

Eureka Math

4th Grade Module 3 Lesson 21

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Directions for customizing presentations are available on the next slide.



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Screen A

ReadyGEN™ in Action

3rd Grade
Unit 3, Module A
Lesson 1

“pop-out”

Screen B

Gr3(2) U3MAL1 Sample Lesson.pptx

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ReadyGEN™ in Action

3rd Grade
Unit 3, Module A
Lesson 1

Icons



Read, Draw, Write



Learning Target



Personal White Board



Problem Set



Manipulatives Needed



Fluency



Think Pair Share



Whole Class



Individual



Partner



Small Group



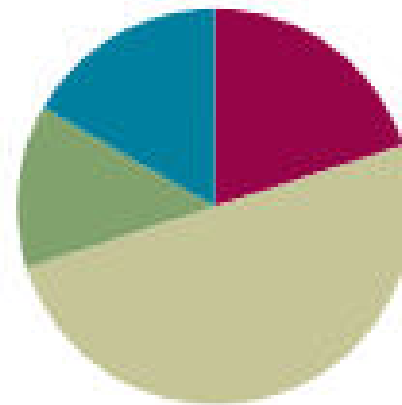
Small Group Time

Lesson 21

Objective: Solve division problems with remainders using the area model.

Suggested Lesson Structure

■ Fluency Practice	(12 minutes)
■ Application Problem	(8 minutes)
■ Concept Development	(30 minutes)
■ Student Debrief	(10 minutes)
Total Time	(60 minutes)





I can solve division problems with remainders using the area model.



Fluency Practice

SPRINT!!!

A STORY OF UNITS

Lesson 21 Sprint

4•3

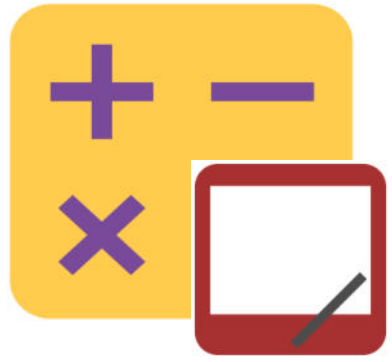
A

Number Correct: _____

Division with Remainders

1.	$8 \div 2$	Q = _____	R = _____
2.	$9 \div 2$	Q = _____	R = _____
3.	$4 \div 4$	Q = _____	R = _____
4.	$5 \div 4$	Q = _____	R = _____
5.	$7 \div 5$	Q = _____	R = _____
6.	$8 \div 5$	Q = _____	R = _____
7.	$5 \div 3$	Q = _____	R = _____

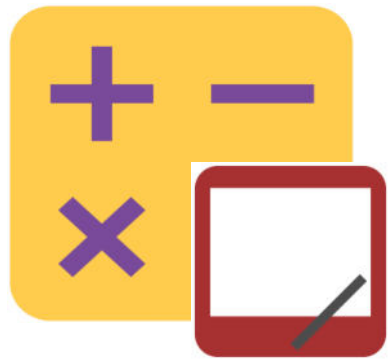
23.	$6 \div 2$	Q = _____	R = _____
24.	$7 \div 2$	Q = _____	R = _____
25.	$3 \div 3$	Q = _____	R = _____
26.	$4 \div 3$	Q = _____	R = _____
27.	$6 \div 4$	Q = _____	R = _____
28.	$7 \div 4$	Q = _____	R = _____
29.	$6 \div 6$	Q = _____	R = _____



Fluency Practice

Find the Unknown Factor

$$6 \times \underline{\quad} = 18$$

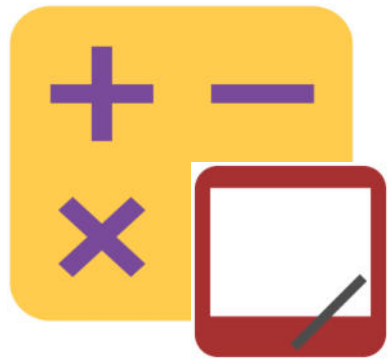


Fluency Practice

Find the Unknown Factor

$$6 \times \underline{\quad 3 \quad} = 18$$

On your personal white board, write the division problem.



