



## Strip Diagrams & Equations in 1- & 2-Step Problems

**Purpose** This activity helps students connect problem contexts, strip diagrams, and equations. Students use the information from a word problem to fill in the missing parts of strip diagrams and equations. Then they solve the problem.

- |   |   |                                       |
|---|---|---------------------------------------|
| <input checked="" type="checkbox"/> Teacher-facilitated w/ Small Student Groups | <input checked="" type="checkbox"/> Tutoring/Intervention | <input type="checkbox"/> Journal      |
| <input checked="" type="checkbox"/> Small Group                                 | <input checked="" type="checkbox"/> Centers               | <input type="checkbox"/> Anchor chart |

### Setting Up For Instruction

- Make 1 copy of **Cruising Along** (PG. 33–35) for each student.
- Make 1 copy of **Cruising Along** Problem #1 so that it can be projected using your classroom technology.

### How-To Guide

1. Put students in pairs and hand out materials.
2. Project **Cruising Along** Problem #1. Work with students to read and understand the problem, fill in the strip diagram, and equation.
3. Have students work with their partners to complete the rest of the problems in the activity.

### Thought Extenders

- |  |  |
|--|--|
| • What operation may be used to solve this problem?  | • What are the parts?                          |
| • Which basic model for the strip diagram is needed? | • Where is the answer in the diagram?          |
| • What are the quantities in the problem?            | • How does the diagram relate to the equation? |
| • What is the total amount?                          | • What does the variable stand for?            |

### Sentence Frames for a Language–Rich Math Classroom (4.1G)

Sentence frames don't have to be complicated! Some sentence frames simply require students to supply missing words; others are more open-ended and serve as a jump start to talking about content more deeply. Instead of spending their brain power on trying to figure out just the right words, English Language Learners and their classmates are freed up to focus on the meaty content of what they are trying to communicate. You can start by considering the Thought Extenders. What kind of academic language is required to answer these? Give it a try, and listen to your English Language Learners succeed!

- I can write the number in expanded form by . . . .
- I found the partial products by . . . .
- When I add \_\_\_\_ and \_\_\_\_, I get the sum of the partial products. The sum is \_\_\_\_.
- The steps for finding the partial products are: 1. \_\_\_\_\_, 2. \_\_\_\_\_, 3. \_\_\_\_\_, etc.
- The standard algorithm is like partial products because both \_\_\_\_\_.
- Another way to solve this problem is . . .



# CRUISING ALONG ANSWER KEY (PG. 1 OF 3)

**Directions:** Fill in the strip diagram using labels and numbers, fill in the equation, and solve the problem. Be sure to label your answer.

- 1 The cruise ship *Golden Monkey* has 2,366 passengers. 1,372 of the passengers are monkeys and the rest are people. How many of the passengers are people?

Strip Diagram	Equation and Solution				
<table border="1" style="margin: auto;"><tr><td colspan="2" style="text-align: center;">2,366 people</td></tr><tr><td style="text-align: center;">1,372 monkeys</td><td style="text-align: center;">994 people</td></tr></table>	2,366 people		1,372 monkeys	994 people	$2366 - 1372 = p$  Solution: 994 people
2,366 people					
1,372 monkeys	994 people				

- 2 All of the chefs on the ship are monkeys. Each of the monkey chefs is in charge of making 10 different kinds of desserts. There are 4 chefs on board the ship. How many different kinds of desserts do the monkey chefs make?

Strip Diagram	Equation and Solution								
<table border="1" style="margin: auto;"><tr><td colspan="4" style="text-align: center;">Total Number of Desserts</td></tr><tr><td style="text-align: center;">10 desserts</td><td style="text-align: center;">10 desserts</td><td style="text-align: center;">10 desserts</td><td style="text-align: center;">10 desserts</td></tr></table>	Total Number of Desserts				10 desserts	10 desserts	10 desserts	10 desserts	$10 \times 4 = d$  Solution: 40 desserts
Total Number of Desserts									
10 desserts	10 desserts	10 desserts	10 desserts						



## CRUISING ALONG ANSWER KEY (PG. 2 OF 3)

- 3 The *Golden Monkey* made its first stop at beautiful Pirate Island. 35 pirates rushed aboard (including Springback Jack), because they saw the ship's name and thought it was full of gold. But there was no gold on the ship. They decided to stay aboard because pirates love monkeys. Now how many passengers (including pirates) are on board? (Hint: Look back at Problem #1 to find a number you'll need to solve the problem.)

