

Numbers Through the Year

Summary

Students use manipulatives in activities to learn to recognize numbers.

Main Core Tie

Mathematics Kindergarten

[Strand: COUNTING AND CARDINALITY \(K.CC\) Standard K.CC.4.](#)

Additional Core Ties

Mathematics Kindergarten

[Strand: COUNTING AND CARDINALITY \(K.CC\) Standard K.CC.1.](#)

Mathematics Kindergarten

[Strand: COUNTING AND CARDINALITY \(K.CC\) Standard K.CC.2.](#)

Mathematics Kindergarten

[Strand: COUNTING AND CARDINALITY \(K.CC\) Standard K.CC.3.](#)

Mathematics Kindergarten

[Strand: COUNTING AND CARDINALITY \(K.CC\) Standard K.CC.5.](#)

Mathematics Kindergarten

[Strand: MEASUREMENT AND DATA \(K.MD\) Standard K.MD.1](#)

Mathematics Kindergarten

[Strand: MEASUREMENT AND DATA \(K.MD\) Standard K.MD.2](#)

Group Size

Individual

Materials

Number Generator

2 small rings per child

Index cards

Scissors

The Plate Game

Paper plates

Manipulatives

Ring and Do

Paper plates

Manipulatives

Bell

Number cards

Markers/chalk

Response board

What's Missing?

Number pocket chart

Number cards

Memory Frames

- [Ten Frame Dot Cards](#)

- [Blank Ten-Frames](#)

Counters.

Center 1: Number Stamp

- [Number Stamp](#)

Number Stamps

Stamp pad

Marker stamp pens

Red marker

Math journal

Center 2: Bead Counters

- [Numbered Bead Cards](#)

Shoelaces

Beads

Paper Clips

Paper Punch

Center 3: Spin-A-Number

- [Spin-A-Number](#)

Game spinners

Crayons/colored pencils

Red marker

Math journal

Center 4: Fishing for Numbers

- [Fish Pattern](#)

Cardstock

Fishing pole

String

Magnet

Small magnetic strips

Tub

- [Number Recording Sheet](#)

Math journals

Writing utensils

Center 5: Ten Frame Counting

Counters

- *Ten Frame*

- [Ten Frame Recording Sheet](#)

- [Ten Frame-Part of the Whole](#)

