

Eureka Math

4th Grade Module 3 Lesson 20

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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



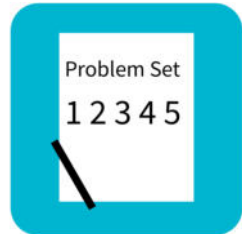
Read, Draw, Write



Learning Target



Personal White Board



Problem Set



Manipulatives Needed



Fluency



Think Pair Share



Whole Class



Individual



Partner



Small Group



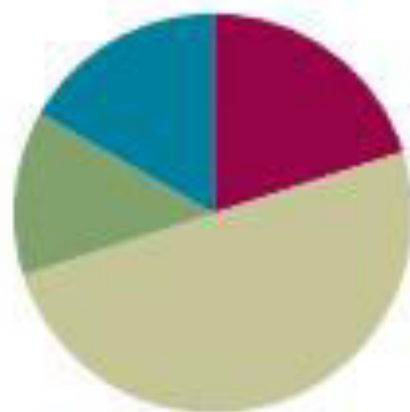
Small Group Time

Lesson 20

Objective: Solve division problems without remainders using the area model.

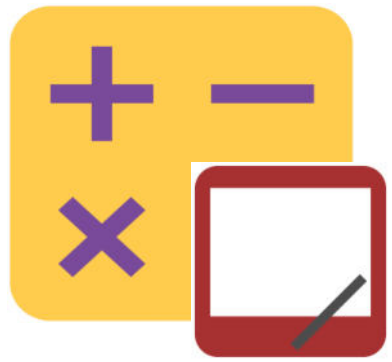
Suggested Lesson Structure

■ 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 without remainders using the area model.

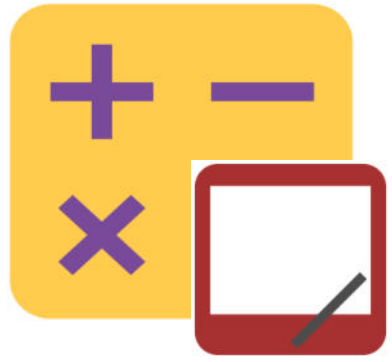


Fluency Practice

Divide Using the Standard Algorithm

Repeat the process from Lesson 17...

$$67 \div 2$$



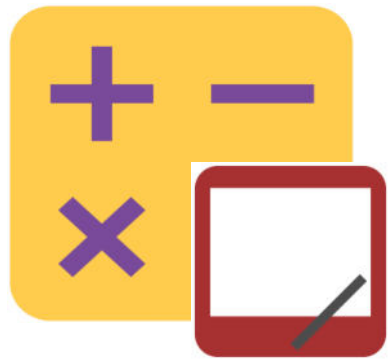
Fluency Practice

Divide Using the Standard Algorithm

Repeat the process from Lesson 17...

$$67 \div 2$$

$$60 \div 4$$



Fluency Practice

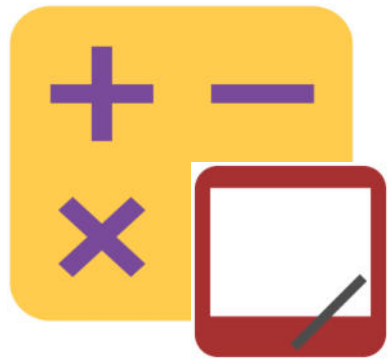
Divide Using the Standard Algorithm

Repeat the process from Lesson 17...

$$67 \div 2$$

$$60 \div 4$$

$$29 \div 3$$



Fluency Practice

Divide Using the Standard Algorithm

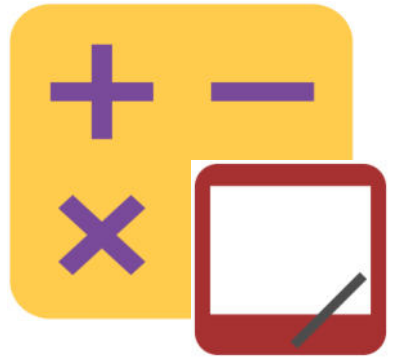
Repeat the process from Lesson 17...

$$67 \div 2$$

$$60 \div 4$$

$$29 \div 3$$

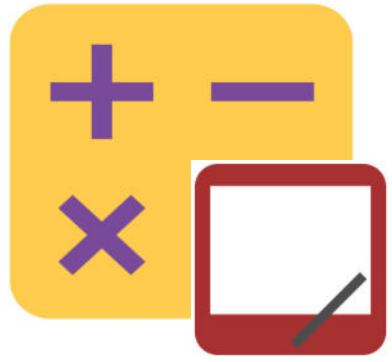
$$77 \div 4$$



Fluency Practice

Find the Unknown Factor

$$5 \times \underline{\quad} = 15$$

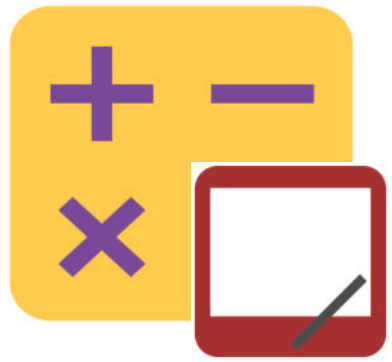


Fluency Practice

Find the Unknown Factor

$$5 \times \underline{\quad 3 \quad} = 15$$

On your personal white board, write the division problem.



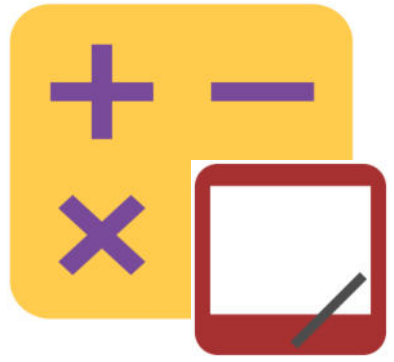
Fluency Practice

Find the Unknown Factor

$$5 \times \underline{\quad 3 \quad} = 15$$

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

$$15 \div 5 = 3$$

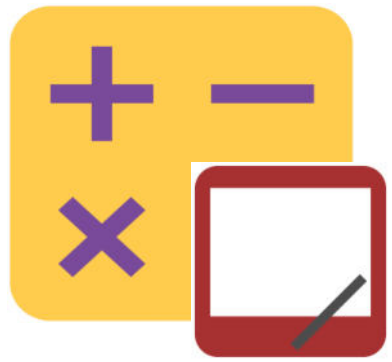


Fluency Practice

Find the Unknown Factor

Continue with the following:

