



FRAC TIONS

National Teacher Training Institute
Media-Rich Lesson Plan
by Sheryl Kohl
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Grade Levels: grades 3 - 4 regular education
grades 5 - 6 students with special needs

Time Allotment: Three 45 minute class periods

Overview: The activities in this lesson will provide students with a basic understanding of fractions. They will demonstrate equal sharing, the number of equal parts, and the number of parts removed from the object or group. They will be able to identify and illustrate the numerator, denominator, and equivalent fractions.

Subject Matter: Fractions

Learning Objectives:

Students will:

- illustrate a fraction, when given the numerator and denominator
- define the denominator as how many equal parts are in the whole or set
- define the numerator as to how many of those parts are being talked about or referred
- use a fraction to name a part of one thing
- use a fraction to name part of a collection of things
- demonstrate fractions equal to a whole

Standards:**From the National Council of Teachers of Mathematics Standards
for grades 3-5, available online at**

<http://standards.nctm.org/document/chapter5/numb.htm>

Measurement Standard for Grades 3-5:

In grades 3 - 5 all students should -

- develop understanding of fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers,
- use models, benchmarks, and equivalent forms to judge the size of fractions
- recognize and generate equivalent forms of commonly used fractions, decimals, and percents.

From the Montana Standards for Mathematics, available online at

<http://www.opi.state.mt.us/index.html>

Content Standard 2:

All students should demonstrate understanding of and ability to use numbers and operations.

- By the end of grade 4, all students will model and explain **part/whole relationships** in everyday situations.
- By the end of grade 8, all students will use four basic operations with whole numbers, **fractions**, decimals, and integers.

Media Components:**Video**

PBS video series: *Cyberchase, episode 106, Zeus on the Loose*

Web Sites**Fractions: Part of a Whole**

<http://www.oswego.org/testprep/math4/d/fractionplacel.cfm>.

This web site introduces the students to the terminology of fraction, numerator, and denominator.

Find Grampy

<http://www.visualfractions.com/FindGrampy.html>

This web site is an interactive game in which the students practice writing a fraction. The student has to find Grampy who is hiding in the forest. The denominator is given, and then it is up to the student to determine where Grampy is hiding, his location being the numerator.

Flitting with Fractions

<http://www.learningmedia.co.nz/butterfly.swf>

This web site is an interactive game in which the students must catch a specific type of butterfly and then put all of that type in the jar. The denominator is the total number of butterflies flying around, and the numerator is the number of butterflies caught in the jar. Requires Shockwave plug-in, version 8.5 or later (www.macromedia.com).

Materials:**For the class:**

a roll of *Fruit by the Foot* (available in the candy section of stores)
 cuisenaire rods, fraction pieces or paper fraction manipulatives

For each small group:

- a piece of the roll of *Fruit by the Foot*
- scissors
- piece of string longer than the piece of *Fruit by the Foot*
- one type of fruit - the group should receive a smaller number of pieces of that fruit, than there are members in the group. For example, if the group has four members, the teacher could give the group one, two, or three oranges.
- knife to cut the fruit (teacher may prefer to do this)
- paper plates or napkins

For each student:

- plain paper for illustrating concepts/ideas
- crayons or colored pencils

Prep for Teachers:

- Prior to teaching this lesson, bookmark the web sites used in the lesson on each computer to be used by the students. Load the Shockwave plug-in (available free at www.macromedia.com) onto each computer as well.
- Acquire the book *Eating Fractions* by Bruce McMillan, (Scholastic, 1991)
- Divide the roll of *Fruit by the Foot* into sections, the same number of sections as there are small groups in the classroom
- print off patterns for paper fraction manipulatives if needed and make copies
note: patterns for paper fraction manipulatives available at:
<http://abcteach.com/Math/fraction1.htm>
<http://abcteach.com/Math/fraction2.htm>
- copy and separate the paper fraction manipulatives

When using media, provide students with a FOCUS FOR MEDIA INTERACTION, a specific task to complete and/or information to identify during or after viewing of video segments, web sites, or other multimedia elements.

Introductory Activity:

Step 1: Read the book *Eating Fractions* by Bruce McMillan to the class. As the teacher is reading the book, focus the students' attention on the whole food and number of pieces it is cut into.

Step 2: Using the book as a reference, have the students list on the board the foods that were shared in the story. Then next to each food list, have the students write down the number of parts each food was divided into. Explain to the students that when something

is divided into parts, the number of parts becomes the denominator of a fraction. After each food listed on the board rewrite the number as a fraction, missing the numerator.

Learning Activities:

Step 1: Insert *PBS Cyberchase, episode 106, Zeus on the Loose* into your VCR. Provide your students with a FOCUS FOR MEDIA INTERACTION: Ask students what the most important thing is to remember when dividing something in parts.

(They must be divided equally or All parts must be equal.)

START the tape as Inez asks, “Where are we going to get a gift?”

PAUSE the tape when Jackie exclaims, “...and one third for you!”

