



**THIRD SPACE
LEARNING**

Math Intervention Pack

Solving two-step word
problems using all 4
operations

Grade 3

How To Use This Resource

1. Title Slide

Use this slide to activate prior knowledge needed for lesson. Students should be encouraged to initially attempt the question presented independently.

2. Let's Learn

Use this slide to introduce the concept. Tutors should work with the student to explore the concept together, usually using diagrams to support understanding.

3. Follow Me + Your Turn

The tutor should work through the follow me slide, modeling the process and explaining their thinking out loud.

Students should use the your turn slide as an opportunity to work through a question similar to the follow me questions. They should apply the method modeled by the tutor in the follow me slide. Students should be encouraged to explain their thinking out loud.

4. You Do

Students should work through a range of questions that build in complexity.

Tutors can offer support but students should initially be encouraged to attempt these questions independently.

5. Go Further

Use this slide to allow students to apply their understanding to a more challenging question in an unfamiliar context.

6. Support for Slides

The support slide is used to support students during the lesson. In the tutor notes, there will be guidance as to when to use the support slide.

7. Check Your Understanding

Tutors should use this slide to assess the student's knowledge and whether or not they have mastered the concept within the lesson.

Standard

3.OA.8: Solve two-step word problems using the four operations. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding

Key Mathematical Ideas

1. Understand how to solve 2-step problems using all 4 operations, addition, subtraction, multiplication and division
2. Represent these problems using equations with a letter standing for the unknown quantity.

Overview

Terminology

- **Word problem:** A math problem written in words, typically in a scenario that the students have to solve for a specific solution(s).
- **Bar model:** A visual model to represent equations that are useful in solving for an unknown quantity.
- **Equation:** A mathematical sentence in which one part is the same or equal to the other part.

Sentence Stems

- + =
- - =
- X =
- ÷ =

Overview

Common Misconceptions

Common Misconceptions	Tutoring Strategies	Checks for Understanding
Students stop solving after completing the first step in a two-step problem.	Have students plan out both steps needed before solving any parts. This can be done with a bar model/strip diagram or equation.	<ul style="list-style-type: none">• How many steps are needed to solve this problem?• Can we draw a diagram// write an equation for the first step?• Can we draw a diagram// write an
Students defaulting to addition or multiplication, and randomly plugging numbers into the equation to find an answer.	<p>This is one of the most common habits of students working with word problems. Typically a student will read the problem and cannot determine what operation needs to be performed in order to solve correctly.</p> <p>Addition and multiplication are considered “easy,” and most students will plug numbers into these equations to solve.</p>	<ul style="list-style-type: none">• What information are we given about this problem?• Are there any keywords that are used that can help us determine the operation?• Can we draw a picture or bar model to help us understand and visualize the problem better?

Title Slide

If stuck

- Use of bar models or other visuals can assist students in making a plan for solving the problem.
- Ask students how many steps are needed to solve this problem.
- Students will first need to calculate how many cards Ruby had ($35 + 27 = 62$ cards)
- Then you will subtract to represent the number of cards given away ($62 - 15 = 47$)
- Ruby has 47 football cards.

Answers

- Ruby has 47 cards.

35 cards		27 cards	
15 cards	no. cards Ruby has		

Let's Learn

If stuck

- The bar model should be a visual representation to assist students in understanding how to solve problems.
- Important to remind students that it's a two-step question, so they will be required to do two-steps to find the final answer.

Questions

- How many flat rocks does Cameron have? How many shiny rocks?
- How can we find the total number of rocks Cameron has?
- How many boxes will Cameron split the rocks into?
- How can we find the number of rocks that will be put into each box?

Watch out for

- Students stop solving after completing the first step in a two-step problem.
- Students defaulting to addition or multiplication, and randomly plugging numbers into the equation to find an answer.

Answers

1. $25 \div 11 = 36$ rocks

2. $36 \div 3 = 12$

$r = 12$

25 flat rocks	11 shiny rocks	
$r = \text{rocks per box}$	12	12

12

Follow Me

Modeling prompts

- The question is wanting us to determine the amount of money Traci has left over, after she purchased two t-shirts.
- First, we need to know how much money she earned. The problem tells us she earned \$65.
- Now we need to find how much each shirt was. The problem also tells us this information, and each t-shirt was \$17.
- We will need to find how much she spent on the two shirts combined, so I will add
- $17 + 17 = 34$.
- I can't stop there because the question is wanting me to find the amount she had LEFT after she bought the shirts.
- I will need to subtract $65 - 34$ to find the amount of money she has left.
- $65 - 34 = 31$
- Traci has \$31 left after purchasing the two t-shirts.

