

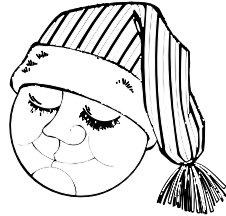


Let's Count

Finger play - "There were 10 in the Bed"

(Create your own hand motions)

See Blackline Master Week 19 for words.



(1.01a, 1.01d)



I Wonder

"Give me a hand (or a foot)"

Have each student trace around their hand (or foot). Ask them to estimate how many unit cubes wide their hand span is, and to record this estimate on the back of their paper. Then have them actually measure with cubes and record this number. Repeat using a different unit (such as paperclips or links). Discuss the relationships between the size of the unit and the number needed.

(2.01)



I Spy

To give children more experience in forming numerals, give each child a geoboard and bands. Let children explore ways to form each numeral and/or provide geoboard numeral cards for the children to reproduce.

(See Blackline Master Week 19)

(1.01c)



Growing Mathematically

The beginning of the second semester is the time to take another look at your math center. Use these guidelines to evaluate and update your math area

Have you:

Are your storage containers:

- | | |
|---|-------------------------------|
| • rotated materials | • in good repair |
| • taken out materials that no longer challenge students | • accessible, easy to return |
| • added new equipment | • inviting |
| • labeled a <u>space</u> for everything | • adequate in size and number |

Remember: when children are no longer involved with the materials -- it's time for a change.



What Do You Think?

To introduce Venn Diagrams make a transparency from the Blackline Master Week 19 to use on the overhead. Choose two specific attributes to classify. Ex. large buttons and buttons with four holes. After labeling circles have students verbally help the teacher decide which item goes in which circle. Let the purpose of the shared space (intersection) evolve through class discussion. It will take repeated experience for children to learn this concept?

(5.01)

Math News 3 For Parents

Wrong answers can also help us learn

Accuracy will always be important, but children also learn through their mistakes. Wrong answers give us insight into children's thinking and allow us to see what the children do and do not understand. Rather than always correcting our children, we may help them more by encouraging them to explain their thinking, test their ideas, and reconsider their answers. Children do not intentionally give incorrect answers. They want to succeed. Sometimes wrong answers are due to haste or carelessness. Often when we ask for explanations, children find their own mistakes. Since we want to encourage our children to think for themselves, we must value their efforts and use responses such as

- Tell me how you decided on that answer.
- How would this (another solution) work?
- I'm not sure that I agree. Tell me more about your idea.

Mathematics and Literature

Many children's books weave mathematical ideas into interesting stories. Here are some books you may want to look for at the library.

- Don't Forget The Bacon by Pat Hutchins
- The Cake That Mack Ate by Rose Robart
- Right Number of Elephants by J. Sheppard
- Ten Little Rabbits by Grossman & Long
- Mr. Grumpy's Outing by John Burningham
- One Watermelon Seed by Celia Lottridge
- The Button Box by Margarette Reid
- Look at Annette by Marion Walter
- Two of Everything by Lily Toy Hong
- 10 for Dinner by Jo Ellen Bogart
- Changes, Changes by Pat Hutchins
- The Shopping Basket by John Burningham
- If You Take A Pencil by Fulvio Testa
- Make A Bigger Puddle; Make A Smaller Worm by Marion Walter
- Ten Little Ducks by Franklin Hammond
- Mouse Count by Ellen Stoll Walsh
- Boxes! Boxes! by Leonard Fisher

Strategies for Instruction in Mathematics: Kindergarten

The importance of questions

Can you remember when your child's favorite word was "why?" Children are naturally curious. As they get older, we want to nurture that curiosity and occasionally turn the questions back to them. *Look at this pattern. Do you see a mistake?*



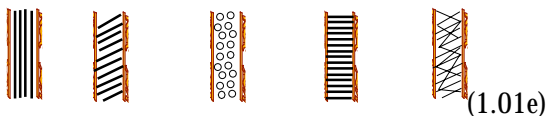
How do you know there is a mistake? What do you need to do to make the pattern correct? Can you make the same pattern using actions instead of symbols? Good questions encourage thinking and discussion. Why do you think that? How do you know? How could you find out? What could we do to find the answer? Perhaps, if we become skillful at this, our children will think that our favorite question is "Why?"