Step 2: Give each small group a strip of *Fruit by the Foot*, string, and a scissors. Have the students cut their string the same length as the piece of candy. Then have the students fold their string into same number of sections as there are people in their group just as the Cyber team did in the video clip. For example, if a group has four members, the string should be folded into four equal sections. Have the students show the teacher their folded string. After it has been checked for the correct number of sections and verified that the sections are all equal in length, have the students cut the string into sections. Using the pieces of string as a measuring device, have the students lay the pieces next to the strip of *Fruit by the Foot* and cut the same lengths as the string sections. After the teacher has verified the results of the “sharing” of the *Fruit by the Foot*, the students may eat their own piece.

Step 3: Have the students log on to the “Fractions: Part of a Whole” web site at <http://www.oswego.org/testprep/math4/d/fractionplacel.cfm>. Explain to the students that this web site will help them to understand the meaning of numerator and denominator.

(The teacher may want to use this site as class demonstration using large screen projection.) Provide your students with a FOCUS FOR MEDIA INTERACTION: Ask the students to explain what a numerator is and what a denominator is.

(The numerator is tells how many equal parts are described by the fraction. The denominator tells the number of equal parts into which a whole is divided.)

Step 4: Have the students log on to the “Find Grampy” web site at <http://www.visualfractions.com/FindGrampy.html>. Explain to the students that this web site will help them to practice writing a fraction, indicating both the numerator and the denominator. Provide your students with a FOCUS FOR MEDIA INTERACTION: Ask the students how they determine what is the denominator and the numerator.

(To find the denominator a student must count the number of equal parts into which the whole is divided. To find the numerator a student must count the number parts described/colored/indicated, etc.)

Step 5: Have the students log on to Flitting with Fractions web site at <http://www.learningmedia.co.nz/butterfly.swf>. Explain to the students that this web site will help them to practice creating a fraction and then writing the correct fraction.

Provide your students with a FOCUS FOR MEDIA INTERACTION: Ask the students how they created a fraction with butterflies.

(To create the fraction the student has to catch a specific type of butterfly and then put all of that type in the jar. Note: the activity requires the students to write the fraction which represents the butterflies caught.)

Step 6: Insert *PBS Cyberchase, episode 106, Zeus on the Loose* into your VCR. Provide the students with a FOCUS FOR MEDIA INTERACTION: Have the students illustrate on paper how the Cyber team divided the two apples into equal shares for the three-headed dog.

(The team cut one apple into three equal parts and then cut the other apple into three equal parts. They had six pieces. They then fed each dog two pieces.)

START the tape when Digit stutters, “d-d-d-dog, m-m-m-monster!”

PAUSE the tape when Digit asks, “Hey, what do you expect?”

Provide time for the students to illustrate how the Cyber team divided the two apples. Have some students explain their illustrations. Display the illustrations.

Step 7: Provide each small group with one type of fruit. The group should receive a smaller number of pieces of that fruit, than there are members in the group. For example, if the group has four members, the teacher could give the group one, two, or three oranges. Have the students illustrate on paper how they would divide their fruit equally among their group members. After the students have finished their illustration, check for accuracy. Have the students write a fraction to represent the sections of the fruit they will each receive. Check for accuracy. Allow the students to divide the fruit for their group and give each member their share.

Step 8: Insert *PBS Cyberchase, episode 106, Zeus on the Loose* into your VCR. Provide the students with a FOCUS FOR MEDIA INTERACTION: Have the students illustrate the number of halves to make a whole, the number of fourths to make a whole, and the number of eighths to make a whole. Require that the students use accuracy, not sketchy illustrations.

(2 halves make a whole, 4 fourths make a whole, 8 eighths make a whole)

START the tape as the two goat-headed creatures are arguing, and one exclaims, “You are a goat-headed fool!”

PAUSE the tape as Inez whispers to Digit, and Digit explains, “Because eight one-eighths is the same as a whole.”

Step 9: Pass out the pieces to use to demonstrate fractional parts. Have the students show the number of halves, thirds, fourths, fifths, etc. that make a whole. Extension: have students how many halves, thirds, fourths, etc. are needed to make two or three wholes.

Culminating Activity:

Step 1: Insert *PBS Cyberchase, episode 106, Zeus on the Loose*, into your VCR. FOCUS FOR MEDIA INTERACTION: Have the students look for other examples of fractions used in the video.

(The team enters one of the four caves. In “For Real”, Harry’s lemonade must be divided several different ways as more people are invited to his house.)

START the video at the beginning and play the entire episode.

Cross-Curricular Extensions:

Consumer Education:

- Have the students follow recipes.
- Have the students practice measuring fabric.
- Have the students read a gas gauge.

Industrial Education:

- Have the students practice measuring pieces of lumber.

Music:

- Have the students read the notes, and understand why they are given fractional names.

Holiday Celebrations:

- Provide the students with individual packages of M&Ms, Skittles, candy hearts, etc., during the various holiday seasons. Have the students determine the fraction of each color/flavor within their own package.