Week 9, Day 5
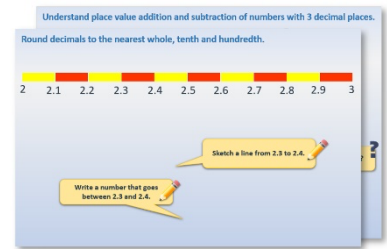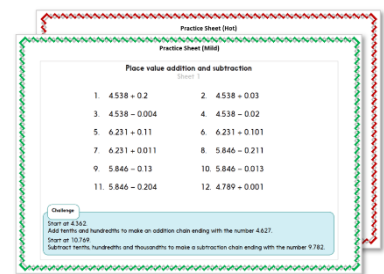## Multiply three numbers using commutativity

Each day covers one maths topic. It should take you about 1 hour or just a little more.
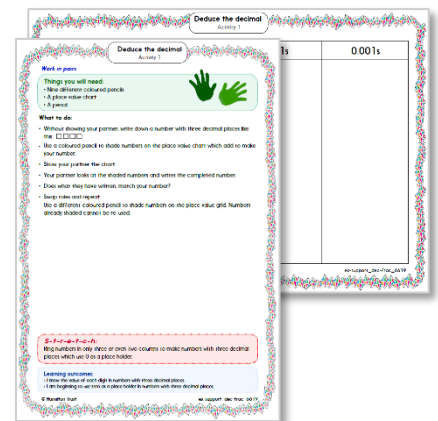
1. Start by reading through the **Learning Reminders**.
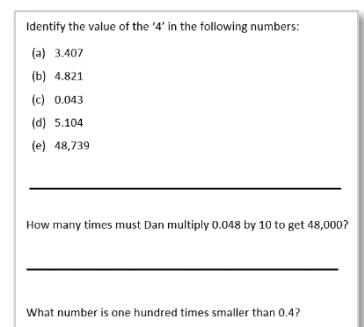They come from our *PowerPoint* slides.

2. Tackle the questions on the **Practice Sheet**.
There might be a choice of either Mild (easier) or
Hot (harder)!
Check the answers.

3. Finding it tricky? That's OK… have a go with a
grown-up at **A Bit Stuck?**

4. Have I mastered the topic? A few questions to
Check your understanding.
Fold the page to hide the answers!

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Learning Reminders

Multiply three numbers, recognising where commutativity can simplify a calculation, e.g. 2 × 6 × 5 = 6 × 10.

2 + 7 + 8

How would you work this out?

We can add in any order, so we could add 2 and 8 to make 10, then add the 7 on!

Multiplication can be done in any order, just like addition, to arrive at the same answer.
Work out 1 × 2 × 3 and 3 × 1 × 2.

We call this property 'commutativity'.

Learning Reminders

Multiply three numbers, recognising where commutativity can simplify a calculation, e.g. 2 × 6 × 5 = 6 × 10.

4 × 7 × 5

How could we change the order of this multiplication to help simplify the calculation?

e.g. 4 × 5 × 7, i.e. working out 20 × 7.

7 × 2 × 8

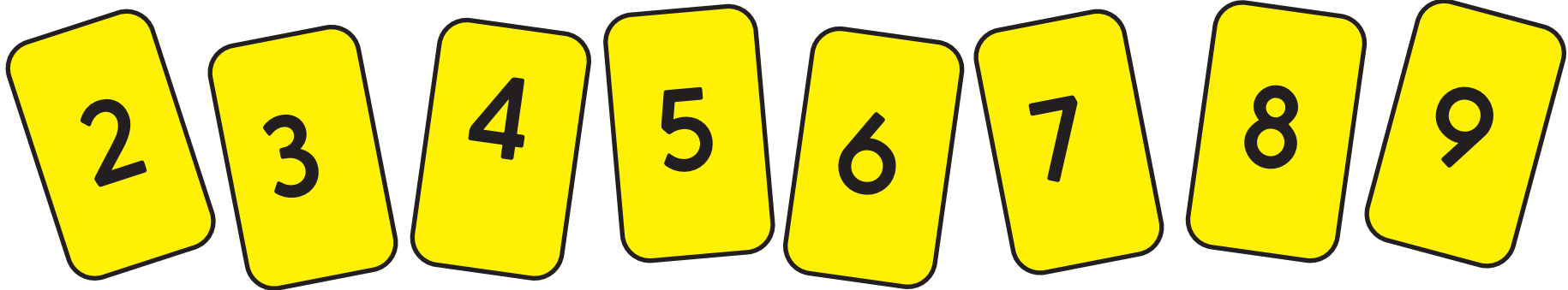How could we change the order of this multiplication to help simplify the calculation?