Let's Count

"Ribbon Line Up"

Select five different ribbons and place them in a row. Ask students to tell which one is third/first/fifth, etc. As an extension give each child in a small group an identical set of ribbons. Tell them which to put in each position. Ask them to tell which is first/third, etc. or to identify the position of a specific ribbon.



(1.01e)



I Wonder

"Comparing Cans"

To make this game, cut 12 different lengths of ribbon or yarn and put each piece in a film canister (or plastic Easter egg). Store the 12 cans in an egg carton. Children work with a partner. Each chooses a can and removes the ribbon. Then they compare and tell whose ribbon is longer or shorter. These can also be used for seriation by having the children choose three (or more) cans and put the ribbons in order from shortest to longest.

(3.02)



I Spy

Where's The Ribbon?

Hide a ribbon somewhere in your classroom. Have the children ask questions using positional language (see Week 14 - I Spy) to locate the ribbon. For example, "Is it under the sand table?" Is it to the left of the sink?"

(3.03)



Growing Mathematically

Comparing is the first step in learning to measure. Children need lots of opportunities to compare real objects and to talk about what they discover. When doing a comparison activity, first have children predict which item they think is longer/lighter/bigger/thinner, etc. Then directly compare the objects to verify predictions. Be sure to include experiences with length, weight/mass, capacity and time. Seriation (ordering) is another essential skill. Begin by having children order small sets (3-5 objects) which have very obvious differences. As their skill level increases give them larger sets (5-10 objects) with small differences between items. Materials for seriation include: drinking straws cut to different lengths, ribbons of different lengths or widths, stacking cups and Cuisenaire rods.



What Do You Think?

Ribbons are a good material for comparing and sorting. Children can sort pairs of ribbon by length or width. A simple sorting mat can help them get organized.

(5.01)

WIDE	NARROW



Let's Count

Use the copy of Ringo Rango in the Blackline Master Week 21 to help students practice rote counting to 30.

(1.01d)



I Spy

The Not Game

Gather students in a circle. Pass around a bag of attribute blocks or shapes and have each child draw out one. Place sorting loops in the center of the circle. The teacher then gives directions that always include the word **NOT**. Ex. In this loop put shapes that are not blue; in this loop shapes that do not have corners. etc.

(5.01)



What Do You Think?

Pattern Walk

Explain to students that they are going on a "pattern walk" to find as many patterns around their school as they can. Have each child carry blank pages to record the patterns they find. When they return, share their patterns and discuss where they found them. Ask questions like: what comes next in your pattern; what part of your pattern repeats itself. etc. Pages can be made into individual or class books.

(5.02)



I Wonder

Extend students understanding of estimation and comparison to include weight with this activity. The teacher chooses 2 objects easily held by students and distinctly different in weight. Students predict which object weighs more (or less) by holding one object in each hand at the same time. After everyone has had a chance to predict and discuss their choices, verify the results on a balance scale. *NOTE: Teacher should make the correlation between the parts of the scale and the students' bodies, i.e., hands are like pans, arms like the beam, etc.

(2.01)



Growing Mathematically

Math Logs

When assessing children, Math Logs are a very effective way of documenting student progress. These journals of student work can be as simple as pages stapled inside a construction paper cover or as elaborate as a comb-bound booklet with laminated covers. It is a convenient place for children to demonstrate their understanding of a concept, the results of the class Stumper or an independent math project. It provides ongoing and continuous evidence of progress and is a great way to show growth at Parent Conferences or report card time. Work samples can be generated in the log or glued in later. Pages should be dated, which makes for an excellent real-life application of math!

On-Going Assessment

For assessment to be valid it must be ongoing and consistent. Reassess the activities in Week 3 to document student growth. Remember it may not be necessary to interview every child individually if you have documentation in other ways (i.e., math logs, student samples, observation notes). Remember to focus on the children whose performance has been inconsistent or whom you have had questions about.

