MATH@WORK ™
CONNECTING MATH TO 21ST CENTURY CAREERS

From the Webisode:
Math Meets Fashion

featuring **Tim Gunn** *and* **Diane von Fürstenberg**

LESSON 2

Ready to Budget

In this lesson, students solve a multi-step problem by converting inches to yards and multiplying fractions by whole numbers.

CCSS CONNECTIONS	LANGUAGE SUPPORT	

CCSS CONNECTIONS

- Solve problems involving multiplication of fractions and mixed numbers. **5.NF.B.6**
- Convert between different standard measurement units. **5.MD.A.1**
- Understand and describe a unit rate $\frac{a}{b}$ associated with a ratio. **6.RP.A.2**
- Use ratio reasoning to convert measurement units. **6.RP.A.3d**

LANGUAGE SUPPORT

MATH TERMS

convert
change from one unit of measurement to another

unit price
price per unit

ACADEMIC LANGUAGE

bolt
unit of measurement for fabrics stored in a roll

budget
amount of money planned for spending

SET UP

### Introduce Chapter 3 from *Math Meets Fashion.*

Ask questions to review Lesson 1 and connect to Lesson 2.

For example: ***How did we use math in the last lesson to create a pattern?*** (We created a pattern by multiplying by 6, by using a ratio, or with a scale factor.)

Ask students to list the steps it might take to go from a sewing pattern to a completed outfit. Explain that the next step after creating a pattern is to buy materials.

Today, we'll use math to see if Robin has enough money in her budget to buy the fabric that she has chosen.

▶ **Play Chapter 3: Ready to Budget.**

— 48 in. — |12 in.|
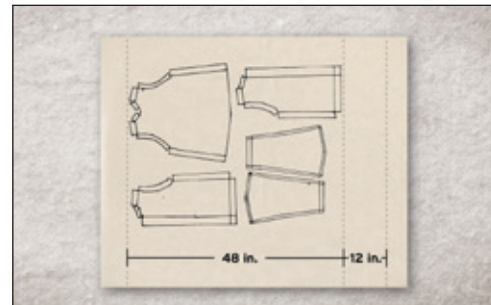
[Pause at 01:57.]

PLAN

Create a plan to solve the problem.

Robin needs to buy 60 inches of fabric for her workout outfit. The price of the fabric is $16 per yard, and it is sold by the $\frac{1}{4}$ yard. Robin's budget is $30. Does she have enough money to buy the fabric?

Read the problem aloud to students.

Ask students to analyze the different quantities in the problem. Then have students break the problem into parts.

For example: ***What information does Robin need to solve the problem?*** (how much fabric she needs to buy; the total cost of the fabric)

What is the unit price of the fabric? ($16 per yard) ***So, which units do we need the fabric to be in to find the total cost?*** (yards)

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LESSON 2

Ready to Budget, *continued*

STANDARDS FOR MATHEMATICAL PRACTICE	Reason Abstractly Students make sense of converted quantities and recontextualize throughout solving the problem.	Construct Viable Arguments Students construct arguments to support their reasoning and summarize the reasoning of others.

SOLVE

Have student pairs solve the problem as you circulate.

Encourage students to come up with multiple strategies, and represent the problem situation in different ways. Guide students to work backwards to check their work.

SUPPORT

Ask questions based on common errors to support student understanding.

- *How do you convert from a larger unit to a smaller unit?*

- *How can you simplify the problem by converting between inches, feet and yards?*

- *Can Robin buy $1\frac{2}{3}$ yards of fabric? Why not?*

- *Will the fabric cost more than $30?*

EXTEND

Ask questions to encourage students to extend their thinking.

- *Will the amount of yards be greater than or less than the amount of inches?*

- *How could you draw a model of the problem?*

- *What if Robin needed 63 inches of fabric? Would that be within her budget?*

SHARE

Have students present their solutions.

Ask students from each pair to explain their solutions to the class. Show at least two different approaches to solving the problem, and one incorrect solution. To extend classroom discussion, call on students to explain the reasoning of the student who is presenting.

Possible student work:

1 yd = 36 in.