7 × 8 × 2 is probably a simpler order to work with because the second step involves finding 56 × 2, rather than 14 × 8.

Multiplying three numbers together

2 3 4 5 6 7 8 9

- Choose three numbers.

- Decide what order would be most efficient to multiply them together.
  Write them in that order and find the product.

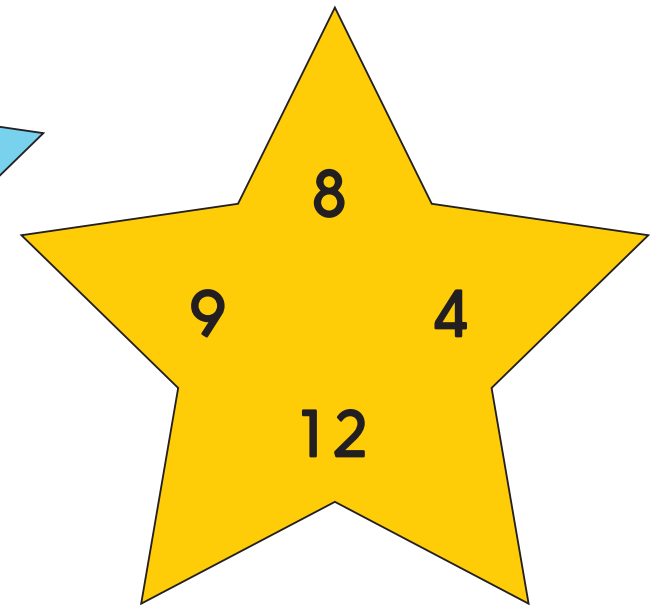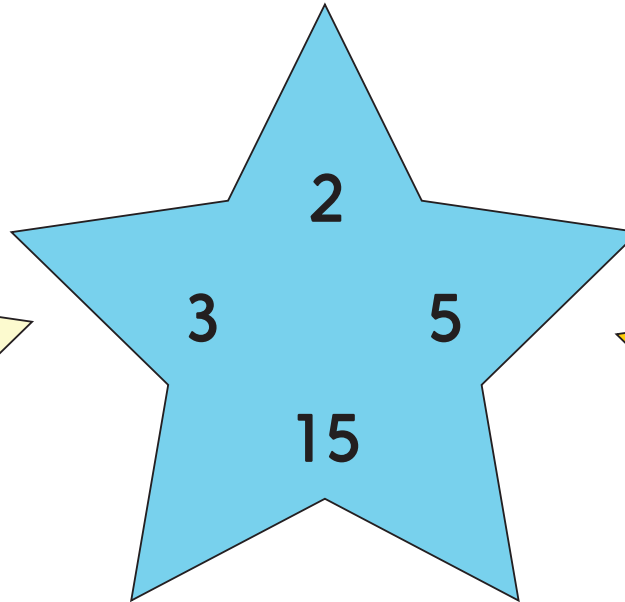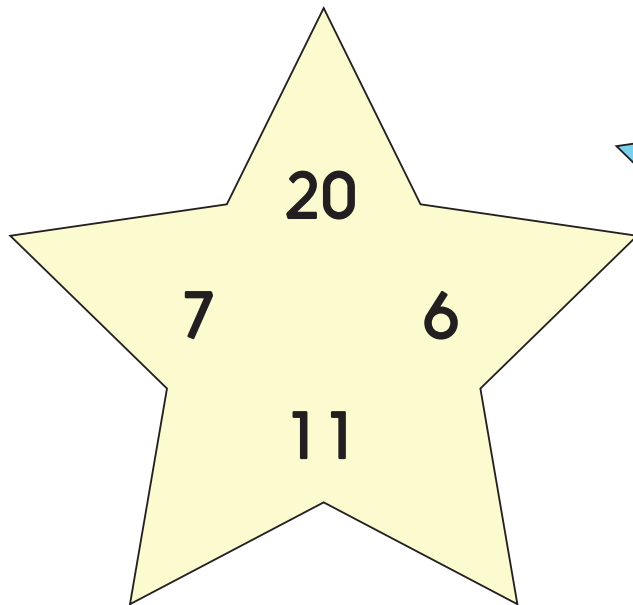- Repeat for at least seven more trios of numbers.

