

Module 5 - Lesson 8:

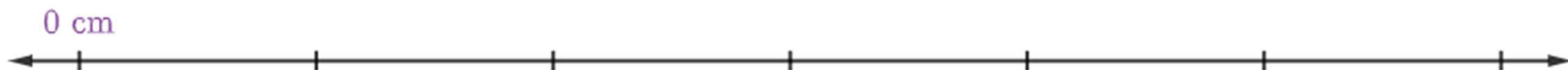
Find areas of square tiles with fraction side lengths by relating the tile to a unit square.

CCSS Standard – 5.NF.B.4.b

FLUENCY (10-min)

Counting on the Number Line by Centimeters and Meters

Use the number line to count forward by 50 centimeters to 300 centimeters.
The first measurement you say is 0 centimeters? Ready?



Now count forward by 50 centimeters again. This time rename every 100 centimeters as a number of meters.
The first measurement you say is 0 meters. Ready?

Now count forward by 50 centimeters again. This time used mixed units, meters and centimeters, when possible. The first measurement you say is 0 meters. Ready?

FLUENCY (10-min)

Whiteboard Exchange: Add Decimals



Write and complete the equation. Show YOUR method.

$$0.5 + 0.8 = \underline{\hspace{2cm}}$$

$$0.63 + 0.29 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 1 \\ 0.5 \\ + 0.8 \\ \hline 1.3 \end{array}$$

$$\begin{array}{r} 1 \\ 0.63 \\ + 0.29 \\ \hline 0.92 \end{array}$$

FLUENCY (10-min)

Whiteboard Exchange: Add Decimals



Write and complete the equation. Show YOUR method.

$$2.7 + 9.63 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 1 \\ 2.7 \\ + 9.63 \\ \hline 12.33 \end{array}$$

$$7.14 + 4.87 = \underline{\hspace{2cm}}$$

$$\begin{array}{r} 1 \quad 1 \\ 7.14 \\ + 4.87 \\ \hline 12.01 \end{array}$$

FLUENCY (10-min)

Whiteboard Exchange: Multiply a Fraction by a Whole Number



Write and complete the equation.

$$3 \times \frac{1}{2} = \underline{\hspace{2cm}}$$

$$4 \times \frac{1}{2} = \underline{\hspace{2cm}}$$

$$4 \times \frac{1}{3} = \underline{\hspace{2cm}}$$

$$7 \times \frac{2}{3} = \underline{\hspace{2cm}}$$

$$9 \times \frac{3}{4} = \underline{\hspace{2cm}}$$

$$10 \times \frac{3}{5} = \underline{\hspace{2cm}}$$

LAUNCH (10-min)

Identify a need to find the area of squares with fraction side lengths by partitioning a unit square.

The picture shows samples of carpet and wood floors. Imagine that you get to choose the flooring for a bedroom in a new home. What would you choose? Why would you choose that type of flooring?

What other flooring materials might you use in a bedroom that are not shown in this picture?

What might influence your decisions about which flooring to use?

- *How much the flooring costs.*
- *What colors are available.*
- *Which material lasts the longest.*
- *What the flooring looks like.*



LAUNCH (10-min)

