

# Multiplication Problems

## Learning Objective:

To use known multiplication strategies to solve scaling problems.



Flippy, floppy,  
fingers!

To play this game you need a partner and your fingers!

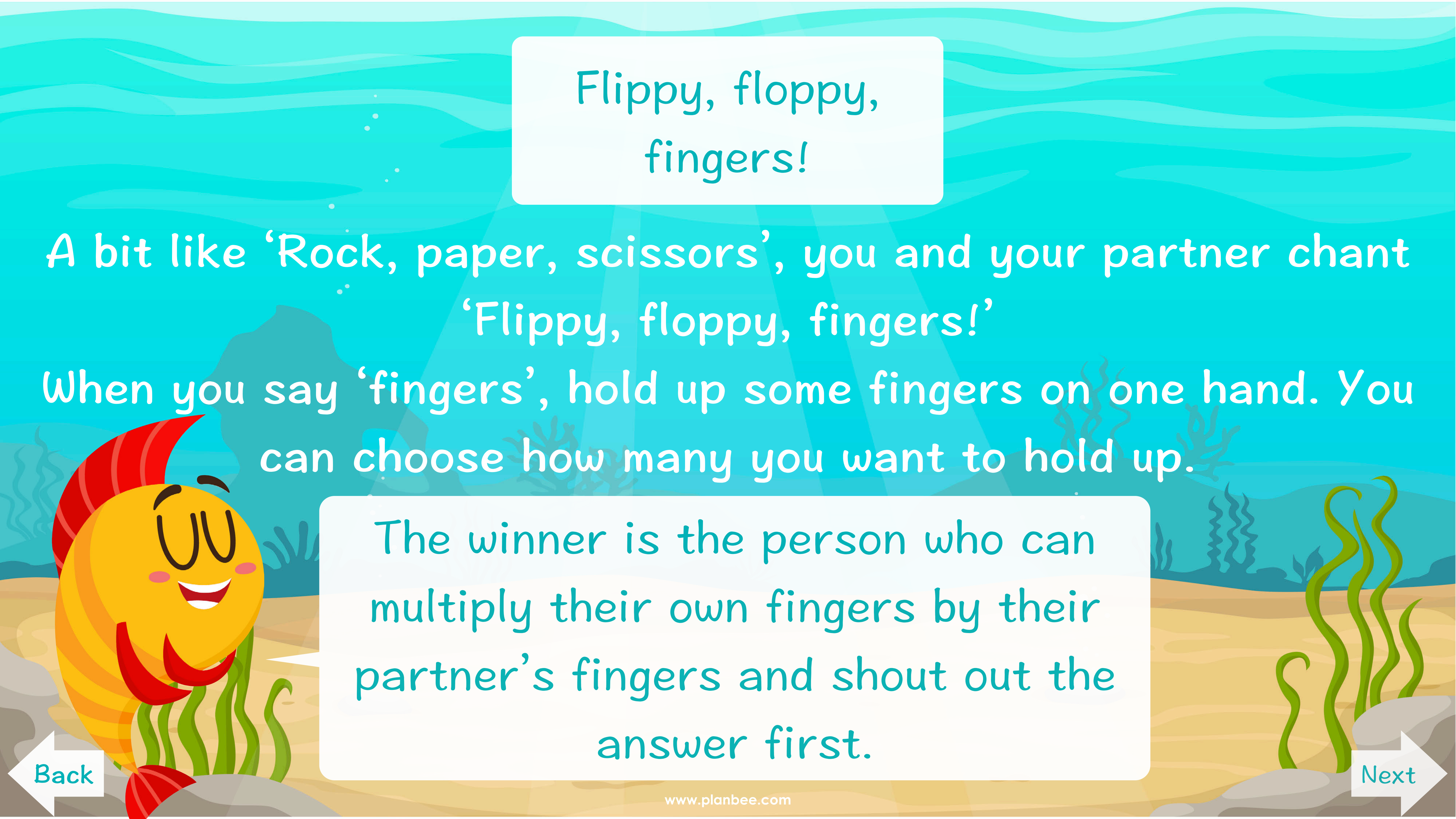
I don't have any fingers!



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Flippy, floppy,  
fingers!

A bit like 'Rock, paper, scissors', you and your partner chant  
'Flippy, floppy, fingers!'

When you say 'fingers', hold up some fingers on one hand. You  
can choose how many you want to hold up.

The winner is the person who can  
multiply their own fingers by their  
partner's fingers and shout out the  
answer first.

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James is in charge of feeding the Pacific tank at the aquarium. For every ten fish he needs one box of food. If he uses eight boxes of food how many fish has he fed?

Hmm. Looks like we need to do some scaling up here! And I am an expert in scales!

Scaling is just multiplying or dividing a number to make it bigger (scaling up) or smaller (scaling down).





James is in charge of feeding the Pacific tank at the aquarium. For every ten fish he needs one box of food. If he uses eight boxes of food how many fish has he fed?

We know that for every ten fish, we need one box of food.

1 box of food									
1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish

What do we need to scale up by in this problem?

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James is in charge of feeding the Pacific tank at the aquarium. For every ten fish he needs one box of food. If he uses eight boxes of food how many fish has he fed?



We need to scale up by eight!

1 box of food									
1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish

So, we need to multiply each part by eight.

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James is in charge of feeding the Pacific tank at the aquarium. For every ten fish he needs one box of food. If he uses eight boxes of food how many fish has he fed?