Answers

1. $17 + 17 = 34$
2. $65 - 34 = 31$
 $m = \$31$

Your Turn

If stuck

- Use of Support slide.
- The bar model should be a visual representation to assist students in understanding how to solve problems.
- Important to remind students that it's a two-step question, so they will be required to do two-steps to find the final answer.

Questions

- How much does each ticket cost?
- How many tickets will need to be bought?
- How can you determine the total cost of all 5 tickets?
- How much of a discount does the coupon give the family? What operation will you perform to take the discount off?
- How much did it cost for all 5 family members to get into the fair?

Watch out for

- Students stop solving after completing the first step in a two-step problem.
- Students defaulting to addition or multiplication, and randomly plugging numbers into the equation to find an answer.

Answers

a.

a					\$10
\$12	\$12	\$12	\$12	\$12	

b. $\$12 \times 5 = \60

c. $\$60 - \$10 = \$50$

You Do

If stuck

- The bar model should be a visual representation to assist students in understanding how to solve problems.
- Important to remind students that it's a 2-step question, so they will be required to do 2-steps to find the final answer.
- Remind students that half is the same as dividing a number by 2.

Question a)

- How many eggs did Lace start with?
- Can she still sell the broken eggs?
- How can you find the total number of eggs Lace has to split between the boxes?
- How many eggs can fit into each box?
- What operation will be performed to determine how many boxes she can fill with the 54 eggs remaining?

Question b)

- How many students will be at the picnic?
- How many students brought a dish to share?
- What operations will be used to determine how many students brought a dish to share?

Watch out for

- Students stop solving after completing the first step in a two-step problem.
- Students defaulting to addition or multiplication, and randomly plugging numbers into the equation to find an answer.
- Students not knowing the meaning of half

Answers

a1. Lacy has 54 eggs ($62 - 8 = 54$)

a2. She has 9 boxes to sell ($54 \div 6 = 9$)

b1. There are 24 students ($8 \times 3 = 24$)

b2. 12 students brought dishes to share ($24 \div 2 = 12$)

Go Further

If stuck

- The bar model should be a visual representation to assist students in understanding how to solve problems.
- Don't let students forget that there are 4 total people sharing the candy. Tyson + 3 friends = 4 friends.

Questions

- How many people will be sharing the candy? (4 people)
- How many total pieces of candy will Tyson need to share 6 pieces with each person? ($6 \times 4 = 24$)
- How many boxes of candy will be needed to have 24 pieces of candy?
- $24 \div 8 = 3$ boxes of candy

Watch out for

- Students stop solving after completing the first step in a two-step problem.
- Students defaulting to addition or multiplication, and randomly plugging numbers into the equation to find an answer.

Answers

- Tyson will need to buy 3 boxes of candy.
He needs 24 pieces of candy: $4 \times 6 = 24$
He needs 3 boxes of candy: $24 \div 8 = 3$

Support for Slide(s)

This slide supports the Your turn slide.

Questions

- How much does each ticket cost?
- How many tickets will need to be bought?
- How can you determine the total cost of all 5 tickets?
- How much of a discount does the coupon give the family? What operation will you perform to take the discount off?
- How much did it cost for all 5 family members to get into the fair?

Answers

- $12 \times 5 = 60$
- $60 - 10 = 50$
 $a = 50$

Check Your Understanding

Correct answers

- \$53
- Students should first determine the total amount of money that Aria would have made by raking 7 yards at \$10 a piece.
 $7 \times 10 = \$70$
- Now that they know the total amount of money she made, they will need to subtract the amount of money she had to spend on the rake and trash bags.
 $70 - 17 = \$53$.
- Aria made \$53 off raking 7 lawns.



Today you will learn about

Solving two-step word problems using all 4 operations

Warm up question

Ruby had 35 football cards.

She bought 27 more but 15 of them were the same so she
gave them away.

How many football cards does Ruby have now?



Let's learn

When solving **two-step problems**, we need to pick out the most important information and break it down.

