem.

Small Groups: Have the students use manipulatives to represent the number stories that are told on the appropriate addition or subtraction BLM board.

Teacher Note: Writing addition and subtraction sentences is not a mastery requirement for kindergarten.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Teacher observation and anecdotal notes
- The student’s work products or pictures of student’s products will be put in the student’s portfolio to measure his/her progress.
- The student will make up his/her own math story to show objects being added and subtracted. The student will use counters or concrete objects to find sums and differences.

Activity-Specific Assessments

- Activity 9: The students will correctly model addition sentences using manipulatives. Provide oral addition sentences for students to model with manipulatives.
- Activity 12: The student will count the total number of counters (up to ten). The student will turn his/her back while the teacher hides some of the counters

under a cup. The student will correctly determine how many counters are missing.

- Activity 18: The students will use a number line to identify the numbers coming before and after a given number and between 2 given numbers.

Resources

Children's Books

Demi. *The Empty Pot*.

**Kindergarten
Mathematics
Unit 8: Exploring Numbers and Money**

Time Frame: The content of this unit should be taught throughout the year with activities integrated into all content areas.



Unit Description

The opening of the unit consolidates student understanding of the number names, sequences, and numeral recognition for numbers from 1 to 20. The major foci of the unit are the development of coin recognition skills for penny, nickel, and dime and their values

Student Understandings

Students will work on the development of coin (penny, nickel, dime) recognition and establishment of related values.

Guiding Questions

1. Can students recognize pennies, nickels, and dimes and their values?
2. Can students use 1-to-1 correspondence when counting coins?
3. Can students compare groups of coins?

Unit 8 Grade-Level Expectations (GLEs)

GLE #	GLE Text and Benchmarks
Number and Number Relations	
6.	Identify pennies, nickels, and dimes and their values using the cent sign (¢) (N-1-E) (N-2-E) (N-6-E) (M-1-E)
9.	Use concrete objects to model simple real-life addition and subtraction problems (N-4-E)
10.	Use operational vocabulary (<i>add, subtract, join, remove, take away, put together</i>) to explore sets of objects (N-5-E)
Algebra	
11.	Use the words <i>same, different, equal, not equal, greater than, and less than</i> while using concrete objects for comparative models (A-1-E)
12.	Model and act out story problems, physically or with objects, to solve whole number sentences with sums less than or equal to 6 (A-2-E)

Measurement	
13	Use vocabulary such as: <i>yesterday, today, tomorrow, hours, weeks</i> , names of days, names of months; sequence events; and identify calendars and clocks as objects that measure time (M-1-E) (M-2-E) (M-5-E)
Geometry	
17.	Compare, contrast, and sort objects or shapes according to two attributes (e.g., shape and size, shape and color, thickness and color) (G-2-E)

Sample Activities




Some activities provide suggestions for context; however, classroom themes and events will often provide the context in which the activities should be used and may affect the order of the activities.

Activity 1: Calendar Coins (GLEs: 6, 13)

Materials List: coins, calendar, clear coin pockets

Teacher Note: Start this activity on the first day of school and review if this unit is taught last during the school year.

Whole Group: Add a penny for each day of school attended throughout the year. When five pennies are added to the penny pocket, exchange them for a nickel and put the nickel into the nickel pocket. When another five pennies are added trade them for another nickel, then both nickels for a dime. Trading for quarters may be optional as mastery of the quarter is not a mastery skill for kindergarten. After 100 days have a celebration. See sample below of what coin pockets might look like.

Penny	Nickel	Dime
		

Activity 2: Money Bag (GLEs: 6, 17)

Materials List: plastic coins, Coin Categorization Chart BLM, floor chart

Whole Group or Small Groups: Using plastic, pretend coins, give each student a penny, a nickel, and a dime. Ask students to tell you how the coins are alike and how they are different. Write their responses on the Coin Categorization Chart BLM with two columns labeled “Alike” and “Different.” Ask if they know how much each coin is worth. After these discussions, display a floor chart (graph) that is divided into three columns. Label the columns 1¢, 5¢, and 10¢. Using a bag of assorted coins (pennies, nickels, dimes), ask a student to reach in the bag and take out one coin. The student

should identify the coin and then place it on the chart in the column that is labeled with the coin's value. Continue the activity until each student has had a turn to choose a coin and place it on the chart. Have the students count the number of coins in each column. Compare the number of coins in each of the columns (e.g., there are more pennies than nickels). Students who are ready may wish to find the total value of the coins in each column. However, finding the value of a set of coins is not a mastery skill in kindergarten.

