Ark Curriculum+

Year 3 Unit 6: Multiplication and division

Week 2: Multiplication

Mathematics
Mastery

Year 3 Unit 6: Multiplication and division

Mathematics Mastery

This Week

Lesson 6: How many outfits?

- Solving correspondence problems

Lesson 7: Doubling to find multiplication facts

- Recalling and using multiplication facts for three and four to find multiplication facts for six and eight

Lesson 8: Ten times greater

- Deriving 'ten times greater' facts for known multiplication tables

Lesson 9: Use bar models to represent word problems

- Matching appropriate bar models to multiplication and division problems

Lesson 10: Consolidation and review

- See unit narrative (no slides provided)

Ark Curriculum+

Year 3 Unit 6: Multiplication and division

Lesson 6: How many outfits?

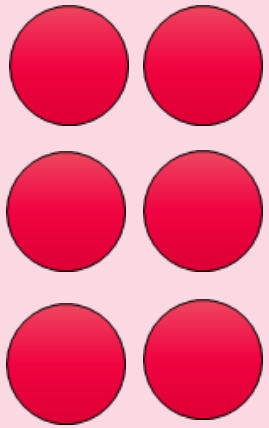
Mathematics
Mastery

Find the factors

Do Now

Can you find all the factors for each number? Use counters to make each number and find all the ways that it can be shared into equal groups. Remember the 'number of equal parts' and the 'value of the parts' are the factors. The whole is also known as the _____.

6



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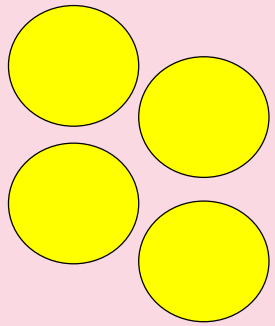

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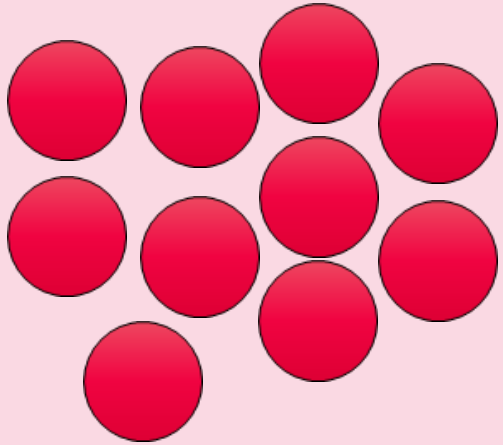

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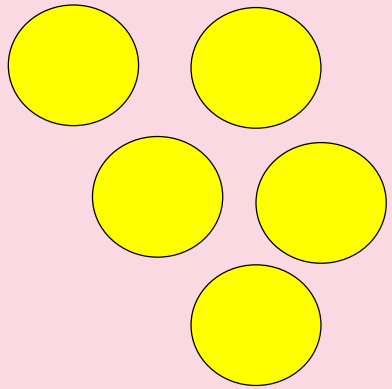


Can you use your multiplication facts to help you?
Remember, every number can be shared into 1 group or into groups of 1.

Key learning: To solve correspondence problems

Star Words

combinations

systematic

Finding all the ways

Main course options: sausages or chicken

Dessert options: fruit pie or chocolate cake

New Learning

Finding all the ways

Main course options:
sausages or chicken

Dessert options:
fruit pie or chocolate cake

First I will start with _____ and find all the combinations.
Then I will change_____ for _____ and find all the combinations. I will know I have finished because _____.
Altogether we found _____ combinations.

Let's Explore

Identifying number patterns in correspondence problems

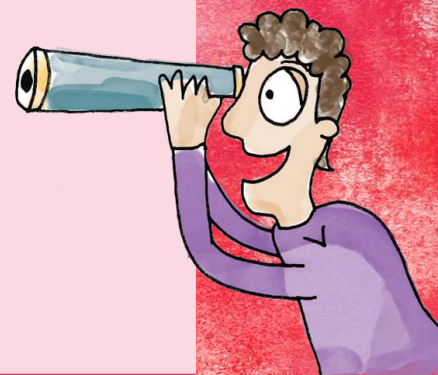



Did you find all the ways?

How many ways with sausages first?

How many ways with chicken first?

Develop Learning

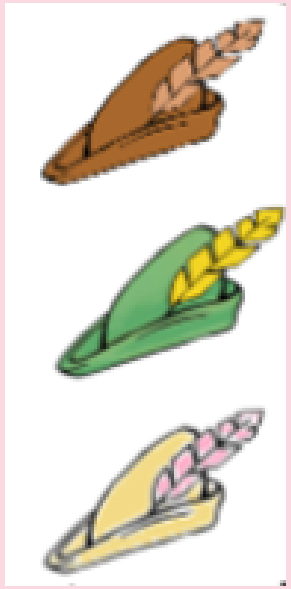


Key learning: To solve correspondence problems

Independent Task

I have 3 different hats and 4 different tops. How many outfits can I create?

How many outfits would I be able to create with 4 different hats and 4 different tops?



Can you see a number pattern in your answer? How many outfits could be created with 5 different hats and 4 different tops?

Celebrating success and addressing misconceptions

Plenary

I have 3 different hats and 4 different tops. How many outfits can I create?

How many outfits would I be able to create with 4 different hats and 4 different tops?

Number of hats	Number of tops	Number of combinations
3	4	
4	4	
5	4	

Can you see a number pattern in your answer? How many outfits could be created with 5 different hats and 4 different tops?

Ark Curriculum+

Year 3 Unit 6: Multiplication and division

Lesson 7: Doubling to find multiplication facts

Mathematics
Mastery

Multiples of three and four

Do Now

Play the game Fizz Buzz to 30.

Key learning: To recall and use multiplication facts for three and four to find multiplication facts for six and eight

