Tips for Helping at Home

- Questions to ask:

  What is it that you don't understand (have the student be specific)?

  What about putting things in order?

  Could you try it with simpler numbers?

  Can you guess and check?

  Does this make sense?

  What can you do to explain your answer to show others what you are thinking?

  Does your answer seem reasonable?

- In this unit, students work on dividing squares in several different ways. You can help your child by encouraging him/her to come up with unusual divisions and to convince you that the squares are really divided in half (or quarters, eighths, etc.)

- Watch for situations at home where similar thinking is relevant—for example, how can we split the driveway in equal amounts for shoveling snow; what are some different ways we can put cheese on half of a pizza?

- Look for opportunities to talk to your children about comparing fractions like 2/3 or 3/4.

Mathematical Emphasis

Investigation 1—Parts of Squares: Halves, Fourths, and Eighths

- Understanding that equal fractions of a whole have the same area
- Understanding that equal parts of shapes are not necessarily congruent—that is, they may have different shapes
- Understanding that cutting and pasting shapes conserves their area
- Becoming familiar with halves, fourths, and eighths

Investigation 2—Parts of Rectangles: Thirds, Sixths, and Twelfths

- Knowing that equal fractions of different-sized wholes will be different in area
- Becoming familiar with relationships among thirds, sixths, and twelfths
- Using different combinations to make a whole
- Comparing fractions that have "one piece missing"
- Working with fractions that have numerators larger than one

Investigation 3—Ordering fractions

- Comparing any fraction to the landmarks 0, 1/2, 1, and 2
- Using both numerical reasoning and area to order fractions
- Using the size of the numerator to compare fractions that have the same denominator
- Using the size of the denominator to compare fractions with the same numerator
- Comparing fractions greater than 1 with fractions less than or equal to 1
- Understanding that fractions "missing one piece" are ordered inversely to the size of the missing piece
- Identifying equivalent fractions

Websites

http://cms.everett.k12.wa.us/math

http://nlvm.usu.edu/en/nav/vlibrary.html

Investigations in Number, Data, and Space

Grade 4

Different Shapes, Equal Pieces

Fractions and Area

Everett Public Schools

Vocabulary

Area: the size of a two-dimensional figure I square units

Perimeter: distance around the outside edge of a closed figure

Equivalent: having the same value

Congruent: having exactly the same shape and size

<: less than symbol (4 < 5)

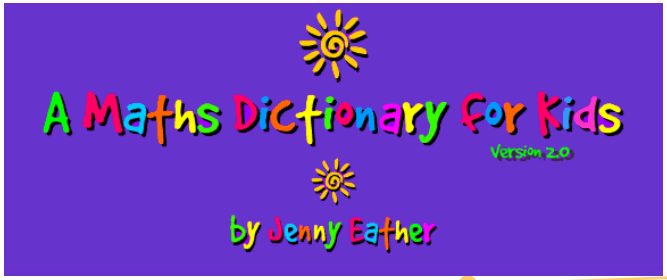
> : greater than symbol (5 > 4)

Fraction: a number showing part of a whole

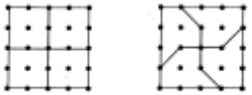
Whole Number: all counting numbers including zero

Glossary

http://www.amathsdictionaryforkids.com/



In this unit students are asked to come up with many different ways to divide a square into fourths and then eighths. One interesting way to generate fourths is to start with a simple division into fourths, such as example A, and to cut a small piece from each fourth to add to the next fourth, as in example B. As long as you do the same thing to all four fourths, the resultant figure with also be divided into equal fourths.



As students work with these fractions, they soon begin to come up with many creative ways to divide squares into fourths.

When working with eighths, students will likely first come up with a picture like Kim's, then begin to modify into something like Jesse's. More unusual eighths, like Qi Sun's, may emerge more slowly, as these eights require a deeper understanding.

Tierney, C. Investigations in Number, Data, and Space: Different Shapes, Equal Pieces. Dale Seymour, 1998.

Capture Fractions

Materials: Deck of fraction cards

Players: 2 or more

How to Play:

1. Divide the deck into equal-sized piles, one for each player. Players hold their piles upside down.
2. In each round, each player turns over the top card in his or her pile. The person with the largest fraction wins, takes the other player's cards, and puts them on the bottom of his or her own pile.
3. If two of the cards show equivalent fractions, those two players turn over another card. Whoever has the larger fraction wins all the other player's cards.
4. The person with the most cards wins. The game can be stopped at any time.