Activity 3: Coin Connections (GLEs: 6, 17)

Materials List: plastic coins, sorting mats

Whole Group or Small Groups: Prior to the lesson, make a chart of a modified *word grid* ([view literacy strategy descriptions](#)) on chart paper to help students compare and contrast coins. *Word grids* help students make connections between key terms and features.

	Round	Brown	Silver	Has a man's picture on it.
Penny	X	X		X
Nickel	X		X	X
Dime	X		X	X
Quarter	X		X	X
Dollar				X

Display one coin at a time, and have students decide which column applies to it and thus needs to be checked. After the *word grid* is completed, ask comparison questions about colors. For example, “What coin is round but not silver?”

Centers: Provide students with plastic coins and sorting mats. Each mat should be labeled with the picture, word, and value of a coin (penny, nickel, dime). Students may sort the coins onto the mats.

Activity 4: Penny Day (GLE: 6)

Materials List: Penny BLM, Log Cabin BLM, Coins BLM, one penny per child, paper, pencils, glue, chart paper, felt tip marker

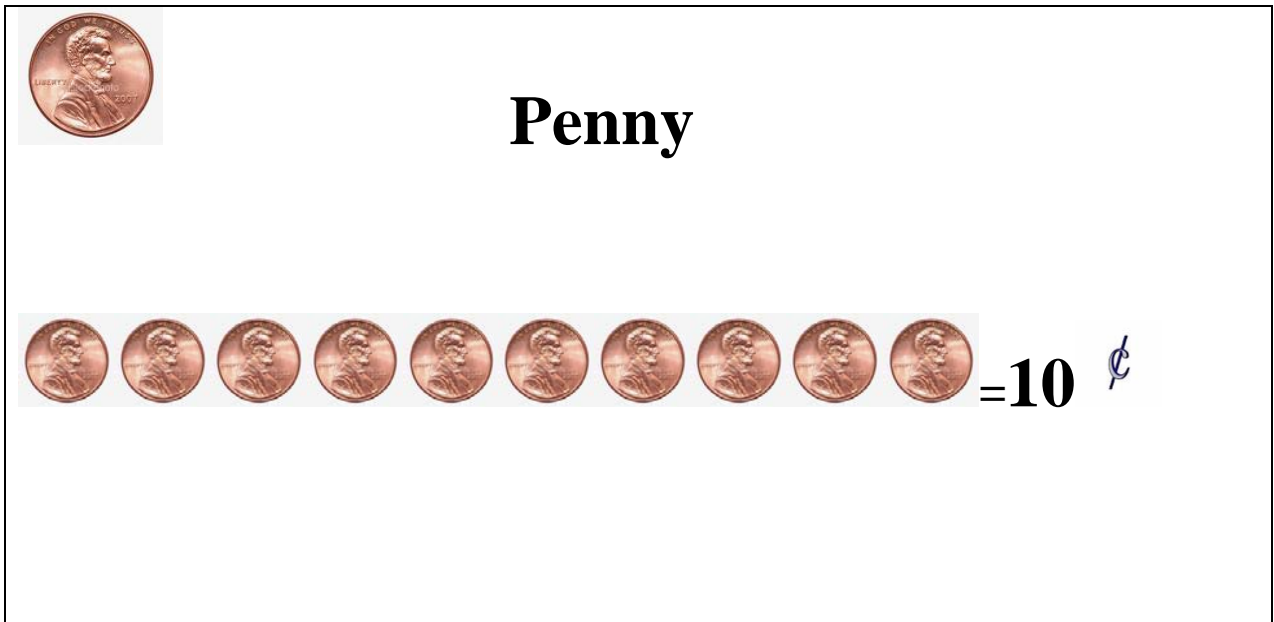
Whole Group: Use the following poem to help kindergarten students learn to identify the penny. Print the poem on large chart paper, and add the picture of the penny found on the Coins BLM. Read the poem chorally.

Penny, penny,
Easily spent
Copper brown
and worth one cent.

Small Groups: Use the Penny BLM to discuss Abraham Lincoln and who he was. Show students his picture on the heads side of a penny. Show several pennies, and have students count them by ones.

Center Activity: Each student will do a coin rubbing of a penny. The rubbings will be glued in the window of the Log Cabin BLM.

