

Parts of a Dozen

Summary

In this activity, students will use the whole of an egg carton to manipulate the denominator by sectioning off the egg carton. Students will use the vocabulary of numerator and denominator as they explore the different ways that a dozen-egg carton can be divided up into parts.

Group Size

Large Groups

Materials

Invitation to Learn

Dozen Egg Carton

String

Journal

Counters

- [Parts of a Dozen](#)

- [Egg Carton Transparency](#)

Additional Resources

Books

Jump, Kangaroo, Jump, by Stuart J. Murphy; ISBN 0060276142

Background for Teachers

In this activity, students will use the whole of an egg carton to manipulate the denominator by sectioning off the egg carton. A fraction is generally known as either a whole that has been divided up into sections, or a set that is divided into groups. With this activity we will be working with a whole. One egg carton that is divided up into 12 sections. Note if you were dealing with the eggs instead of the egg carton, you would be dealing with a set of objects. Students will use the vocabulary of numerator and denominator as they explore the different ways that a dozen-egg carton can be divided up into parts.

A numerator is the number above the line in a fraction. It also denotes the number of parts out of the whole that are being identified or used. A denominator is the number below the line in a fraction. This denotes how many parts the whole is divided into. Equivalent fractions are two fractions that express the same part of a whole. There is a number by which both the numerator and denominator of one fraction can be multiplied or divided to yield an equivalent fraction. $\frac{1}{4}$, $\frac{2}{8}$, and $\frac{3}{12}$ are all equivalent fractions.

It is important to remember that groups do not have to be in the same shape in order for them to make equal parts. Students will use string to show the different ways that the egg carton can be divided up into. They include halves, thirds, fourths, sixths and twelfths.

Intended Learning Outcomes

2. Become effective problem solvers by selecting appropriate methods, employing a variety of strategies, and exploring alternative approaches to solve problems.
3. Reason logically, using inductive and deductive strategies and justify conclusions.

Instructional Procedures

Invitation to Learn

Ask the students/ teachers to answer the following questions using the sticky notes on their desks.

Questions you could ask students:

Write your name on a sticky note and place it on the first poster (this will give us the denominator).

If you have more than 5 siblings place a sticky note on poster number 2.

If you have 2-4 siblings place your sticky note on poster number 3.

If you are an only child place your sticky note on poster number 4.

If you have played a video game in the past week put a sticky note on the fifth poster.

If you ate breakfast this morning put your last sticky note on poster number 6.

Using the information gathered from the class, quickly talk about fractions created from the posters.

Talk about what poster #1 tells us.

Instructional Procedures

Review background information and talk about some common fractions students use regularly in their life. Ask them what they know about dozens. What are some things that are purchased in a dozen?

Tell them we are going to use a common dozen around the home: eggs. Actually we're not using the eggs, but rather the egg carton.

Hand out one egg carton per student, 12 counters, and string. They will need 12, 12" pieces of string.

Hand out a half sheet of paper with different equivalent fractions, *Parts of a Dozen*.

Remind them of the vocabulary of denominators and numerators; what does each of them tell you? Today we are going to focus on the denominators of the fractions. Ask them to begin with #1 on their *Parts of a Dozen* page. If needed, remind them to look at the denominator to find out how many sections they need to have in their dozen. What does the one in $\frac{1}{3}$ say? What does the 3 say? Using *Egg Carton Transparency* have a student model how to divide the egg carton into the number of parts as outlined by the denominator. The student will make three equal parts.

Now ask the students what does the 1 in $\frac{1}{3}$ represent? Determine if the students know the difference between one cup of the egg carton, and the one part of the three parts. Once the students understand that difference, invite another student to come up and fill in what the 1 in $\frac{1}{3}$ represents with counters. There should be 4 counters in the egg carton. Have the students fill in their first response and then have the students continue with the rest of their fractions. Remind them that for each fraction they need to create the correct number of sections as in the denominator.

Once they have completed their *Parts of a Dozen* page have them sort their fractions based on the number of counters in each different fraction in their journal. They can write the numbers from 1 through 12, and then write down all the fractions that gave them that number of counters or they could circle the fractions with the same number of counters with the same color of crayon or marker. As the students begin to make the connections between the fractions introduce or reintroduce (depending on your classroom) the term equivalent fractions.

Below where they sorted their fractions, invite the students to glue their *Parts of a Dozen* into their journal and write a paragraph using the following vocabulary words. Numerator, denominator, and equivalent fractions. Invite them to explain what patterns they saw while working with their different fractions.

As the students are completing this task find different strategies from the student to share as a summary debrief. Also ask a couple of the students to read their paragraphs, or ask if you can read their paragraph for them.

Extensions

Curriculum Extensions/Adaptations/ Integration

Ask your students who have mastered the benchmark to begin solving multiplying fractions in a similar method. Asking what is 12 of 12 they can begin to see a concrete model of multiplication and division with fractions.

For your students who have not reached the benchmark, provide them with other similar problems, have them work with buddies.

Equivalent fractions are everywhere--use data analysis technology integration to chart the results. Use more than one egg carton to find mixed numbers and improper fractions.

Family Connections

Have the students find other items that come in dozens. Invite the student and their families to construct a list of the different everyday items that are sold in dozens.

Ask the students to find the fractions in their families. The number of boys to the total, girls to the total, kids to the total or adults to the total. Ask them to go a little further, with the number of boys compared to the total number of family member or girls compared to the total number of family members. Have the students write about the fractions that they found in their family in their math journal. This data could be used later to graph their family.

Assessment Plan

Anecdotal notes.

Students' journals, writing and a rubric to check their benchmark understanding of numerator, denominator, and equivalent fractions.

Quick 3-problem check to see if they can still find the number of counters in their parts of a dozen. (Check to see if the students have reached their benchmarks.)

Bibliography

Research Basis

Sowell, E. (1989). Effects of Manipulative Materials in Mathematics Instruction. *Journal for Research in Mathematics Education*. 20(5) 498-505.

This report takes the results of 60 different studies to find what the effects are in a classroom where the teacher uses concrete/ pictorial manipulative instead of simply using the abstract ideas of mathematics. The study came to the conclusion that they greatest lasting results come from teachers who are constantly using concrete/ pictorial manipulative in their classroom. The benefit came when the manipulatives were used for a period greater than one year.

Clarke, D.M., Roche, A., & Mitchell, A. (2008). Ten practical tips for making fractions come alive and make sense. *Mathematics Teaching in the Middle School*. 13 (7) 372-380.

In this article the authors outline ten ideas for helping fractions to come alive in your classroom. One of their points included the idea that teachers need to provide a variety of models to represent fractions. If we as teachers expect our students to function fluidly with their understanding of fractions we need to provide opportunities for the students to represent and use different models.

Authors

[Utah LessonPlans](#)