Spinner

Additional Resources

Books

Number Books from 0-10

10 for Dinner, by Jo Ellen Bogart; ISBN 0-590-71949-1

A-Counting We Will Go, by Rozanne Lanczak Williams; ISBN 0-916119-93-9

Anno's Counting Book, by Mitsumasa Anno; ISBN 0690012888

Bat Jamboree, by Kathi Appelt; ISBN 0-590-76767-4

City By Numbers, by Stephen T. Johnson; ISBN 0-14-056636-8

Count and See, by Tana Hoban; ISBN 0-02-744800-2

Count!, by Denise Fleming; ISBN 0-8050-4252-0

Emeka's Gift, by Ifeoma Onyefulu; ISBN 0-14-056500-0

Feast for 10, by Cathryn Falwell; ISBN 0395620376

How Many?, by Judy Nayer; ISBN 1-56784-307-7 (Big Book)
Moja Means One, by Muriel Feelings; ISBN 0-14-054662-6
More Than One, by Miriam Schlein; ISBN 0-590-10734-8
One, Two, Skip A Few! First Number Rhymes, Illustrated by Roberta Arenson; ISBN 0-439- 22786-0
Ten Black Dots, by Donald Crews; ISBN 0-688-13574-9
Ten Cats Have Hats, by Jean Marzollo; ISBN 0-590-47056-6
Ten Little Rabbits, by Virginia Grossman and Sylvia Long; ISBN 0-8118-1057-7
The Gummy Candy Counting Book, by Amy and Richard Hutchings; ISBN 0-590-34127-8
The Icky Bug Counting Book, by Jerry Pallotta; ISBN 0881066907
Who's Counting?, by Nancy Tafuri; ISBN 0-590-48904-
 Number Books from 0-20
Bears At The Beach, by Niki Yektai; ISBN 0-7613-0047-3
Cat Up A Tree, by John and Ann Hasset; ISBN 0-395-88415-2
Count and See, by Tana Hoban; ISBN 0-02-744800-2
Counting Is For The Birds, by Frank Mazzola Jr.; ISBN 0-88106-951-5
Counting Our Way to Maine, by Maggie Smith; ISBN 0-531-06884-6
Dragon Naps, by Lynne Bertrand; ISBN 0-670-85403-4
How Many? How Much?, by Rosemary Wells; ISBN 0-329-23384-X
Math Counts Counting, by Henry Pluckrose; ISBN 0-516-05452-X
Monster Munchies, by Laura Numeroff; ISBN 0-679-99163-8
One Woolly Wombat, by Rod Trinca and Kerry Argent
The Handmade Counting Book, by Laura Rankin; ISBN 0-8037-2309-1 Media
Math Circus, by Leap Frog (www.leapfrog.com); ISBN 0-7907-9948-0
Winnie the Pooh 123's, by Disney Learning Adventures; ISBN 0-788-4998-0

Organizations

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

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

Background for Teachers

Number sense is described as a person's ability to understand and use numbers. Some scientists believe that humans are born with number sense or an innate ability to comprehend, process, and manipulate numbers. If we in fact have this innate ability then why do so many people struggle with mathematics? We need to cultivate a positive attitude towards math. This will certainly help facilitate confidence in our students thus improving student achievement.

Here are some suggestions of activities that will help build a student's confidence in math:

- Encourage students to explore groups of objects using manipulatives.

- Talk about numbers!

- Give students an opportunity to use numbers to solve problems.

Students struggling with number sense should be explicitly taught number representation, number comparison, number order, number patterns, number estimation, and joining and separating of number sets. Helping students build number sense right from the start, in kindergarten, gives students the background and the confidence they will need to succeed in the future with mathematics.

Intended Learning Outcomes

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

Instructional Procedures

Invitation to Learn

Introduce the Tricky Teen Song on a chart. Later, have the students hold up number cards as you sing the song.

The Tricky Teen Song

(Tune: "Row, Row, Row Your Boat")

Do you know the tricky teens?

Sing them with me!

1 0 is ten.

1 1 is eleven.

1 2 is twelve.

1 3 is thirteen.

1 4 is fourteen

1 5 is fifteen.

1 6 is sixteen.

1 7 is seventeen.

1 8 is eighteen.

1 9 is nineteen.

Now you know the tricky teens!

You sang them with me.

Tricky teens are lots of fun.

Wouldn't you agree?

Instructional Procedures

Number Generator

Each child will need 7 plain index cards.

Cut 6 index cards in half.

Use one full index card as the back of the Number Generator.

Have students write numbers 1, 2, and 3 on individual cards.

Punch the cards at the top left corner.

Attach numbers 1-3 with a ring on the left side of the full index card. (Numbers should be in order.)

Have students write numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 on individual cards.

Punch the cards at the top right corner.

Attach numbers 0-9 with a ring on the right side of the full index card. (Numbers should not be in order)

Now, you are ready to make numbers from 0-30.

Have the students make numbers with the Number Generator and hold it up for you to assess their success.

The Plate Game

Stage One:

Divide the class into groups of 3-4 students.

Provide each group with paper plates numbered from 0-10 (not in order).

Spread the groups out around the room.

Inform the students that each team needs to put the plates in the correct number order.

Give the signal to begin!

Have the team sit down when they have put their plates in the correct number order.

The first team that sits down and has their paper plates in consecutive order wins.

Stage Two:

Divide the class into groups of 3-4 students.

Provide each group with manipulatives. (Remember, you will need more manipulatives for higher numbers.)

Students are informed that the team that puts the plates in correct number order, with the correct number of manipulatives on their plates will be pronounced the winner.

