

# #10138 BASIC MATH: FRACTION BASICS

CEREBELLUM CORPORATION, 2001  
Grade Level: 4-8  
7 mins.  
2 Instructional Graphics Enclosed

## DESCRIPTION

Covers basic fraction terminology, reducing fractions, and common factors. Clear examples and explanations aid understanding of this lesson. Standard Deviants School.

## ACADEMIC STANDARDS

### Subject Area: Mathematics

- Standard: Understands and applies basic and advanced properties of the concepts of numbers
  - ◆ Benchmark: Understands the characteristics and properties (e.g., order relations, relative magnitude, base-ten place values) of the set of rational numbers and its subsets (e.g., whole numbers, fractions, decimals, integers) (See INSTRUCTIONAL GOALS 1-5.)
  - ◆ Benchmark: Understands the relationships among equivalent number representations (e.g., whole numbers, positive and negative integers, fractions, ratios, decimals, percents, scientific notation, exponentials) and the advantages and disadvantages of each type of representation (See INSTRUCTIONAL GOALS 3 and 5.)
- Standard: Uses basic and advanced procedures while performing the processes of computation
  - ◆ Benchmark: Knows the language of basic operations (e.g., "factors," "products," "multiplication") (See INSTRUCTIONAL GOALS 4.)

## INSTRUCTIONAL GOALS

1. To define *fractions* and illustrate their uses.
2. To identify the parts of a fraction by name.
3. To explain equivalent fractions.
4. To examine factors and common factors.
5. To demonstrate reducing fractions.

# C a p t i o n e d M e d i a P r o g r a m

## VOCABULARY

- |                |                 |                    |
|----------------|-----------------|--------------------|
| 1. common      | 7. greater than | 13. present (here) |
| 2. denominator | 8. identical    | 14. reduce         |
| 3. divide by   | 9. numerator    | 15. value          |
| 4. equal       | 10. original    | 16. whole          |
| 5. factor      | 11. over        |                    |
| 6. fraction    | 12. parts       |                    |

## BEFORE SHOWING

1. Review or introduce fractions and the concept that a fraction is simply part of a whole.
  - a. Fold a piece of notebook paper in half. Label one half "A" and one half "B." Explain that a whole piece of paper has been divided into equal parts.
  - b. Discuss how to divide a pizza so it could be shared equally with eight friends. Draw the pizza and divide it on notebook paper. Share solutions by drawing on the board.
2. Copy and distribute the "Fraction Basics: Viewing Guide." (See INSTRUCTIONAL GRAPHICS.)
  - a. Encourage students to follow along on the guide with the video.
  - b. Explain that they will have time to complete the problems either during pauses of the video or after viewing.

## DURING SHOWING

1. View the video more than once, with one showing uninterrupted.
2. Pause after the explanation that fractions can have numerators larger than denominators.
  - a. Review the names of the two parts of the fraction and what each part represents. Practice identifying the numerator and denominator for other fractions.
  - b. Discuss dividing the numerator by the denominator when both are the same to get the number "1." Show other examples.
  - c. Discuss how the numerator of a fraction can be larger than the denominator. Write the fraction for the full pizza plus one additional slice ( $9/8$ ).
3. Pause after the initial discussion of equivalent fractions with the fractions  $2/6$ ,  $3/9$ , and  $4/12$ . Write the actual fractions of the shaded pizzas in the middle of the viewing guide.
4. Pause after the explanation of factors. Identify the factors for each denominator of the three pizza fractions on the viewing guide. Do additional examples as needed.
5. Pause after the examples of reducing fractions. Allow students time to do the math to reduce the pizza fractions on the viewing guide. Do more examples as necessary.

## AFTER SHOWING

### Discussion Items and Questions

1. What are the two parts of a fraction called? What do they represent?
2. How can a fraction equal one? How does a fraction also represent a division problem?
3. Explain how a numerator can be larger than a denominator. Give an example.
4. Explain how two different fractions can be equivalent. Give examples.
5. What are *factors*? How are factors found? What are factors used for?
6. What does it mean to simplify or reduce a fraction?

