

Fun with Fractions

Summary

Activities lead the students to the understanding that the larger the denominator the more parts the whole is being divided into.

Main Core Tie

Mathematics Grade 3

[Strand: NUMBER AND OPERATIONS - FRACTIONS \(3.NF\) Standard 3.NF.1](#)

Materials

- whiteboard
- whiteboard markers
- color gel paper
- overhead projector
- scissors
- [Letter to My Friend](#) pdf

Additional Resources

Books

- *Apple Fractions*
, by Jerry Pallotta; ISBN 0-439-38901-1
- *The Hershey's Milk Chocolate Fractions Book*
, by Jerry Pallotta; ISBN 0-439-13519-2
- *Math to Know: A Mathematics Handbook*
, by Mary C. Cavanagh; ISBN 0-669-47153-4
- *Fraction Action*
, by Loreen Leedy; ISBN 0-8234-1244-X
- *Fraction Fun*
, by David Adler; ISBN 0-8234-1341-1
- *Piece=Part=Portion*
, by Scott Gifford; ISBN 0-439-74054-1
- *Clean-Sweep Campers*
, by Lucille Penner; ISBN 1-57565-096-7
- *Inchworm and A Half*
, by Elinor Pinczes; ISBN 0-618-31101-7
- *Give Me Half*
, by Stuart Murphy; ISBN 0-06-446701-8

Games

- *Pizza Fraction Fun, Jr.*
, Learning Resources (LER 5061 is the item number from the catalog; check website or catalog for ordering)
- *Pie in the Sky Fraction Game*
, Learning Resources (LER 5054 is the item number from the catalog; check the website or catalog for ordering.)
- *Auntie Pasta's Fraction Game*
, Learning Resources (LER 5053 is the item number from the catalog; check website or catalog for ordering.)

Background for Teachers

A fundamental knowledge of number sense and relationship (greater than, less than, equal to, grouping) needs to be in place as well as the ability to add, subtract, multiply and divide small numbers. In addition, students should understand what the numerator and denominator of a fraction represents and that halves, thirds, fourths, sixths, and eighths are represented with the symbols $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{8}$. And, don't forget--keep up the attitude of curiosity, creativity, and fun!

Intended Learning Outcomes

1. Develop a positive learning attitude toward mathematics.
2. Become effective problem solvers by selecting appropriate methods, employing a variety of strategies, and exploring alternative approaches to solve problems.
6. Represent mathematical ideas in a variety of ways.

Instructional Procedures

Invitation to Learn

Divide Us! Divide Us!

Take your class outside and tell them that we are going to explore dividing us up into parts. When you get them outside explain that what we are going to do requires them to work together well and quickly and that sometimes you will remove a student or two from the group in order to facilitate correctly dividing the group. Begin by asking the students how many there are in the whole class (at this point you have already chosen a number you are going to divide into halves, thirds, fourths, sixths, or eighths, e.g., 24). If you have had to pull any students aside have them help you check for accuracy of the work done by the others. Now ask the students to divide themselves into halves. Make sure the students move far enough apart that the division is clear. Use your white board and marker to have the students help you figure out how many that fraction is equal to after you have divided them (i.e., $\frac{1}{3}$ of 24 is 6). Continue to do this using student numbers of a few (6-12) to the entire class, having them continue to divide into halves, thirds, fourths, sixths, and eighths. You could extend this activity by asking one fraction of the group to do something such as jump up and down, pat their stomachs, or sit down.

Instructional Procedures

Have students return to desks after Divide Us! Divide Us! activity.

Explain to students that they are now going to make some fraction strips that show how we can divide the whole into equal parts and compare them.

Give each student six different colored strips of color gel paper (1-inch x 12 inches).

Take one colored strip and label it whole (make sure all students are using the same color--it will help as you continue to work with the strips).

Take a second strip and have students divide the strip in half. Have them label each part with $\frac{1}{2}$.

Continue doing this with each different colored strip until students have divided and labeled whole, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{8}$. This should take about 15 minutes.

Explain that you are going to take a look at the sizes of each fraction compared to each other. Have students explore the relative sizes of each fraction strip by asking them questions such as "Which is larger: $\frac{1}{2}$ or $\frac{1}{3}$? $\frac{1}{6}$ or $\frac{1}{8}$?" It is important that as you ask questions you should also have students explain their reasoning for which is larger.

As you work with students on these comparisons have them notice the denominators of these fractions. Ask the question, "Look at the denominator. Why, if the number is bigger, do we have smaller pieces of the whole?" As a class, explore this and lead the students to the understanding that the larger the denominator the more (and thus, smaller) parts the whole is being divided into.

Finish this lesson with the assessment activity *A Letter to My Friend*.

Extensions

Extend this lesson by having students compare different sized fractions with each other. For example: what is bigger $\frac{1}{2}$ or $\frac{2}{3}$? Is $\frac{3}{4}$ bigger than $\frac{2}{3}$? How many fourths are there in $\frac{1}{2}$? How many sixths are there in $\frac{1}{2}$? In $\frac{3}{4}$?

Share the book *Fraction Action* with students.

Play the game *Pizza Fraction Fun, Jr.* (see additional resources for ordering option.)

Family Connections

Check books or games out to students and allow them to take them home to share with their families.

Find items around the house that students can divide into groups (beans, cereal, coins, noodles, stickers, etc.) Have them quiz older family members and check for accuracy. Have family members quiz the students and check for accuracy. This could be given as a homework assignment.

Assessment Plan

A Letter to My Friend: Using the paper *A Letter to My Friend*, have each student explain why $\frac{1}{3}$ is larger than $\frac{1}{4}$. Make sure that students write the letter so that their friend understands what they are writing. Have them use pictures, words and numbers (or any combination of these).

Pair students up and give them handfuls of items such as beans, plastic coins, or small cubes.

Have them show each other their solutions that you give them to problems such as: make a pile of 30. Show me how you divide the pile into halves. Show me thirds. Sixths. Use any total that you can divide into halves, thirds, fourths, sixths, or eighths.

Bibliography

Research Basis

Wood, T., (January 1996). Events in Learning Mathematics: Insight from Research in Classrooms. *Educational Studies in Mathematics*, Vol. 30 (Number 1), Page 85

The author shows evidence that learning, and therefore teaching, mathematics involves more than efficient calculations; it should emphasize constructing mathematical meaning. This involves, among other things, processes of conflict with previous knowledge leading to the desire to resolve that conflict as children engage in what is referred to as reflective thinking. It is discussed heavily that the classroom environment is a critical factor in creating an atmosphere conducive to students learning.

Kelley, K., (October 2003). Cultivating Classrooms with Heart. *Classroom Leadership*, Vol. 7 (Number2), Page 1

The need for a classroom that offers students a place to feel accepted and safe is discussed in this article. The author presents examples that support her idea that "...what our students see and remember of us is not what we do, but who we are. Our students will also remember how well we helped them become who they are." Though the author teaches high school students, the concepts are easily transferred to an elementary setting.

Authors

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