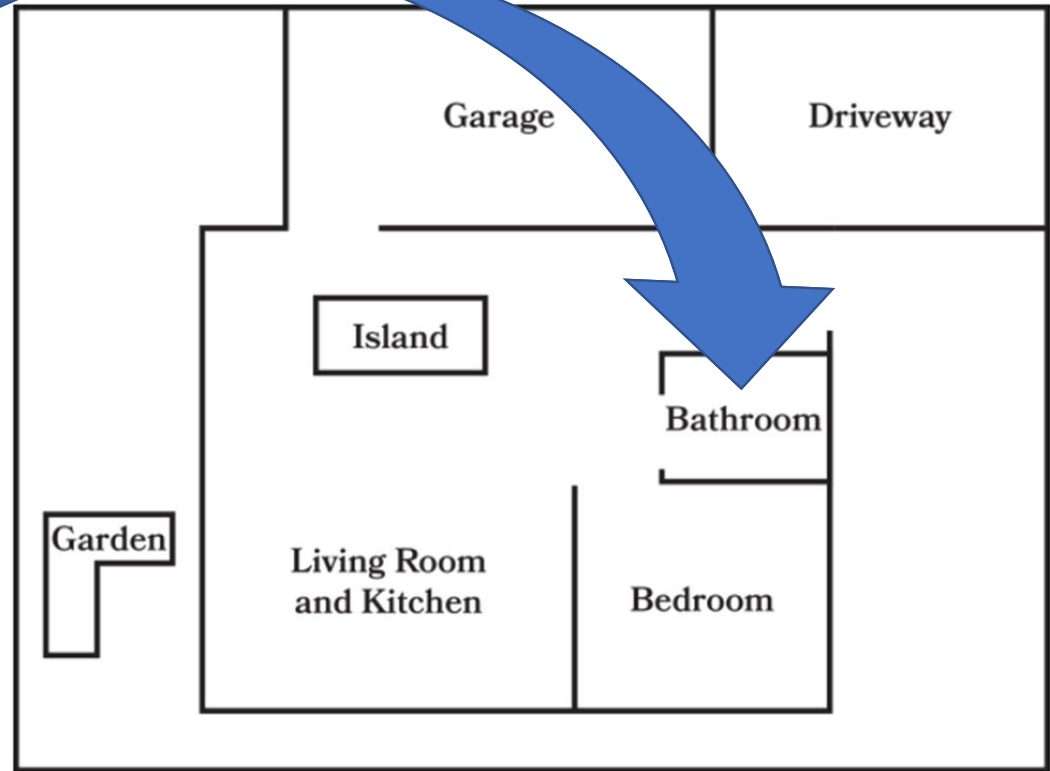
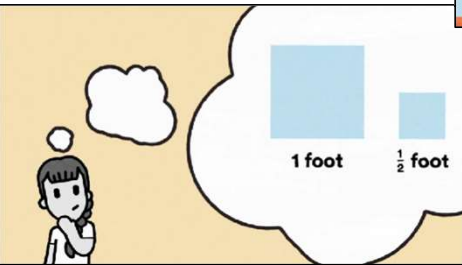
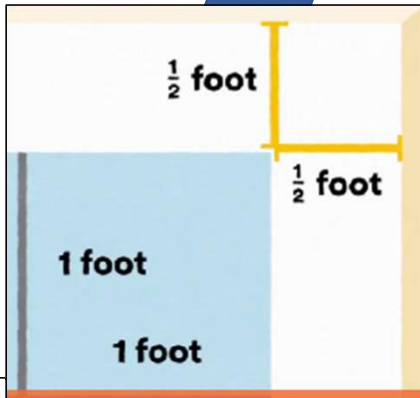
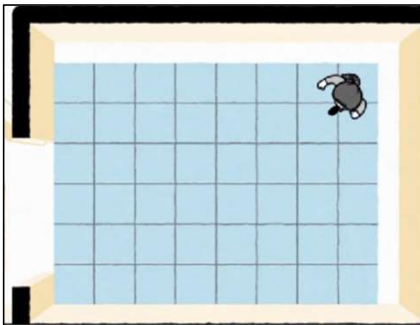
Identify a need to find the area of squares with fraction side lengths by partitioning a unit square.



What do you notice? Wonder?

**FLOOR
TILES**

1 foot \times 1 foot
TILES

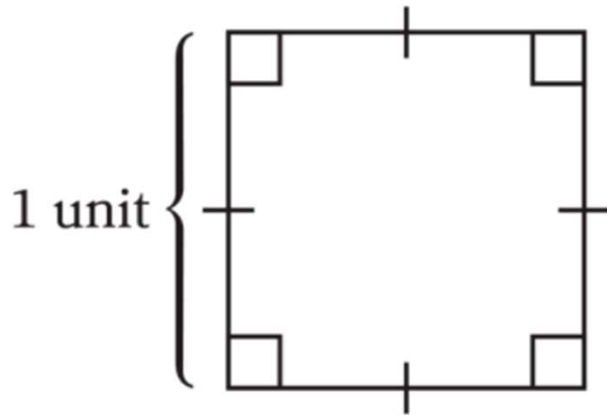


*Today, we will find the **AREA** of squares with fraction side lengths.*

LEARN (30-min)

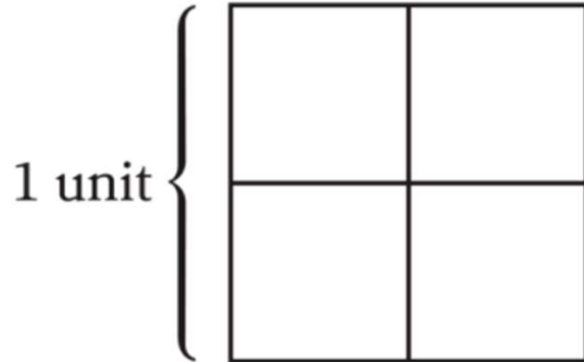
Area of Square Tiles with Fraction Side Lengths

What do you notice about this square?



- The side lengths are all 1 unit.
- The square has 4 sides of equal length, if one side is 1 unit the other three sides must each also be 1 unit.
- The **AREA of a unit square** is "1 square unit".
 $1 \text{ unit} \times 1 \text{ unit} = 1 \text{ square unit}.$

What can we say about each part of the square?



- Each part is the same size.
- Each part has the same area.
- Each part is $\frac{1}{4}$ of the square.

