From the Webisode:
Math Meets Fashion

HMH

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

LESSON 1

Epic Scale

In this lesson, students solve a multi-step problem using ratio to scale measurements from a drawing to a life-sized sewing pattern.

CCSS CONNECTIONS

- Solve problems involving multiplication of fractions and mixed numbers. **5.NF.B.6**
- Understand ratios and describe ratio relationships between two quantities. **6.RP.A.1**
- Solve problems involving scale drawings of geometric figures. **7.G.A.1**

LANGUAGE SUPPORT

MATH TERMS

ratio
relationship between two numbers

scale factor
ratio of the corresponding lengths in similar figures

ACADEMIC LANGUAGE

sewing pattern
outline that is traced on fabric to create a garment

torso
main part of the human body between the head and legs

SET UP

Introduce Chapter 2 from *Math Meets Fashion*.

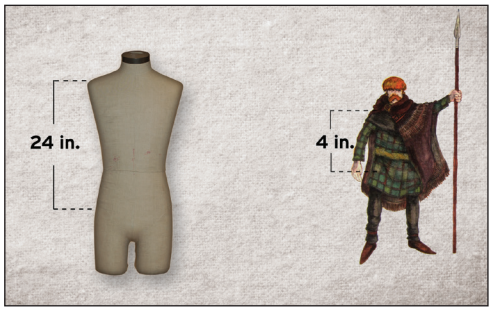
Ask questions to review the video with students.

For example: ***What types of careers do you think there are in fashion?*** (fashion designer, costume designer, model, buyer) ***How does math relate to fashion?*** (Fashion designers use ratios and percentages to create patterns, budget, and make decisions about pricing.)

Review the definition of *sewing pattern*.

Today, we'll use a ratio to find the measurements of the life-sized pattern a costume designer will create based on his drawing of a cape.

Play Chapter 2: Epic Scale.

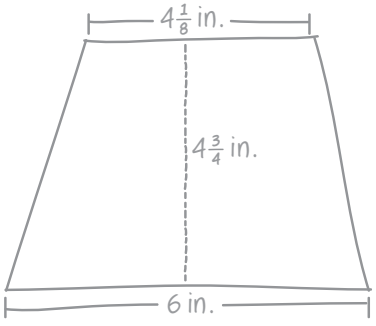


[Pause at 02:09.]

PLAN

Create a plan to solve the problem.

Drew is creating a pattern based on his drawing. The length of the torso in his drawing is 4 inches. The length of his mannequin's torso is 24 inches. Find the measurements for Drew's pattern so that it will fit his mannequin.



Read the problem aloud to students.

Guide students to analyze the quantities and look for entry points to solve the problem.

For example: ***What is the problem asking us to find?*** (the actual measurements for Drew's sewing pattern) ***What information do we have?*** (the lengths of the torso)

How can we find the measurements and label the pattern? (Find the ratio of the length of the torso in the drawing to the length of the mannequin's torso.)

Point out to students that the ratio of torso lengths can be applied to find all of the measurements for Drew's sewing pattern.

LESSON 1

Epic Scale, *continued*

STANDARDS FOR MATHEMATICAL PRACTICE	**Persevere and Solve Problems** Students apply logical thinking to the information in the problem and plan a solution pathway.	**Attend to Precision** Students carefully specify units of measure while labeling a scale model.

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 many times larger is the mannequin than the drawing? How do you know?***
- ***How does the torso ratio help you to generalize a solution strategy?***
- ***How do you know where to label each measurement on the pattern?***

EXTEND

Ask questions to encourage students to extend their thinking.

- ***What would happen if the scale factor was 5? Would the cape be larger or smaller?***
- ***Do you have enough information to find the lengths of the other two sides of the pattern?***
- ***Can you find the area of the pattern?***

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:

$\frac{4}{24} = \frac{1}{6} = 1:6$

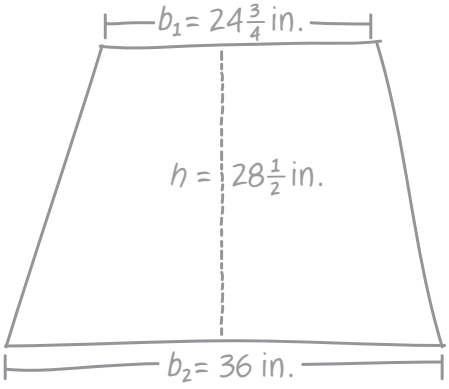
$b_1 \rightarrow 4\frac{1}{8}\text{ in.} \times 6 = 24\text{ in.} + \frac{6}{8}\text{ in.}$

$= 24\frac{3}{4}\text{ in.}$

$h \rightarrow 4\frac{3}{4}\text{ in.} \times 6 = 24\text{ in.} + \left(\frac{3}{4} \times 6\right)\text{ in.}$

$= 28\frac{1}{2}\text{ in.}$

$b_2 \rightarrow 6\text{ in.} \times 6 = 36\text{ in.}$



Play the Chapter 2 Solution from *Math Meets Fashion*.

Have students complete the Practice and Reflect sections on Student Page 2.

HOMEWORK IDEAS

Have students create their own pattern!

Students create a pattern to fit themselves or a friend.

- *What is the scale factor?*
- *Find all the measurements.*
- *Can you create a pattern that works for more than one size?*

Your Name _____

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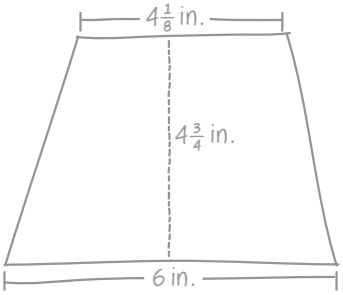

PLAN

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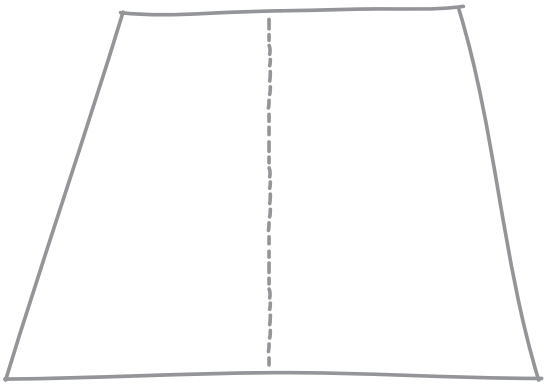
SOLVE

Use your plan to solve the problem.



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LESSON 1

Epic Scale, *continued*

PRACTICE **Apply your skills to solve another problem.**

Drew creates a new pattern based on his original drawing. The dimensions of the new pattern are $16\frac{1}{2}$ inches, 19 inches, and 24 inches. What is the measurement ratio of the new pattern to Drew's original drawing?

REFLECT **Explain how you made sense of the math.**

How did you find the corresponding sides?

I found the corresponding sides by _____

_____

_____

_____

How are ratios and scale factors similar?

Ratios and scale factors are similar because _____

_____

_____

_____

SCORE 0 1 2 3

Your Name _____

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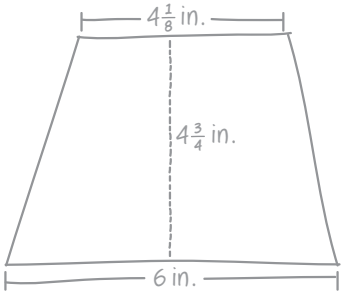

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LESSON 1

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