Star Words

factor

whole

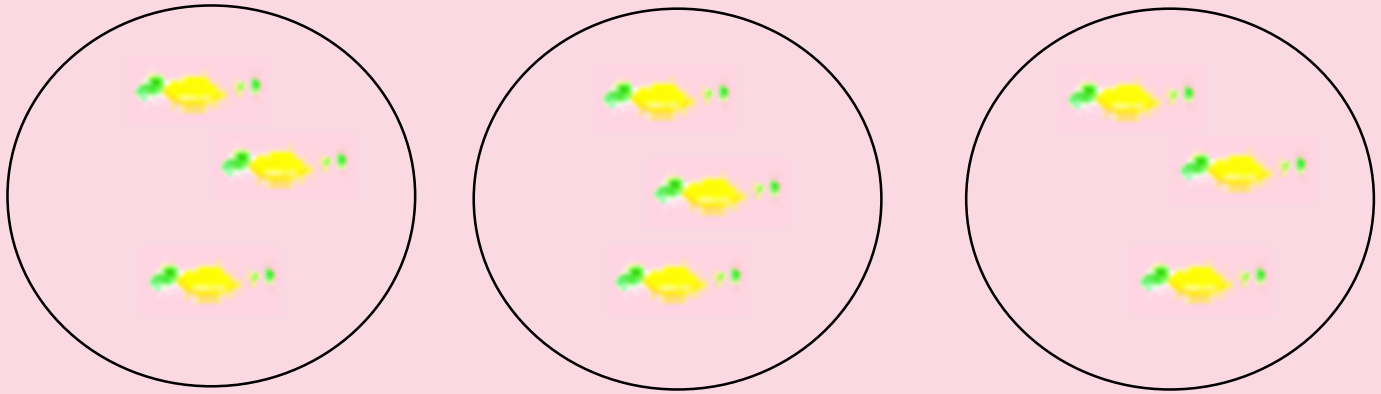
product

double

equal parts

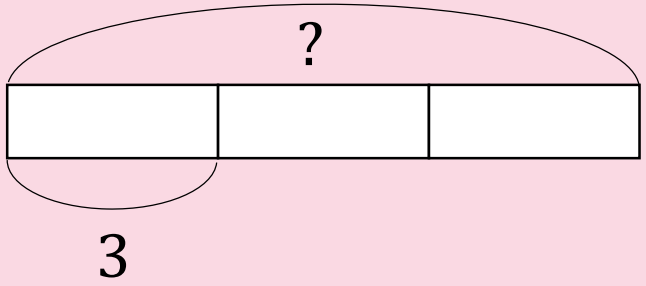
times as many

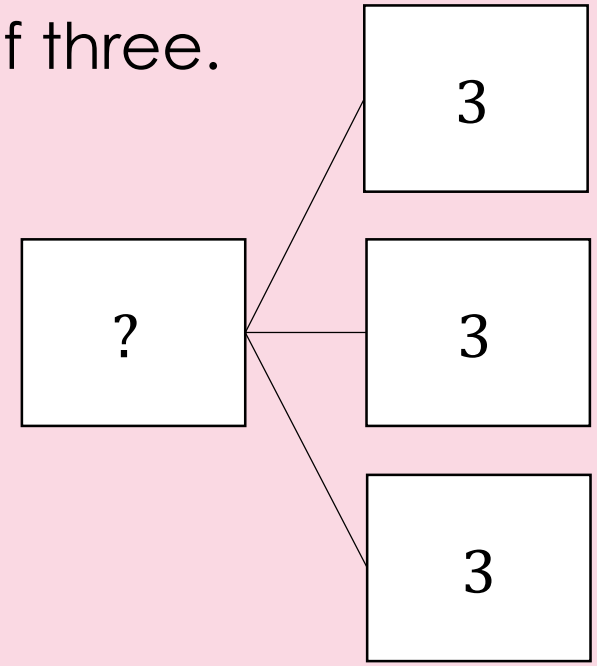
Explore doubling



Robin asked me to put three sweets in each lunch bag for the Merry Men. There are three of us going on an adventure today so I need to put sweets in three bags. How many sweets will I need?

I have made three groups of three.

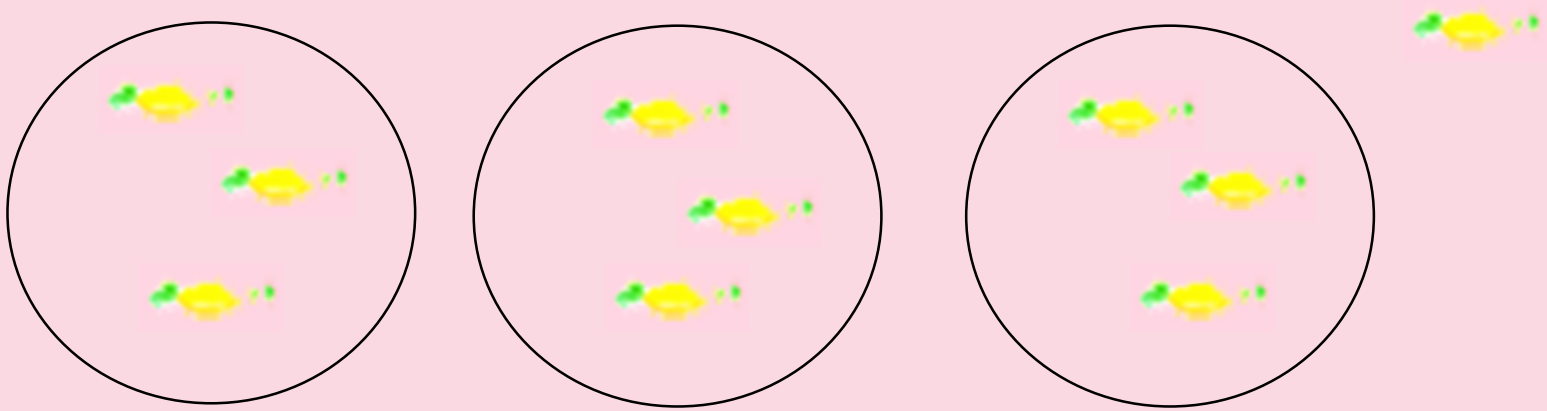




$3 \times 3 = \square$

New Learning

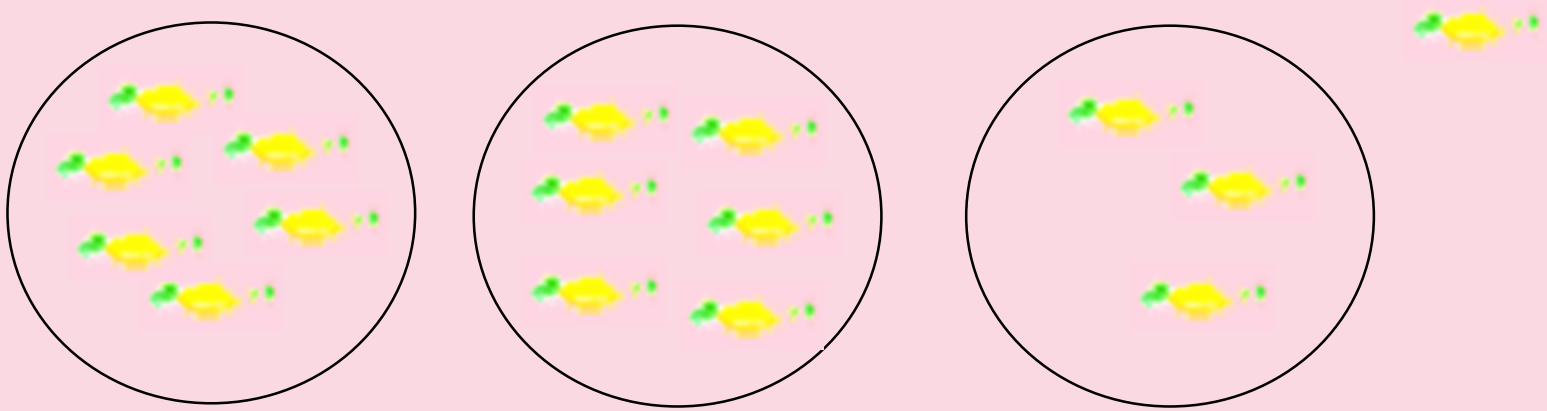
Explore doubling



Friar Tuck decided that it would make us happier if we had more sweets so he told me to put two times as many in each bag. How many do I need now?