AREA

Area is the amount of flat space a shape takes up.

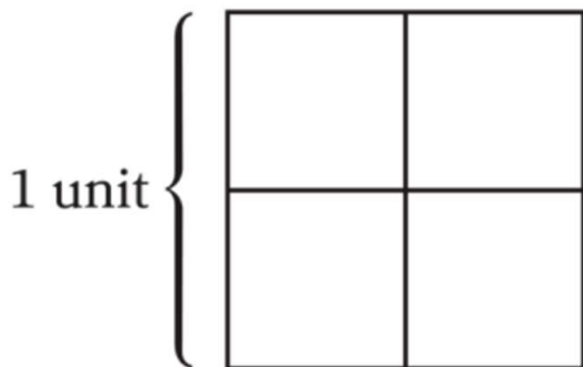
Why is area measured in square units?

- When we measure area, we fill up space **inside the shape with squares**.
- We want to find out how many square tiles cover the shape **without gaps or overlaps**.
- For squares and rectangle, finding AREA is very straightforward. **AREA = Length x Width**. The answer is in square units.

LEARN (30-min)

Area of Square Tiles with Fraction Side Lengths

If each of these smaller squares is $\frac{1}{4}$ of the unit square, I wonder what the length of one side of each smaller square is?



The larger square has a side length of 1 unit; therefore, the **AREA is 1 square unit**.

THINK-PAIR-SHARE:

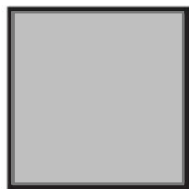
How many squares with side lengths of $\frac{1}{2}$ unit do you think will fit into or cover the unit square with no gaps or overlaps?

If it takes 4 tiles to cover 1 unit square, or to make 1 square unit, what is the **AREA of EACH tile**?

$$1 \div 4 = \frac{1}{4}$$

Each tile has an area of $\frac{1}{4}$ square unit.

$\frac{1}{2}$ unit



How many tiles do we need to cover 1 square unit?

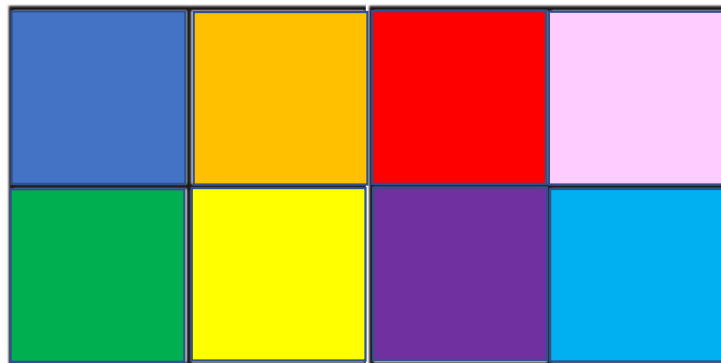
This is a square with side lengths of $\frac{1}{2}$ unit. Let's call this smaller square a **tile** because we are using it to tile the unit square. Very similar to the tiles on the floor of our classroom.

LEARN (30-min)

Area of Square Tiles with Fraction Side Lengths

How many square tiles with side lengths of $\frac{1}{2}$ unit
do you need to cover 2 square units?

Draw to show your thinking.



AREA is 1 square unit.

AREA is 1 square unit.

TOTAL: 2 square units

We found that we need 8 square tiles with side lengths of $\frac{1}{2}$ unit to cover 2 square units.

$$\text{Area} = \text{Length} \times \text{Width}$$
$$2 \times 4 = 8 \text{ tiles}^2$$

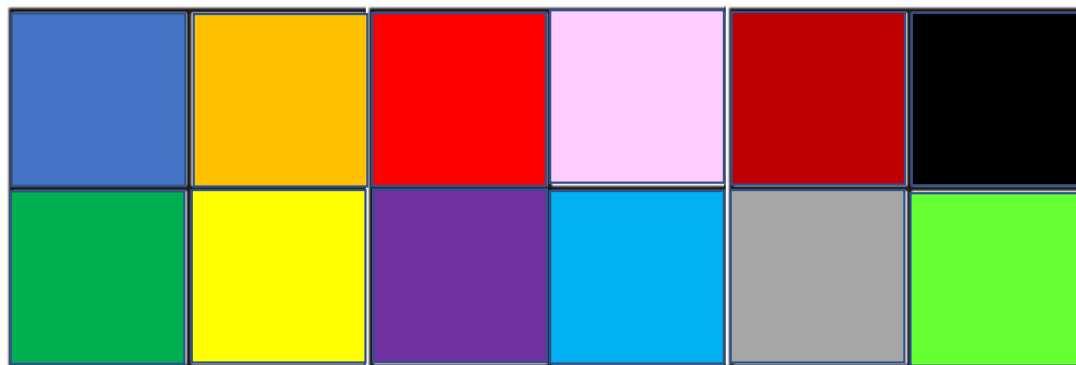
LEARN (30-min)

Area of Square Tiles with Fraction Side Lengths

How many square tiles with side lengths of $\frac{1}{2}$ unit
do you need to cover 3 square units?