$1\frac{2}{3}$ yd

12 in.
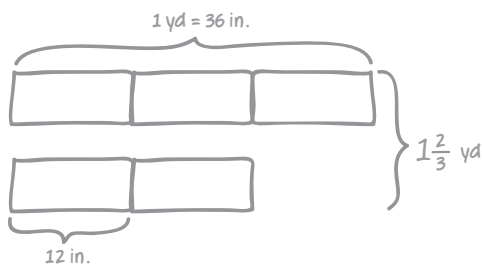
$$\frac{1 \text{ yd}}{36 \text{ in.}} \times 60 \text{ in.} = \frac{60}{36} \text{ yd}$$

$$= \frac{5}{3} \text{ yd}$$

$$= 1\frac{2}{3} \text{ yd}$$

$1\frac{2}{3}$ yd is close to $1\frac{3}{4}$ yd.

$$\$16 \times 1\frac{3}{4} = \$28$$

$$\$28 < \$30$$

▶ **Play the Chapter 3 Solution from *Math Meets Fashion*.**
Have students complete the Practice and Reflect sections on Student Page 2.

HOMEWORK IDEAS

Have students design their own piece!

Students choose an item of clothing and plan a budget for their design.

- *How much is your budget?*

- *How much fabric do you need to buy?*

- *Can you buy enough fabric and fit your budget?*

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Your Name _____

LESSON 2

Ready to Budget

MATH TERMS

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change from one unit of measurement to another

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price per unit

Robin needs to buy 60 inches of fabric for her workout outfit.
The price of the fabric is $16 per yard, and it is sold by the $\frac{1}{4}$ yard.
Robin's budget is $30. Does she have enough money to buy the fabric?

PLAN Create a plan to solve the problem with your partner.

SOLVE Use your plan to solve the problem.

LESSON
2

Ready to Budget, *continued*

PRACTICE Apply your skills to solve another problem.

Robin needs to buy 30 inches of fabric for a jacket.
The price of the fabric is $16 per yard, and it is sold by the $\frac{1}{4}$ yard.
How much will Robin spend on the fabric for her jacket?

REFLECT Explain how you made sense of the math.

How did you convert from inches to yards?

I converted from inches to yards by _____

_____

_____

_____

How did you use unit rate to solve the problem?

I used unit rate to solve the problem by _____

_____

_____

_____

SCORE ⓪ ① ② ③

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Your Name _____

LESSON 2

Ready to Budget

POSSIBLE STUDENT WORK

MATH TERMS

convert
change from one unit of measurement to another

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Robin needs to buy 60 inches of fabric for her workout outfit.
The price of the fabric is $16 per yard, and it is sold by the $\frac{1}{4}$ yard.
Robin's budget is $30. Does she have enough money to buy the fabric?

PLAN

Create a plan to solve the problem with your partner.

The unit price of the fabric is $16 per yard.
First, I find the cost per $\frac{1}{4}$ yard.
Then, I convert 60 inches to feet, and then to yards.
Then, I find the total cost and compare it to Robin's budget.

SOLVE

Use your plan to solve the problem.

1 yd ➡ $16

$\frac{1 \text{ yd}}{4} = \frac{\$16}{4}$

   = $4

So, the cost per $\frac{1}{4}$ yd is $4.

1 ft = 12 in.
60 ÷ 12 = 5
   60 in. = 5 ft

1 yd = 3 ft

5 ÷ 3 $= \frac{5}{3}$

     $= 1\frac{2}{3}$

5 ft $= 1\frac{2}{3}$ yd

$1\frac{2}{3}$ yd is close to $1\frac{3}{4}$ yd.

Cost for $1\frac{3}{4}$ yd ➡ $16 + 3($4) = $16 + $12

                     = $28

$28 < $30

So, Robin has enough money in her budget to buy the fabric.

LESSON 2

Ready to Budget, *continued*

POSSIBLE STUDENT WORK

PRACTICE Apply your skills to solve another problem.

Robin needs to buy 30 inches of fabric for a jacket.
The price of the fabric is $16 per yard, and it is sold by the $\frac{1}{4}$ yard.
How much will Robin spend on the fabric for her jacket?

First, I need to convert 30 inches to yards.

Cost	Yards	Feet	Inches
$16	1	3	36
$32	2	6	72

I can use the table of conversions to measure yards, feet, and inches.

Since 1 yd = 36 in., $\frac{30 \text{ in.}}{36 \text{ in.}} = \frac{5}{6}$ yd.

$\frac{5}{6}$ yd is close to 1 yd.

So, Robin will spend $16 on the fabric for her jacket.

REFLECT Explain how you made sense of the math.

How did you convert from inches to yards?

I converted from inches to yards by _____
representing 30 inches as a fraction
of a yard.

How did you use unit rate to solve the problem?

I used unit rate to solve the problem by _____
finding the price per 1 or $\frac{1}{4}$ yard, and
using that to find the total cost.

SCORE ⓪ ① ② ③