Equal Shares

Summary

This activity will aid in the understanding of breaking a single object into equal shares using candy and other exciting models. Students will learn about fractions and how they can make all different kinds fractions with even more fractions.

Materials

Invitation to Learn

Licorice rope

Instructional Procedures

Manipulative set (one per class)
Construction paper - variety of colors
Scissors

- *Can You Make?* (pdf)
- *Share Equally* (pdf)
- *If This Is...?* (pdf)
- *Matching Bars Game*
- *Big Inch*

Background for Teachers

This exploration is best done following a class discussion lead by the teacher of what a fraction is and what it really represents. Often time students are intimidated with the concept of fractions. Have them relax and just think of the fraction as another way to write or express a division equation. Mathematicians are known to be very "efficient" folks and seem to always find the most efficient way to write, express, and communicate things quickly. They are always anxious to move on and get the job done. Show the students the ÷ symbol. Do you see the fraction model in this symbol? The line means to "share equally." The denominator is the number of shares. Students relate to sharing with friends, so you might refer to the denominator as, "how many friends you will be sharing with?" The numerator is the portion of the shares to be considered. You can actually cover that number of shares with your hand to give the students an action cue to depend on. The following exploration and experience with the manipulatives is to as much uncover what the students know as much as to allow them to discover!

Instructional Procedures

Invitation to Learn

Provide each group of four to five students with a single licorice rope. Ask them to share this one licorice rope with the group "equally." Don't allow them to eat the shares until you have a chance to talk as a class. This activity will only take a few minutes. Children share everyday, all day long, so they will jump right in and get busy sharing. Travel among the groups and listen for snippets or phrases being said during the sharing. Pull the class together and share things you heard and go right into a discussion of "sharing equally." Depending on the responses and your assessment of understanding you might need to "share" more objects on the overhead with the class. Then share the traditional fraction model. Discussing and clarifying as needed. Let them eat!

Instructional Procedures

Provide single manipulative sets on a table or area where students have access: fraction circles, fraction pieces, pattern blocks, fraction bars, 12-centimeter cubes, yard stick, ruler, egg carton, *Cake* worksheet, number line 0-1, and *Clock* worksheet. These are suggestions only. You can

pare down the choices or add others depending on the degree of challenge you wish to deal with and availability.
Challenge the students to show, model, and name as many equal shares of the tool, object, or manipulative being used.
Invite the individual groups to pick the manipulative of their choice.
Circulate among the groups and assess knowledge level, vocabulary being used, and progress.
Allow about ten minutes for group members to interact on the task.
Then suggest to the class the use of a graphic organizer, *Can You Make?*, to help record findings.
Some explanation of how the *Can You Make?* graphic organizer is set up and its use may be needed and this usually works itself out if you take a manipulative and start working through an example on the overhead.
Students continue working and complete organizer to twelfths. There is value in the sketching of the manipulative pieces and a few groups may be confronted with having to construct sevenths, ninths, and elevenths. Provide construction paper of colors not represented in manipulative pieces.
Groups will then present findings to the total class. This will give an opportunity for you to discuss proper vocabulary in depth and clear up misconceptions that might have come up. This is a rich exploration. Students access prior knowledge, organize findings, organize patterns, interpret patterns, identify equivalents, process proportions, use estimation, order relationships of fractions to the whole, and make connections to other concepts in mathematics.
Have groups record the patterns that developed as they filled in the graphic organizer. Do this in traditional fraction representation.
Discuss and write equivalent fractions on a chart, overhead or chalkboard as they are shared.
In their math journal or on the bottom of the *Can You Make?* graphic organizer have them write: What I learned or discovered from this experience?

Strategies for Diverse Learners

An extension for advanced learners would be the worksheet, *Share Equally and/or If This Is...?*
Adaptations for learners with special needs or as a re-teaching activity for a smaller group is the *Matching Bars Game*.

Place the fraction bar set of 16 pieces face down in the center of the group. Arrange them in equal rows and columns.
To determine which player goes first: each player picks one of the face down bars. The player with the greatest amount shaded goes first. Replace the bars face down.
Now take turns turning over two bars per turn that have the same shaded amount. If the shaded amounts are the same, he keeps the bars and goes again.
If the two bars do not have the same amount shaded, they are turned over again and the next student takes a turn.
Play continues until all the bars have been matched. The student with the most matching bars wins.

Another adaptation for those needing further practice in linear and length models is the folding activity *Big Inch*.

Pretend that the paper is going to be an inch magnified.
Fold the paper in half end to end.
How many sections do you have?
Draw a line along the fold about three inches long.
Write ½ under that line.
Now fold the paper in half again.

How many sections do you have?
Draw a shorter line on each fold.
Write 1/4 under the first line, 2/4 on the second line, and 3/4 on the last fold line that was created.
Now fold the paper in half again.
How many sections do you have now?
Fill in the numbers on the folds created.
Now fold the paper in half again.
How many sections?
Fill in the numbers on the folds created.
Discuss the experience and allow students to measure with their Big Inch.

Take the pattern blocks and change the unit whole. For example: two yellow hexagons equal one. What would be the value of the other pieces?
Have students create a design with pattern blocks. What is the design's value if the unit whole is the green triangle?

Extensions

Family Connections
Home Fraction Hunt:

What are the most common fractions found in the home?
Where are most of the fractions found in your home??

Assessment Plan

A performance assessment is built into the completion of *Can You Make?* graphic organizer.
Observation and interview of the experience.
Journal writing of students reflection on the experience.

Bibliography

Zull, J.E. (2004). The art of changing the brain. *Educational leadership*. September 2004
This article explores the fact that learning should feel good. When a student is experiencing, exploring, developing connections, and learning then positive emotions are generated. This biochemical reward of learning is not provided by explanations from the teacher, but by the student developing their own idea and ownership of those ideas. It goes on to discuss that the way we feel always influences our brain and strengthens growth and wiring. The article shares some best practices for teachers to optimize learning in the classroom.
De Geest, E., & Watson, A., (2004). Instilling Thinking. *Mathematics Teaching*. June 2004.
This article shares research done to identify and develop ways of stimulate mathematical thinking. It explores the common practice of giving students in the lowest achieving group repetitive, simplified mathematics. When studies show that more good is done helping learners develop thinking skills and understanding throughout every level of mathematics lessons. This with a teachers high expectations help a student's self-awareness that they are learning and progressing. Students showed significant gains in self-esteem and their ability and willingness to engage with extended, unfamiliar, and complex tasks.

Authors

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