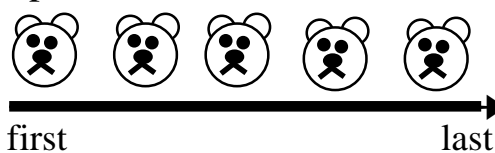
Sorting

Give the student sorting material they have had little or no prior experience with and ask them to sort by a teacher-supplied rule (3.02). Ask the student to re-sort the same material and give you their rule (3.02).

During the sorting process ask the student to explain the differences and likenesses of the sorted objects (3.01).

Ordinals

Set up 5 counters in a line on the table top (unifix cubes, bears, etc.) Ask the child to point to or identify the 3rd cube, the first, etc. Have the child reposition the counters and tell you the position of the counters (1.06, 2.03). Record correct responses



Directional and Positional Language

Give the student a counter and two blocks. Using the word list from Week 5 ask the students to demonstrate their understanding of the words by positioning the objects. Although this assessment is lengthy it is very important to use all the words on the list. At another time assess their expressive understanding by the teacher's positioning the counter and asking the child to describe the place or action.



Let's Count

Ordinals 1st-10th

Give each child ten snap cubes in many different colors. Students should line up the cubes following your oral directions i.e. "Put the green cube first, the red cube second, etc." Then have them describe the position of each cube. For example, a student says, "The blue cube is fourth, the red cube is eighth."

(1.01e)



I Spy

"Corners and Sides"

Begin by asking the children to explore the pattern blocks and talk about the number of corners and sides on each shape. Then give each child a geoboard and bands. Show the square pattern block and ask the children to copy it on their geoboard. Then ask them to make three more shapes with four corners. Encourage the children to share the shapes and talk about how they are alike and different. Repeat with 3-cornered shapes. What did you notice about all the 3-cornered shapes?

(3.01)



I Wonder

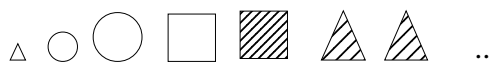
Before beginning any structured activities with capacity, children need plenty of opportunities to explore freely. You can encourage this exploration by creating one or more capacity centers and supplying a variety of containers (different shapes and sizes), and funnels. Be sure to encourage vocabulary development by talking with the children about full, empty, half-full, more and less. You can use the capacity cards in the Blackline Masters Week 22 for the children to label their work.

(2.01)



What Do You Think?

Create a difference train with attribute blocks or relationships. Let each child choose a shape. Select one block to begin the train and place it on the floor. Tell the children that the next block must be different in exactly one way. Ask whose block can go next and have that child add his or her shape to the train. Continue until no more blocks can fit the rule. See whether you can create a new train with the remaining blocks.



Variation: Try a two-difference train!

(3.02, 3.04, 5.01)



Growing Mathematically

Number sense is more than counting!

Kindergarteners need to begin to develop an understanding of number relationships. They need to be able to mentally decompose numbers into parts and to put the parts together to create wholes. Fluency with small numbers (up to 10) enables students to work easily with large numbers and complex mental computations later. One way to do this is to use a ten frame transparency and counters to flash quick images with the overhead projector. Images should be shown for 3 seconds. Be sure to fill the ten frame from left to right and top row before bottom. See "Let's Count" above, for a sample activity. For sample ten-frames see Blackline Masters Week 22.



Let's Count

Personal Abacus

Make a personal abacus for each child by using ten beads and a 12-inch pipe cleaner. Have child make a twisted loop at one end. Count out ten beads (five of one color, five of another) and lace onto stem. Complete by adding a loop to the other end. Makes a great counter to use at the computer.

(1.01b)



I Wonder

Literature Connection

Read Frank Asch's book Mooncake to your students. Ask how numbers were used in the story. Practice the launch count- down several times. 10, 9, 8... This will help children learn to count backwards from ten.

(1.01d)



I Spy

Literature Extension

After reading Mooncake invite teams of students to the block area to build a rocket. Have them problem-solve before they start and count the number of blocks they used when they are finished. Then students can count backwards to Blast Off!

(1.01b, 3.04)



Growing Mathematically

The Classroom Climate

Here are some things you should do to establish a positive climate in your classroom for problem-solving:

- Be enthusiastic about problem-solving
- Have students bring in problems from their personal experiences.
- Personalize problems whenever possible (e.g., use students' names).
- Recognize and reinforce willingness and perseverance.
- Reward risk takers.
- Encourage students to play hunches.
- Accept unusual solutions.
- Praise students for getting correct solutions, but during problem-solving, emphasize the selection and use of problem-solving strategies.
- Emphasize persistence rather than speed.

