

How Many Ways Can You Represent a Number?

Summary

This scaffolded lesson can span the entire school year and asks kindergarteners to work with whole numbers 1 through 10.

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.](#)

Materials

Beginning of the School Year

- 40 one-inch colored tiles

- White mat

October

- 40 one-inch colored tiles

- [Exploration Tile Mat](#) pdf

November

- [Numbered Tile Mat](#) pdf

- Colored one-inch tiles

- Crayons (red, blue, green, yellow)

December

- Numbered Tile Mats

- Colored one-inch tiles

- Crayons (red, blue, green, yellow)

January

- Numbered Tile Mats

- Numbered Tile Recording Sheet

- Colored one-inch tiles

- Pencils

- Markers

- Crayons (red, blue, green, yellow)

February

- Numbered Tile Mats

- Numbered Tile Recording Sheet with plus (+) and equal (=) signs

- Colored one-inch tiles

- Pencils

- Markers

- Crayons (red, blue, green, yellow)

March

- [Number Representation Book](#) pdf

Small rubber stamps

Stamp pad

Crayons

Markers

Pencils

Additional Resources Books

- *Moo-ving into Math Journals*

, by Margaret Allen, Ph.D.; ISBN 0-9722832-0-X

- *Every Day Counts Partner Games*

, by Patsy F. Kanter and Janet G. Gillespie; 0-669-44373-5

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

Background for Teachers

Scaffolding instruction is an important teaching strategy that can be used in all curriculum areas. One of the major benefits of scaffolding instruction is that learners are constantly engaged. Scaffolding instruction allows students to move from dependent learners to independent thinkers. Scaffolding instruction is individualized so it can benefit each learner. This becomes important when our classrooms are filled with students ranging from gifted to special needs students. The activity that is presented in the preceding plan is a scaffolded lesson plan. It is an activity that can be used at the beginning of the year and progresses in intensity to meet the needs of the students at the end of the kindergarten year. The idea of a scaffolded lesson is that students spend less time figuring out what they are supposed to do and more time learning and discovering. This actually results in an increase in student learning, and students are able to internalize their learning more effectively.

Intended Learning Outcomes

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.

Instructional Procedures

Invitation to Learn

In the middle of the table there is a container with one-inch colored tiles. The tiles are red, blue, green, and yellow. Make a design using these tiles that you would like to share with the class. Make your design on the white mat on your table. You need to make your own unique design.

Beginning of the School Year

Students are given one-inch colored tiles

Tiles are placed in the middle of the table.

Students are allowed to create, organize, and discover different ways to arrange the tiles.

Designs should be made on the white mat provided for the students.

These designs are shared with the class.

October

Students are given an Exploration Tile Mat.

Students are given 40 one-inch colored tiles.

Students are allowed time to place tiles, of their choosing, within the grid on the Exploration Tile

Mat.

Some students will finish quickly. Have these students clear their mats and try alternate ways to place the colored tiles in the grid.

This activity will be placed in a center for further exploration.

November

Students are given Numbered Tile Mats starting with the Number 2 Mat continuing through the Number 10 Mat.

Students are given two different colors of one-inch tiles.

Numbered Tile Mats have a grid for students to follow.

Students are asked to use the one-inch tiles to make representations of the specified number on the mat.

Each grid must be a different representation of the specified number. Students cannot duplicate patterns.

Students color in the Numbered Tile Mat with a matching crayon to the one-inch tile.

Students are informed that the same color of tile must be grouped together (e.g. a yellow tile cannot be between two blue tiles).

This activity is then placed in a center for further exploration.

December

Students are given Numbered Tile Mats starting with the Number 2 Mat continuing through the Number 10 Mat.

Students are given two different colors of one-inch colored tiles.

Numbered Tile Mats have a grid for students to follow.

Students are asked to use the one-inch tiles to make representations of the specified number on the mat.

Each grid must be a different representation of the specified number. Students cannot duplicate patterns.

Students color in the Numbered Tile Mat with a crayon that is the same color as the tile.

Students are informed that the same color of tiles must be grouped together.

Each grid is followed by two lines for the students to write down the numbers of each grouping of colored tiles.

This activity is then placed in a center for further exploration.

January

Students are given Numbered Tile Mats starting with the Number 2 Tile Mat continuing through the Number 10 Tile Mat.

Students are given two different colors of one-inch colored tiles.