New Learning

Explore doubling



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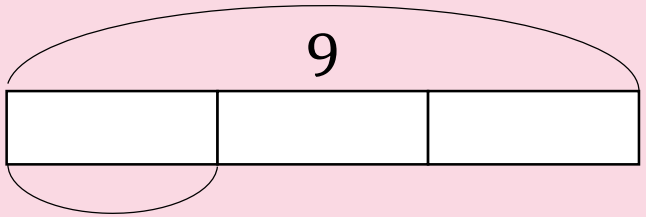
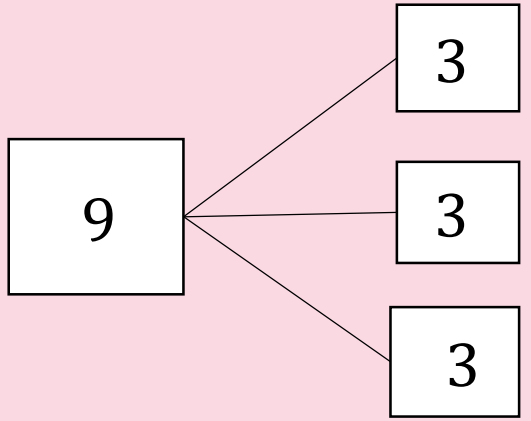
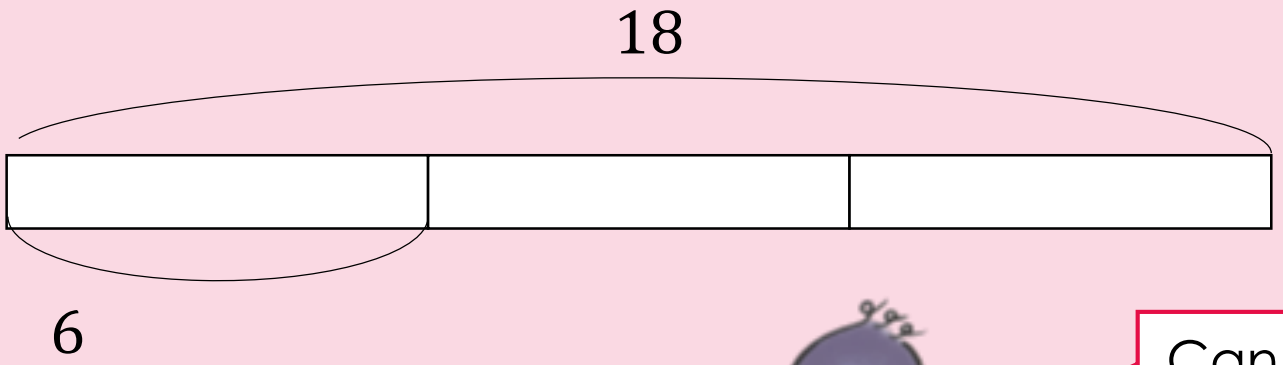
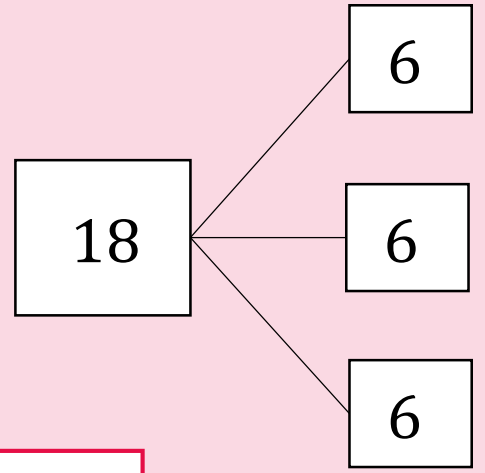
New Learning

Explore doubling









Can you compare the representations of the two problems? What's the same? What's different?

New Learning

Explore doubling

When we doubled the value of each part, the value of the whole (the product) was also doubled. Does this always happen?

$$3 \times 3 = 9$$

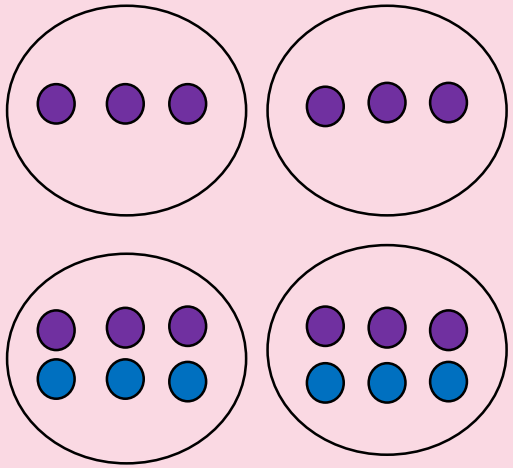
$$3 \times 6 = 18$$

New Learning

Doubling multiplication facts

Talk Task

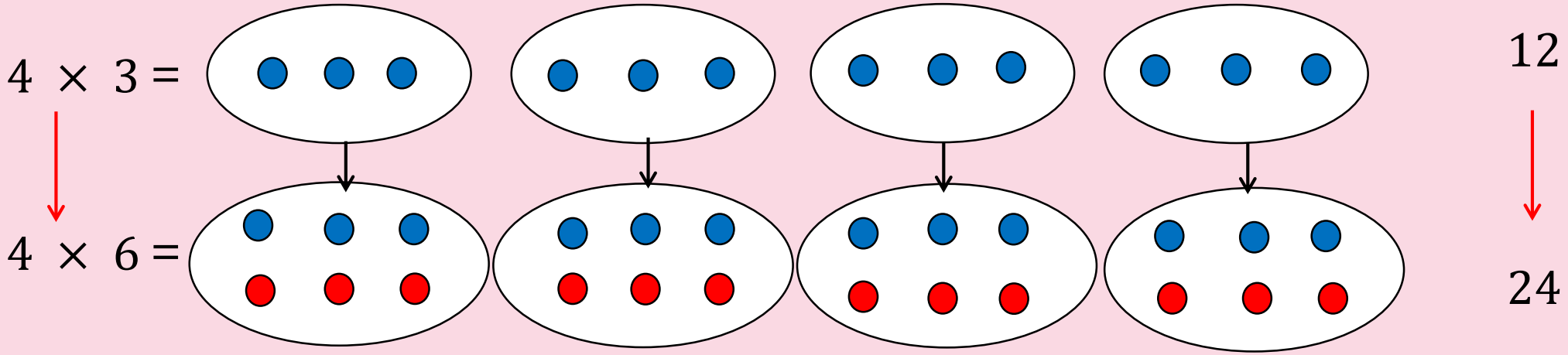
Roll two dice and represent a multiplication equation. Represent using equal parts. Double the number of counters in each part. Calculate the new product. Record the products. What do you notice?



Calculation	Product	Product when doubling each part
□ × □		
□ × □		

When I compared the products, I noticed...

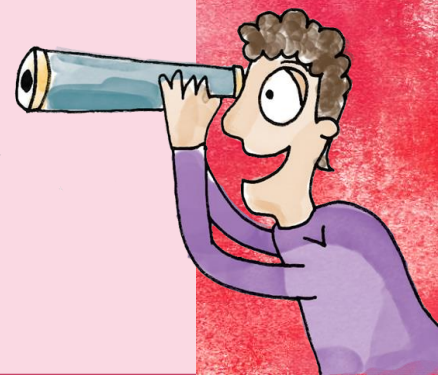
Double multiplications of three to solve multiplications of six



□ × 6 will always be double □ × 3

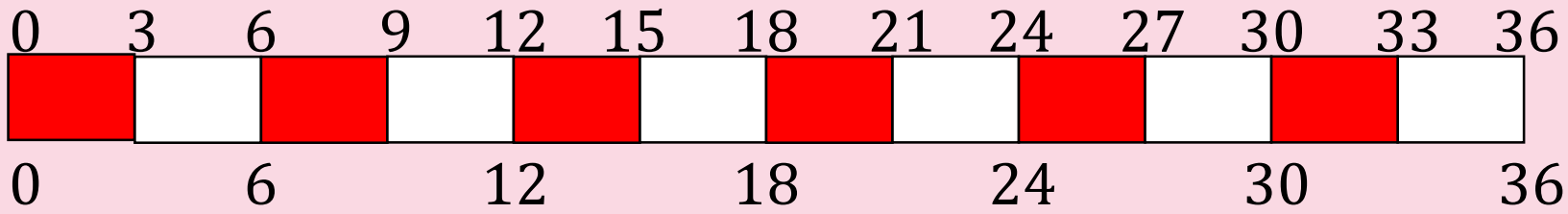
when these two numbers are the same because 6 is double 3.

