

Sharing Brownies Equally with Two People

(Same size rectangles and scissors available to all students)

Students work with partners.

Give each partner group about 10 paper brownies of 4 or 5 different colors. Students should use one color for cutting brownies in halves; another color for fourths, another color for eighths, for third, and sixths (Emphasize the idea we can only compare shares when the whole is the same size).

Directions for Sharing Brownies Equally with Two People

- Using one straight cut, cut a brownie so that two people can share the brownie equally.
- Using one cut, try to find more than one way you can cut a brownie so both people will have equal shares.
- Share different ways to cut the brownie into two equal pieces. Ask: "How do you know that these are equal shares?"
- Work with partners or teams of 3 or 4 to find ways to prove that brownie cuts of different shapes are the same size. Share proofs.
- What part of the whole brownie will be one person's share?
- Ask students to label each part as $\frac{1}{2}$ in fractional notation and with words (one-half).
- What does the number on the bottom (denominator) tell us? (number of equal shares in the whole)
Write the word denominator in view of students.
When using this word, students should say "the denominator is 2 and tells us the whole has been partitioned (divided) into 2 equal parts".
- What does the number on top (numerator) tell us? When students use the word, numerator, expect them to say, "the whole has been partitioned or divided into 2 equal parts and I have 1 of the parts or $\frac{1}{2}$ of the brownie."
Write numerator in view of all students. Tell students the numerator tells us the number of equal shares we have.
- How many $\frac{1}{2}$ brownies are equal to one whole brownie?

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Repeat the Process by Sharing brownies equally with 4 people. Will the brownie pieces be smaller or larger? Explain your thinking.

- Are students able to prove that their brownie pieces are equal?
- Are students able to correctly label the brownie pieces?
- Ask students to compare one-half of a brownie with one-fourth of a brownie. Do students see that $\frac{1}{4}$ brownie is smaller than $\frac{1}{2}$ brownie?
- Can students explain why?
- Ask: How many $\frac{1}{4}$ brownies are equal to one whole brownie?
- Ask: Is there a way to make $\frac{1}{2}$ of a brownie with brownies that are cut into 4 equal pieces?
- Are students able to explain what the top and bottom numbers of a fraction tell us? (For $\frac{1}{4}$, the same size brownie was divided into 4 equal parts. Each brownie piece is named $\frac{1}{4}$.)

Repeat the process by sharing brownies equally with 8 people.

- How will you label one of eight equal pieces?
- Will the brownie pieces be smaller or larger?
- Is there a way to share $\frac{1}{2}$ of a brownie if I cut the brownie into 8 equal pieces?
- Is there a way to have $\frac{1}{4}$ of a brownie, if I cut the brownie into 8 equal pieces. Explain your thinking.

Repeat the Process by sharing brownies equally with 3 people and then with 6 people.