

**Leadership**

**6-8**

**2**



**Handout**

**Imagine Learning IMK12 for  
School & District Leaders**

## 2.1 Review vs Warm-up Roleplay

**Directions:** Role-play each scenario with a partner. One partner takes on the role of the teacher, and the other partner acts as the student.

### Scene 1

#### Gradual Release

##### Warm-up: Review Percentages

Solve each problem. Show your work.

1. Bottle A contains 4 ounces of water, which is 25% of the amount of water in Bottle B. How much water is there in Bottle B?

**Teacher:** Ok. Let's start with a warm-up! Go ahead and work on these problems while I take attendance. (waits for 1 minute)

I notice that some are struggling to get started, so I am going to help you with the first one. (Teacher moves to the board and prepares to write.) We are being asked to find the amount of water in Bottle B. To do that, I can write an equation! I know that 25% is the same as 0.25. I also know that "of" means multiply! So we can write the equation  $0.25B = 4$ . My last step is to get B by itself by dividing by 0.25 on both sides. This gives me an answer of 16 ounces of water in Bottle B! Does this make sense? (Students nod in agreement.)

**Student 1:** Oh yeah! I remember doing this before.

**Teacher:** Good! Remember that we can change the percent to a decimal by moving the decimal place over two places to the right. That will help us solve the equation!

**Student 2:** So we need to remember "of" means multiply, and for the percent, move it over two. Is that right?

**Teacher:** That's right! Now you're going to try doing one on your own!

#### Problem-based

Solve each problem mentally.

- 1) Bottle A contains 4 ounces of water, which is 25% of the amount of water in Bottle B. How much water is there in Bottle B?

**Teacher:** Please take 30 seconds of quiet thinking time to find the value of this expression. Give me a thumbs-up when you have an answer and a strategy.

**Teacher:** Okay, time's up. Did anyone get an answer?

**Students:** 16

**Teacher:** Did anyone get a different value? (waits a moment) Can someone share your strategy?

**Student 1:** I knew that 25% was equivalent to one-fourth, so I had four boxes in my head (teacher annotates on the board). I knew that one of the boxes had to be 4, so I put a 4 in the other three boxes. I added  $4 + 4 + 4 + 4$  and got 16. So 16 ounces.

**Teacher:** Thank you for sharing that! I love the visual structure that you used in your head! Does anyone else want to share a strategy?

**Student 2:** I'm not sure if I got it right, but I knew that 25% was one-fourth, and I took one-fourth of 4, which is 1. So my answer was 1 ounce.

**Student 3:** I think Student 2 took 25% of 4, instead of determining what whole that 4 is 25% of. I noticed that 25% of Bottle B would give me Bottle A, so I was envisioning a bottle sliced into 4 equal parts. Since the first fourth filled up 4 ounces, I did 4 times 4 to get 16 ounces for all of Bottle B. I agree with Student 1.

## Scene 2

## Gradual Release

**Warm-up: Review Percentages**

Solve each problem. Show your work.

2. Bottle C contains 150% of the water in Bottle B. How much water is there in Bottle C?

**Teacher:** Let's look at another one! Take one minute to write an equation and then solve it. (waits one minute) Okay, who can help us with this one?

**Student 1:** I think I can! I got  $0.150B = C$ .

**Student 2:** I didn't multiply by 0.150, I multiplied by 1.5 instead. If you move it over 2, the decimal is between the 1 and the 5.

**Student 1:** I had that at first, but the last one we did had 0 in front of the decimal (0.25), so I thought I was wrong. Which way is correct?

**Teacher:** Good question! If we move the decimal over two spaces to the right, we get 1.50. This is the same as taking the percent and dividing by 100.

**Student 1:** Okay I think I can take it from there. So  $1.50B = C$ . We know from the first problem that B was 16 ounces, so we get 1.50 times 16, which gives us 24 ounces of water in Bottle C.

**Teacher:** Great work! I loved how we helped each other out to work through our mistakes.

## Problem-based

Solve each problem mentally.

- 1) Bottle A contains 4 ounces of water, which is 25% of the amount of water in Bottle B. How much water is there in Bottle B?
- 2) Bottle C contains 150% of the water in Bottle B. How much water is there in Bottle C?

**Teacher:** Let's look at another one. When you have the value and a strategy, put your thumb up. (Thumbs go up at different times during a one minute quiet thinking time.)

**Teacher:** Student 4?

**Student 4:** I got 24 ounces.

**Teacher:** Did anyone get a different number? (waits) Student 4, tell us about your strategy.

**Student 4:** I did the same thing that Student 1 did for the last problem. I visualized the 16 ounces with 4 in each of the 4 boxes. I knew that 150% was the whole Bottle B, plus another half of it! Half of Bottle B is 8 ounces, so  $16 + 8$  is 24 ounces.

**Student 2:** Me too!

**Teacher:** That makes sense. Who thought about it in a different way?

**Student 5:** I just multiplied our answer from Bottle B (16 ounces) by 1.5.

**Teacher:** Where did you get 1.5?

**Student 5:** I knew that 150% is equal to 1.5. We know that percent means out of 100, so 150 out of 100 is 1.5. And 1.5 multiplied by 16 is 24 ounces.

