

Math 4 - Act. 05: Fantastic Fractions

Summary

The goal of this lesson is to help students see the sense in fractions through hands-on experience and reasoning.

Materials

pattern blocks
2 sheets of paper per student
scissors, crayons
1 die per partner
Exchange Game score sheet

Additional Resources

Lessons for Introducing Fractions by Marilyn Burns (Math Solutions Publication)

Background for Teachers

If students are expected to memorize and practice procedures, the main goal of making sense of mathematics takes a back seat. When talking with students about fractions, it is important to make sure they understand what the whole is. In this lesson, students will use pattern blocks to visually understand halves, thirds, and sixths through comparing shapes and their areas. They first look at all the different ways they can make a congruent yellow hexagon using other pattern block pieces. After the investigation, they represent their solutions using pictures and fractional notation. They will also play a game to increase an understanding of equivalence.

Intended Learning Outcomes

1. Demonstrate a positive learning attitude toward mathematics.
2. Become mathematical problem solvers.
3. Reason mathematically.
4. Communicate mathematically.
5. Make mathematical connections.
6. Represent mathematical situations.

Instructional Procedures

Invitation to Learn

Have students use different pattern blocks to build hexagons that are the same size and shape as the yellow hexagon pattern block. Try to find all the different ways.

Instructional Procedures

Make a book to record the above hexagons. Trace a yellow hexagon on the front cover and give the book a title (e.g., My Fraction Book)

Trace 2 red trapezoids on the next page and ask what the fractional value of each piece is. ($\frac{1}{2}$)

Write the fraction sentence $\frac{1}{2} + \frac{1}{2} = \frac{2}{2}$ or one whole hexagon. Explain that it is $\frac{1}{2}$ because it is one out of two equal pieces.

Record each different hexagon combination with picture and symbolic notation.

Play the Exchange Game in partners.

Use the yellow hexagons, red trapezoids, blue rhombuses, green triangles, and one die.

The first partner rolls the die and takes the number of green triangles that appear on the die (e.g., If a two results in a roll, they take 2 green triangles).

Check to see if there is another fractional piece that could be exchanged for the same

shape (e.g., 2 green triangles can be exchanged for 1 blue rhombus $2/6 = 1/3$). This fraction is now in simplest form B showing the least amount of pieces to make a shape. Students will be exchanging fractional pieces to make simplest form.

The second partner rolls the die and repeats the steps above.

The first person to build 5 hexagons is the winner. Once a yellow hexagon is formed, color one of them on the score sheet and return the yellow hexagon to the pile of pattern blocks. Remember that when you simplify you have to use all the same color (e.g., 4 green triangles = 2 blue rhombuses $4/6 = 2/3$). If a five is rolled, neither 2 red trapezoids nor 2 blue rhombuses would work. So $5/6$ must already be in simplest form. The student would need to wait for their next turn to add more pieces to create a hexagon. They will need to build all green ($6/6$), all blue ($3/3$), or all red ($2/2$) to make one hexagon.

Extensions

Possible Extensions/Adaptations

Have various pattern blocks represent one whole and determine the fractional value of each pattern block piece (e.g., if the red trapezoid represents one whole, what would the fractional value of the green pattern block be? One-third because it is one out of three equal pieces). See attached handout.

Homework & Family Connections

Find examples of fractions used in newspapers, magazines, and other sources. Be prepared to share these findings with the class.

Assessment Plan

Have students write which of two fractions is larger and how they know. Have them identify equivalent fractions for $1/2$, $1/3$, etc. and explain how they know.

Authors

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