$$3 \times \underline{\quad} = 12$$



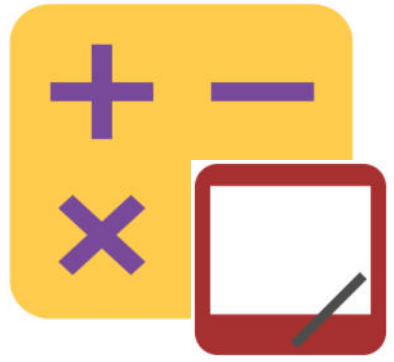
Fluency Practice

Find the Unknown Factor

Continue with the following:

$$3 \times \underline{4} = 12$$

$$12 \div 3 = 4$$

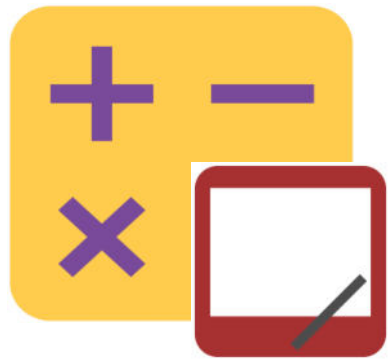


Fluency Practice

Find the Unknown Factor

Continue with the following:

$$5 \times \underline{\quad} = 35$$



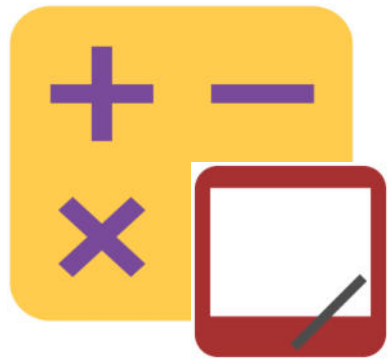
Fluency Practice

Find the Unknown Factor

Continue with the following:

$$5 \times \underline{7} = 35$$

$$35 \div 5 = 7$$



Fluency Practice

Find the Unknown Factor

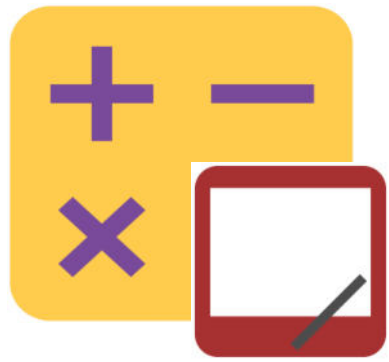
Continue with the following:

$$6 \times \underline{\quad\quad} = 36$$

$$7 \times \underline{\quad\quad} = 49$$

$$6 \times \underline{\quad\quad} = 48$$

$$9 \times \underline{\quad\quad} = 54$$

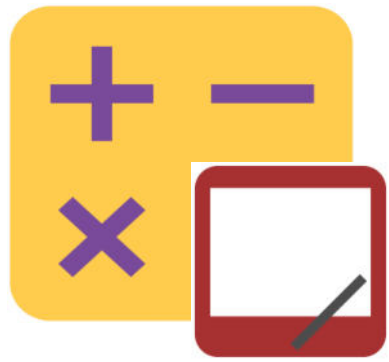


Fluency Practice

Mental Multiplication

$$3 \times 2$$

**Say the complete multiplication sentence in
unit form**



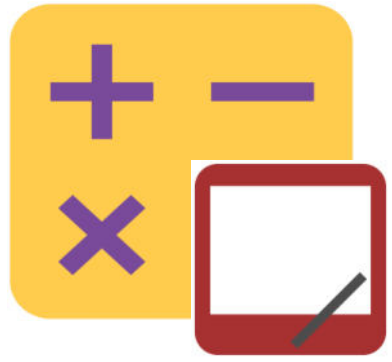
Fluency Practice

Mental Multiplication

$$3 \times 2$$

**Say the complete multiplication sentence in
unit form**

$$3 \text{ ones} \times 2 = 6 \text{ ones}$$

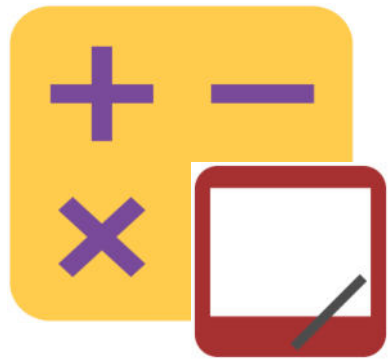


Fluency Practice

Mental Multiplication

$$30 \times 2$$

**Say the complete multiplication sentence in
unit form**



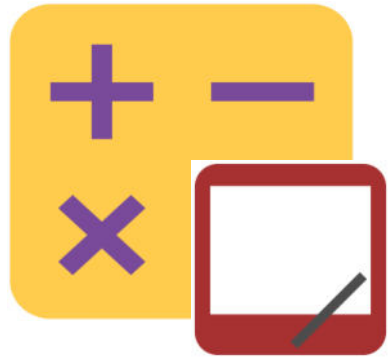
Fluency Practice

Mental Multiplication

$$30 \times 2$$

**Say the complete multiplication sentence in
unit form**

$$3 \text{ tens} \times 2 = 6 \text{ tens}$$

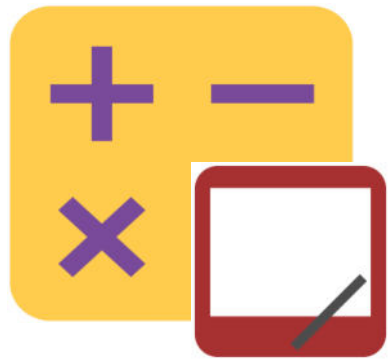


Fluency Practice

Mental Multiplication

$$30 \times 20$$

**Say the complete multiplication sentence in
unit form**



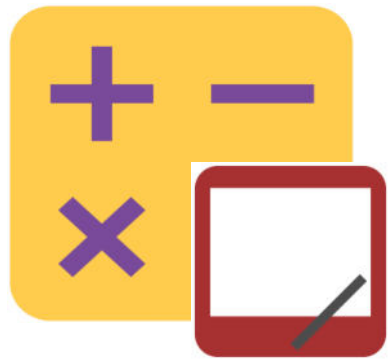
Fluency Practice

Mental Multiplication

$$30 \times 20$$

**Say the complete multiplication sentence in
unit form**

3 tens \times 2 tens = 6 hundreds



Fluency Practice

Mental Multiplication

Continue with the following:

$$4 \times 2$$

$$40 \times 2$$

$$40 \times 20$$



Fluency Practice

Mental Multiplication

Continue with the following:

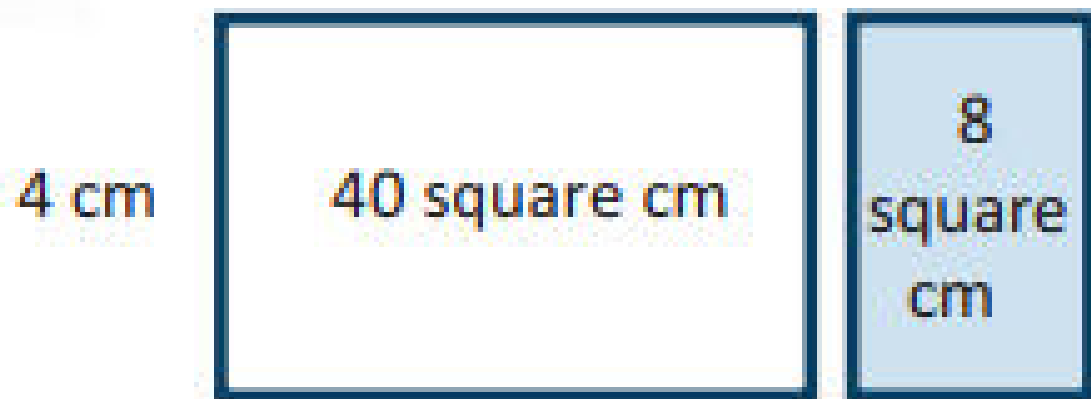
$$5 \times 3$$

$$50 \times 3$$

$$50 \times 30$$

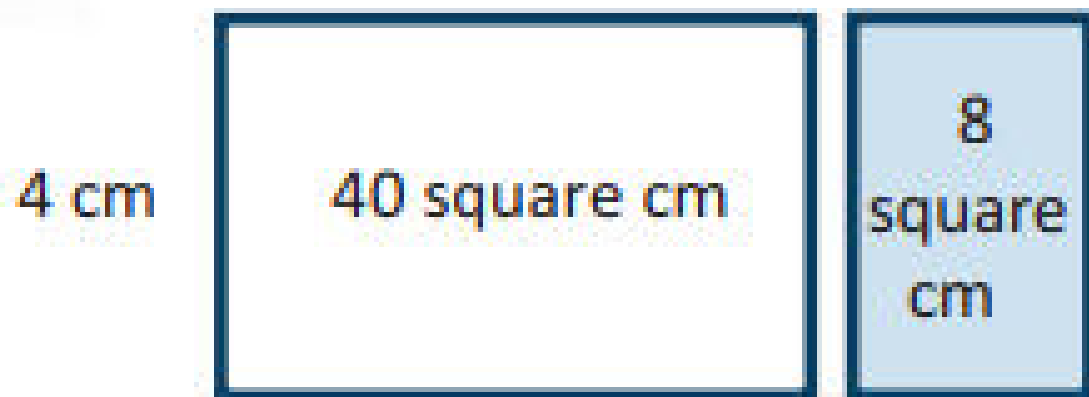
Application Problem

Write an expression to find the unknown length of each rectangle. Then find the sum of the two unknown lengths.



Application Problem

Write an expression to find the unknown length of each rectangle.

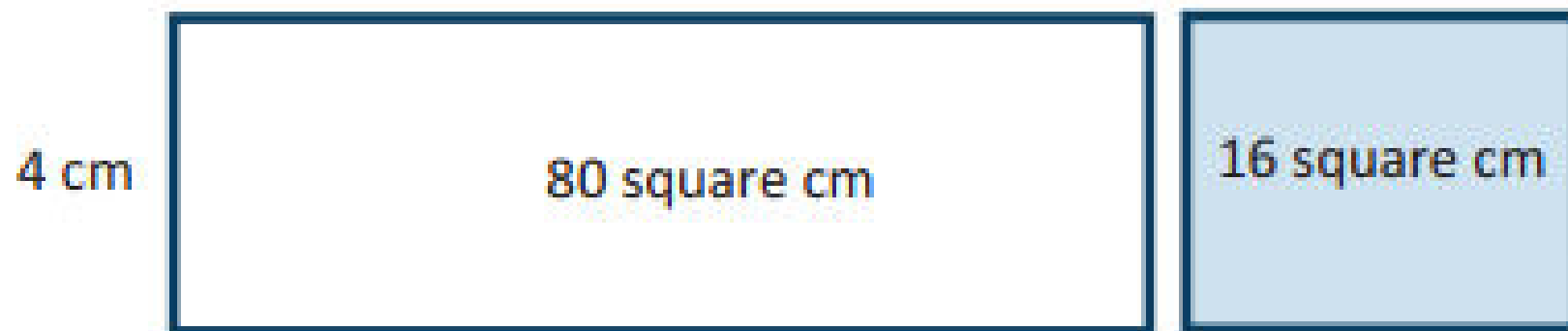


$$\begin{aligned} & (40 \div 4) + (8 \div 4) \\ & 10 + 2 = 12 \end{aligned}$$

12 centimeters

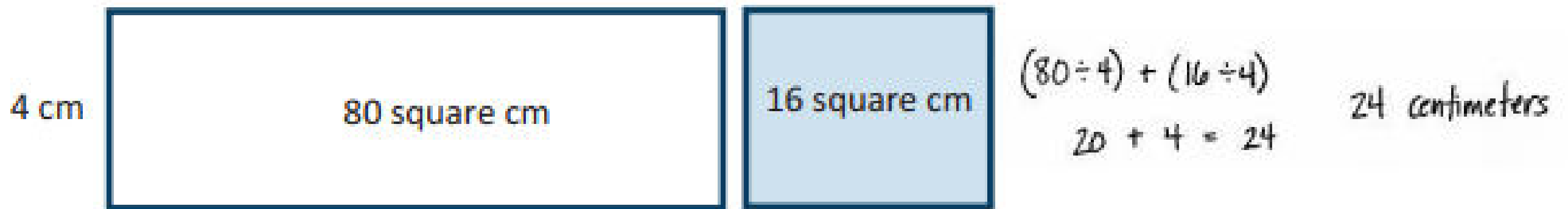
Application Problem

Write an expression to find the unknown length of each rectangle. Then find the sum of the two unknown lengths.



Application Problem

Write an expression to find the unknown length of each rectangle.