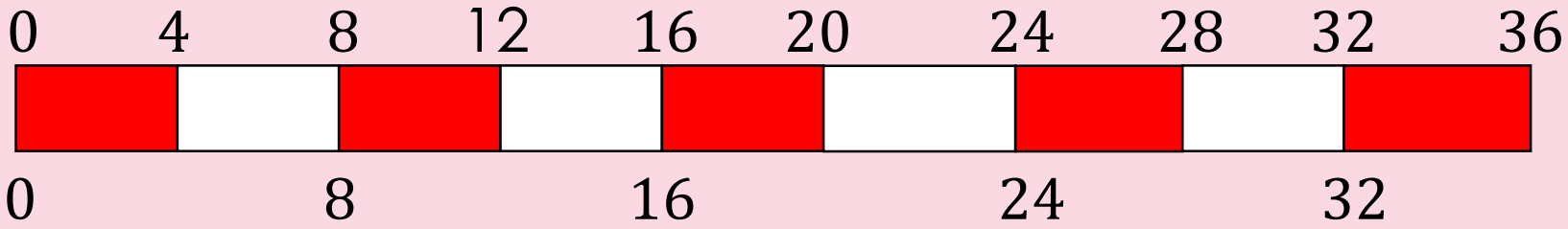
Rule: If you double the value of the parts the product will be doubled.

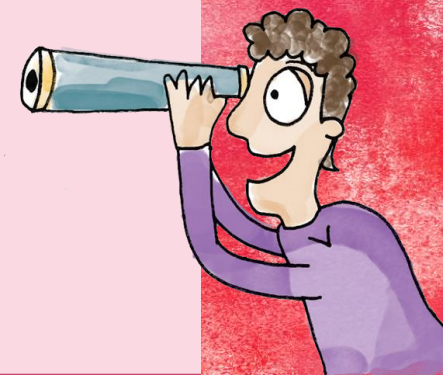


Develop Learning

Double multiplications of three to solve multiplications of six







Develop Learning

Key learning: To recall and use multiplication facts for three and four to find multiplication facts for six and eight

Independent Task

1×3	3×3	2×6
5×3	2×4	4×4
5×8	1×4	10×3
5×4	1×6	2×3
3×6	10×6	5×6
1×8	4×8	2×8

Find pairs of multiplication facts so that you can double one fact to find the other. You know your threes and fours – use them to help you work our your sixes and eights. Work out the two facts and write them down. Then show that you are right by using the bead string to check.

Celebrating success and addressing misconceptions

Plenary

Ark Curriculum+

Year 3 Unit 6: Multiplication and division

Lesson 8: Ten times greater

Mathematics
Mastery

Multiple Bingo (3x and 4x times table facts)

Do Now

Key learning: To derive ‘ten times greater’ facts for known multiplication facts

Star Words

ten times greater/ less

value

ten times as much

place value

related facts

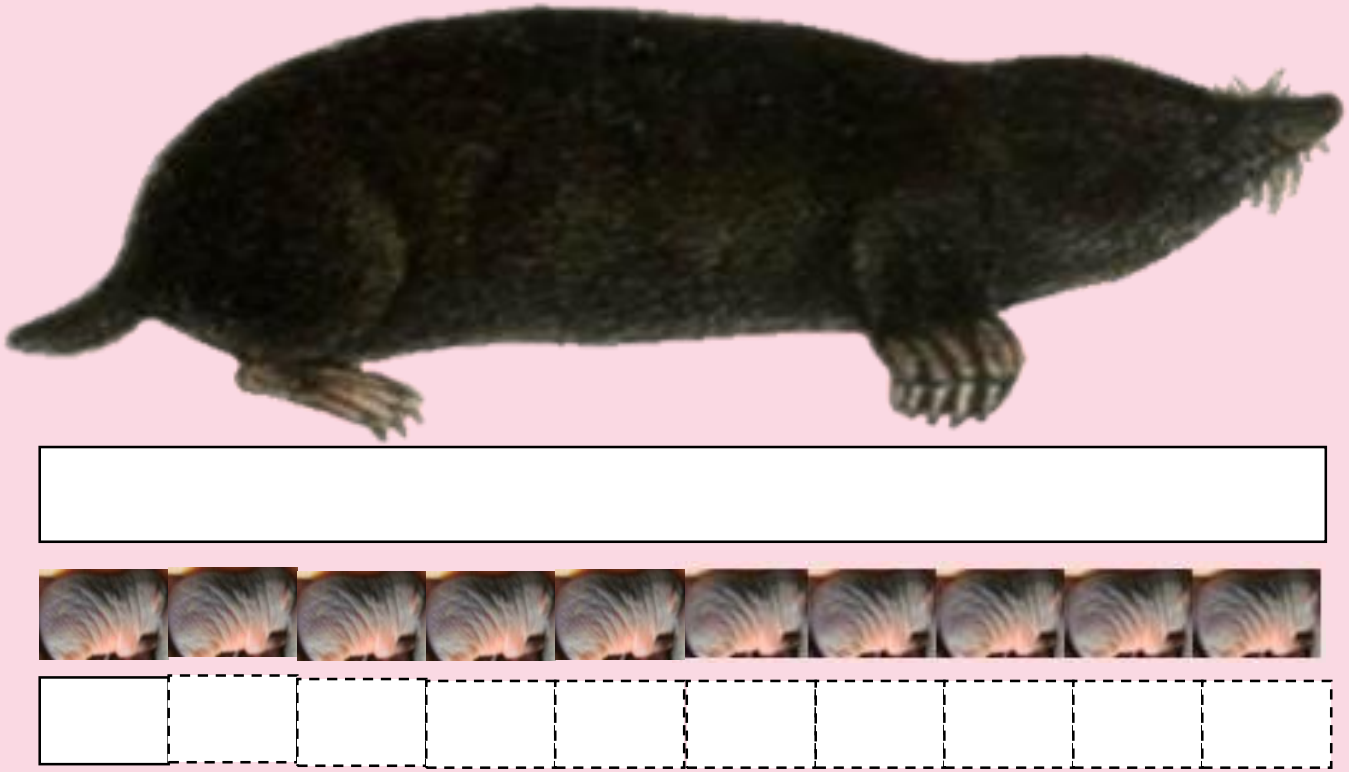
Ten times greater

When baby moles are born they are usually about $2cm$ long. An adult mole is usually ten times longer. How long would an adult mole be?

How can we represent the maths in this word problem?