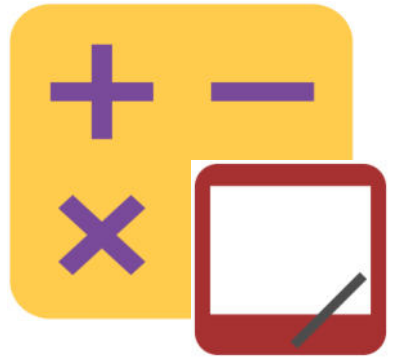
Fluency Practice

Find the Unknown Factor

$$6 \times \underline{\quad 3 \quad} = 18$$

**On your personal white board, write
the division problem.**

$$18 \div 6 = 3$$

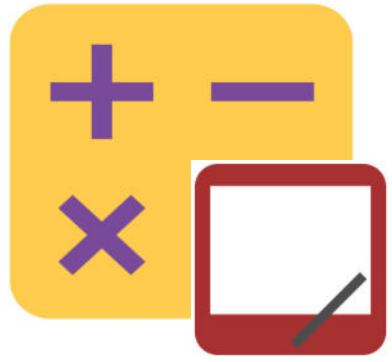


Fluency Practice

Find the Unknown Factor

Continue with the following:

$$3 \times \underline{\quad} = 21$$



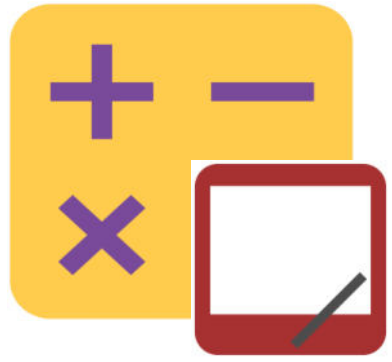
Fluency Practice

Find the Unknown Factor

Continue with the following:

$$3 \times \underline{7} = 21$$

$$21 \div 3 = 7$$

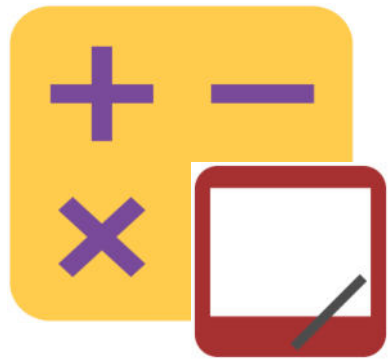


Fluency Practice

Find the Unknown Factor

Continue with the following:

$$4 \times \underline{\quad} = 20$$



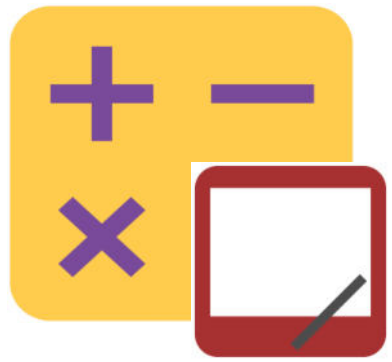
Fluency Practice

Find the Unknown Factor

Continue with the following:

$$4 \times \underline{5} = 20$$

$$20 \div 4 = 5$$



Fluency Practice

Find the Unknown Factor

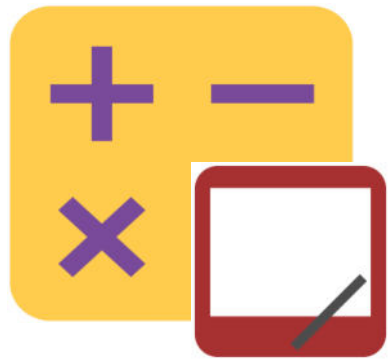
Continue with the following:

$$5 \times \underline{\quad} = 25$$

$$6 \times \underline{\quad} = 42$$

$$7 \times \underline{\quad} = 56$$

$$9 \times \underline{\quad} = 72$$



Fluency Practice

Find the Unknown Factor

Continue with the following:

$$6 \times \underline{\quad\quad\quad} = 54$$

$$7 \times \underline{\quad\quad\quad} = 63$$

$$9 \times \underline{\quad\quad\quad} = 63$$

Application Problem

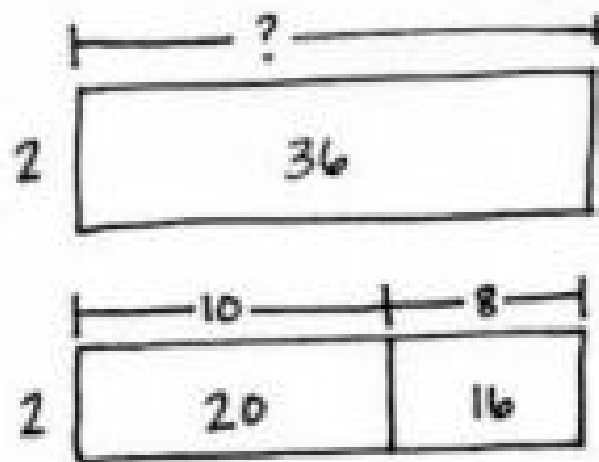
**A rectangle has an area of 36 square units
and a width of 2 units.**

What is the unknown side length?