Concept Development

Materials

(S) Personal white board



Concept Development

Solve division, without remainders using area model

Use *area model* to solve.

$$48 \div 4$$

**Draw a rectangle with an area of 48 square units
and a width of 4 units.**



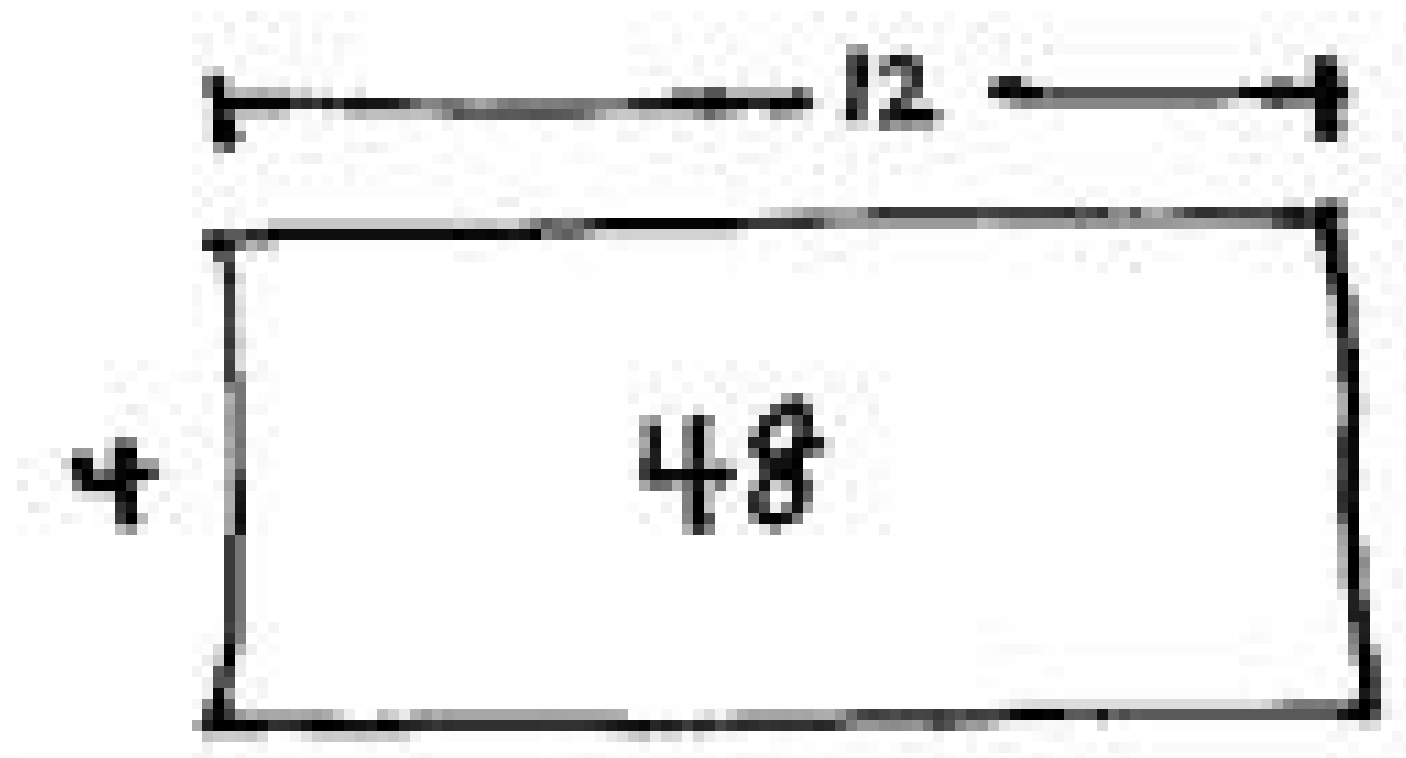
Concept Development

Solve division, without remainders using area model

Use **area model** to solve.

$$48 \div 4$$

Draw a rectangle with an area of 48 square units and a width of 4 units.





Concept Development

Solve division, without remainders using area model

Use *area model* to solve.

$$48 \div 4$$

Draw a NEW rectangle with the same area directly below, but partitioned into tens and ones.



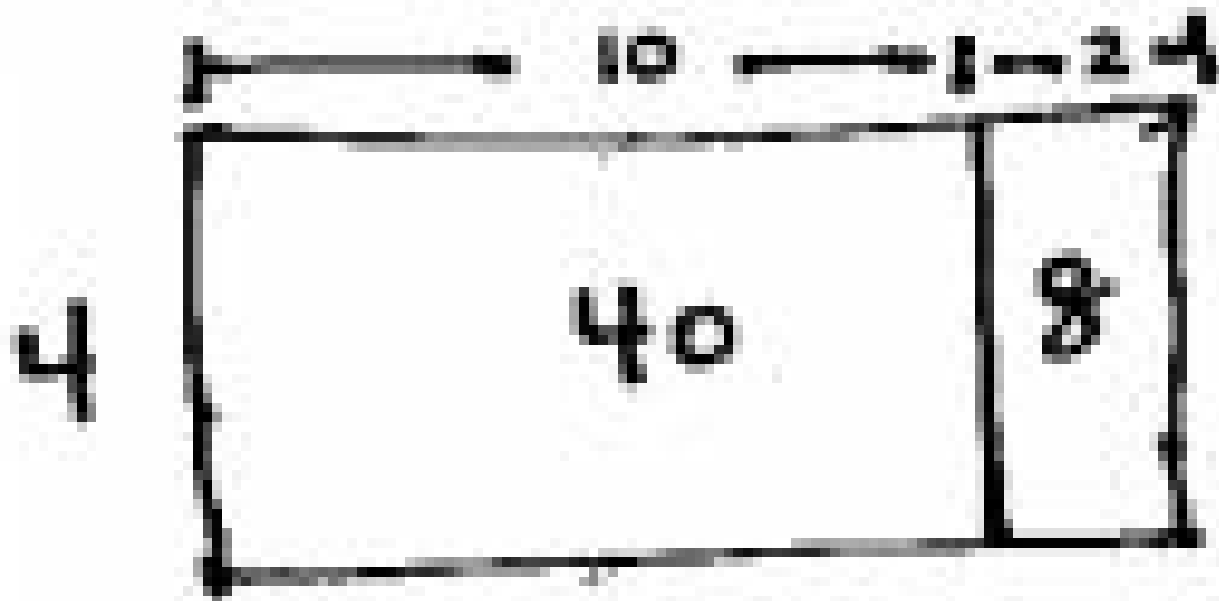
Concept Development

Solve division, without remainders using area model

Use **area model** to solve.