From: Charles, R. I. et al. Problem-Solving Experiences in Mathematics. Teacher Sourcebooks, Grades 1-6. Addison-Wesley Publishing Company, 1985. pp. vii



What Do You Think?

On the back of this page is a problem-solving guide to help your students think through the problem-solving process. You could make a transparency of it or enlarge it to create a poster or bulletin board. Talk with your students about the three steps and what each means. Help them to plan before they begin working. After they have finished be sure to share and discuss solutions.

(1.03)

A Guide to Problem-Solving

Understanding

- Listen to the problem
- Decide what you are asked to do
- Find the important information

Planning

Choose a strategy:

- Draw a picture
- Use objects
- Act it out
- Look for a pattern

Answering & Reflecting

- Check your work
- Be sure you used all the important information
- Be sure your answer makes sense.



Let's Count

"Show Me"

Here's a quick way to practice modeling numbers. Give each child approximately 15 counters and a work space.* Say a number and have each child show that many counters. To work on recognizing numerals, show a numeral card (don't say the number name) and have each child display that many counters. This gives you a chance to do some assessment by observing children's work.

* 8 x 10 rectangle of colored paper or felt (1.01a)



I Spy

"Lots of Lines"

This activity provides practice in estimating, measuring, counting, and writing numerals. Each child will need a copy of the Lines Sheet Blackline Master. First they estimate how many unifix cubes will fit along each line. Next they actually put the cubes beside the line to measure and then count them. Finally they record the number of cubes in the circle. Create your own puzzles using the blank sheet Blackline Master Week 24. This is a good independent activity.

(3.01, 3.04)



What Do You Think?

Give each child a strip of paper and ask them to draw a pattern. When everyone is finished, share patterns and have each child describe their pattern.

These can be sewed and placed in math logs or portfolios.

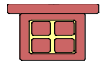


(5.02)



I Wonder

Help children record and organize their measurement experiences. The measurement recording sheet Blackline Master Week 24 can be used for length, capacity or mass/weight. In the first column the child writes the name or draws a picture of the object to be measured. In the second column they record their prediction with a number and unit. The last column is for recording the actual count and unit. Labels on containers of units will help children record independently.

	11 straws	14 straws
---	-----------	-----------

(2.01)



Growing Mathematically

After children have had lots of experiences with comparing length, capacity, and mass/weight, they can begin to explore measurement with nonstandard units. Introduce this concept by connecting it to comparison activities. Show an object to be measured and also one of the units, for example, a pencil and a unifix cube. Ask the children to estimate many cubes are needed to measure the object (pencil) then verify their predictions by actually measuring and recording the results. Below is a list of some nonstandard units that can be used. Be sure that all units in a set are the same.

<u>LENGTH</u>	<u>WEIGHT/MASS</u>	<u>CAPACITY</u>
Unifix cubes	Unifix cubes	Spoons
Toothpicks	Wooden cubes	Scoops
Paperclips	Large lima beans	Teacups
Links	Pennies	Vials
Straws	Acorns or other nuts	Small cartons
New crayons	Counters	Small bowls
Popsicle sticks		

More Math Fun at Home!

5

Talk about eating at home and eating out. How are they alike and different?

Look at some coins. Which are pennies, nickels and dimes?

The next time you eat out, look for patterns and shapes in the restaurant.

What is your favorite place to eat out? Tell why it is your favorite.

Describe the sequence of events of eating in a restaurant.

EATING OUT

Survey your family and friends to find out their favorite colors.

What is your favorite color? Draw three things that are that color.

Find some objects (crayons, toys, caps, shoes, etc.); sort them by color.

Make a color pattern.

Count everything in your room that is your favorite color.

COLORS

What is your favorite kind of weather? Tell why.

Look at a thermometer. What numbers do you see?

Name all the kinds of weather you know. How many can you name?

What is the weather like today? How is it similar to and different from yesterday?

Watch the weather on T.V. Talk about the numbers you see.