Centers: The students will make a modified version of one *vocabulary card* ([view literacy strategy descriptions](#)) each day a penny, nickel, dime, and quarter (optional). *Vocabulary cards* allow students to see connections between words, examples of the word, and the critical attributes associated with the word. These *vocabulary cards* are modified as students will make vocabulary pages instead of cards. The Coins BLM can be used to provide students copies of coins to glue onto their *vocabulary cards*. These pages will be made into a booklet. See sample below:



Activity 5: Nickel Day (GLE: 6)

Materials List: chart paper, felt tip marker, Coins BLM, coins, Nickel BLM, Coin Venn Diagram BLM

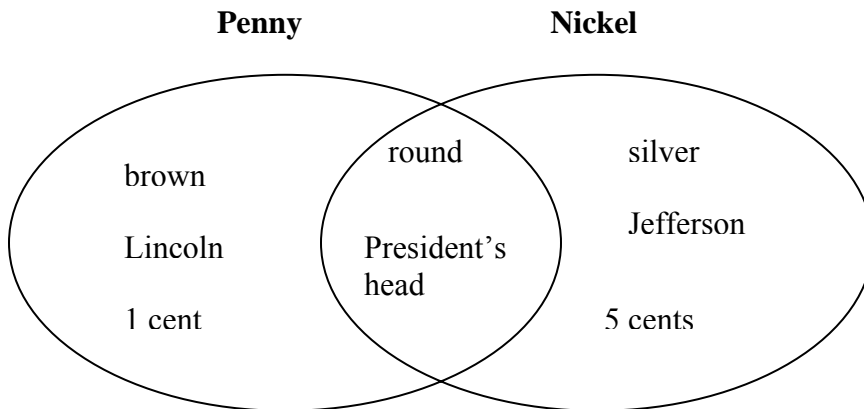
Whole Group: Use the following poem to help kindergarten students learn to identify the nickel. Print the poem on large chart paper, and add the picture of the nickel found on the

Coins BLM. Read the poem chorally. The penny poem may also be reviewed prior to learning the nickel poem.

Nickel, nickel,
Thick and fat,
You're worth five cents.
I know that.

Small Groups: Show a picture of Thomas Jefferson from the Nickel BLM. Discuss some details about his life. Show several nickels, and let students practice counting them by fives.

A Venn diagram *graphic organizer* ([view literacy strategy descriptions](#)) will be used to show relationships between the penny and the nickel. The Venn diagram is made up of two or more overlapping circles and is often used in mathematics to show relationships between sets. See example:



Centers: Students will make a *vocabulary card* ([view literacy strategy descriptions](#)) for the nickel (see instructions in Activity 3).



5¢

Nickel



25¢

Activity 6: Dime Day (GLE: 6)

Materials List: chart paper, felt tip marker, Coins BLM, coins, Dime BLM, Quarter BLM (optional)

Whole Group: Use the following poem to help kindergarten students learn to identify the dime. Print the poem on large chart paper, and add the picture of the nickel found on the Coins BLM. Read the poem chorally. The penny and nickel poems may also be reviewed prior to learning the dime poem.

Dime, dime,
Little and thin,
I remember,
You're worth ten.

Small Groups: Show a picture of Franklin D. Roosevelt from the Dime BLM. Discuss some details about his life. Show several dimes, and let students practice counting them by tens.

Centers: Students will make a *vocabulary card* ([view literacy strategy descriptions](#)) for the dime. See instructions in Activity 3.

Optional Activity: The quarter poem can be added. The quarter is not to be mastered in kindergarten, but most students are familiar with it. It might be helpful to learn the quarter, too, as they will have a familiar coin with which to compare unfamiliar coins.

Quarter, quarter
Big and bold,
You're worth twenty-five
I am told!

Small Groups: Show a picture of George Washington from the Quarter BLM. Discuss some details about his life.

Centers: Students will make a *vocabulary card* for the dime. See instructions in Activity 3.

Activity 7: Piggy Bank (GLE: 6)

Materials List: computer, pretend/plastic coins, construction paper circles or mini paper plates, crayons

Whole Group: Show students all of the different kinds of coins there are. Students will *brainstorm* ([view literacy strategy descriptions](#)) why they think there are different kinds of coins. Chart each student's response. *Brainstorming* is a technique for generating ideas. It is based upon the belief that when a great number of ideas are generated, the chances of uncovering a good idea or solution are increased. Ground rules are essential for this activity to be effective and successful:

- All critical judgment is suspended. List all ideas without judging them. Passing judgment inhibits creativity and decreases the number of ideas generated.
- Quantity is more important than quality.
- Build on other peoples' ideas and modify them. Write their ideas on a chart.
- Ensure that all students participate.