$$48 \div 4$$

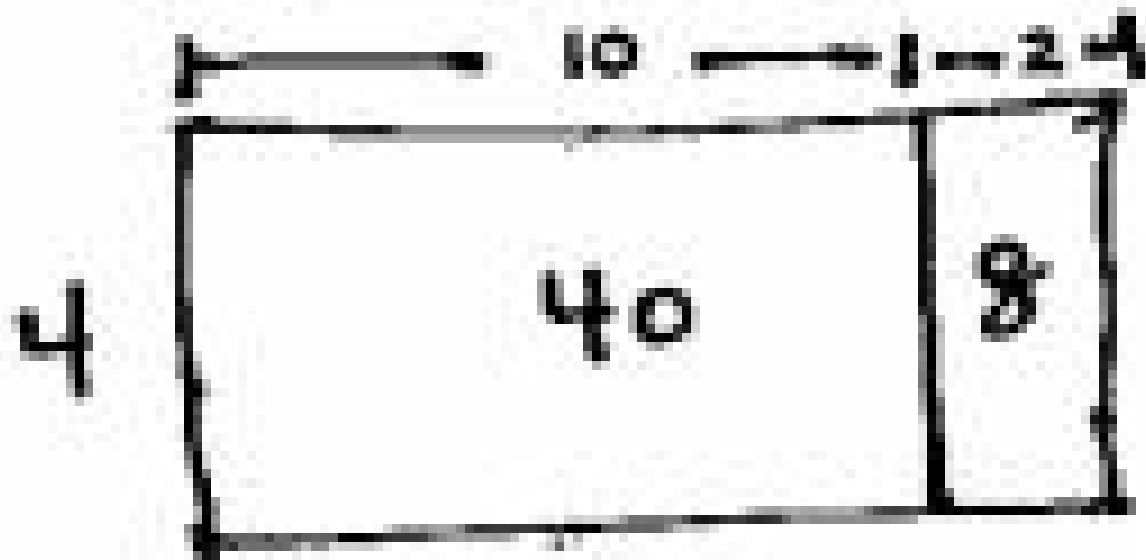
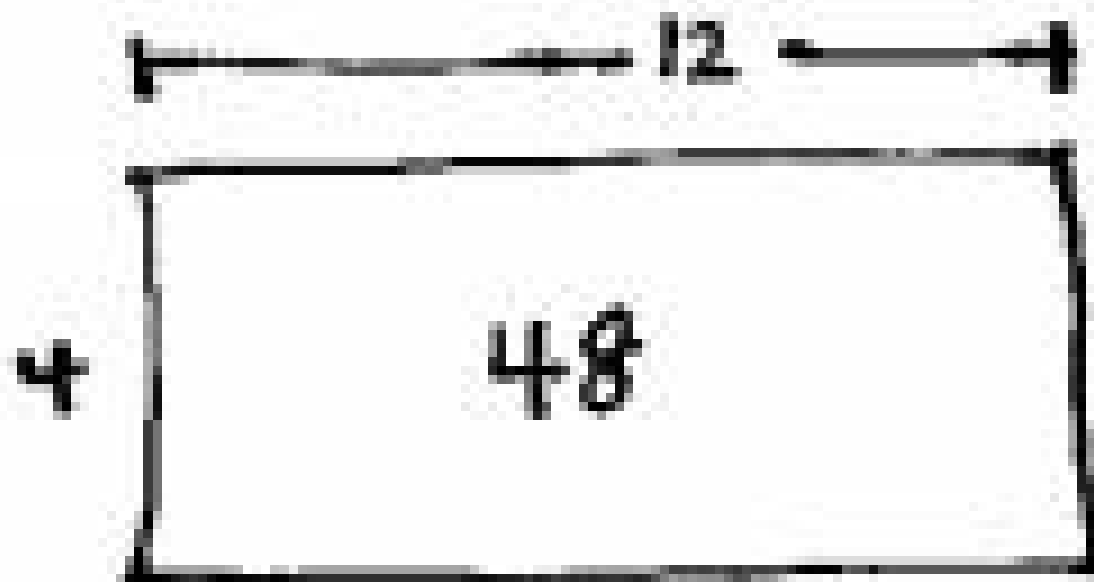
Draw a NEW rectangle with the same area directly below, but partitioned into tens and ones.





Concept Development

Solve division, without remainders using area model

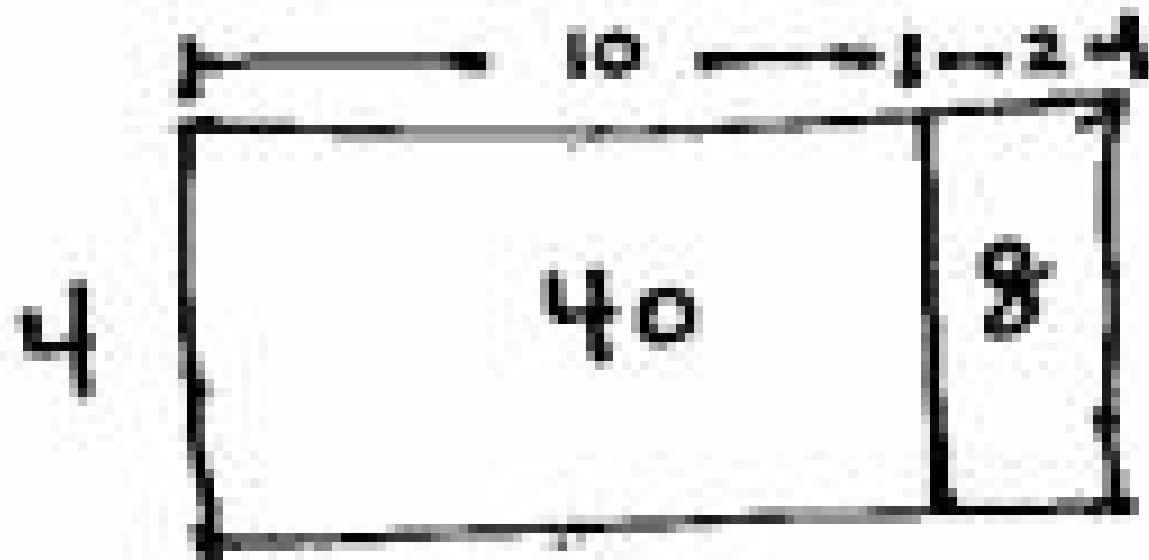
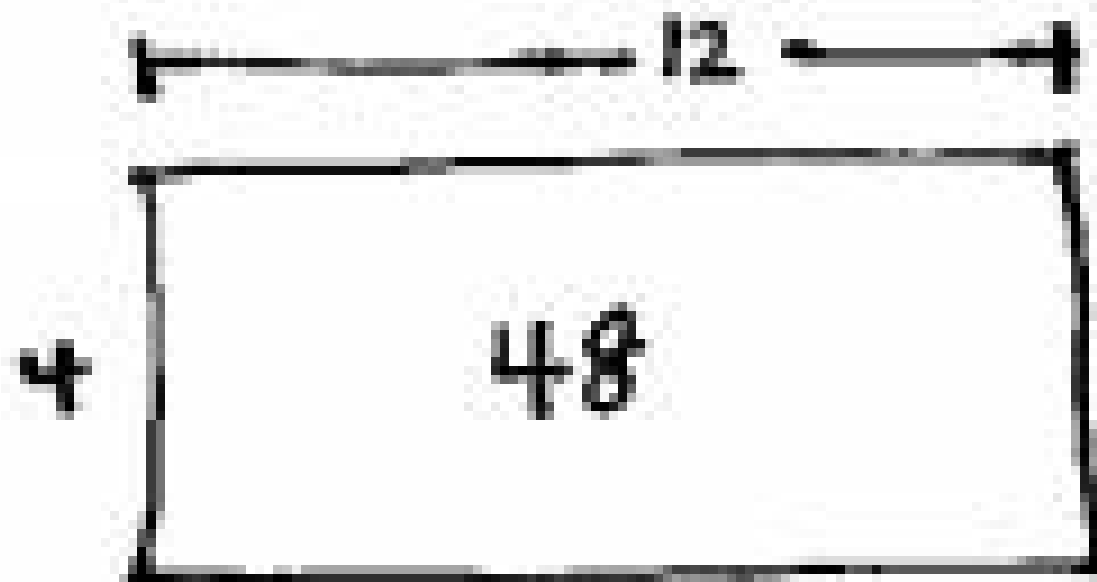