New Learning

Ten times greater



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New Learning

Ten times greater

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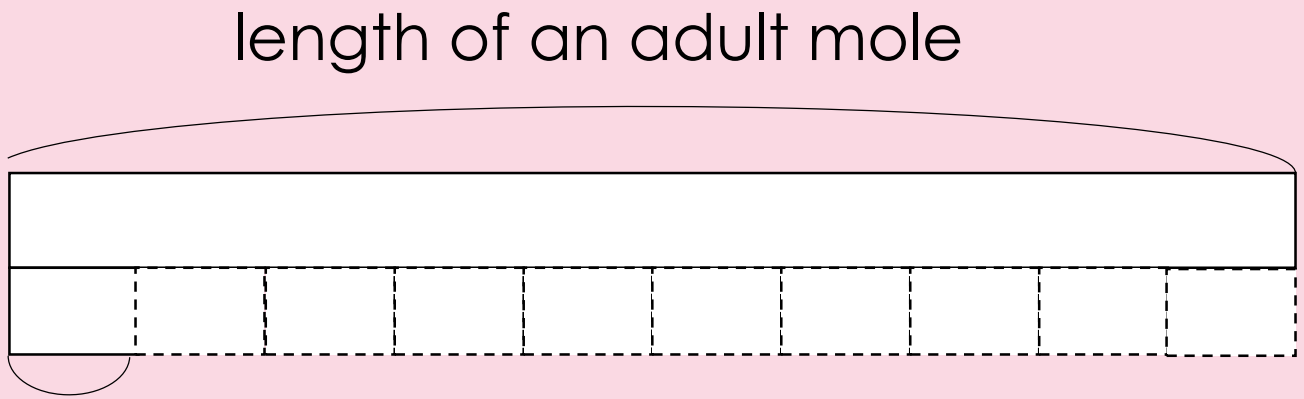


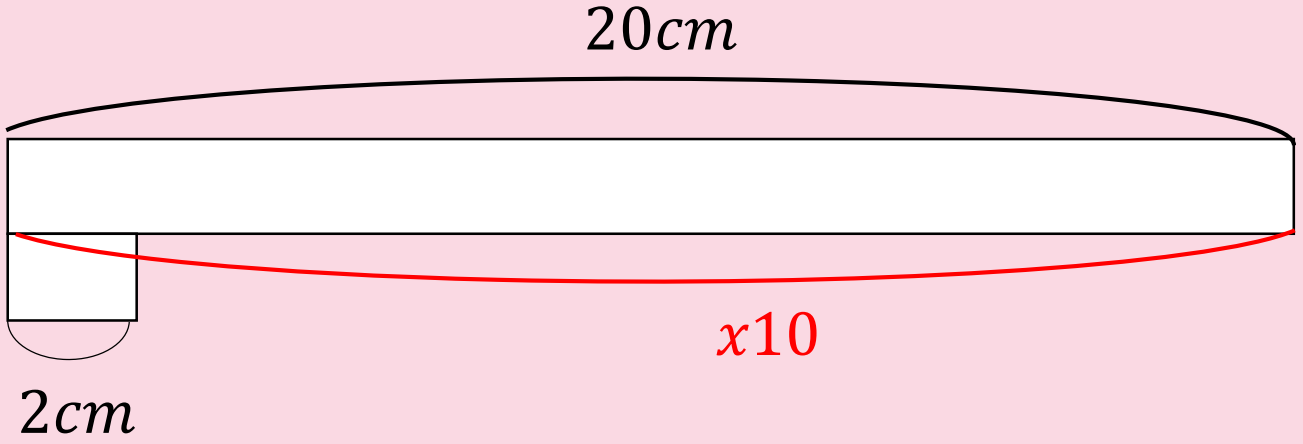
New Learning

Ten times greater

When baby moles are born they are usually about $2cm$ long. An adult mole is usually ten times longer. How long would an adult mole be?

$$\mathbf{2 \times 10 = 20}$$

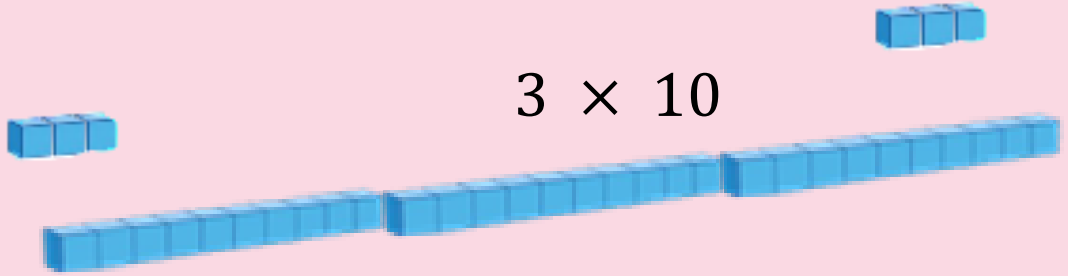
Two multiplied by ten is equal to twenty.
$2cm$ multiplied by ten is equal to $20cm$.
Adult moles are usually $20cm$ long.



New Learning

Exploring ten times greater multiplications

Choose a calculation. Represent the 1-digit number using ones in a bar. Make a 'ten times greater' bar using the same number of tens. Record the completed multiplication equations.



3×10

$3 \times 10 = 30$

I am making a bar representing ten times greater using one Dienes ten for each Dienes one in the first bar.

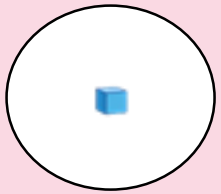
I noticed that the first value has a __ in the ones and the second value has a __ in the tens. I think this is because...

Let's Explore

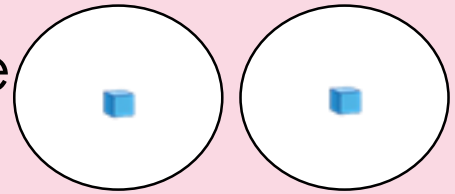
Applying learning about ten times greater

What did you find out? Why does it happen?

One group of one
1×1

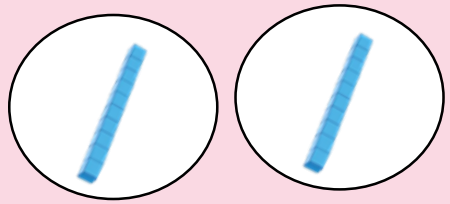


Two groups of one
2×1 or 1×2

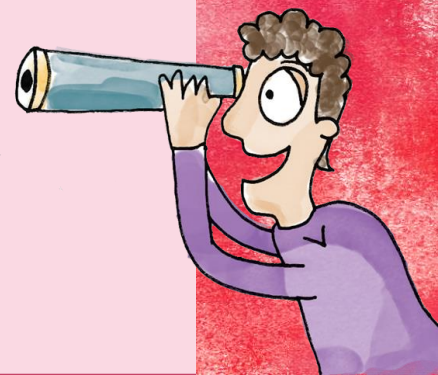


One group of ten
1×10 or 10×1

Two groups of ten
2×10 or 10×2



If we make the value ten times greater,
<u>each one</u> now has a value of ten.



Develop Learning

Applying learning about ten times greater

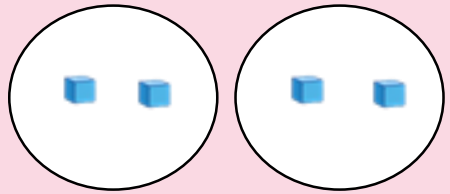
What if the first value is greater than one?