Small Groups: Students will view the "Piggy Bank" *PowerPoint*[®] at:

<http://www.schools.pinellas.k12.fl.us/educators/tec/matz/piggybanksong.htm>

The *PowerPoint*[®] goes with Greg and Steve's song *The Piggy Bank* song and teaches how many pennies it takes to equal other coins. Students can use pretend money to act out each page of the *PowerPoint*[®]. Revisit *brainstorming* responses, and discuss how much easier it would be to carry a dollar bill than 100 pennies. Ask students if they would rather carry 25 pennies or one quarter.

Independent Work: Students will design a new coin using their faces as the heads side, and something related to their life on the tails side.

Activity 8: Name That Coin (GLE: 6)

Materials List: *vocabulary cards* from Activities 3, 4 and 5, Coins BLM, Coin ID BLM

Whole Group: Have students review *vocabulary cards* ([view literacy strategy descriptions](#)). Hold up coins to quiz students orally on identification. Students will color coins on the Coin ID BLM the appropriate color as specified by the teacher.

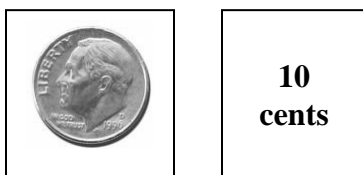
Small Groups: Show students a penny, nickel, dime, and quarter. Ask students to name each coin and tell the value of each. Use the rubric below to assess students' knowledge.

	1	2	3	4	5
<i>Coin Name Recognition</i>	<i>Student is unable to name any of the coins.</i>	<i>Student is able to name 1 out of 4 coins</i>	<i>Student is able to name 2 out of 4 coins.</i>	<i>Student is able to name 3 out of 4 coins</i>	<i>Student is able to name all 4 coins.</i>
<i>Coin Value Recognition</i>	<i>Student is unable to tell the value of any of the coins.</i>	<i>Student is able to tell the value of 1 out of 4 coins.</i>	<i>Student is able to tell the value of 2 out of 4 coins.</i>	<i>Student is able to tell the value of 3 out of 4 coins</i>	<i>Student is able to tell the value of all 4 coins.</i>

Activity 9: Sing a Song of Cents (GLE: 6)

Materials List: chart paper, marker, Coins BLM, index cards

Teacher Note: Write the *Cents* song on chart paper prior to lesson. Also, make index cards with either a coin on them or a coin value on them. The Coins BLM can be used to copy coins for use on the cards. Make sure there are enough coins for each child to have one and to make sure that all coins and values are covered. Example:



Whole Group: Sing the *Cent* song to the tune *Farmer in the Dell*.

Cents

A penny is worth 1

A nickel is worth 5

A dime is 10

And a quarter, 25

After singing the song enough times for students to become familiar with tune, the class will play a coin game. Game Directions:

1. Give each child an index card. Each child will have a card with either a coin picture on it or a coin value.
2. Students will form a circle and sing the song. The students will step forward as the word for their card is said. For example, when the word “penny” is sung the students holding a card with a picture of a penny will step forward. Then the word “1” is said the students with a card that says “one cent” will step forward.

Another version of the game is for the teacher to call out the name of a coin. All students who have the cards with the picture of that coin and the students who have cards with the matching coin value will stand up and try to find a partner. For example, a child with a penny picture needs to find a child with a card with a “one cent” value, and they need to link arms. When everyone finds a partner they will sit down and the teacher will call out another coin.

Activity 10: Shopping Spree I (GLEs: 6, 9)

Materials List: objects or pictures of objects, price tags, cups, plastic coins, cash register

Small Groups: Provide students with a variety of objects or pictures of objects that are priced 1¢, 2¢, 3¢, and 4¢. Give each student a small cup or bag of play pennies. Invite students to spend their coins in a shopping spree. Have students match the appropriate coin to the object.

Variation: Have students purchase snacks instead of objects.

Centers: Provide students with play money, cash register, and objects for merchandise in a pretend store as a dramatic play activity. Variations are a grocery store (collect clean, empty food containers for merchandise), a bakery, or a restaurant.

Activity 11: Shopping Spree II (GLEs: 6, 9)

Materials List: objects with which to play store, pretend/plastic coins, cash register

Small Groups: Use the same materials from Activity 11 except use pennies, nickels and dimes. Reprice the objects as 1¢, 5¢, and 10¢ each. Ask the students to purchase the items.