Strip Diagram	Equation and Solution
<p>Strip Diagram:</p> <p>Total Number of Passengers: <u>2,366 passengers</u></p> <p>35 pirates</p>	$\underline{2366} + 35 = \underline{2401}$ <p>Solution: <u>2,401 passengers</u></p>

- 4 The *Golden Monkey* made its second stop at Fantastical Island. Everyone, including the pirates, wanted to explore the island. Everyone on the ship divided into 7 groups of the same size so they could go on a fantastical adventure. How many passengers were in each group? (Hint: Use the total number of passengers from Problem #3 to help you solve the problem.)

Strip Diagram	Equation and Solution
<p>Strip Diagram:</p> <p>2,401 passengers</p>	$2401 \div \boxed{\quad} = p$ <p>Solution: <u>343 passengers</u></p>



# CRUISING ALONG ANSWER KEY (PG. 3 OF 3)

- 5 The next day, 16 of the pirates were bored and jumped overboard. How many people were left on the ship? (Hint: How many pirates are there? How many people were on the ship from the beginning of the cruise?)

Strip Diagram	Equation and Solution																		
<p>There are several ways to solve this problem. If this method doesn't make sense to you, solve it your way on scratch paper, then fill out this strip diagram.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" style="text-align: center;">_____ 31 pirates _____</td> </tr> <tr> <td style="text-align: center;">16 pirates</td> <td style="text-align: center;">_____ 15 pirates _____</td> </tr> <tr> <td colspan="2" style="text-align: center;">Total Passengers on the Cruise Ship</td> </tr> <tr> <td style="text-align: center;">_____ 2,366 passengers _____</td> <td style="text-align: center;">_____ 15 pirates _____</td> </tr> </table>	_____ 31 pirates _____		16 pirates	_____ 15 pirates _____	Total Passengers on the Cruise Ship		_____ 2,366 passengers _____	_____ 15 pirates _____	<table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">_____ 31 _____</td> <td style="text-align: center;">-</td> <td style="text-align: center;">16</td> <td style="text-align: center;">=</td> <td style="text-align: center;">_____ 15 _____</td> </tr> <tr> <td style="text-align: center;">_____ 2366 _____</td> <td style="text-align: center;">+</td> <td style="text-align: center;">15</td> <td style="text-align: center;">=</td> <td style="text-align: center;">_____ 2381 _____</td> </tr> </table> <p>Solution: <u>2,381 passengers</u></p>	_____ 31 _____	-	16	=	_____ 15 _____	_____ 2366 _____	+	15	=	_____ 2381 _____
_____ 31 pirates _____																			
16 pirates	_____ 15 pirates _____																		
Total Passengers on the Cruise Ship																			
_____ 2,366 passengers _____	_____ 15 pirates _____																		
_____ 31 _____	-	16	=	_____ 15 _____															
_____ 2366 _____	+	15	=	_____ 2381 _____															

- 6 The following day, the rest of the pirates decided to leave the ship. Before they left, Springback Jack called out, "We need some monkey pirates. There are 5 boats that can hold 6 monkeys each to take you to the ship. Come with us!" Some of the monkeys decided to go with the pirates and filled up the boats. How many passengers were left on the cruise ship?

Strip Diagram	Equation and Solution																				
<p>Draw your own strip diagram. <i>Answers will vary.</i></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="5" style="text-align: center;">Monkeys that Went with the Pirates</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> <td style="text-align: center;">6</td> </tr> <tr> <td colspan="5" style="text-align: center;">2366 passengers</td> </tr> <tr> <td style="text-align: center;">30 monkeys</td> <td colspan="4" style="text-align: center;">Passengers Left on the Ship</td> </tr> </table>	Monkeys that Went with the Pirates					6	6	6	6	6	2366 passengers					30 monkeys	Passengers Left on the Ship				<p>Write your own equation and solve the problem. <i>Equations may vary.</i></p> $6 \times 5 = 30$ $2366 - 30 = p$ <p>Solution: <u>2,336 passengers</u></p>
Monkeys that Went with the Pirates																					
6	6	6	6	6																	
2366 passengers																					
30 monkeys	Passengers Left on the Ship																				



Name: \_\_\_\_\_

**Directions:** Fill in the strip diagram using labels and numbers, fill in the equation, and solve the problem. Be sure to label your answer.

- 1 The cruise ship *Golden Monkey* has 2,366 passengers. 1,372 of the passengers are monkeys and the rest are people. How many of the passengers are people?