Let's draw a number bond to match the whole and parts of the rectangle.



Concept Development

Solve division, without remainders using area model



$$\begin{array}{c} 48 \\ \swarrow \quad \searrow \\ 40 \quad 8 \\ \downarrow \quad \downarrow \\ (40 \div 4) \quad + \quad (8 \div 4) \\ = 10 \quad + \quad 2 \\ = 12 \end{array}$$



Concept Development

Solve division, without remainders using area model

Work with your partner to partition the same area of 48 as 2 twenties and 8.

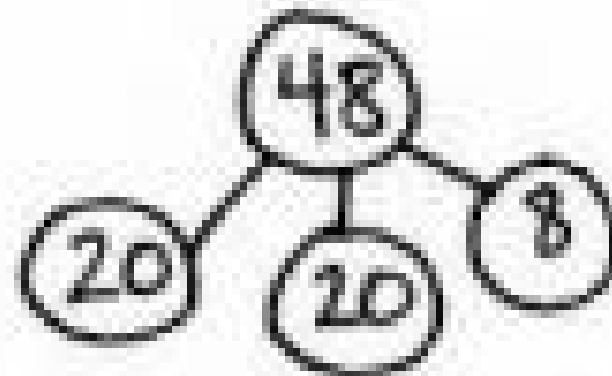
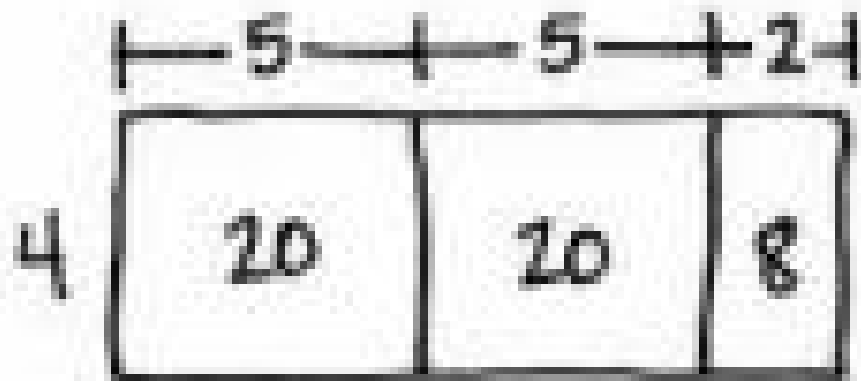
When you are finished, try to find *another* way to partition the area of 48 so it's easy to divide.



Concept Development

Solve division, without remainders using area model

Work with your partner to partition the same area of 48 as 2 twenties and 8.



$$\begin{aligned} & (20 \div 4) + (20 \div 4) + (8 \div 4) \\ & = 5 + 5 + 2 \\ & = 12 \end{aligned}$$



Concept Development

Solve division, without remainders using area model

**What other way did you and your partner
partition the area of 48?**



Concept Development

Solve division, without remainders using area model

Use **area model to solve.**

$$96 \div 4$$

**Draw a rectangle with an area of 96 square units
and a width of 4 units.**

Partition the area to be easily divisible by 4.

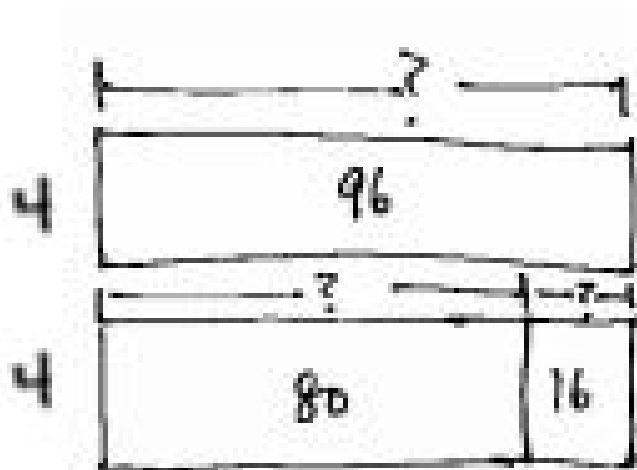


Concept Development

Solve division, without remainders using area model

Use area model to solve.

$$96 \div 4$$



$$\begin{array}{l} 96 \\ \swarrow \quad \searrow \\ 80 \quad 16 \\ \left(\frac{80}{4} \right) \quad + \quad \left(\frac{16}{4} \right) \\ 20 \quad + \quad 4 = 24 \end{array}$$

$$\begin{array}{l} 96 \\ \swarrow \quad \downarrow \quad \searrow \\ 40 \quad 40 \quad 16 \\ \left(\frac{40}{4} \right) + \left(\frac{40}{4} \right) + \left(\frac{16}{4} \right) \\ 10 + 10 + 4 = 24 \end{array}$$



Concept Development

Solve division, without remainders using area model

Compose from part to whole

$$96 \div 4$$

Thinking about area, let's try a new way to divide!

We know the area is 96 square units. We are trying to find out the length of the unknown side.