### Applications and Activities

1. Review the information from the video using the viewing guide.
2. Complete the "Fraction Basics: Check Your Knowledge" worksheet. (See INSTRUCTIONAL GRAPHICS.)
3. In groups of two or three, find the factors for all the numbers in a given range to solve riddles. Divide the numbers so each one does part of the range of numbers (e.g., 1-4, 5-7, 8-10).
  - a. What two numbers between 1 and 10 have three factors? (4 and 9)
  - b. What number between 11 and 20 has five factors? (16)
  - c. What number between 21 and 30 has six factors? (28)
  - d. What number between 31 and 40 has nine factors? (36)
  - e. What number between 41 and 50 has eight factors? (42)
  - f. What number between 51 and 60 has twelve factors? (60)
  - g. Create an original factoring riddle using the numbers in the 70s, 80s, or 90s. Challenge classmates to solve it.
4. Practice identifying, modeling, and comparing various fractions with fraction blocks or strips. Arrange in order by size. Show equivalent fractions. Show the reduction of fractions.
  - a. Fold sheets of paper to show the fractions  $\frac{1}{2}$ ,  $\frac{1}{4}$ ,  $\frac{1}{8}$ , and  $\frac{1}{16}$ .
  - b. Make fraction strips to model and compare fractions.
    - i. Cut strips of paper that are the same length and width.
    - ii. Divide into two parts for  $\frac{1}{2}$ , into three parts for  $\frac{1}{3}$ , and so on. Draw lines to show the parts.
    - iii. Leave one strip undivided to represent "1."
5. Demonstrate that fractions become smaller as the denominator becomes larger by using paper folding or other manipulatives.
6. Have a pizza party. Cut the pizzas into sixths, ninths, and twelfths. Identify the fraction of pizza each person eats. Compare and figure equivalent fractions.
7. Introduce the use of fractions with a set of two different colored blocks. Identify and model various fractions and their equivalent fractions.
8. Use graph paper to find the factors of a given number visually.
9. Choose a number, such as 12.
10. On graph paper, draw all rectangles that contain exactly 12 squares.
11. Practice linear measurement using inches and fractions of inches.

## CMP RELATED RESOURCES

- *Basic Math: Adding and Subtracting Fractions* #10136
- *Basic Math: Multiplying and Dividing Fractions* #10140
- *Fractions and All Their Parts–Part 1* #3245
- *Fractions: Any Way You Slice It* #3609
- *Ace Math For Kids: Volume II, Part 4* #3559

## World Wide Web



The following Web sites complement the contents of this guide; they were selected by professionals who have experience in teaching deaf and hard of hearing students. Every effort was made to select accurate, educationally relevant, and “kid safe” sites. However, teachers should preview them before use. The U.S. Department of Education, the National Association of the Deaf, and the Captioned Media Program do not endorse the sites and are not responsible for their content.

- **FRACTIONS** <http://www.math.com/school/subject1/lessons/S1U4L1GL.html>

Multiple-page Web site with explanations of fractions and reducing fractions. Also has an interactive “workout” of online fraction problems.

- **E-LAB GRADE 3** [http://www.harcourtschool.com/activity/elab2002/grade\\_3/](http://www.harcourtschool.com/activity/elab2002/grade_3/)

This site provides several visual interactive models related to the concepts in the video. Try “Parts of a Group” or “Equivalent Fractions.”

- **AAA MATH: FRACTIONS** <http://www.aamath.com/B/fra.htm>

Find a whole range of fraction activities, each with an explanation, interactive practice, and games.

- **MATH FORUM: ASK DR. MATH** <http://forum.swarthmore.edu/dr.math/>

“Ask Dr. Math” allows users to e-mail questions to Dr. Math and access archived material. For other materials that relate to this media, click on “Elementary” and then “Fractions/Decimals,” or choose “Middle School” and then “Factoring Numbers or Fractions/Percents.”

## INSTRUCTIONAL GRAPHICS

- FRACTION BASICS: VIEWING GUIDE
- FRACTION BASICS: CHECK YOUR KNOWLEDGE

# Fraction Basics: Viewing Guide

A **fraction** is made up of two parts:

*Numerator*—represents the part present.

*Denominator*—represents the whole.

$\frac{3}{7}$      $\longrightarrow$     numerator

$\frac{3}{7}$      $\longrightarrow$     denominator



*How would you write this as a fraction?*

Easy!  $\frac{6}{6} = 1$  whole pizza

- Fractions can have larger numerators than denominators.
- Fractions can have different but equal values.

Example:



$\frac{1}{3}$



$\frac{1}{3}$



$\frac{1}{3}$

**When can you reduce a fraction?**

\* When the numerator and denominator have common factors.

**What is a factor?**

\* A factor is a number that can be evenly divided into another number.

Every positive integer has at least two factors: 1 and itself.

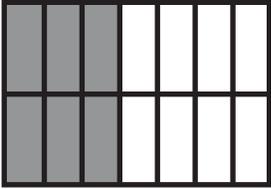
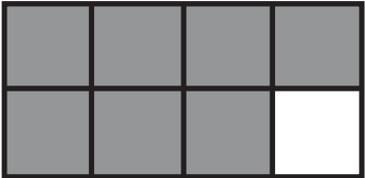
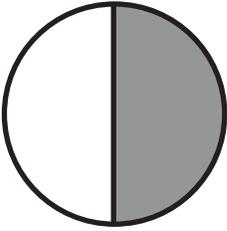
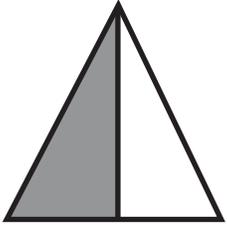
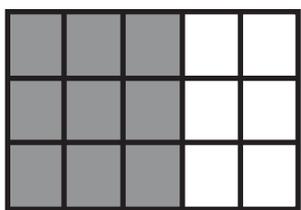
Example:    6  
               $2 \times 3 = 6$   
               $1 \times 6 = 6$   
              Factors: 1, 2, 3, 6

# Fraction Basics: Check Your Knowledge

Total Score  
/ 50

**A. I Need Shades**

Circle the fraction that represents the shaded regions below (1 point each).