Strip Diagram	Equation and Solution				
<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center; padding: 10px;">2,366 people</td> </tr> <tr> <td style="width: 50%; padding: 10px;">1,372 monkeys</td> <td style="width: 50%; padding: 10px;">_____ people</td> </tr> </table>	2,366 people		1,372 monkeys	_____ people	$2366 - \underline{\hspace{2cm}} = \underline{\hspace{2cm}}$ <p style="text-align: right; margin-top: 20px;">Solution: _____</p>
2,366 people					
1,372 monkeys	_____ people				

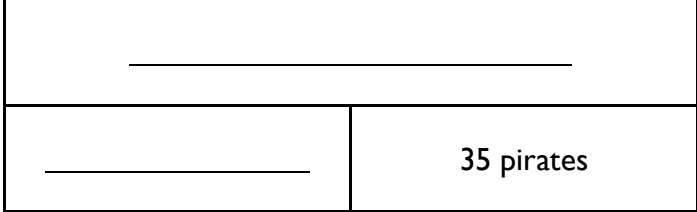
- 2 All of the chefs on the ship are monkeys. Each of the monkey chefs is in charge of making 10 different kinds of desserts. There are 4 chefs on board the ship. How many different kinds of desserts do the monkey chefs make?

Strip Diagram	Equation and Solution								
<table border="1" style="margin: auto; border-collapse: collapse;"> <tr> <td colspan="4" style="text-align: center; padding: 10px;">_____</td> </tr> <tr> <td style="width: 25%; padding: 10px;">_____</td> <td style="width: 25%; padding: 10px;">_____</td> <td style="width: 25%; padding: 10px;">_____</td> <td style="width: 25%; padding: 10px;">_____</td> </tr> </table>	_____				_____	_____	_____	_____	$\underline{\hspace{2cm}} \times \underline{\hspace{2cm}} = d$ <p style="text-align: right; margin-top: 20px;">Solution: _____</p>
_____									
_____	_____	_____	_____						

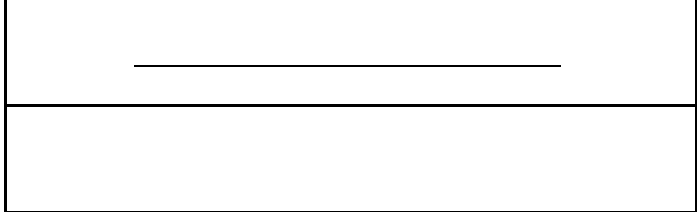


Name: \_\_\_\_\_

- 3 The *Golden Monkey* made its first stop at beautiful Pirate Island. 35 pirates rushed aboard (including Springback Jack), because they saw the ship's name and thought it was full of gold. But there was no gold on the ship. They decided to stay aboard because pirates love monkeys. Now how many passengers (including pirates) are on board? (Hint: Look back at Problem #1 to find a number you'll need to solve the problem.)

Strip Diagram	Equation and Solution
	<p style="text-align: center;">_____ + 35 = _____</p> <p>Solution: _____</p>

- 4 The *Golden Monkey* made its second stop at Fantastical Island. Everyone, including the pirates, wanted to explore the island. Everyone on the ship divided into 7 groups of the same size so they could go on a fantastical adventure. How many passengers were in each group? (Hint: Use the total number of passengers from Problem #3 to help you solve the problem.)

Strip Diagram	Equation and Solution
	<p style="text-align: center;">2401 <span style="border: 1px solid black; display: inline-block; width: 20px; height: 20px; vertical-align: middle;"></span> _____ = <math>p</math></p> <p>Solution: _____</p>



- 5 The next day, 16 of the pirates were bored and jumped overboard. How many people were left on the ship? (Hint: How many pirates are there? How many people were on the ship from the beginning of the cruise?)

Strip Diagram	Equation and Solution				
<p>There are several ways to solve this problem. If this method doesn't make sense to you, solve it your way on scratch paper, then fill out this strip diagram.</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <div style="border: 1px solid black; width: 100%; height: 20px; margin-bottom: 5px;"></div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">16 pirates</td> <td style="width: 70%; padding: 5px;">_____</td> </tr> </table> <div style="border: 1px solid black; width: 100%; height: 20px; margin-top: 5px; text-align: center;">Total Passengers on the Cruise Ship</div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 30%; padding: 5px;">_____</td> <td style="width: 70%; padding: 5px;">_____</td> </tr> </table> </div>	16 pirates	_____	_____	_____	<div style="margin: 10px 0;"> <math>_____ \square 16 = _____</math> </div> <div style="margin: 10px 0;"> <math>_____ \square 15 = _____</math> </div> <p>Solution: _____</p>
16 pirates	_____				
_____	_____				

- 6 The following day, the rest of the pirates decided to leave the ship. Before they left, Springback Jack called out, "We need some monkey pirates. There are 5 boats that can hold 6 monkeys each to take you to the ship. Come with us!" Some of the monkeys decided to go with the pirates and filled up the boats. How many passengers were left on the cruise ship?

Strip Diagram	Equation and Solution
<p>Draw your own strip diagram.</p>	<p>Write your own equation and solve the problem.</p> <p>Solution: _____</p>