

# Sharing Brownies

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**Strand:** Numbers and Number Sense

**Topic:** Exploring equal sharing problems

**Primary SOL:** 1.4 The student will

- represent and solve practical problems involving equal sharing with two or four sharers; and
- represent and name fractions for halves and fourths, using models.

**Related SOL:**

## Materials

- Pencil
- Brownie template (attached)
- Equal Sharing Problem Recording Sheets

## Vocabulary

*equal, fair shares, fourths, halves, parts, sharing, whole*

**Student/Teacher Actions: What should students be doing? What should teachers be doing?**

*Note: Many young children have encountered situations involving sharing. The emphasis at this grade level is on equal sharing and developing student understanding of how parts relate to wholes, not on fraction notation.*

1. If you have access to the book “The Doorbell Rang,” by Pat Hutchins, introduce the lesson by reading and discussing the book. (If desired, use link to a [free online educational video](#). In the story, Ma bakes cookies, and as the doorbell rings, more friends come to share the cookies. This book is about fair shares and sharing equally.
2. After sharing the story, facilitate a discussion about what happened in the story. *How did the friends share the cookies to begin with? What happens to the size of the equal shares as they are split between more friends?*
3. Next, hold up a large candy bar, cookie, or other item. Break it up into different-sized pieces and begin passing the pieces out to students. Ask students to consider the following questions: “*Will this be an equal way of sharing the candy bar, cookie, etc.?*” “*Why or why not?*” “*How could it be shared equally?*” Let students share and discuss their ideas with their classmates. (Parts of the candy bar/cookie are not equal-sized pieces, so it is not an equal way of sharing.)
4. Pose the following story problem to students. **Sam and Josh want to share 6 brownies so that each of them gets the same amount. How many brownies can each boy have?** Teachers should read the problem to students and discuss what is happening in the problem. “*What are we trying to figure out? How many children are sharing? How many brownies are they sharing?*” However, they should refrain from showing students

how to solve the problem, so students have an opportunity to use their own strategy to solve the problem.

5. Have students work individually or with a partner to figure out the problem. Have students record their thinking on paper using pictures, words, and/or numbers. A brownie template has also been included with this lesson. While students are working, observe student strategies and how they are tackling the problem. Listen to discussions between partners about the problem that may be good to bring up during the class discussion of the problem. What strategies are students using? Are they sharing the brownies equally among the children in the problem? Do their pictures accurately represent equal parts? What difficulties are they having? What are students doing well? How are they recording to show how many brownie pieces one child will get?
6. Some common ways that students may solve this problem include, but are not limited to:
  - Students may divide six whole brownies between the two sharers, one for Sam and one for Josh, until they run out of brownies. Each boy would end up with three brownies each.
  - Students may divide each brownie into two equal parts (halves) and count how many parts (halves) each boy will get. Students will often say six pieces, which are really six halves. The teacher can bring this up in discussion about how those pieces are not whole pieces but are called halves.
7. After students have had an opportunity to work on the problem, gather the group together to discuss student strategies for solving the problem. Facilitate the discussion by asking some of the following questions: *“How did you figure out how many brownies each would get?” “How did you represent this?” “What did you draw?” “How do you know they shared the brownies equally? Prove it.” “How did drawing a picture help you solve this problem?” “Does anyone have a different strategy for figuring out the problem?” “How are the strategies similar?” “How are the strategies different?”* Record student strategies on chart paper/board so students can refer to it when comparing various strategies. During the group discussion, introduce the vocabulary— *half* and *halves*—in relation to what students are sharing (i.e., Sam and Josh each got half of the brownies. When we divide a set into two equal parts we call those parts halves.)
8. Next, pose another story problem to students. **Two children want to share five brownies so that each child gets the same amount. How much can each child have?** Teachers should read the problem to students and discuss what is happening in the problem. However, they should refrain from showing students how to solve the problem, so students have an opportunity to use their own strategy to solve the problem.
9. Again, have students work individually or with a partner to figure out the problem. Have students record their thinking on paper using pictures, words, and/or numbers (brownie template). While students are working, observe student strategies and how they are tackling the problem. How do students decide what to do with the remainder? Listen to discussions between partners about the problem that may be good to bring up during the class discussion of the problem.