One group of two

1 × 2 or 2 × 1

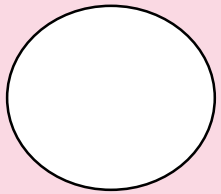
Two groups of two

2 × 2



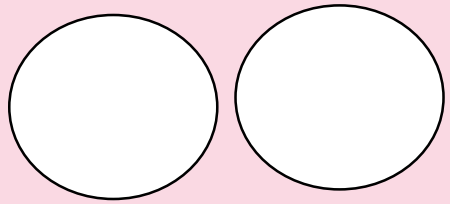
____ group of ____

□ × □ = □

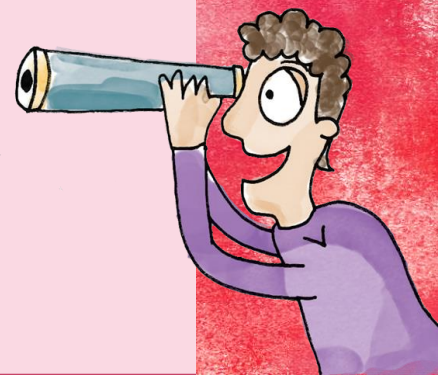


____ groups of ____

□ × □ = □



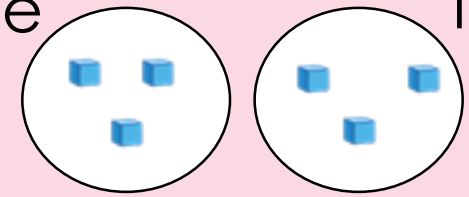
Develop Learning



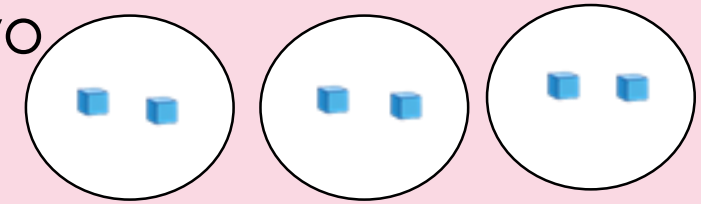
Applying learning about ten times greater

What if the first value is greater than one?

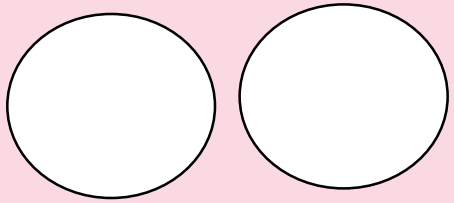
Two groups of three
3 × 2 or 2 × 3



Three groups of two
3 × 2 or 2 × 3

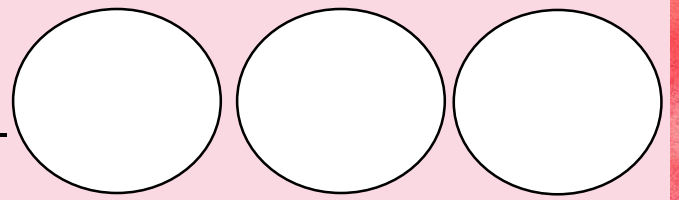


____ groups of ____



□ × □ = □

____ groups of ____



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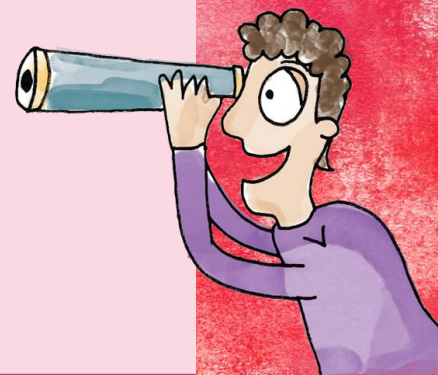
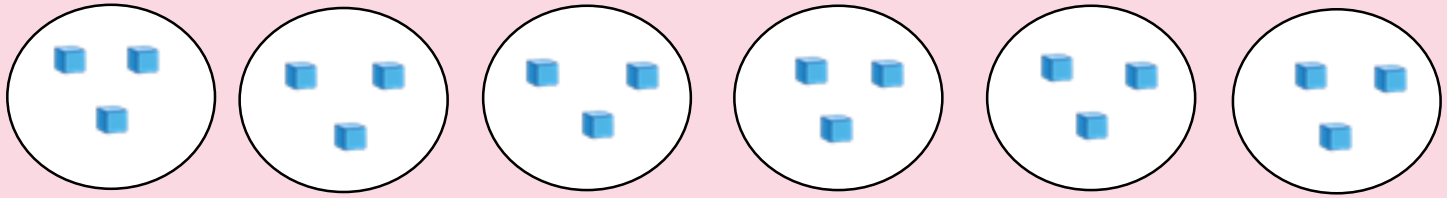
Develop Learning



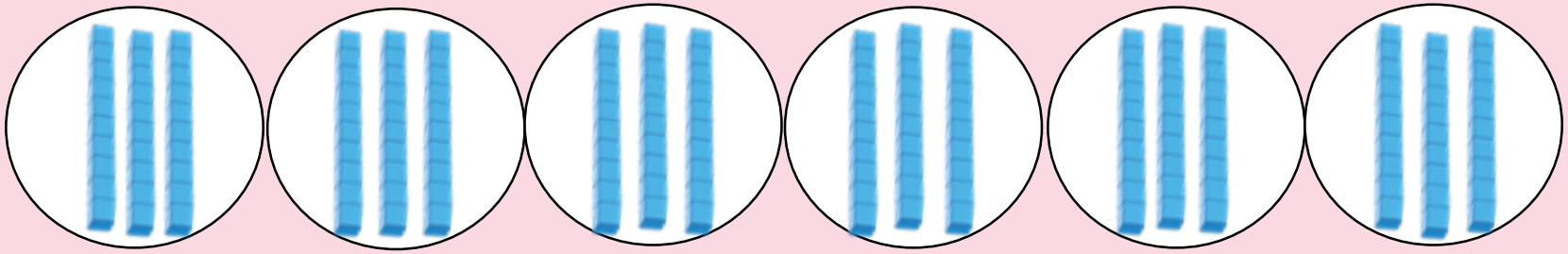
Applying learning about ten times greater

How could this help us?