THE WEATHER

Tell how many kindergarten classes are in your school.

Describe your teacher.

What is the best thing about school? Tell why it is the best. What is the worst thing about school? Tell why it is the worst.

Describe the sequence of events of a day at school.

Talk about which days of the week you go to school.

YOUR SCHOOL

(1.01a, 4.01, 5.01, 5.02)



Let's Count

"Domino Critters"

Make copies of the Dominos Critters. Select a target number between 12 and 30. Have children work with a partner to place dominoes on the critters so that each has the target number of dots. If you don't have real dominoes you can make paper ones using the Blackline Masters Week 25.

(1.01b)



I Wonder

Call students to the estimating center to introduce the idea of comparing time. Have a general discussion about familiar classroom activities and verbally compare tasks. Ex. Does it take longer to wash your hands or go to P.E.? Choose two cards from Blackline Masters Week 19 and explain that we are going to estimate which task will be longer or shorter. Have each child make a prediction. Students can verify results by acting out card activities.

(2.01)



I Spy

"Cover Up"

Provide pairs of children with containers of pattern blocks. Challenge them to find as many ways to cover the yellow hexagon as they can.

Extension: Can you cover the red trapezoid with two blocks/with three blocks? Can you cover the yellow hexagon with three blocks/with four blocks? etc.

(3.01, 3.04)



Growing Mathematically

When planning geometric experiences for our kindergarteners we need to go beyond just naming shapes. We need to be sure that we are developing spatial sense, helping children compare and analyze shapes, to see relationships among shapes, and to identify shapes in the environment. Here is a list of materials to help children develop geometric concepts:

- unit blocks
- geoboards
- sets of geometric solids
- pattern blocks
- toothpicks and clay
- Polydrons
- parquet blocks
- found geometric solids - cans, boxes, balls, etc.



What Do You Think?

"Matrix Patterns"

Help children explore matrix patterns using geoboards and unifix cubes. Prepare some pattern cards (see Black line Masters Week 25) by coloring a pattern on the top two rows. Explain to the children that they are to copy and extend the pattern by placing the appropriate color unifix cube on each nail. They should fill the whole geoboard. Later students can use copies of the blackline master to create and record their own matrix patterns.

(5.02)

Make each domino critter have the same number of dots. What numbers can you make? Can you make "12" critters?



Three domino shapes, each with a vertical line down the center.



Four domino shapes: one with a horizontal line, two with vertical lines, and one with a horizontal line. The two vertical dominoes have small hooks at their bottom ends.



Domino Critters

Four domino shapes: one with a vertical line, one with a vertical line, one with a horizontal line, and one with a vertical line.



Let's Count

"Sky Scrapers"

Materials: unifix cubes, dice (dotted or numbered), gameboard (on the back of this page). Children work with partners and take turns rolling a die to build sky scrapers for their "city" (each child builds on one side of the gameboard). The number on the die tells how many unifix cubes tall to make the building. When all the spaces on the gameboard are full, children snap together all of their sky scrapers and compare the length of their tower with that of their partner.

(1.01b, 1.01d)



I Spy

Tangram puzzles are great for developing spatial visualization skills. They can be purchased commercially or you can copy them on heavy paper (Blackline Master Week 9).

(3.04)



What Do You Think?

Border Patterns

Give each child a large piece of construction paper to use in making a placemat. Have them start at the top edge with their pattern, go across, turn paper, continue along that edge, and so on until they have completed the border. Patterns can be made using potato prints, sponge prints, fingerprints, stickers, paper cutouts, buttons, etc.

(5.02)



I Wonder

"How Long Is A Minute"

To help your students get a feel for how long a minute is, ask them to stand in front of their chairs and close their eyes. Tell them to sit down silently when they think a minute has gone by. The teacher keeps time. Talk about how close they were. Repeat and see if they get closer.