Application Problem

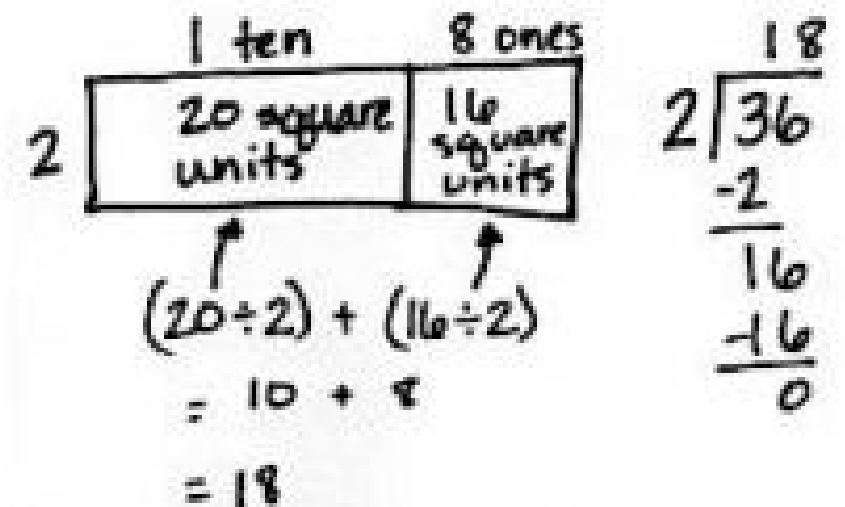
A rectangle has an area of 36 square units and a width of 2 units.

Method 1:

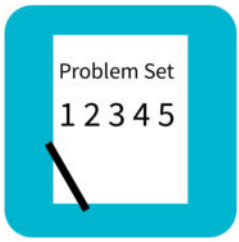


$$\begin{array}{c} 36 \\ \swarrow \quad \searrow \\ 20 \quad 16 \\ (20 \div 2) + (16 \div 2) \\ 10 + 8 = 18 \end{array}$$

Method 2:



The unknown side length is 18 units.