Numbered Tile Mats have a grid for students to follow.

Students are asked to use the colored tiles to make representations of the specified number on the mat.

Each grid must be a different representation of the specified number. (Students cannot duplicate patterns.)

Students are informed that the same color of tiles must be grouped together.

Students transfer the information off the Numbered Tile Mat to the Numbered Tile Recording Sheet.

Pencil/marker is used to record the number of colored tiles and a crayon is used to indicate the color of the tiles.

This activity is placed in a center for further practice.

February

Students are given Numbered Tile Mats starting with the Number 2 Tile Mat continuing through the Number 10 Tile Mat.

Students are given two different colors of one-inch colored tiles.

Numbered Tile Mats have a grid for students to follow.

Students are asked to use the one-inch tiles to make representations of the specified number on the mat.

Each grid must be a different representation of the specified. Students cannot duplicate patterns.

Students are informed that the same color of tiles must be grouped together.

Students transfer the information off the Numbered Tile Mat to the Numbered Tile Recording Sheet.

Pencil/marker is used to record the number of colored tiles and a crayon is used to indicate the color of the tiles.

This recording sheet now includes the symbols for plus (+) and equal (=). Talk about these symbols and why they are important.

This activity is placed in a center until the end of the school year.

March

Students will make a Number Representation Book. Throughout the school year, students have written the numbers from 0-10, stamped the numbers, made tally marks, colored pictures of specific numbers, and used tiles to represent each number. Now, it is time to make a number representation book that will help the students see on one page all the ways that they know how to represent a specific number.

Students are given a specific Number Representation Sheet.

Students will need to trace the specific written numeral.

Students will need to write the specific numeral on their own.

Students will use tally marks to represent each number.

Students will stamp the specific number of objects.

Students will color objects to represent the specific number.

Students will color in the specified number of tiles at the bottom of the Number Representation Sheet.

Number Representation Sheets represent numbers from 0-10. A page a day can be completed and eventually they will complete a *Number Representation Book*.

Extensions

Students are allowed to move through the Numbered Tile Mats at their own pace thus individualizing education for both the gifted and special needs students.

Students are allowed to manipulate objects to help them internalize the mathematical process.

Scaffolding the math activities allows for teacher instruction progressing to independence of students. The scaffolding strategy can be used in all subject areas.

Number Mats are available on the [Core Academy website](#) at under Materials 2007.

Family Connections

Students are encouraged to take home Numbered Tile Mats for homework. Paper one-inch colored squares in two colors are sent home with the Numbered Tile Mat. Homework should be returned to school upon completion.

Math Night- Parents are invited to participate in the Numbered Tile Mat activities at a family math night.

Assessment Plan

Student watching is the observation and recording of student's interactions during regular instructional activities. This can be recorded on small sticky notes or an [Observation Sheet](#) pdf.

A [Math Checklist](#) pdf is kept to keep track of student progress as they move through the Number

2 Tile Mat to the Number 10 Tile Mat.

Number Tile Mats and Number Tile Recording Sheets could be collected as part of a student's math portfolio. This collection of a student's work would represent the growth or progress of a student during the course of a school year.

Ask probing questions to focus children's thinking when doing these activities.

Bibliography

Research Basis

Raymond, E. (2000). Cognitive Characteristics. *Learners with Mild Disabilities* (169-201). Needham Heights, MA: Allyn & Bacon, A Pearson Education Company.

Scaffolding instruction as a teaching strategy originates from Lev Vygotsky's socio-cultural theory and his concept of the zone of proximal development (ZPD). The zone of proximal development is the distance between what children can do by themselves and the next level of learning that they can be helped to achieve with competent assistance. Vygotsky defined scaffolding instruction as the role of teachers and others in supporting the learner's development and providing support structure to get to that next stage or level. According to Vygotsky, the external scaffolds provided by the educator can be removed because the learner has developed a more sophisticated cognitive system.

Chang, K., Chen, I., & Sung, Y. (2002). The effect of concept mapping to enhance text comprehension and summarization. *The Journal of Experimental Education* 71(1), 5-23.

The scaffolding teaching strategy provides individualized support based on the learner's zone of proximal development. An important aspect of scaffolding is that the scaffolds are temporary. As the learner's abilities increase, the scaffolding provided by the more knowledgeable other is progressively withdrawn. The learner is then able to complete the task or master the concepts independently.

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