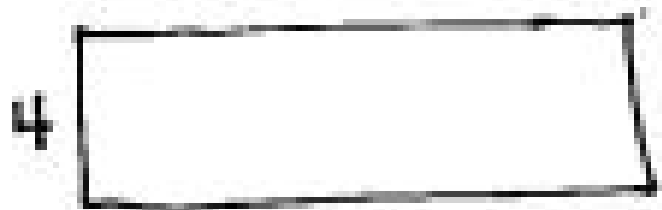
Concept Development

Solve division, without remainders using area model

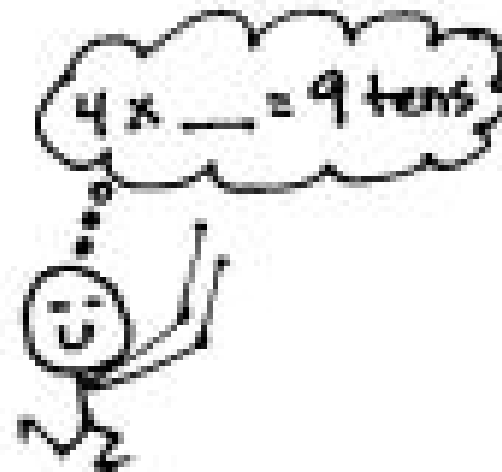
Compose from part to whole

$$96 \div 4$$

4 times how many tens gets us as close as possible to an area of 9 tens?



$$4 \overline{) 96}$$





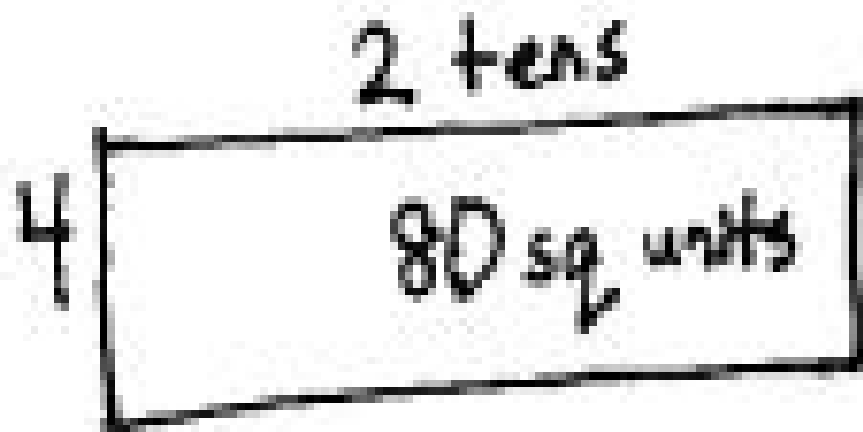
Concept Development

Solve division, without remainders using area model

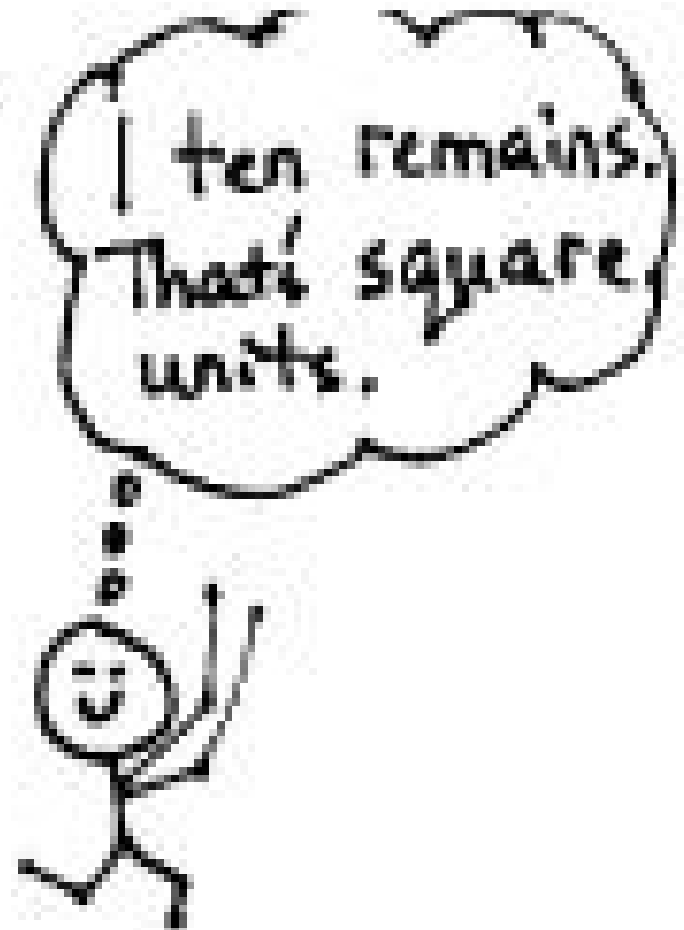
Compose from part to whole

$$96 \div 4$$

Let's give 2 tens to the length.



A hand-drawn long division diagram. The divisor '4' is on the left, and the dividend '96' is on the right. A horizontal line is drawn above '96'. The quotient '24' is written above the line. A vertical line is drawn below '96', and the remainder '0' is written below the line.





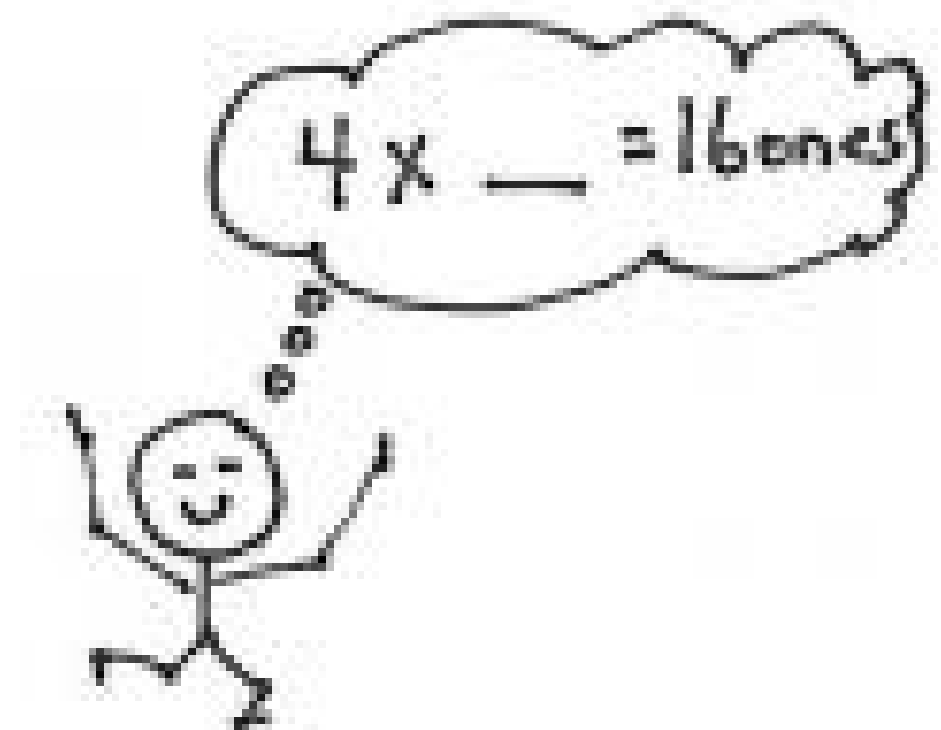
Concept Development

Solve division, without remainders using area model

Compose from part to whole

We have 16 square units remaining with a width of 4.