Concept Development

Materials

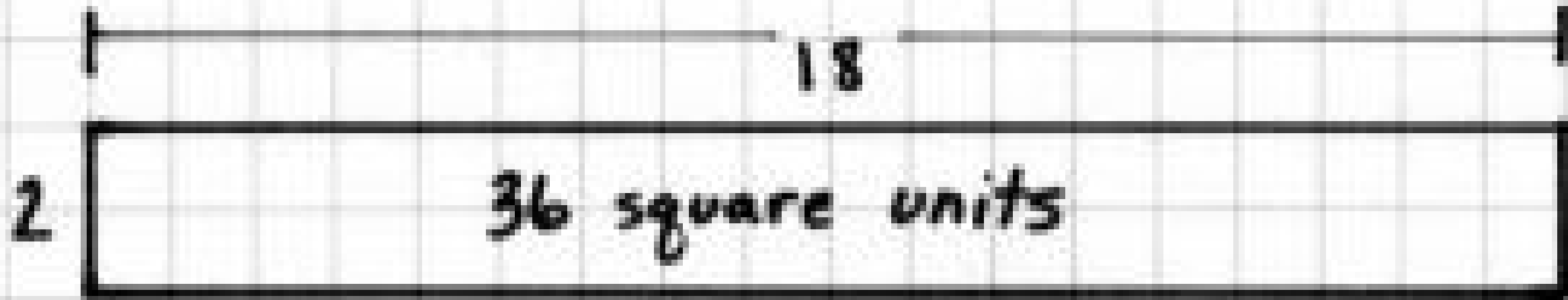
(T) Square grid paper

(S) Problem Set

Concept Development

Solve division, with remainders using area model

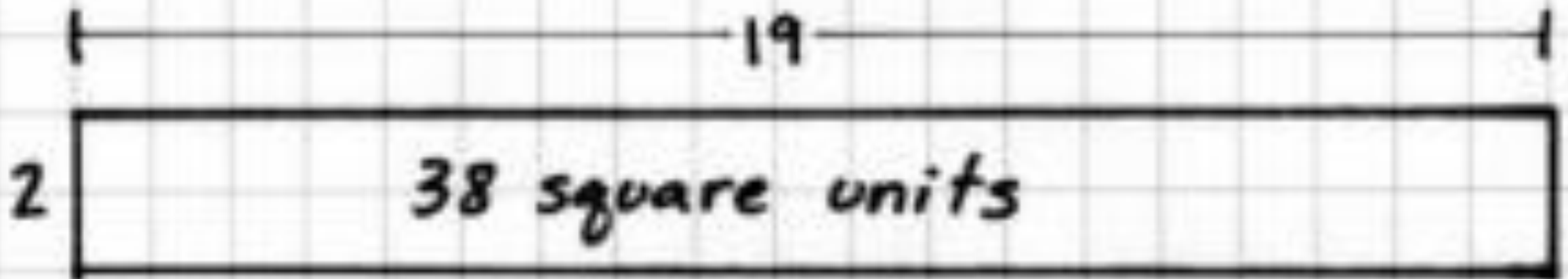
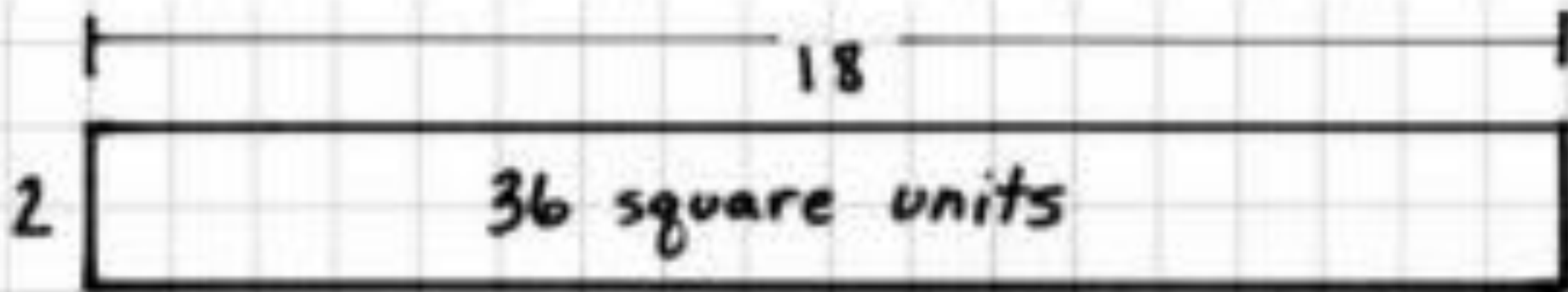
This rectangle has a side length of 18.



