

Problem 2.1

All of the pans of brownies are square. A pan of brownies costs \$12. You can buy any fractional part of a pan of brownies and pay that fraction of \$12. For example, $\frac{1}{2}$ of a pan costs $\frac{1}{2}$ of \$12, or \$6. We can write this as a number sentence using *of*: $\frac{1}{2}$ of 12 = 6.

A Mr. Williams asks to buy $\frac{1}{2}$ of a pan of brownies that is $\frac{2}{3}$ full.

1. Use a copy of the brownie pan model shown at the right. Draw a picture to show how the brownie pan might look before Mr. Williams buys his brownies.
2. On the same model, use a different color to show the part of the brownies that Mr. Williams buys. Note that Mr. Williams buys a *part of a part* of the brownie pan.
3. What fraction of a whole pan of brownies does Mr. Williams buy? How much does he pay? Write number sentences using *of* to show your thinking.

Model of a Brownie Pan



B Serena buys $\frac{3}{4}$ of another pan that is half full.

1. Draw a picture to show how the brownie pan might look before Serena buys her brownies.
2. Use a different color to show the part Serena buys.
3. What fraction of a whole pan of brownies does Serena buy? How much does she pay? Write number sentences using *of* to show your thinking.

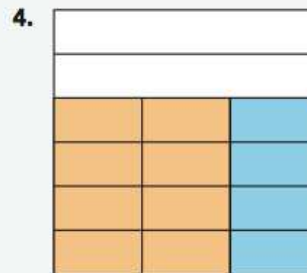
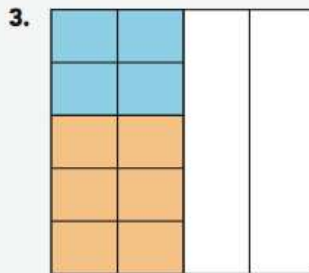
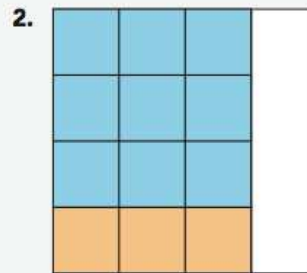
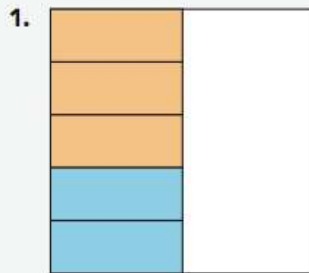
C Draw a brownie pan picture for each example below. Then write a number sentence using *of* for each. Find the part of a whole brownie pan that results.

1. $\frac{1}{3}$ of $\frac{1}{4}$ of a brownie pan
2. $\frac{1}{4}$ of $\frac{1}{3}$ of a brownie pan
3. $\frac{1}{3}$ of $\frac{3}{4}$ of a brownie pan
4. $\frac{3}{4}$ of $\frac{2}{5}$ of a brownie pan

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Problem 2.1 *continued*

D The pictures below are models of brownie pan problems. Consider *orange* to be the portion of the brownie pan that is purchased. Consider *blue* to be the portion of the brownie pan that is left in the pan. For each picture, write a number sentence using *of* to describe what fraction of the brownie pan is purchased.



E 1. Draw pictures to check that each of the following number sentences is correct.

a. $\frac{3}{4}$ of $\frac{1}{2} = \frac{3}{8}$

b. $\frac{2}{5}$ of $\frac{4}{5} = \frac{8}{25}$

2. What pattern do you notice in the denominators? How does this pattern relate to your drawings?
3. What pattern do you notice in the numerators? How does this pattern relate to your drawings?
4. Paulo says that when you find a *part of a part*, your answer will always be less than either of the original parts. Is this true? Explain your reasoning.