

Have Some Pie

For Grades 3-5

Math Learning Goals:

- Compare different types of fractions.
- Recognize when to add and subtract fractions.
- Draw and visualize different types of fractions.
- Recognize how multiplication of fractions changes value.

Materials Needed:

- Have Some Pie! Activity Sheet
- Have Some Pie! For Better or For Worse by Lyn Johnson

Activity:

This is a short activity that can easily show the students understanding of fractions. This can be done at any time during a class period, and can be adapted for a whole lesson. The comic at the beginning of the activity is important for the questions below, so make sure to read it. Along with the comic, there are four questions pertaining to the comic with one of the questions being a type of challenge question.

TN Math Standards:

3rd Grade:

Number and Operations:

3d.) Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when two fraction refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$ and justify the conclusion, e.g., by using a visual fraction model.

4th Grade:

Numbers and Operations:

3a.) Understand addition and subtraction as joining and separating parts referring to the same whole.

3b.) Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation.

4c.) Solve word problems involving multiplication of a fraction by a whole number, by using visual fractions models and equations to represent the problem.

5th Grade:

Number and Operations:

1.) Add and subtract fraction with unlike denominators by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.

2.) Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, by using visual fractions models or equations to represent the problem.

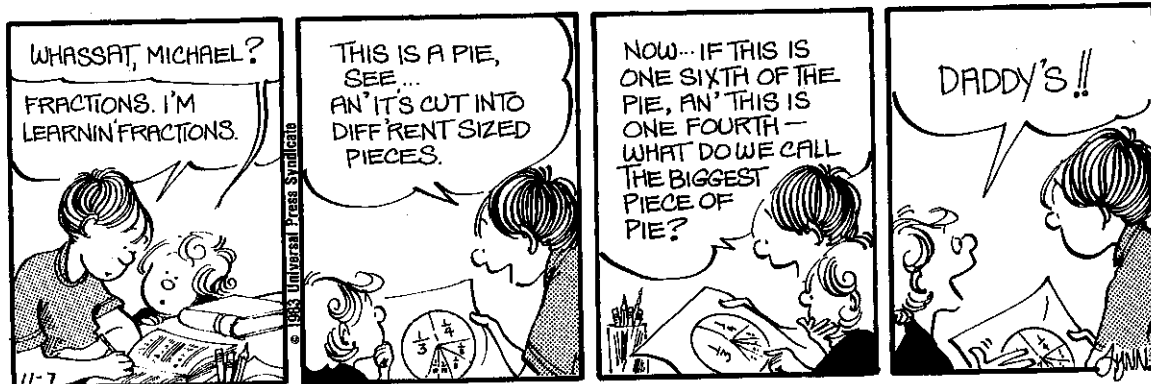
6.) Solve real world problems involving multiplication of fractions and mixed numbers by using fraction models or equations to represent the problem.

Adapted by Virginia Parkman, Kelly Sturner, and Suzanne Lenhart

Have Some Pie!

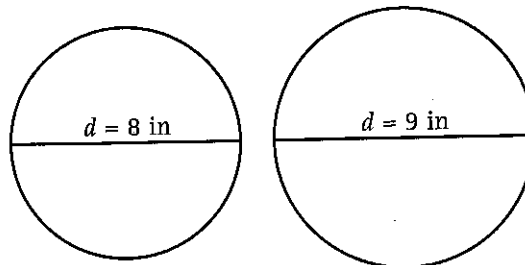
For Better or For Worse

by Lynn Johnston



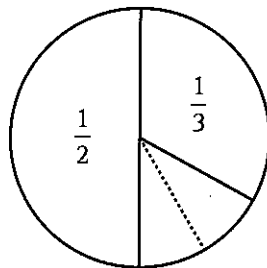
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1. Which piece is larger, $\frac{1}{6}$ of the pie or $\frac{1}{4}$ of the pie? How much larger?
2. The cartoon shows two large pieces, $\frac{1}{3}$ and $\frac{1}{4}$. After these two pieces are eaten, how much of the pie remains for the other four pieces?
3. Sara divides $\frac{1}{2}$ of the blueberry pie into three pieces. One piece equals $\frac{1}{3}$ of the whole pie, and the other two pieces are the same size as each other. How large is each of the smaller pieces? (Hint: draw a picture!)
4. **Challenge:** Would you rather have a serving that is $\frac{1}{3}$ of an 8-inch pie or a serving that is $\frac{1}{4}$ of a 9-inch pie? Show your work, and justify your answer.



Solutions

1. One-fourth of the pie is larger; the difference between the two pieces is $1/12$.
2. $5/12$
3. Visually, if you continue to divide the pie into equal pieces that are the same size as the two smallest pieces shown, you will have 12 pieces and each piece will be $1/12$ of the pie. See the drawing. Some students will solve the equation $1/2 + 1/3 + 2x = 1$ for x and also find that $x = 1/12$.



4. The area of an 8-inch pie (using 3.14 for pi) is about 50.2 square inches; the area of a 9-inch pie is about 63.9 square inches. Therefore, $1/3$ of the 8-inch pie is about 16.7 square inches, and $1/4$ of the 9-inch pie is about 16.0 square inches, which is a difference of less than 1 square inch. Since $1/3$ of the 8-inch pie is a little bigger, some students may choose this piece.

Field-Test Comments

This cartoon was used with my average 8th-grade class in mid-November. The students related well to the assignment, as we had just reviewed fractions and Thanksgiving was approaching. One student gave a unique response to problem 4; she preferred the smaller piece with the comment "I'm on a diet!"

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Other Ideas

- Break the class into groups, and have them use large paper and markers to illustrate their fraction calculations with pictures and computations. Then have each group share its results with the class. If you can make four groups, have each group illustrate one problem from questions 1–4. Otherwise, have each group do its own interpretation of all four problems.
- If you can use this activity around Thanksgiving, change the blueberry to "pumpkin" and illustrate the fractional parts with real pies. A pumpkin pie will cut "cleaner" than a blueberry one anyway. Be sure to have enough extra pies for everyone to have a taste when you are done.
- NCTM's Illuminations Web site has a number of resources to support conceptual learning of fractions. One example is <http://illuminations.nctm.org/LessonDetail.aspx?id=L284>.

Adapted from "Cartoon Corner," *Mathematics Teaching in the Middle School*, April 2002, page 444, edited by Kris Warloe