**Teacher:** Ahh. So how are the methods we have heard so far similar?

**Student 6:** They are similar because they both take 150% of what is in Bottle B. They just did it in different ways.

## Scene 3

## Gradual Release

**Warm-up: Review Percentages**

Solve each problem. Show your work.

3. Bottle D contains 12 ounces of water. What percentage of the amount of water in Bottle B is this?

**Teacher:** Okay, last one. For this one, I am going to walk around and check on your progress as you work.

**Teacher:** (after 2 minutes) Okay, it looks like most of you are finished working. The answer to this one is 75%. Raise your hand if you got 75% (some hands go up). Can someone walk us through the steps?

**Student 3:** I can! (student walks to the board and talks as he writes) We know from before that Bottle B has 16 ounces of water. So, Bottle D divided by Bottle B is  $\frac{12}{16}$ . This simplifies to  $\frac{3}{4}$  or 75%.

**Teacher:** Great work. Are there any questions before we move on? (Many students shake their heads no.)

**Teacher:** Great. Let's move on! We will use these strategies later in today's lesson.

## Problem-based

Solve each problem mentally.

- 1) Bottle A contains 4 ounces of water, which is 25% of the amount of water in Bottle B. How much water is there in Bottle B?
- 2) Bottle C contains 150% of the water in Bottle B. How much water is there in Bottle C?
- 3) Bottle D contains 12 ounces of water. What percentage of the amount of water in Bottle B is this?

**Teacher:** Last one! Put your thumb up when you have a value and a strategy. (Thumbs go up at different times during one minute of quiet thinking time.)

**Teacher:** Ok. What's the percentage?

**Many Students:** 75

**Teacher:** Ok. Let's talk strategies! Student 7, how did you figure this out?

**Student 7:** I knew that 12 is some percentage of Bottle B, which is 16 ounces. So I set up an equation  $12 = 16B$ . If I take 16 and divide it on both sides, I get  $B = \frac{12}{16} = 0.75$ .

**Teacher:** Thank you Student 7! We are going to move on, because we are almost out of time! I want to briefly make sense of all of the strategies that you have shared. We have seen a few different techniques to calculate percent of a number. We can convert a percentage to a decimal or leave it as a percentage and multiply. We can use division to take two quantities and find the percentage. Or we can use a mental representation like Student 1 first discussed to help us make sense of percents. This was great! We will use these ideas as we move into the activity.

**Discuss:** How did it feel as the teacher? How did it feel as the student(s)?



## 2.2 Warm-up Teaching Notes

**Directions:** Independently read through the warm-up cards and teaching notes, noting anything that would be useful for teachers beginning implementation.

**Learning Goal:** Let's use equations to find percentages.

**Pacing:** 5 minutes for warm-up activity

### About the warm-up

- Warm-ups help students get ready for the day's lesson, or give students an opportunity to strengthen their number sense or procedural fluency.

### Activity narrative

- The purpose of this warm-up is to rekindle anything students remember about percentages and representations they use to reason about them.

### Standards:

Building on: 6.RP.A.3.c

Solve each problem mentally.

1)

Bottle A contains 4 ounces of water, which is 25% of the amount of water in Bottle B. How much water is there in Bottle B?

### Teaching notes

**Instructional routine:** Number Talk

#### Launch

- Display one problem at a time.
- Give students 30 seconds of quiet think time for each problem and ask them to give a signal when they have an answer and a strategy.
- Keep all problems displayed throughout the talk.
- Follow with a whole-class discussion.
- The activity synthesis happens throughout the activity as students share their responses and strategies. See the Activity Synthesis heading below.

#### Activity Synthesis

- Invite students to share different representations and ways of reasoning.
- Record student strategies and nonchalantly write an equation for each in the process.

**Student Response**

1. 16 ounces

**Support for English Language Learners**

- Speaking: MLR8 Discussion Supports. Display sentence frames to support students when they explain their strategy. For example, “First, I \_\_\_\_\_ because ...” or “I noticed \_\_\_\_\_ so I ...”. Some students may benefit from the opportunity to rehearse what they will say with a partner before they share with the whole class.  
*Design Principle(s): Optimize output (for explanation)*

**Support for students with disabilities**

- *Representation: Internalize Comprehension.* To support working memory, provide students with sticky notes or mini whiteboards.
- *Supports accessibility for: Memory; Organization*

Solve each problem mentally.

- 1) Bottle A contains 4 ounces of water, which is 25% of the amount of water in Bottle B. How much water is there in Bottle B?
- 2) Bottle C contains 150% of the water in Bottle B. How much water is there in Bottle C?

**Student response**

1. 16 ounces
2. 24 ounces

Solve each problem mentally.

- 1) Bottle A contains 4 ounces of water, which is 25% of the amount of water in Bottle B. How much water is there in Bottle B?
- 2) Bottle C contains 150% of the water in Bottle B. How much water is there in Bottle C?
- 3) Bottle D contains 12 ounces of water. What percentage of the amount of water in Bottle B is this?

**Student response**

1. 16 ounces
2. 24 ounces
3. 75%

## 2.3 Warm-up and Teaching Notes Discussion

**Directions:** Review the warm-up and teaching notes. With your team, discuss:

How do the teaching notes connect to the instructional rhythm and to the teachers in the roleplay?

What are student responsibilities during the warm-up?

How do the resources support shifts in instructional practice?