

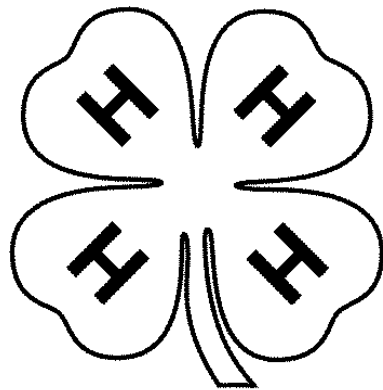
FRACTION POWER

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FRACTION POWER

Suggested Grades: 3rd & 4th

People have been using math principles for thousands—even millions—of years. Their use is spread across countries and continents; whether sailing a boat off the coast of Japan or building a house in Peru, math principles are used to get things done.

How can math be so universal? First, human beings didn't invent math concepts; we discovered them. Also, the language of math is numbers, not English or German or Russian. If we are well versed in this language of numbers, it can help us make important decisions and perform everyday tasks.

One essential math concept is fractions. Because we know about fractions, we are able to fix a tasty meal, travel around our neighborhood or farther in our cars, arrive at school on time, buy our favorite toy, or share a treat with our friends.

This lesson will use the hands-on activity of constructing a dry cookie mix to explore the math principles of fractions and the highlight the importance of fractions in daily life.

Why are fractions important?

How are they used in our daily lives?

OBJECTIVES

- ✓ List three ways fractions are used in daily life and describe why they are needed to complete the stated tasks
- ✓ Apply knowledge of fractions to successfully solve real-world problems.

MATERIALS

- One copy of “Fractions Don’t Bug Me” for each student (p10)
- One 2" X 11" (approx) strip of plain paper for each student
- Pen or pencil for each student
- One quart-sized jar or clear deli container with lid for each student
- One set of measuring cups AND measuring spoons for each four students
- One plastic knife for each four students
- One copy of recipe card for each student
- Flour
- White sugar
- Brown Sugar (light or dark)
- Baking Soda
- Salt
- Oatmeal (old-fashioned or quick-cooking)
- Chocolate chips



PREPARATION ACTIVITIES

- Introduce the concept of fractions using the “Fractions Don’t Bug Me” activity sheet on page 10. Discuss the meaning of *numerator*, *denominator*, and *fraction* with the students as you guide the class through the first few items on the worksheet if necessary. Allow groups of 3 to 4 students to complete the remainder of the activity on their own if possible.

- Introduce the importance of fractions in daily life. With the students’ help, make a list of ways that fraction are used every day, and tell why fractions are essential for each task. Some suggestions are:
 - Clock- knowing about three quarter, half and quarter hours makes it possible to tell time
 - Gas gauge in car- tells how much fuel is left so car doesn’t run out
 - Money- allows people to compute cost and pay for goods and services
 - Cooking- need to know fractions so recipes will taste good

- Introduce the concept of equivalent fractions with the Critter Crawl exercise, below.

Critter Crawl

1. Tell students that you have invented a totally new unit of measurement called the “critterfoot”. It is the distance that a creepy crawly critter can squirm, slither or slide in one minute. Tell them that they are going to spend some time investigating it now.
2. Distribute one 2" x 11" (approximately) strip of paper to each student.
3. Ask students to fold the paper in half, then unfold and look at the crease that was formed. Talk about the fact that the critterfoot is now in 2 parts. If a critter walked to the fold and stopped, he would only have walked over 1 of the 2 parts ($\frac{1}{2}$) of the distance.
4. Ask them to write the fraction $\frac{1}{2}$ on the fold, near the edge of the paper.

5. Fold the strip of paper back into halves, then fold it again. Ask students to open the paper and observe that it is now divided into 4 sections.
6. Write the fractions $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ on the appropriate folds. Write $\frac{2}{4}$ below the $\frac{1}{2}$ that is already written there.
7. Repeat the process twice more, dividing the piece of paper into eighths ($\frac{1}{8}$ s) and sixteenths ($\frac{1}{16}$ s).
8. When writing a new fraction on a fold that already has one or more fractions written on it, ask the students to write the new fraction below the previous one(s).
9. After all the fractions are written, tell students that those written on the same fold are *equivalent fractions*. Discuss what the term *equivalent* means using the questions below as a guide:

What happened when you folded the paper?

Were some of the folds the same for halves, fourths, eighths and sixteenths?

Each fraction has a different name, but some of the names are in the same place. What does that mean?

If the fractions are the same, does it matter what you call them?

Why do you think so?

10. To ensure students' understanding of fractions and equivalencies, pose some problems that they can answer with the help of their critterfoot ruler. Some examples are:

If Anthony Ant crawled to the $\frac{3}{4}$ mark, and William Worm squirmed to $\frac{7}{8}$, who walked the farthest?

Christopher Cockroach, Inez Inchworm, and Fezziwig Fly decided to race. They made it to $\frac{3}{8}$, $\frac{3}{16}$, and $\frac{3}{4}$ of a critterfoot, respectively, by the end of the race. Who won the race?

Bobbi Beetle ran to the $\frac{3}{4}$ critterfoot line and Earnestine Earwig scurried to the line that marked $\frac{12}{16}$ in the same length of time. Who traveled farthest? Why do you think that?

Sylvester Silverfish scurried across $\frac{4}{8}$ of a critterfoot to get to Sally Spider's house. How many different names can you think of that mean the same as $\frac{4}{8}$?

PROCEDURAL STEPS

- ① Divide class into groups of four. Place each group at a work station.
- ② Distribute activity supplies. Each activity group will need:

- One set of measuring cups
- One set of measuring spoons
- One plastic knife
- Four quart jars or clear delicatessen containers with lids
(one for each student in the group)
- All purpose flour (about 5 cups)
- Baking soda (about 1/4 cup)
- Salt (about 1/4 cup)
- Brown sugar (about 3 cups)
- White Sugar (about 3 cups)
- Chocolate chips (about 2 cups)
- Uncooked oatmeal (about 3 cups)

You may wish to place the dry ingredients on a cafeteria tray and cover each work station with table paper to help contain the mess.

- ③ One at a time, direct students to layer the dry ingredients into their jar or delicatessen container. An attractive-looking mix can be constructed if the ingredients are added in the order and amount listed below.

Allow enough time for all students in every group to complete the measuring process before introducing the next ingredient. You may wish to keep all ingredients at a central location and distribute only one ingredient at a time to the student groups.