1 box of food										1 box of food									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 box of food										1 box of food									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 box of food										1 box of food									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 box of food										1 box of food									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

$$8 \times 1 = 8 \text{ (boxes of food)}$$
$$8 \times 10 = ? \text{ (number of fish)}$$

How many fish would eight boxes of food feed?

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James is in charge of feeding the Pacific tank at the aquarium. For every ten fish he needs one box of food. If he uses eight boxes of food how many fish has he fed?

Well done!

1 box of food										1 box of food									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 box of food										1 box of food									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 box of food										1 box of food									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
1 box of food										1 box of food									
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

$$8 \times 1 = 8 \text{ (boxes of food)}$$

$$8 \times 10 = 80 \text{ (number of fish)}$$

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James is in charge of feeding the Pacific tank at the aquarium. For every ten fish he needs one box of food. If he has fed 100 fish, how many boxes of food has he used?



1 box of food									
1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish

Think, pair, share...  
How would you work this out?

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James is in charge of feeding the Pacific tank at the aquarium. For every ten fish he needs one box of food. If he has fed 100 fish, how many boxes of food has he used?



This time you had to find out what you were scaling by.

1 box of food									
1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish

How many groups of 10 fish go into 100?

$$10 \times ? = 100$$



James is in charge of feeding the Pacific tank at the aquarium. For every ten fish he needs one box of food. If he has fed 100 fish, how many boxes of food has he used?



Then multiply the number of boxes of food by the scale you found.

1 box of food									
1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish	1 fish

$$10 \times 10 = 100$$

$$1 \times 10 = 10$$





Let's try another!

There are three times as many staff working in the penguin enclosure as there are in the rock pool exhibit. Tommy, Jane and Toby work in the rock pool exhibit, how many staff work in the penguin enclosure?

Penguin enclosure staff		
Tommy + Jane + Toby = 3		

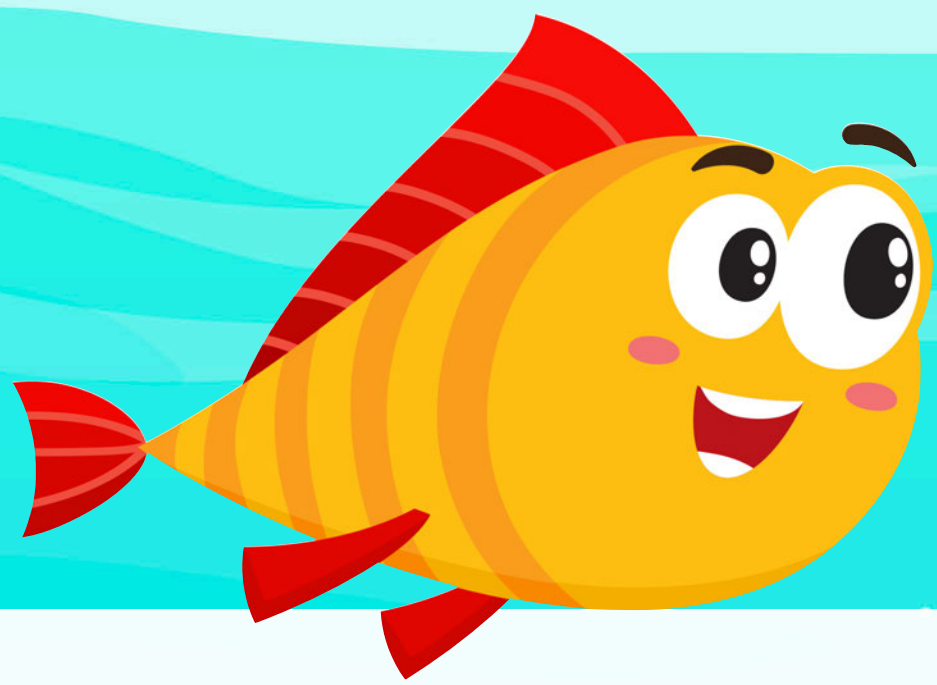
How many staff work in the rock pool exhibit?

What number are you scaling by?

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There are three staff working in the rock pool exhibit and we are scaling by three!

$$3 \times 3 = 9$$

There are three times as many staff working in the penguin enclosure as there are in the rock pool exhibit. Tommy, Jane and Toby work in the rock pool exhibit, how many staff work in the penguin enclosure?

Penguin enclosure staff		
Tommy + Jane + Toby = 3		

Nine staff work in the penguin exhibit.

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There can be a maximum of 40 visitors in the gift shop at once.

There are four times as many children as there are adults.

What are the possible combinations of children and adults that could be in the gift shop at one time?

Can you draw a picture to represent this problem?  
How many children would there be if there was one adult?



This one is going to have lots of answers, and we need to find them all. We can work systematically again!

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There can be a maximum of 40 visitors in the gift shop at once.

There are four times as many children as there are adults.

What are the possible combinations of children and adults that could be in the gift shop at one time?

Number of adults	Number of children (Adults x 4)	Number of guests (Must be <40)
1	4	5
2	8	
3		15
		20
5		
	24	
7		
		40



I thought it would be easiest to understand if I put my answers in a table. Can you fill in the gaps to find all the answers?

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## Plenary

Which of these problems would not require you to use the calculation  $8 \times 2$ ?

There are eight times as many staff working in the rock pool exhibit as there are in the gift shop. Henry and Louie work in the gift shop. How many staff work in the rock pool exhibit?

There are eight times as many children at the aquarium than there are adults. If there are 48 children, how many adults are there?

The filters in each tank can pump eight litres of water every hour. How much water could the filters pump in two hours?



## Plenary

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