Challenge

- Can you find a trio with a product of 60?

- Can you find a trio with a product of 270?

Multiplying three numbers together

Choose one number from each of the 3 stars.
Decide the easiest order to multiply them together.
Repeat as many times as you can.

Star 1 (yellow): 20, 7, 6, 11

Star 2 (blue): 2, 3, 5, 15

Star 3 (orange): 8, 9, 4, 12

Challenge

Find the missing numbers:

$\bigcirc$ x 7 x 6 = 420

8 x 11 x $\bigcirc$ = 440

3 x $\bigcirc$ x 5 = 135

Practice Sheets Answers

Multiplying three numbers together (mild)

Answers could include:

2, 5, 9	5 x 2 = 10	10 x 9 = 90
2, 5, 8	5 x 2 = 10	10 x 8 = 80
2, 4, 5	4 x 5 = 20	20 x 2 = 40
4, 5, 6	5 x 4 = 20	20 x 6 = 120
2, 5, 6	5 x 6 = 30	30 x 2 = 60
3, 5, 6	5 x 6 = 30	30 x 3 = 90
2, 5, 8	5 x 8 = 40	40 x 2 = 80

Challenge

- Can you find a trio with a product of 60? 5 x 2 x 6

- Can you find a trio with a product of 270? 5 x 6 x 9

Multiplying three numbers together (hot)

Answers could include:

20, 2, 8	20 x 2 = 40	40 x 8 = 320	
7, 3, 9	7 x 3 = 21	21 x 9 = 189	(21 x 10) – 21
6, 15, 9	6 x 15 = 90	90 x 9 = 810	
11, 5, 12	5 x 11 = 55	55 x 12 = 660	(55 x 11) + 55

Challenge

10 x 7 x 6 = 420   8 x 11 x 5 = 440   3 x 9 x 5 = 135

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A Bit Stuck?
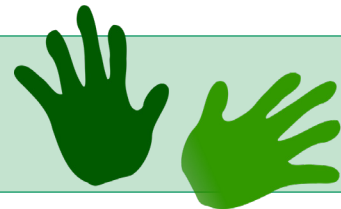## Creepy Crawlies and Sleeping Spiders

Which times table do you need to practise?
Creepy Crawlies will help you revise the 6x table, and Sleeping Spiders focuses on the 8x table. Choose one or do both... it's up to you!

Creepy Crawlies

Work in pairs

Things you will need:
• A set of 0 to 10 cards
• Ten creepy crawly cards

What to do:

• Shuffle the 0 to 10 cards and place face down.

• Turn over the top card.
  This is the number of creepy crawlies hiding under a stone.

• Take that number of creepy crawly cards.
  Use clever counting to work out the number of legs.

• Return the card to the bottom of the pack.
  BUT if you knew the answer without using clever counting, keep the card.

• Turn over the next card and repeat.