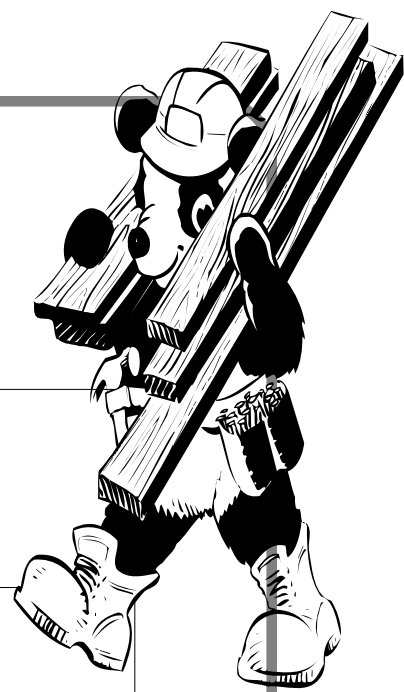
(2.01)



Growing Mathematically

Children learn a lot from each other. Encourage your students to work together to solve problems. Kindergarteners tend to do best working with a partner, rather than in groups of four or more. Sometimes it is helpful for the teacher to assign partners. You know which students need help, which can give help and who should not be put together. However, children like to have some say in the process. Perhaps you could let them suggest three or four students they would like to have as partners, or occasionally let them choose.

Sky Scrapers







Let's Count

Draw a number line from 0-10 outside on the play area or side walk with chalk. Have students walk the number line and call out the number. Variations of hopping, sliding and counting backwards will add to the fun.

(1.01d)



I Spy

"Peek and Build"

This activity helps to develop spatial sense. Out of student's view, make a 4-5 piece design with overhead pattern blocks on the overhead. Provide students with pattern blocks. Tell students to look carefully. Turn on overhead and let students see your design for 2-3 seconds. Turn overhead off. Ask students to build the design from memory. Then show design, compare and discuss.

(3.04)

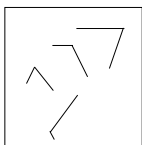
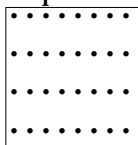


What Do You Think?

In The Round

★Challenge Activity

Use 2 colors of rubber bands to make a shape on the geoboard. Model the activity for students on the overhead and point out the alternating colors and the symmetry around the geoboard's center. Invite the students to make their own and share with the class. Have children explore more of these on their own.



(3.04)



I Wonder

Make a simple 2- column graphing grid. In small baggies put collections of 5-10 small objects (i.e., five paper clips, seven old crayons, nine counters , etc.) You need to have about eight baggies for each pair of children. Place baggies in a paper lunch bag. Children work with a partner. Each child draws a baggie from the paper bag. They compare baggies and predict which has more/less. Then they remove the objects and place them on the graph (Blackline Master Week 27) to verify which has more or less. Replace baggies and repeat.

(1.01d, 4.01)



Growing Mathematically

Math kits are an organizational strategy that can help you take advantage of small blocks of time and keep children productively engaged. You will need one gallon size heavy-duty zipper bag for each kit. Customize the kits to meet your student's needs. Here are some items you might want to include:

- felt work space (8-10")
- 15-20 counters
- paper or plastic coins
- number tiles
- dice
- 10-20 unifix cubes.

More Math Fun at Home!

6

Find things at home that are circle shaped.

Draw a big square, a middle sized square, and a small square.

Find things at home that are rectangle shaped.

Draw three different triangles. How are they alike and different?

Create a pattern with shapes.

SHAPES

Look on the ground. Count how many:
rocks,
insects,
fallen leaves,
sticks.

Make a pattern with objects you find on the ground or draw a pattern in the dirt.

Find two things on the ground. Talk about how they are alike and different.

Rub your hand on a tree trunk, on the grass and over the rocks. Talk about how each feels.

Collect two different types of dirt/soil in baggies. Talk about how they are alike and different.

ON THE GROUND

Feel two items of clothing. Talk about their textures. How are they alike and different?

Go outside. Find three things that are rough.

Rub your hand over your hair, your arm and the bottom of your shoe. What textures do you feel?

Go outside. Find three things that are smooth.

Rub your fingers together. Talk about how that feels. Do it again with soap on your fingers. Compare.

TEXTURES

Name two plants that are short and two that are tall.

Talk about how plants change in different seasons.

Look carefully at two plants. How are they alike and different?

Find a plant the same size as you. Is it wider or narrower than you?

Find a plant with leaves. Look carefully at the leaves and choose a shape that is the closest match.

PLANTS