Four times how many ones gets us as close as possible to an area of 16 square units?





Concept Development

Solve division, without remainders using area model

Compose from part to whole

We have no more area to divide.

What is the length of the unknown side?



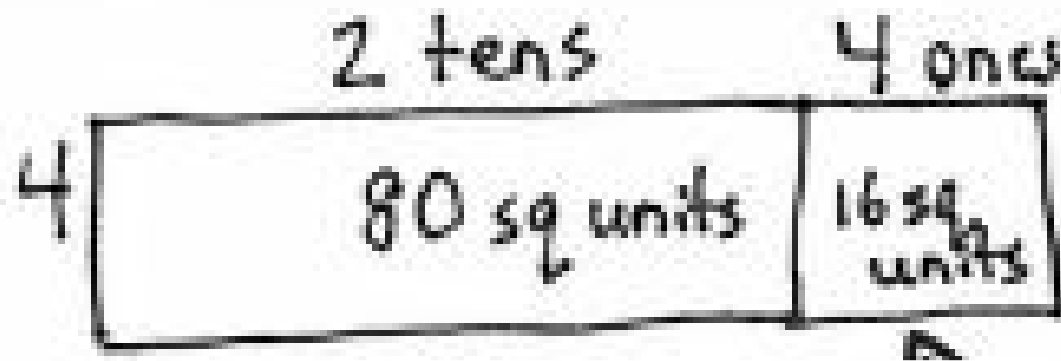
Concept Development

Solve division, without remainders using area model

Compose from part to whole

We have no more area to divide.

What is the length of the unknown side?



$$\begin{array}{r} 24 \\ 4 \overline{) 96} \\ \underline{- 8} \\ 16 \\ \underline{- 16} \\ 0 \end{array}$$



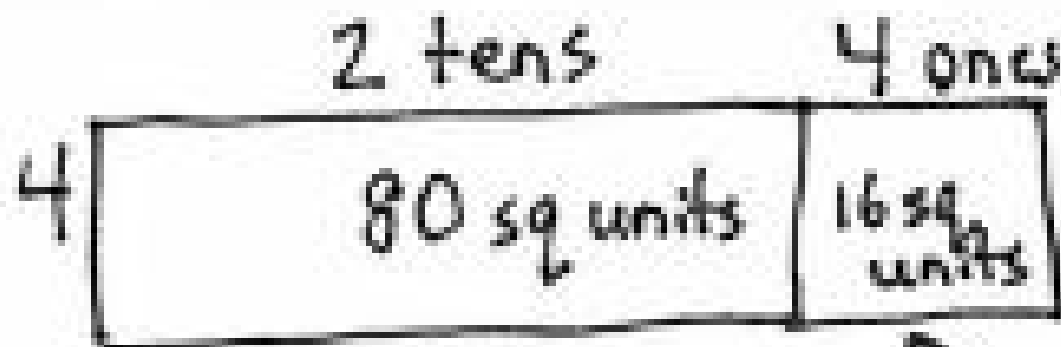


Concept Development

Solve division, without remainders using area model

Compose from part to whole

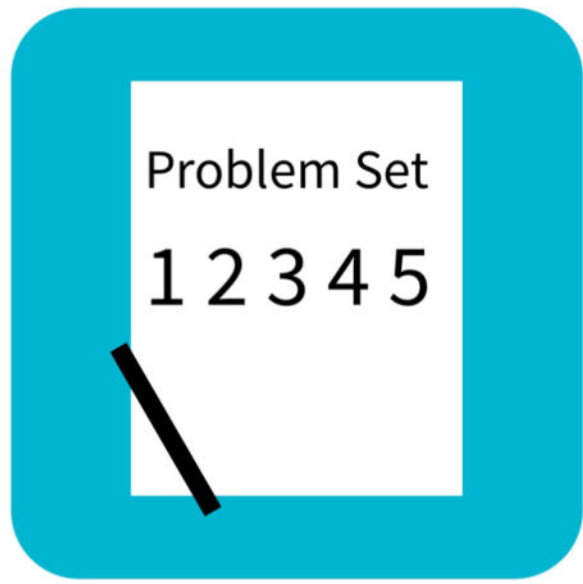
How can we express the length of the unknown side using the distributive property?



$$\begin{aligned} & (80 \div 4) + (16 \div 4) \\ &= 20 + 4 \\ &= 24 \end{aligned}$$

$$\begin{array}{r} 24 \\ 4 \overline{) 96} \\ \underline{-8} \\ 16 \\ \underline{-16} \\ 0 \end{array}$$



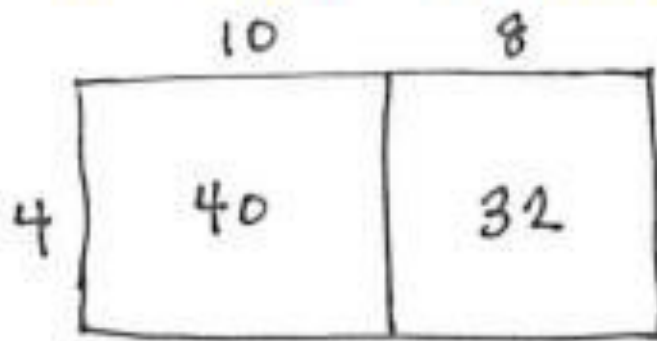


Problem Set

Name _____

Date _____

1. Alfonso solved a division problem by drawing an area model.
 - a. Look at the area model. What division problem did Alfonso solve?



Debrief

In Problem 2, did you partition the rectangle the same way as your partner? Why were we able to go from whole to part?

Explain the connection between the written method, the number bond, and the area model in Problem 3.

In the last problem, explain the connection between the algorithm and the area model.

Debrief

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

Even though division is messy, I think it is the most interesting operation of all because—imagine this—sometimes that little piece that is left to divide is always there, even though it gets infinitely small! Talk to your partner about what you think I might mean by that.

Exit Ticket

Name _____

Date _____

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

