

Represent and solve problems involving multiplication and division within 100

Standard 3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities. For example, use drawings and equations with a symbol for the unknown number to represent the problem.

Key Elements:

- Be sure to identify the key word(s) to help the students know that it is a multiplicative situation.
- Identify the problem type that it is. If it is product unknown, groups unknown, unknown factor, etc.
- Write an equation with the appropriate operation using a variable as the missing number.
- Solve and be sure that your answer has the correct label.
- Check their work by solving it a different way.

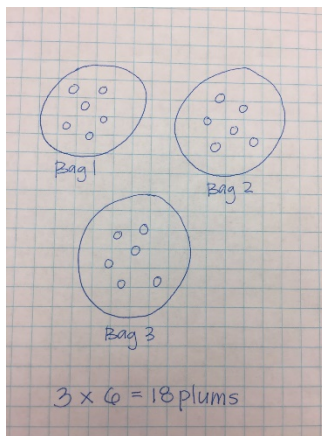
The big 5 is another good strategy for solving word problems:

1. Read the problem
2. Underline important information
3. Draw a picture
4. Write the equation to match
5. Solve and label

Examples of word problems:

Equal groups (unknown product)

There are 3 bags with 6 plums in each bag. How many plums are there in all?



Solution/Model:

Equal Groups (Group Size Unknown)

If 18 plums are shared equally into 3 bags, then how many plums will be in each bag?

Equal groups (Number of groups Unknown)

If 18 plums are to be packed 6 to a bag, then how many bags are needed?

Array (Equal Groups organized in rows and columns)

Mike has a garden. In his garden he has 5 rows with 7 plants in each row, how many plants does Mike have? (**Discrete** word problem because there are individual items that can be counted)

- This model is intentionally used to help build the foundations of the area model, which is less concrete because it does not have countable items.

Area (Dimensional)

Mike has a garden. If one side measures 5 feet, and the other side measures 7 feet, how many square feet is Mike’s garden? (**Continuous** word problem because it measures area or distance and is not countable.)

Measurement quantities

Danny rides his bike 3 miles every day for 8 days. How many miles did he ride his bike?

	Unknown Product	Group Size Known ("How many in each group?" Division)	Number of Groups Unknown ("How many groups?" Division)
	$3 \times 6 = ?$	$3 \times ? = 18$, and $18 \div 3 = ?$	$? \times 6 = 18$, and $18 \div 6 = ?$
Equal Groups	There are 3 bags with 6 plums in each bag. How many plums are there in all? <i>Measurement example.</i> You need 3 lengths of string, each 6 inches long. How much string will you need altogether?	If 18 plums are shared equally into 3 bags, then how many plums will be in each bag? <i>Measurement example.</i> You have 18 inches of string, which you will cut into 3 equal pieces. How long will each piece of string be?	If 18 plums are to be packed 6 to a bag, then how many bags are needed? <i>Measurement example.</i> You have 18 inches of string, which you will cut into pieces that are 6 inches long. How many pieces of string will you have?
Arrays,⁴ Area⁵	There are 3 rows of apples with 6 apples in each row. How many apples are there? <i>Area example.</i> What is the area of a 3 cm by 6 cm rectangle?	If 18 apples are arranged into 3 equal rows, how many apples will be in each row? <i>Area example.</i> A rectangle has area 18 square centimeters. If one side is 3 cm long, how long is a side next to it?	If 18 apples are arranged into equal rows of 6 apples, how many rows will there be? <i>Area example.</i> A rectangle has area 18 square centimeters. If one side is 6 cm long, how long is a side next to it?
Compare	A blue hat costs \$6. A red hat costs 3 times as much as the blue hat. How much does the red hat cost? <i>Measurement example.</i> A rubber band is 6 cm long. How long will the rubber band be when it is stretched to be 3 times as long?	A red hat costs \$18 and that is 3 times as much as a blue hat costs. How much does a blue hat cost? <i>Measurement example.</i> A rubber band is stretched to be 18 cm long and that is 3 times as long as it was at first. How long was the rubber band at first?	A red hat costs \$18 and a blue hat costs \$6. How many times as much does the red hat cost as the blue hat? <i>Measurement example.</i> A rubber band was 6 cm long at first. Now it is stretched to be 18 cm long. How many times as long is the rubber band now as it was at first?
General	$a \times b = ?$	$a \times ? = p$, and $p \div a = ?$	$? \times b = p$, and $p \div b = ?$