Give the signal to start the game.

Have the teams sit down when they have completed the task.

Check the performance of the team that sits down. Make sure that their plates are in number order and count, with the group, the manipulatives on each plate. If they are correct, they are pronounced the winners.

The game continues if the first team makes a mistake and is eliminated from the competition.

This process continues until a winner is declared.

Ring and Do

Part One:

Each student has his/her own paper plate and access to small manipulatives.

The teacher/student draws a number card but does not show it to the group.

The teacher/student rings the bell the number of times indicated on the number card.

Each student puts that number of manipulatives on their paper plate.

As a group, count to the number on the number card as the students remove the manipulatives from their plates.

Check for understanding.

Part Two:

Each student has a chalkboard/marker board and a writing utensil.

The teacher/student draws a number card but does not show it to the group.

The teacher/student rings the bell the number of times indicated on the number card.

Each student then writes down the number of rings that he/she heard.

As a group, students show their answers by holding up their boards.

Check for understanding.

What's Missing?

Have a number pocket chart displayed at the front of the classroom.

Place the numbers in a pattern on the number chart. (Use different patterns throughout the year.)

Secretly remove a number from the number chart.

Have one student identify the color of the missing number and another student identify the missing number.

Point out how each child came up with his/her answer. (This is valuable for students who are having a difficult time coming up with an answer.)

Continue this process several times.

Memory Frames

Each student is given a *Blank Ten-Frame Card*.

The teacher has a variety of *Ten-Frame Dot Cards*.

The teacher holds up one *Ten-Frame Dot Card* for 5 seconds.

The students are asked to use the counters to reproduce the dot card that was shown.

Students are told to complete the task quickly and to the best of their ability.

The teacher walks around checking progress.

The teacher displays the *Ten-Frame Dot Card* that was shown to the group.

Ask: How many put the counters in the correct place?

Ask: How many knew the right number but had the counters in the wrong place?

This game can be used all year. Teachers can hold up two or [three Ten-Frame Dot Cards](#) at a time to make numbers up to 30.

Center 1: Number Stamp

Each student will receive a *Number Stamp recording sheet*.

Students will stamp a number in one or two boxes on the left side of the sheet (e.g., If the student stamps a number 1 and a number 6 then he/she creates the number 16).

Students will then use a marker stamp pen and stamp the corresponding amount in the box on the right side of the recording sheet (e.g., The student will stamp with the stamp pens 16 times).

Students can use this activity to create numbers from 0-99.

Students should use the red marker to self-correct their paper.

Journal Activity: Stamp a number on the journal page and use the marker stamps to represent that number.

Center 2: Bead Counters

Stage One:

The *Numbered Bead Cards* will need to have a hole punched on the right side (not close to the edge).

Knot a shoelace at the back and the front of the *Numbered Bead Cards*.

Have the students look at the first number on the *Numbered Bead Card* and string the beads on the shoelace to match that number.

Have the students put a paper clip on the end of the completed shoelace. This will hold the beads in place until the teacher can check it.

Have the students count the beads that have been strung and self-correct their work.

Students repeat this process with the next number on the card.

Students may have time to complete several cards during a center time.

Journal Activity- Have the students choose one number card to represent in their journal. Have the students write the number, draw a line on their paper, and then color circles to represent the beads that were strung on the card.

Stage Two:

The beads could be strung in patterns.

Center 3: Spin-A-Number

Each student will need a *Spin-A-Number Recording Sheet*.

Students spin the spinner.

Students will write the number on the recording sheet and then color in that number of squares to represent the number.

This process continues by spinning again and recording the number until the sheet is completed.

Have students self-correct their work with the red marker.

Journal Activity- Have the students spin a number and record the number in their journal. Have the students draw a picture of that number of objects in their journal.

Center 4: Fishing for Numbers

Part One:

Copy the Fish Pattern onto cardstock and write numbers from 0-10 on the fish.