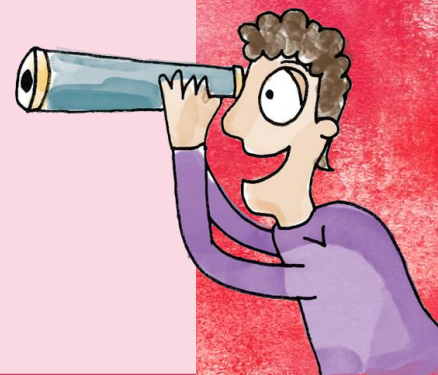
$6 \times 3 = 18$



$6 \times 30 = \square$

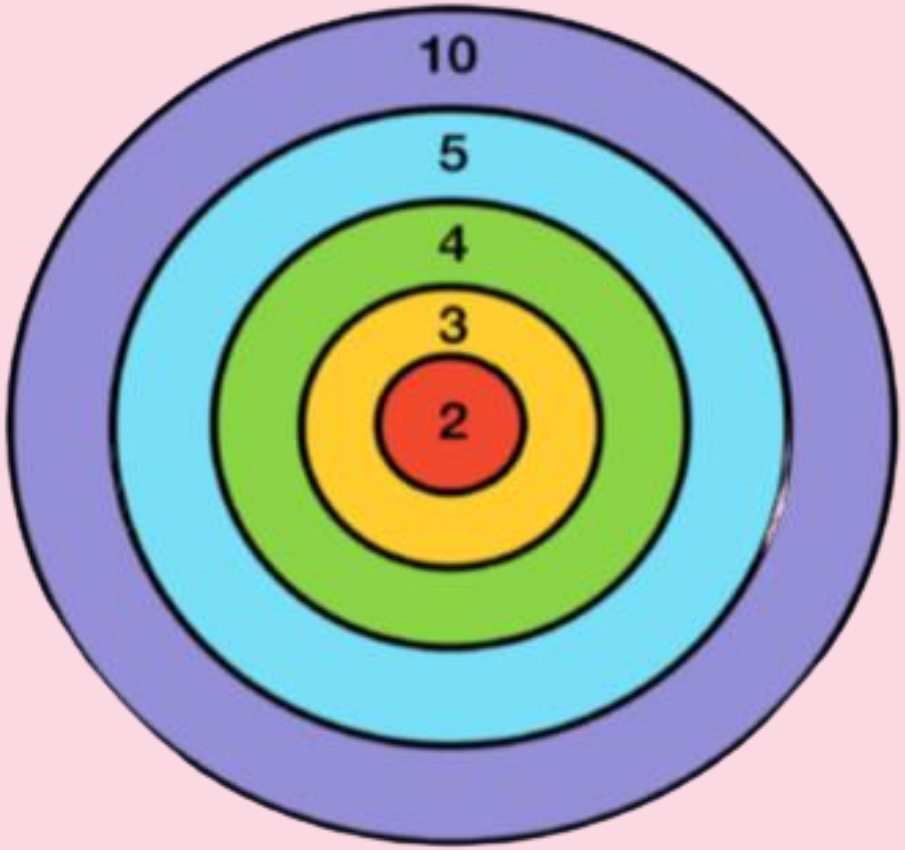


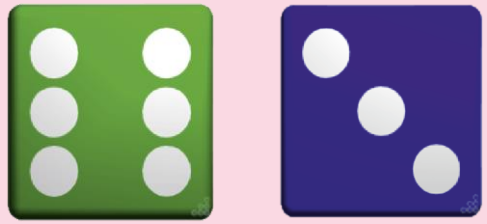
Develop Learning



Key learning: To derive ‘ten times greater’ facts for known multiplication facts

Deriving ‘ten times greater’ multiplication facts





Independent Task

If I know…what else do I know?

If I know that $3 \times 4 = 12$, what else do I know?

$4 \times 3 = 12$

$30 \times 4 = 120$

$12 \div 4 = 3$

$3 \times 4 = 12$

$12 \div 3 = 4$

$120 \div 3 = 40$

$40 \times 3 = 120$

$3 \times 4 = 12$

Plenary

Ark Curriculum+

Year 3 Unit 6: Multiplication and division

Lesson 9: Use bar models to represent word problems

Mathematics
Mastery

Teacher choice

Do Now

Key learning: To match appropriate bar models to multiplication and division problems

Star Words

twice as many/much

half of

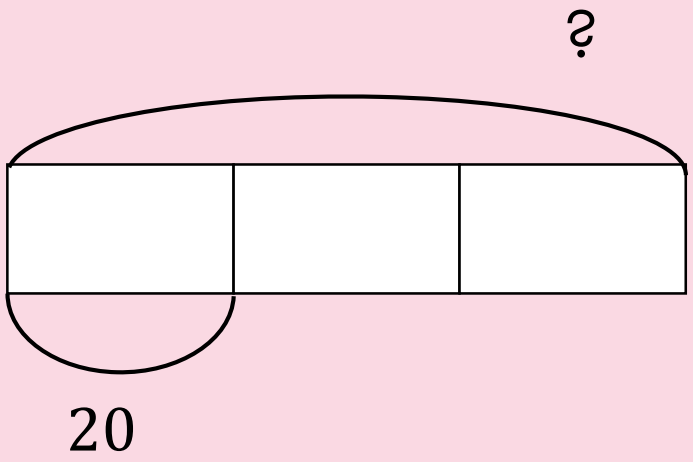
times greater/more

bar model

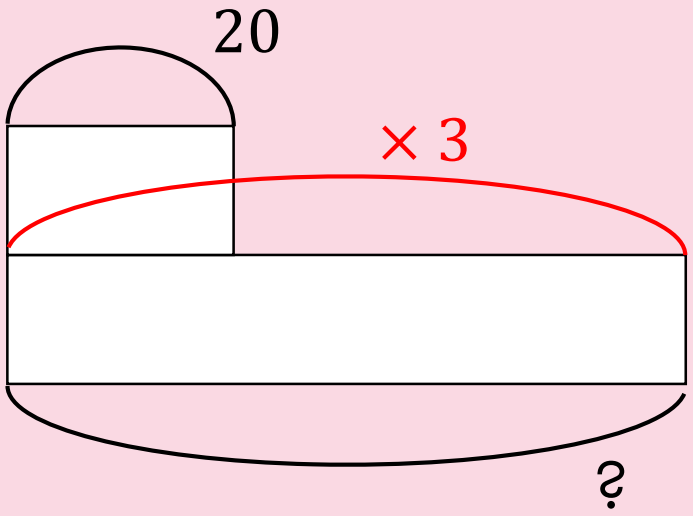
a third of

Comparing bar models for multiplication problems

New Learning



Robin shot his arrow three times as far as the Sheriff. The Sheriff's arrow went 20 metres. How far did Robin shoot his arrow?



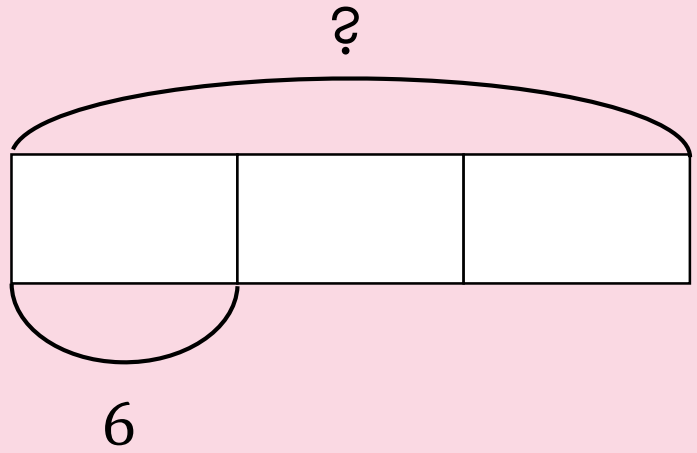
Friar Tuck cooked three bags of sausages. There were 20 sausages in each bag. How many sausages did he cook?

Describing knowns and unknowns to sort bar models

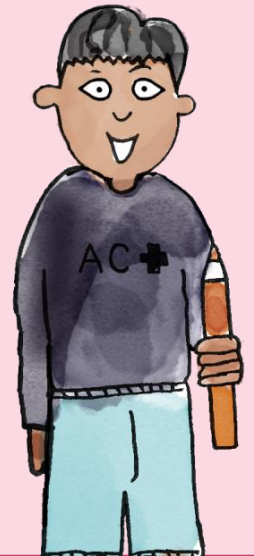
Talk Task for teachers

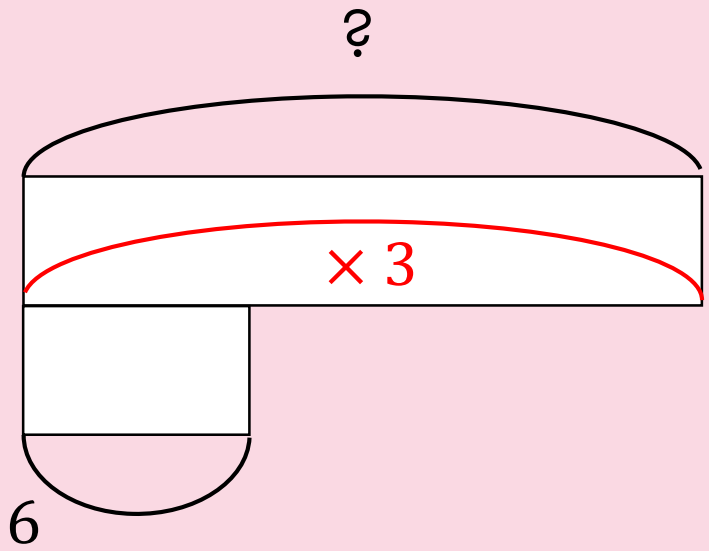
We know there are three equal parts and that each part has a value of six. We don't know the value of the whole.