Activity 12: Alexander’s Money (GLEs: 6, 12)

Materials List: *Alexander, Who Used to be Rich Last Sunday* by Judith Viorst and Ray Cruz, paper, crayons, plastic coins,

Whole Group and Small Groups: Read *Alexander, Who Used to be Rich Last Sunday*. Reread the story and ask the students to draw the money amounts each time Alexander spends money. Also, students should use pretend money to show the amount. Discuss whether or not Alexander’s transactions were wise. Why or why not?

Teacher Note: This activity addresses a higher-level money concept than is required in kindergarten, but some children will be ready for it.

Independent Work: Ask students to write or draw in their math *learning logs* ([view literacy strategy descriptions](#)) what they would have done with their money if they were Alexander. Nonreaders can draw or glue pictures about what they would have done with Alexander’s money. A math *learning log* is a notebook that students keep in order to record ideas, questions, reactions, and new understandings. Documenting ideas in a log about content being studied forces students to “put into words” what they know or do not know. This process offers a reflection of understanding that can lead to further study and alternative learning paths. It combines writing and reading with content learning. The math *learning log* will be used to check for understanding or misconceptions.

Activity 13: Name (GLEs: 6, 9, 10)

Materials List: magnetic coins, magnetic board, pretend coins

Small Groups: The teacher will place three pennies in one hand and two pennies in the other hand. Ask: “How many pennies do I have in all?” Then place both hands together and state, “I have five pennies in all.” Next, trace both hands on a magnetic board and place magnetic coins on each hand. Let students practice counting the coins from both hands combined using addition vocabulary, such as, “If you add the two pennies in this hand to the four pennies in this hand, you would have six pennies.

Partners: Have partners take turns placing pennies in each hand and asking the question: “How many pennies do I have in all?” Have the other child count the pennies. After pennies are mastered, nickels and dimes can be added.

Activity 14: Candy Money (GLEs: 6, 11, 12)

Materials List: computer

Small Groups or Centers: Students will view the following website and take turns clicking the answers with teacher supervision.

<http://www.beaconlearningcenter.com/WebLessons/CoinsForCandy/money001.htm>

Click on Audio Lesson to hear the sound. This website has information about a real life application for learning about money through shopping for candy. The site gives students experiences with coin recognition, coin values, and less and more. The first page of the site is a pretest of sorts, and the following pages are instructional pages followed by question and answer pages. This website could also be used in a center setting as the text on each page is read aloud.

Activity 15: Adding Coins (GLEs: 6, 10)

Materials List: plastic coins, Adding Coins BLM

Small Groups: Review coins and coin values. Allow students time to practice adding coins. Be sure to practice adding like and unlike coins.

Independent Work: Students will add two groups of coins and count groups of like coins to find the sums. A copy of the Adding Coins BLM can be run off for each child.

Activity 16: Choices (GLEs: 6, 9)

Materials List: computer

Centers: Students can play the game found at the following web site:

http://www.primarygames.com/Spending%20Spree/question_1.htm

This game simulates real world shopping experiences where the student makes choices about what he/she wants to buy. After they have selected what they want to purchase, they will be told how much it costs, and the students are given two groups from which of coins to choose the correct amount of coins to buy the object.

Teacher Note: This website will be too advanced for some students due to the fact that they will be asked to add groups of multiple varied coins, including quarters. The web site is self-correcting, however, so even students with limited proficiency can enjoy it.

Sample Assessments

General Guidelines

Documentation of student understanding is recommended to be in the form of portfolio assessment. Teacher observations and records as well as student-generated products may be included in the portfolio. All items should be dated and clearly labeled to effectively show student growth over time.

General Assessments

- Teacher observation and anecdotal notes
- Put in the student's portfolio the student's work products or pictures of student's products to measure his/her progress.
- The student will identify the coins penny, nickel, and dime by name and give the value of each coin but is not required to give the value of a group of coins in kindergarten.

Activity-Specific Assessments

- Activity 8: The student will correctly identify coins and their values.
- Activities 9 and 10: The student will correctly match coins to price tags bearing their values. The student will correctly identify the cent sign (¢). Make a paper version of this assessment by having pictures of objects with price tags on one side of a paper and pictures of coins on the other side. The students draw a line from the coin to the correct priced item.
- Activity 15: The student will correctly add groups of coins. The student will correctly count groups of nickels and dimes by counting by fives and tens. Make copies of the Adding Coins BLM, and students can either write the answers in large group or orally count in small groups.

Resources

Children's Books

Demi. *The Empty Pot*.

Viorst, Judith. *Alexander, Who Used to be Rich Last Sunday*.