Cameron is organizing his rock collection.

He has 25 flat rocks and 11 shiny rocks to split within 3 boxes.

If Cameron places the same amount of rocks in each box, how many rocks are in each one?

25 flat rocks	11 shiny rocks
$r = \text{rocks per box}$	

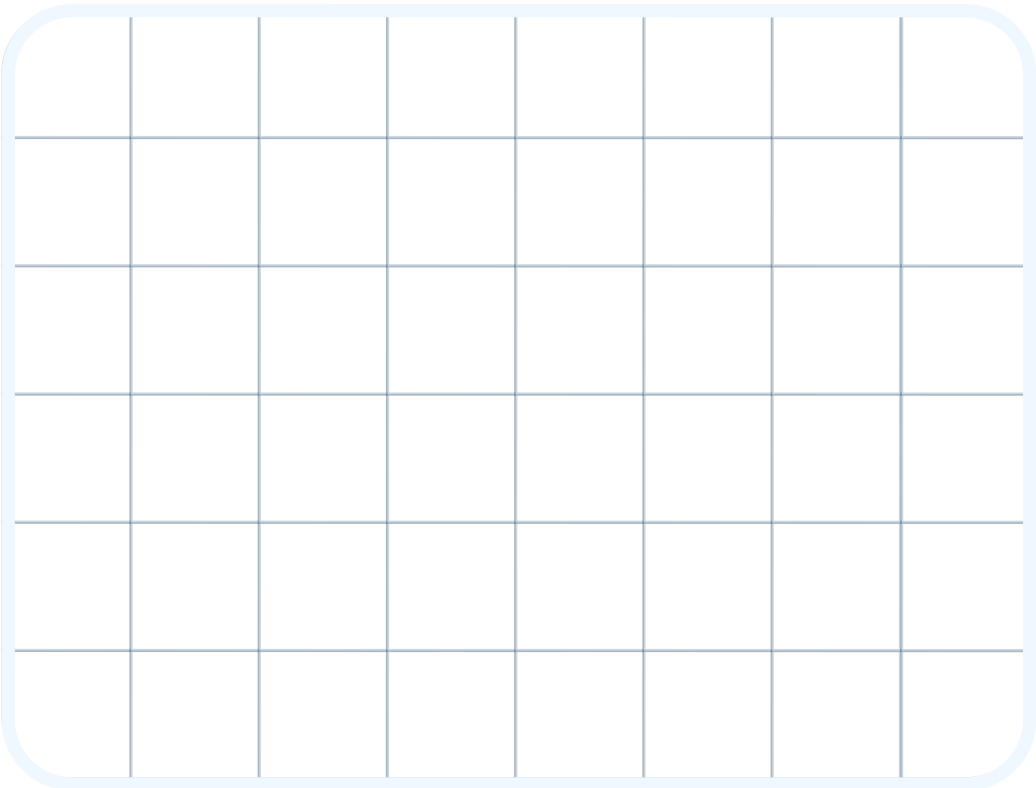
We can show the information in a **bar model**.

We can split this into two different steps to solve the problem.

- 1

Solve for how many flat and shiny rocks Cameron has.
 $25 + 11 =$
.....
- 2

Divide the total number of flat and shiny rocks into 3 boxes.
 $36 \div$ $=$ $r =$



Follow me

Let's look at this problem.

Traci earned \$65 dollars walking dogs over the summer.
She spent her money on 2 t-shirts that cost \$17 each.
How much money does Traci still have?