10. Some common ways that students may solve this problem include, but are not limited to:
  - Students may divide two whole brownies between the two sharers and divide the last brownie in half. Each boy would get two whole brownies and half a brownie. Often, students will say that each boy will get three pieces, not knowing what to call the smaller piece.
  - Students may divide each of the five brownies into two equal parts (halves) and count how many parts (halves) each boy will get. Students will often say five pieces, which are really five halves. The teacher can bring this up in discussion about how those pieces are not whole pieces but are called halves.
11. After students have had an opportunity to work on the problem, gather the group together to discuss student strategies for solving the problem. Facilitate the discussion by asking some of the following questions: *“How did you figure out how many brownies each child would get?” “How did you represent this?” “What did you draw?” “How do you know they shared the brownies equally? Prove it.” “How did drawing a picture help you solve this problem?” “How did you decide to split what is left over?” “Does anyone have a different strategy for figuring out the problem?” “How are the strategies similar?” “How are the strategies different?”* Record student strategies on chart paper/board so students can refer to it when comparing various strategies. During the discussion, use student work to introduce vocabulary of fractional parts, such as halves and fourths. This should be a natural part of the discussion and should not involve fraction notation.
12. In conclusion, give each student an exit ticket (see attached) to check for understanding. Students need to complete and explain their thinking about the problem using pictures and words.

### Assessment

- **Questions**

- Kim and Stacey want to share one sandwich so that they both get the same amount. How much of the sandwich would each girl get? How will you know they have equal parts?
- There are three brownies. Jim and Andy would like to share them equally. How many brownies will each boy get? How do you know? Explain your thinking.
- Mom has four graham crackers for Ashleigh and Claire to share for dessert. How many graham crackers will each girl get if they share them fairly? How do you know? Explain your thinking.
- There are 4 children who want to share 2 oranges so that each gets the same amount. How many will each child get? How do you know? Explain your thinking.

- **Journal/writing prompts**

- Why is it important to divide things into equal parts?
- Create your own equal sharing problem with two sharers.

- **Other Assessments**

- Informal observations while students are working on equal sharing problems. *How do students divide shapes into equal parts? Do they recognize whether the parts are equal or not equal when they share them? How do they prove that they have equal parts when solving practical sharing problems? How do they keep track of sharing? What do students do with leftovers or remainders when sharing things equally?*
- Dad bought Mike and Nicki a pack of chocolate candies with 10 pieces. If they shared the chocolate candies equally, how many would each child get? How many pieces of chocolate candy would each get if there were 13 pieces? How do you know?

**Extensions and Connections (for all students)**

- After introducing equal sharing problems with two sharers, it is recommended that teachers model brownie problems with four sharers. Here are several examples of problems:
  - Four children have five brownies. If they share the brownies equally, how many brownies would each person get?
  - Four children want to share six brownies so that everyone gets the same amount. How much brownie can each child have?
- Students can solve equal-sharing problems in more than one way and compare their strategies with others. For example, in the problem with six brownies and 4 sharers, there is more than one solution that is correct. Possible answers are one and one-half, one and two-fourths, and six fourths. Use a variety of problems that result in answers that are more than one (mixed numbers or improper fractions) and answers that are less than one (proper fractions).

**Strategies for Differentiation**

- Provide templates and/or models that can continuously be divided for students that are having difficulty representing their thinking pictorially.
- Allow students to explore ways to represent halves and fourths using concrete materials, such as paper folding, pattern blocks, pie pieces, two-sided counters, teddy bear counters, etc.
- For struggling students, use set models that can be shared equally before moving to situations that involve dividing a whole into parts.
- Create an anchor chart that shows wholes, halves, and fourths using both region and set models.
- For students with fine-motor difficulties, consider folding instead of cutting.

**Note: The following pages are intended for classroom use for students as a visual aid to learning.**

## Brownie Template


**Name \_\_\_\_\_ Equal Sharing Problem 1**

Sam and Josh want to share 6 brownies so that each gets the same amount. How many brownies can each boy have?

Name \_\_\_\_\_ **Equal Sharing Problem 2**

Two children want to share 5 brownies so that each child gets the same amount. How much can each child have?

## Exit Ticket

Dad cut a brownie into 2 pieces for Renee and Amy to share for a snack. Here is a picture of the brownie. Will Renee and Amy each get half? How do you know? Explain your thinking with pictures and words.

