MATH AT WORK

CONNECTING MATH TO 21ST CENTURY CAREERS

From the Webisode: **Math Meets Entrepreneurship**
featuring the cast of ***Shark Tank***

Lesson 4

What's It Worth?

In this lesson, students will find the valuation of a company and use it to compare investment options.

TEACHER

GRADES 6-8 INSTRUCTIONAL FOCUS

- Find a percent of a quantity as a rate per 100, and solve problems using it.
- Use proportional relationships to solve multistep ratio and percent problems.
- Convert a rational number to a decimal using long division.
- Solve multi-step problems with positive and negative rational numbers.

LANGUAGE SUPPORT

Math Terms

unknown
an amount that is not given.

Academic Language

valuation
the amount of money a business is worth.

SET UP

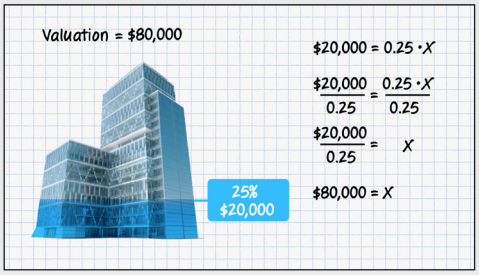
Introduce Chapter 5 from *Math Meets Entrepreneurship.*

Discuss the academic vocabulary word *valuation* to introduce Lesson 4.

For example: ***What factors do you think are important when choosing an offer from an investor?*** (how much they offer, if I want to work with them, how they view my business)

Explain to students that this chapter uses percentages to show the relationship between a company's total value and the amount being offered.
Today, we'll compare two different offers based on the valuation they give the company and the percentage that we get to keep.

Play Chapter 5: What's It Worth?



[Pause at 16:54]

PLAN

Create a plan to solve the problem.

Timothy and Mauro receive two offers for their company.

- Offer A: $20,000 in exchange for 25% of the company
- Offer B: $15,000 in exchange for 15% of the company

How much does each offer value the company for? Which offer you would choose and why?

Read the problem aloud to students.

Ask students to analyze the quantities. Then, guide students in a discussion about how they will solve the problem.

For example: ***How can you find the valuation of each offer?*** (figure out the whole amounts) ***What other amounts should we consider to compare the offers?*** (the percentage of the company they are asking for)

Point out that students might make different decisions based on their comparisons. Ask students what situation would be most favorable to them before they solve the problem.

**Note to teachers: This lesson uses a simplified way of calculating valuation. If an entrepreneur accepts an investment offer, the new cash changes the valuation from a* pre-money valuation *to a* post-money valuation.

Lesson 4 What's It Worth? (continued)

Mathematical Thinking: Construct Viable Arguments

Students are able to analyze situations by breaking them into cases and comparing the effectiveness of different plausible arguments.

SOLVE

Have student groups solve the problem as you circulate.

Divide the class into 3 groups. Assign two of them Shark names, such as Mark and Lori, and the last group Entrepreneurs. Have the Mark and Lori groups explain why their offers are best. Have the Entrepreneurs decide on an offer and explain their reasoning.

Support

Ask questions based about benchmark numbers to support students in creating their models.

- ***$20,000 is 25% of what value?***
- ***What does the keyword "of" tell you about which operation you should use?***
- ***If you sell 25% percent of your company, what percent do you keep?***

Extend

Ask questions to encourage students to expand their thinking.

- ***Is an offer of $50,000 for 50% of the company the same as Offers A or B? Why or why not, and which offer would you prefer?***
- ***What about $75,000 for 75% of the company?***
- ***What about $100,000 for 100% of the company?***

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:

Offer A:
$20,000 = 25% of x
$20,000 = 0.25x$
$20,000/0.25 = 0.25x / 0.25$
$20,000/0.25 = x$
$80,000 = x$

They keep 75% of their company.

75% of $80,000
80,000 × 0.75 = $60,000

Offer B:
$15,000 = 15% of y
$15,000 = 0.15y$
$15,000/0.15 = y$
$100,000 = y$

They keep 85% of their company.

85% of $100,000
100,000 × 0.85 = $85,000

I would pick Offer B because it values the company at more money and would let me hold on to more of the company.

Play the Chapter 5 Solution from *Math Meets Entrepreneurship.*

PRACTICE

Have students complete the Practice and Reflect sections on Student page 2 in class or as a homework assignment.

Students pitch an idea to the sharks and get three offers. They must choose one and defend their choice.

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Name: _____

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PLAN

Create a plan to solve the problem with your group.

1. Divide the offer by the decimal value of the percent to find the total valuation.
2. Identify the amount of money received, the percentage of their company they would have to give up, and the percentage of their company they would get to keep.
3. Compare the values and percentages to make a final decision.

SOLVE

Use your plan to solve the problem.

POSSIBLE STUDENT WORK:

	Receive	Give Up	Valuation
Offer A	$20,000	25%	$80,000
Offer B	$15,000	15%	$100,000

Offer A:
$20,000 = 0.25$x$
$20,000/0.25 = x$
$80,000 = x$

Offer B:
$15,000/0.15 = y$
$100,000 = y$

I would choose Offer B. Even though it is less money, it has a higher valuation and I would give up less of the company.

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SOLVE

Use your plan to solve the problem.

Name: _____

Lesson 4

What's It Worth? (continued)

STUDENT

PLAN

Apply your skills to solve another problem.

You have started your own company that you have an opportunity to pitch on *Shark Tank*.

Company Name: Boarding School

Describe your product.
Teach kids how to make their own skateboards.

You have three offers from the Sharks.

- Lori's offer: $15,000 for 20% of your company
- Mark's offer: $10,000 for 10% of your company
- Barbara's offer: $50,000 for 50% of your company

Which do you choose and why?

Mark and Barbara's offers both have a higher valuation than Lori's. Mark's offer leaves me with 90% of the company though, and Barbara's offer leaves me with only 50%, so I would take Mark's offer.

Lori

$\frac{\$15,000}{0.2} = \$75,000$

Mark

$\frac{\$10,000}{0.1} = \$100,000$

Barbara

$\frac{\$50,000}{0.5} = \$100,000$

REFLECT

Explain how you made sense of the math.

A) What would have been your initial request to the Sharks?

My initial request would have been $20,000 for 15%, because it would value the company at more than $100,000 and give me more money to start out with.

B) How did you compare offers that had the same valuation?

I compared the offers with the same valuation by comparing the percentage of the company I would get to keep.

Name: _____

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What's It Worth? (continued)

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