<p>1. </p> <p style="text-align: center;"> <math>\frac{6}{14}</math>      <math>\frac{8}{13}</math>      <math>\frac{9}{14}</math> </p>	<p>2. </p> <p style="text-align: center;"> <math>\frac{3}{3}</math>      <math>\frac{2}{3}</math>      <math>\frac{1}{3}</math> </p>	<p>3. </p> <p style="text-align: center;"> <math>\frac{6}{11}</math>      <math>\frac{7}{8}</math>      <math>\frac{9}{11}</math> </p>
<p>4. </p> <p style="text-align: center;"> <math>\frac{1}{9}</math>      <math>\frac{2}{8}</math>      <math>\frac{1}{2}</math> </p>	<p>5. </p> <p style="text-align: center;"> <math>\frac{2}{2}</math>      <math>\frac{1}{2}</math>      <math>\frac{1}{3}</math> </p>	<p>6. </p> <p style="text-align: center;"> <math>\frac{12}{15}</math>      <math>\frac{9}{15}</math>      <math>\frac{4}{14}</math> </p>

**B. Fraction Smaction**

Reduce each fraction to its lowest terms. If the fractions is already reduced as far as possible, write "reduced" (4 points each).

- |                    |                    |                    |                   |
|--------------------|--------------------|--------------------|-------------------|
| 1. $\frac{1}{2}$   | 2. $\frac{6}{12}$  | 3. $\frac{6}{10}$  | 4. $\frac{7}{9}$  |
| 5. $\frac{15}{15}$ | 6. $\frac{6}{14}$  | 7. $\frac{1}{3}$   | 8. $\frac{3}{30}$ |
| 9. $\frac{5}{5}$   | 10. $\frac{8}{10}$ | 11. $\frac{9}{27}$ |                   |

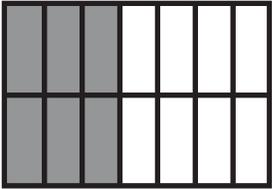
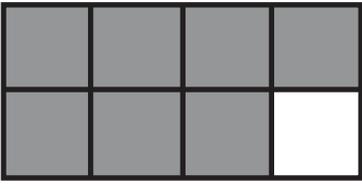
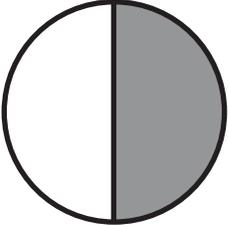
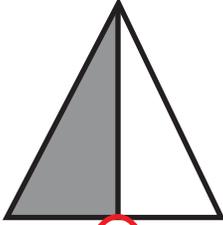
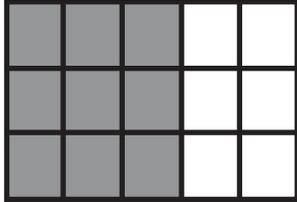
# Fraction Basics: Check Your Knowledge

## Answer Key

Total Score  
/ 50

**A. I Need Shades**

Circle the fraction that represents the shaded regions below (1 point each).

<p>1. </p> <p><math>\frac{6}{14}</math>      <math>\frac{8}{13}</math>      <math>\frac{9}{14}</math></p> <p><math>\frac{3}{3}</math>      <math>\frac{2}{3}</math>      <math>\frac{1}{3}</math></p>	<p>2. </p> <p><math>\frac{6}{11}</math>      <math>\frac{7}{8}</math>      <math>\frac{9}{11}</math></p>	<p>3. </p>
<p>4. </p> <p><math>\frac{1}{9}</math>      <math>\frac{2}{8}</math>      <math>\frac{1}{2}</math></p> <p><math>\frac{2}{2}</math>      <math>\frac{1}{2}</math>      <math>\frac{1}{3}</math></p>	<p>5. </p> <p><math>\frac{12}{15}</math>      <math>\frac{9}{15}</math>      <math>\frac{4}{14}</math></p>	<p>6. </p>

**B. Fraction Smaction**

Reduce each fraction to its lowest terms. If the fractions is already reduced as far as possible, write "reduced" (4 points each).

- |                    |                    |                    |                   |
|--------------------|--------------------|--------------------|-------------------|
| 1. $\frac{1}{2}$   | 2. $\frac{6}{12}$  | 3. $\frac{6}{10}$  | 4. $\frac{7}{9}$  |
| reduced            | $\frac{1}{2}$      | $\frac{3}{5}$      | reduced           |
| 5. $\frac{15}{15}$ | 6. $\frac{6}{14}$  | 7. $\frac{1}{3}$   | 8. $\frac{3}{30}$ |
| 1                  | $\frac{3}{7}$      | reduced            | $\frac{1}{10}$    |
| 9. $\frac{5}{5}$   | 10. $\frac{8}{10}$ | 11. $\frac{9}{27}$ |                   |
| 1                  | $\frac{4}{5}$      | $\frac{1}{3}$      |                   |