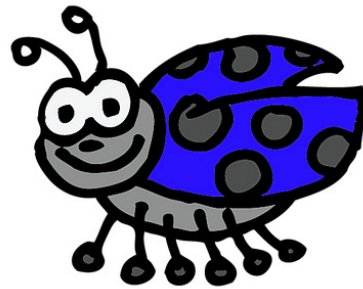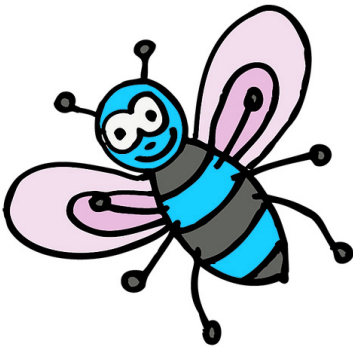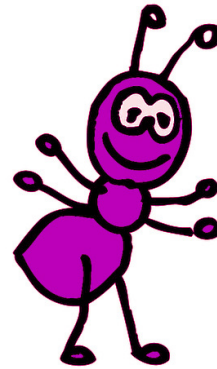• Keep playing the game until you don't have many cards left in the pack because you have learned so many facts!
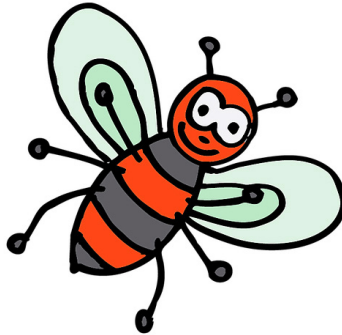
S-t-r-e-t-c-h:
Use the 0 to 12 cards. See if you can learn eight facts by heart!
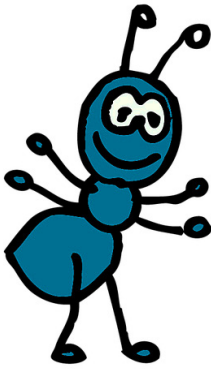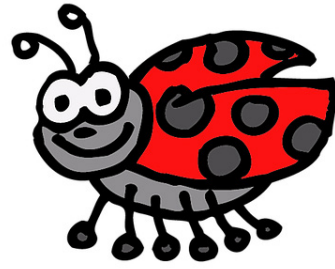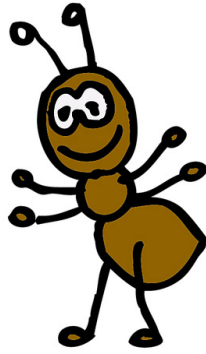
Learning outcomes:
• I can multiply numbers by 6.
• I am beginning to know some facts for the 6 times tables by heart.

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Work in pairs

Things you will need:
• A set of 0 to 10 cards
• Ten spider cards

What to do:

• Shuffle the 0 to 10 cards and place face down.

• Turn over the top card. This is the number of spiders asleep in a room in your house.

• Take that number of spider cards. Use clever counting to work out the number of legs.

• Return the card to the bottom of the pack. BUT if you knew the answer without using clever counting, keep the card.

• Turn over the next card and repeat.

• Keep playing the game until you don't have many cards left in the pack because you have learned so many facts!
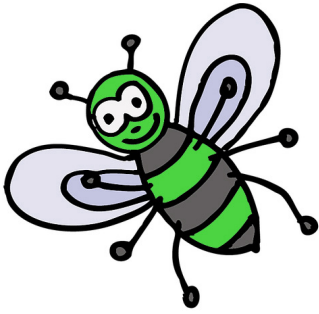
S-t-r-e-t-c-h:
Use the 0 to 12 cards. See if you can learn eight facts by heart!

Learning outcomes:
• I can multiply numbers by 8.
• I am beginning to know some facts for the 8 times tables by heart.

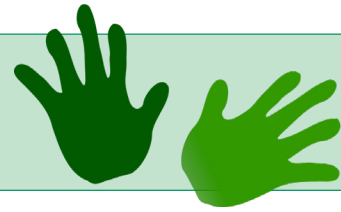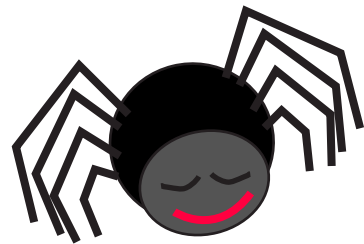Explore more Hamilton Trust Learning Materials at https://wrht.org.uk/hamilton

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Check your understanding
Questions

Find three different multiplication facts that you can multiply by 10 to give an answer of 400.

Reorder to find the product:
  i. 2 x 8 x 5
  ii. 5 x 3 x 4
  iii. 12 x 7 x 5
  iv. 7 x 4 x 15

Fill in the missing numbers:
□ x 5 x 6 = 120
4 x □ x 4 = 320

Fold here to hide answers

Check your understanding
Answers

Find three different multiplication facts that you can multiply by 10 to give an answer of 400.
Any of 1 × 40, 2 × 20, 4 × 10, 5 × 8. i.e. the factor pairs of 40, or trios such as 2 x 5 x 4, or 2 x 2 x 10.

Reorder to find the product:
  i. 2 x 8 x 5 80
  ii. 5 x 3 x 4 60
  iii. 12 x 7 x 5 720
  iv. 7 x 4 x 15 420

Fill in the missing numbers:
4 x 5 x 6 = 120
4 x 20 x 4 = 320