Copy the Fish Pattern onto cardstock and make dots to match the numbers from 0-10.

Cut and laminate the fish.

Place a small magnetic strip on the back of each fish.

Decorate a tub to look like water.

Place the fish in the tub.

Make a fishing pole with a dowel, string, and a magnet.

Have the students take turns catching a fish.

Match the numbered fish with the fish with dots.

Journal Activity: Have the students catch fish from the tub. The students will then draw a fish

and record the number that was on the fish in their journals. Have the students draw small circles to represent that number so that they look like bubbles coming from the fish. Students could write the numbers in the bubbles from 0 to the number that was caught.

Part Two:

Have the students put the fish that are caught in numerical order from 0-10, 0-20, 0-30.

Part Three:

Have the students record the number on the fish on a *Number Recording Sheet*.

Center 5: Ten Frame Counting

Part One:

Give each student a small container of counters.

The student spins the spinner.

On the Ten Frame card, the student places the same number of counters indicated on the spinner.

Part Two:

Students will record their spin on the Ten Frame recording sheet.

Part Three: Part of the Whole

Give each student a small container of counters and several ten frame cards with 5 spaces filled in.

The student spins the spinner that is numbered from 6 to 10.

The student fills in the missing part to make the number whole (e.g., if the student spins seven then they will need to put 2 counters on the Ten Frame card to make the number 7).

Students record their spin on the Ten Frame- Part of the Whole recording sheet.

This process can continue with numbers up to twenty and thirty. A spinner will need to be made for higher numbers, and recording sheets are available at www.coreacademy.usu.edu.

Extensions

Curriculum Extensions/Adaptations/ Integration

All students can use centers. Adaptations in quantity of numbers can be adjusted to meet the specific needs of each student.

Center activities should be taught to the whole group and then placed in a center for students to practice and become proficient in the subject matter.

Numbers should be talked about in all curriculum areas (e.g., How many pages are in this book? or How many seasons are in a year?).

Family Connections

- [Number Writing Sheets 0-30](#)

could be sent home for writing practice.

Number Book 0-30 could be sent home for number representation and writing practice.

Math Night -- Parents would be invited to make the math activities for their homes.

Assessment Plan

The math journal is an excellent way for you to evaluate a student's mathematical thinking.

Observations: These can be recorded on small sticky notes or on an *Observation Sheet*. Make notes about students that need to be pulled into a small group for extra help.

Ask probing questions to focus students' thinking when using manipulatives.

Have students share their thinking about the activity.

Collect any recording sheets. This will give you time to make an in-depth assessment of a student's number sense.

Bibliography

Research Basis

Clements, D. H. (1999). 'Concrete' manipulatives, concrete ideas. *Contemporary Issues in Early Childhood*, 1(1), 45-60.

Students who use manipulatives in their mathematics classes usually outperform those who do not. This benefit holds across grade level, ability level, and topic, given that use of a manipulative "makes sense" for that topic. Manipulative use also increases scores on retention and problem solving tests. Attitudes toward mathematics are improved when students have instruction with concrete materials provided by teachers knowledgeable about their use.

Burns, M. (April 1996). How to Make the Most of Math Manipulatives. *Instructor Magazine*. 45-50.

7 Musts for Using Manipulatives:

- Talk to students about why manipulatives help them learn.

- Set ground rules for using materials.

- Set up a system for storing materials and familiarize students with it.

- Time for free exploration is worth the investment.

- Post class charts about manipulative materials.

- Manipulatives are a natural for writing assignments. Manipulatives provide concrete objects for children to describe.

- Let parents get their hands on manipulatives, too. It's important for parents to understand why their children are using materials.

Moyer, P. & Jones G. (2004). Controlling Choice: Teachers, Students and Manipulatives in Mathematics Classrooms. *School Science and Mathematics*. Vol. 104.

Manipulatives are designed to represent explicitly and concretely abstract mathematical ideas.

Research on their use has shown that students who use manipulatives during learning outperform those who do not.

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