Draw to show your thinking.

We found that we need 12 square tiles with side lengths of $\frac{1}{2}$ unit to cover 3 square units.



AREA is 1 square unit.

AREA is 1 square unit.

AREA is 1 square unit.

TOTAL: 3 square units

Area = Length x Width
 $2 \times 6 = 12 \text{ tiles}^2$

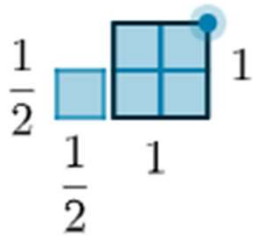
LEARN (30-min)

Tile Unit Squares

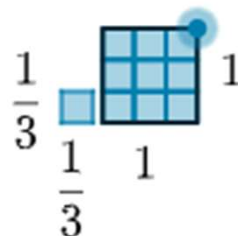
Use Tiling Digital Interactive on Digital Great Minds.



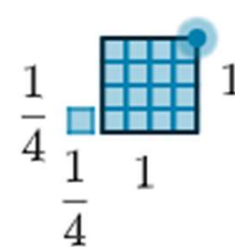
Notice: To tile 1 square unit, it takes more tiles as the length of the tiles become smaller.



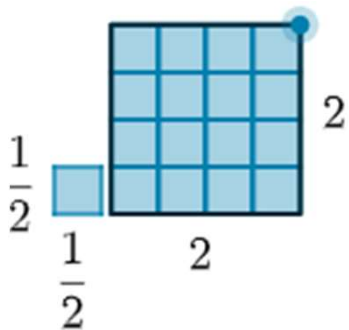
AREA = $2 \times 2 = 4$ square tiles
Square tile area: $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$



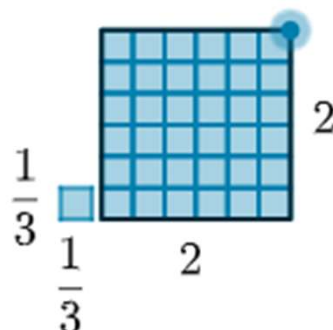
AREA = $3 \times 3 = 9$ square tiles
Square tile area: $\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$



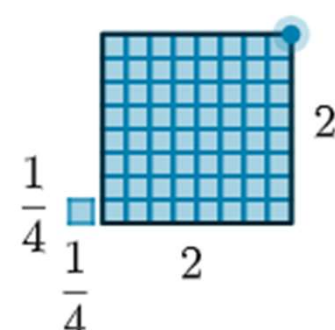
AREA = $4 \times 4 = 16$ square tiles
Square tile area: $\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$



AREA = $4 \times 4 = 16$ square tiles



AREA = $6 \times 6 = 36$ square tiles

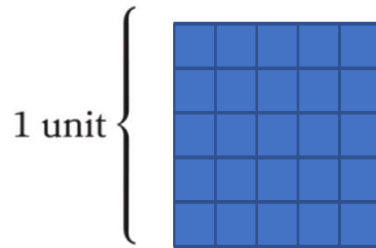


AREA = $8 \times 8 = 64$ square tiles

LEARN (30-min)

Tile Unit Squares

What is the area of a square tile with the side length of $\frac{1}{5}$ unit?



*The larger square has a side length of 1 unit; therefore, the **AREA is 1 square unit.***



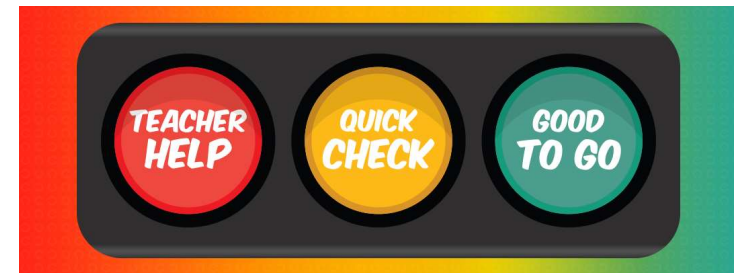
*This is a square with side lengths of $\frac{1}{5}$ unit. Let's call this smaller square a **tile** because we are using it to tile the unit square.*

The AREA of this TILE is $\frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$

That means, it will take 25 of these tiles to cover the 1 square unit above.

LAND (10-min)

Exit Ticket



Name

Date



8

What is the area of a square tile with side lengths of $\frac{1}{5}$ unit? Sketch to show how you know.

Exit Ticket – PAGE 65

Small Group Time:

Problem Set Pages 61 - 64

Homework:

Page 53 APPLY BOOK