Concept Development

Solve division, with remainders using area model

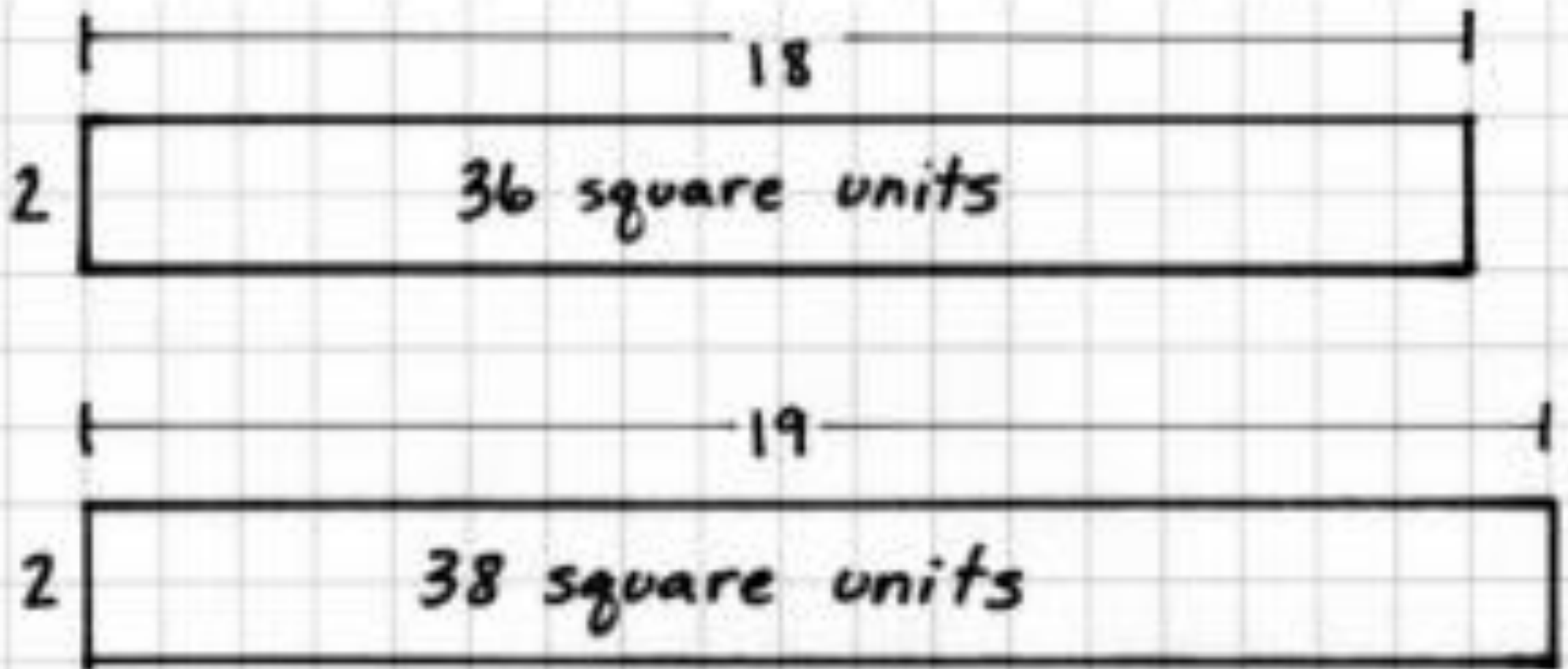
What would be the area of a rectangle with a width of 2 and a length of 19 units?



Concept Development

Solve division, with remainders using area model

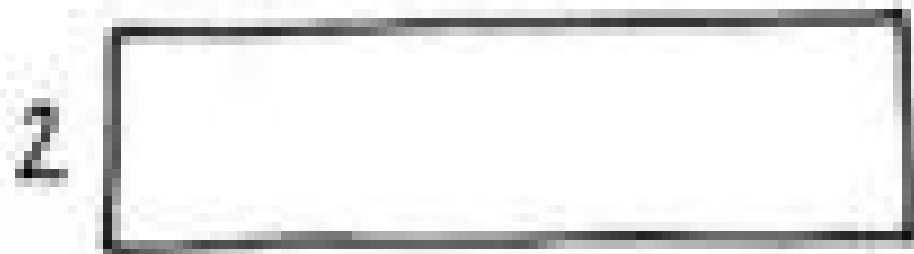
So, we cannot represent a rectangle with a width of 2 and an area of 37 square units.



Concept Development

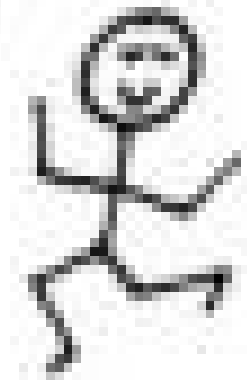
Solve division, with remainders using area model

Draw a rectangle. Label the width as 2 units.