We know that one value is six and we know that the second value is three times greater than six. We don't know the second value.



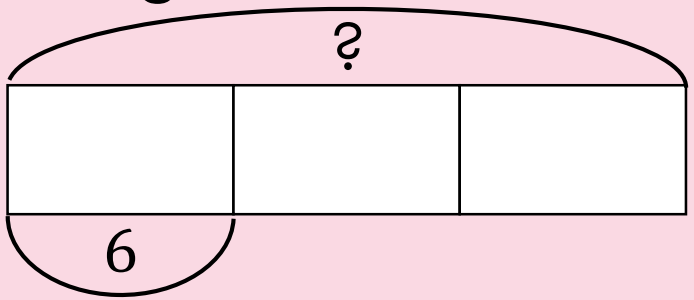
The first bar model has equal parts and a whole. The second bar model shows a times greater or times more relationship.

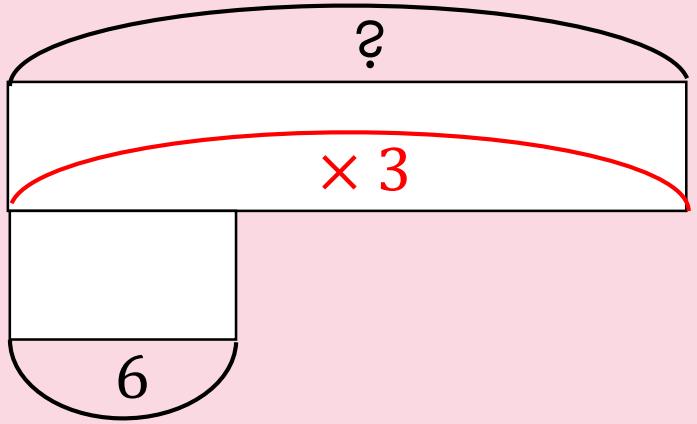




Describing knowns and unknowns to sort bar models

Choose a pair of bar models. Describe what is known and what is unknown. Sort the bar models as either **equal parts and whole** or **times greater / more.**





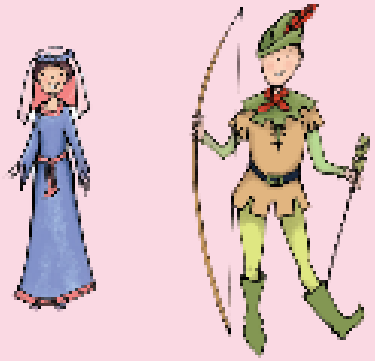
We know .... We don't know ...

This bar model shows a times greater or times more relationship.

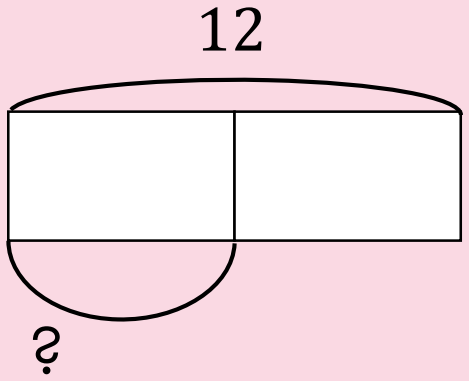
This bar model has equal parts and a whole.

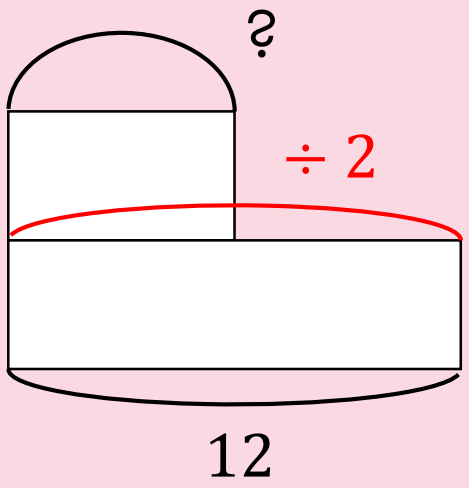
Talk Task

Comparing bar models for division problems

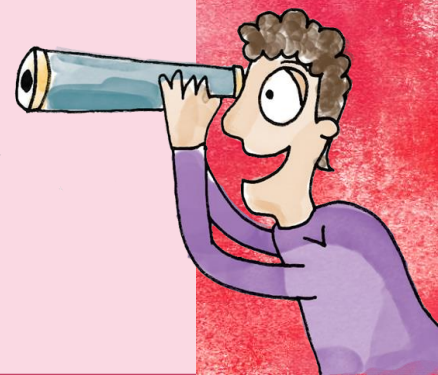


Maid Marian climbed 12 metres up a tree. Robin managed to climb half as high. How high did Robin climb?





The Sheriff was forced to give his gold coins to two Merry Men. There were 12 coins and each Merry Man got a fair share. How many coins did they get each?

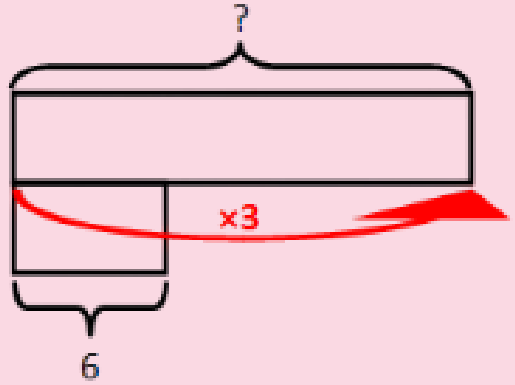


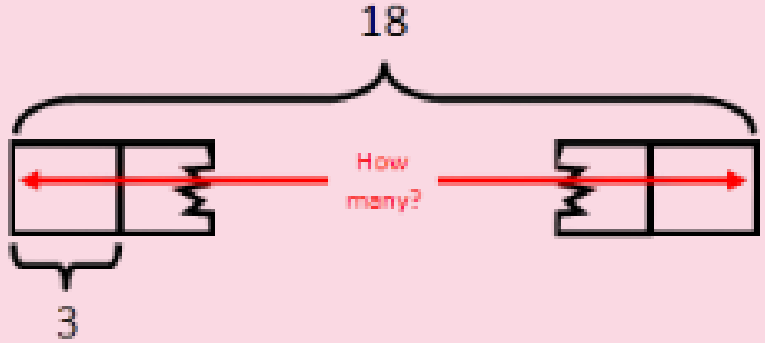
Develop Learning

Key learning: To match appropriate bar models to multiplication and division problems

Match bar models to multiplication and division problems

- Read each problem carefully.
- Describe the known and unknown values and find the appropriate bar model to match to the problem.
- Use the bar model to decide on the calculation needed to solve the problem. Calculate solution (using known number facts) and write a sentence to answer the question in the problem.





1) Marian has 18 biscuits. She gave three biscuits to each Merry Man when they came back from their adventures. How many Merry Men got biscuits?
2) Will Scarlett ate six chicken drumsticks. Friar Tuck ate three times as many! How many did Friar Tuck have?

Independent Task

How bar models helped to identify the calculation to solve the problem

Plenary

How good was your explanation?

Did the bar models help you understand what calculation was needed?