\$65		
\$17	\$17	<i>m</i>

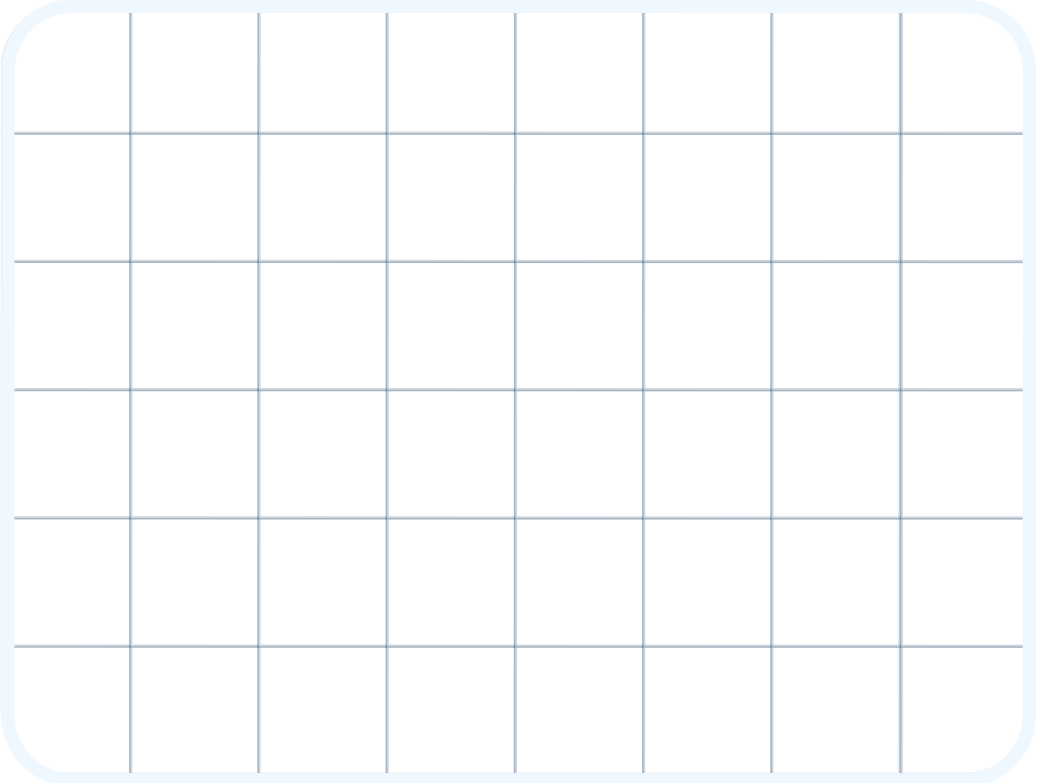
We can use the letter *m* to represent the money left over.

- 1
- Solve for how much money she spent on the 2 t-shirts.
- 2
- Subtract the amount of money spent on the t-shirts from the total money she earned.

17 + 17 =

65 - =

m =



Your turn

Now you try.

A family of 5 are going to the fair.
It costs \$12 dollars for each ticket.
They have a coupon for \$10 off.

How much does it cost for the family to get into the fair?

a

Complete the bar model with the information from the problem.



We can use the letter a to represent the cost of getting into the fair.

b

How much will 5 tickets cost?

..... x =

c

How much will the cost be with the coupon?

..... - =

Solve these problems. You can use a bar model to help you.

- a Lace has collected 62 eggs from her chickens.
8 eggs cracked as she was putting them into boxes.
She sells them in boxes of 6.
How many boxes of eggs does Lace have to sell?

- b Ms. Murillo is organizing a class picnic.
There are 8 blankets and 3 students can sit on each.
Half of the students brought a dish to share.
How many students brought a dish to share?

He will share the candy between himself and 3 friends.

If Tyson wants each person to get 6 pieces of candy, how many boxes of candy will he need to buy?

Tyson will need to buy boxes of candy.

Let's take a closer look at this problem.

A family of 5 are going to the fair.
It costs \$12 dollars for each ticket.
They have a coupon for \$10 off.

How much does it cost for the family to get into the fair?

You first need to find how much all the tickets will cost.

$12 \times 5 =$



One ticket costs \$12.
They bought 5 tickets

We know the family had a \$10 coupon.
We need to subtract the coupon from the total cost of the tickets.

..... $- 10 =$

$a =$

Check your understanding

Aria is saving money for a new cellphone.
She rakes leaves for \$10 a yard.
She spent \$17 on a rake and trash bags.
If she rakes 7 yards, how much money has she made?

Why do I need to try this question
on my own first?

- To show your tutor what you understand
- To give you more practice
- To show your teacher how you are doing



Do you have a group of students who need a boost in math?

Each student could receive personalized lessons every week from our specialist one-on-one math tutors.




- ✓ Differentiated instruction for each student
- ✓ Aligned to your state's standards
- ✓ Scaffolded learning to close gaps

“We just had our first session and it went great! The kids really liked it and felt like they were learning! One even said he finally felt like math was making sense.”



Michelle Craig, Instructional Coach,
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