$2 \times \text{--- tens} = 3 \text{ tens}$

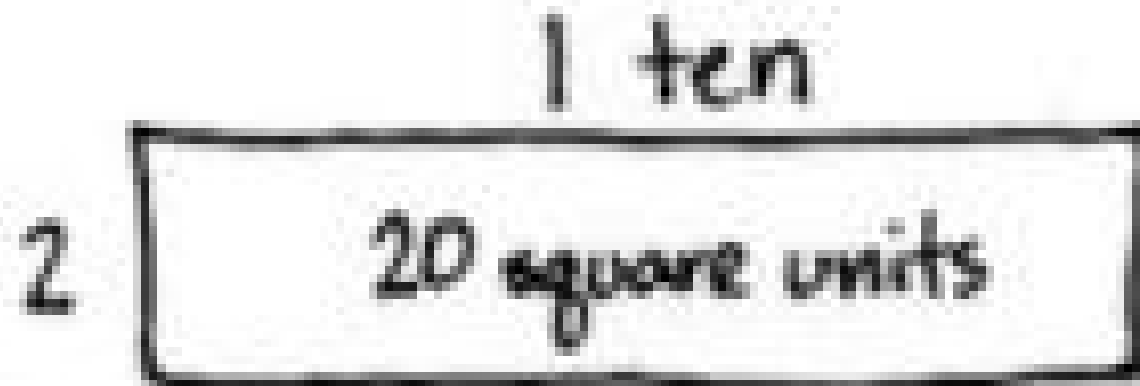
$$2 \overline{) 37}$$



Concept Development

Solve division, with remainders using area model

Label this rectangle with a length of 1 ten.



$$\begin{array}{r} 1 \\ 2 \overline{) 37} \\ \underline{-2} \\ 1 \end{array}$$

Concept Development

Solve division, with remainders using area model

17 ones remain. Two times ho many ones give us an area CLOSE to 17 square units?

The diagram consists of three main parts:

- Thought Bubble:** A cloud-shaped bubble containing the text:

$$1 \text{ ten} + 7 \text{ ones} = 17 \text{ ones}$$

$$2 \times \text{--- ones} = 17 \text{ ones}$$
- Area Model:** A large rectangle divided into two sections. The left section is labeled "1 ten" above it and "20 square units" inside. The right section is labeled "8 ones" above it and "16 square units" inside. A "2" is written to the left of the entire rectangle.
- Long Division:** A vertical long division problem:

$$2 \overline{) 37}$$

$$\underline{-2} $$

$$17$$

$$\underline{-16}$$

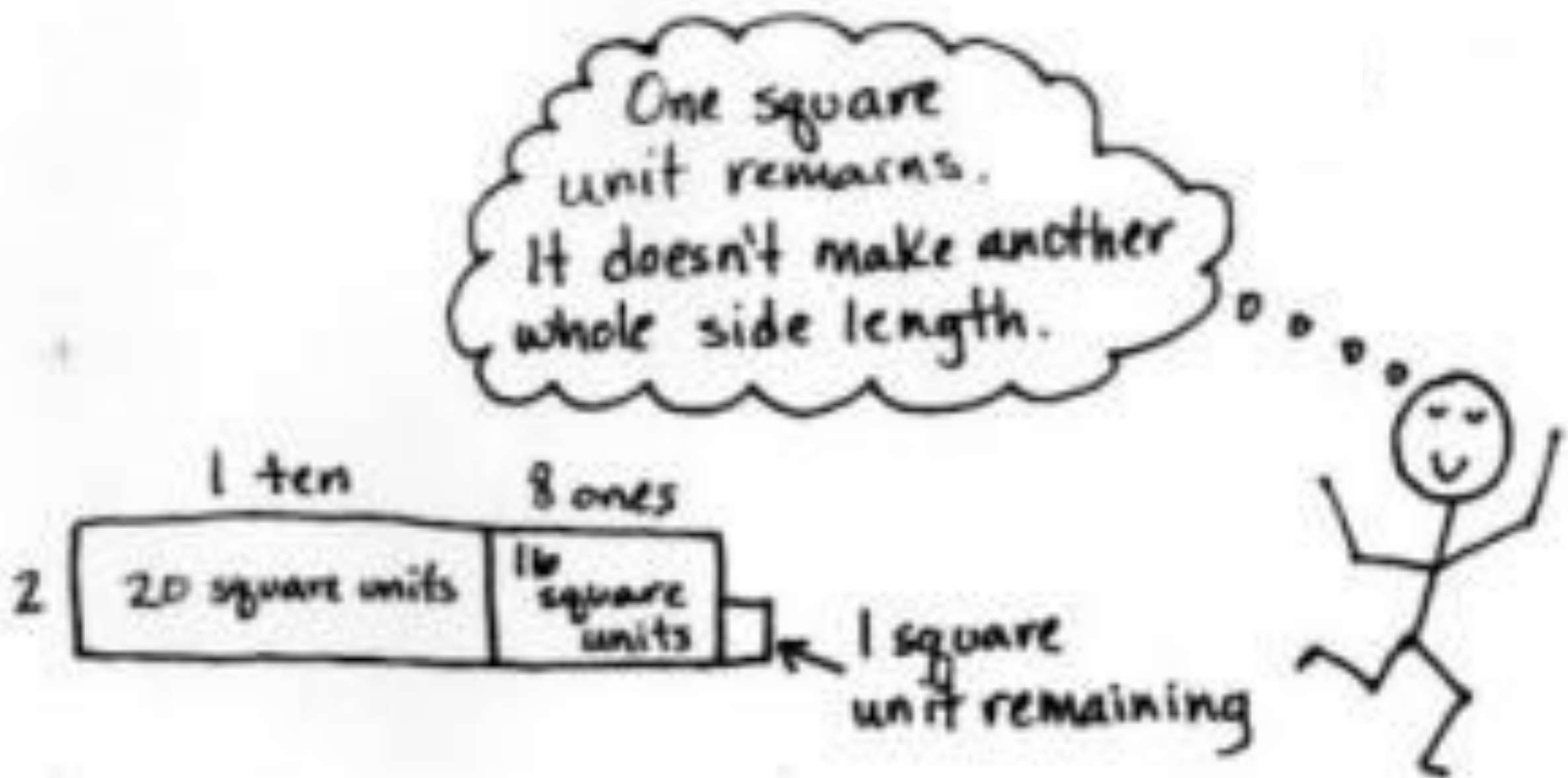
$$1$$

A stick figure is drawn to the right of the long division, with a thought bubble leading to the thought bubble above.

Concept Development

Solve division, with remainders using area model

How many ones remain?



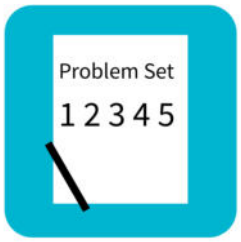
Concept Development

Solve division, with remainders using area model

Let's validate our drawing and algorithm using the distributive property.

$$\begin{aligned} & (20 \div 2) + (16 \div 2) \\ & = 10 + 8 \\ & = 18 \end{aligned}$$

$$(18 \times 2) + 1 = 37$$

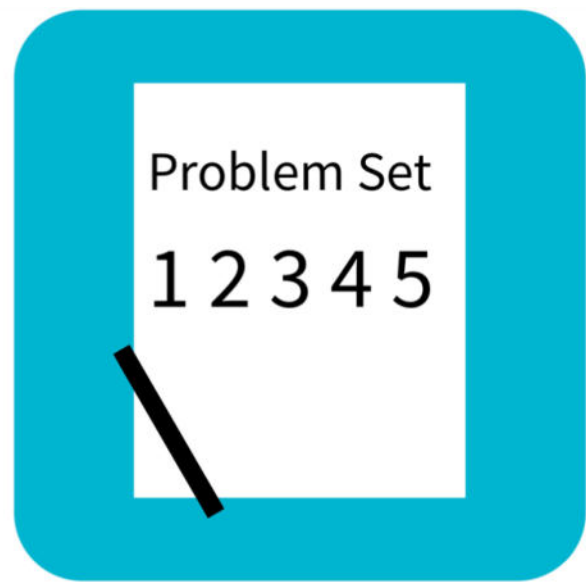


Concept Development

Solve division, with remainders using area model

Repeat the process using $76 \div 3$

See page 296 of teacher manual if needed.



Problem Set

Name _____

Date _____

1. Solve $37 \div 2$ using an area model. Use long division and the distributive property to record your work.

Debrief

Explain to your partner the connection between the distributive property and the area model in Problem 3.

Because we often have remainders when we divide, we have to use the area model by building up from part to whole. What did the first rectangle you drew in Problem 1 represent? The next chunk of the rectangle?

Each time we divide, what happens to the amount of area we still have left to divide?

Why don't we have this complication of leftovers or remainders with multiplication?

Debrief

In Problem 4, we didn't know if we were going to have a remainder in the ones place, so instead we built up to the area working with one place value unit at a time. How might the problems with remainders have been challenging if you started with the whole area, like in Lesson 20?

(Optional.) Let's look back at Problem 2, $76 \div 3$. What if we cut this remaining square unit into 3 equal parts with vertical lines? What is the length of one of these units? What if we stack them to add more area? What is the total length of the new rectangle, including this tiny piece?

Exit Ticket

Name _____

Date _____

1. Kyle drew the following area model to find an unknown length. What division equation did he model?

