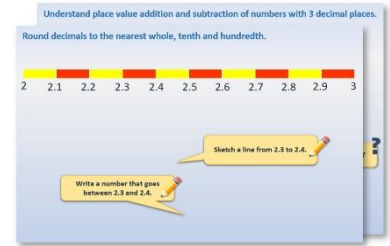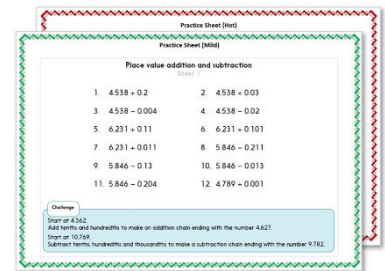# Week 14, Day 4
Sequences

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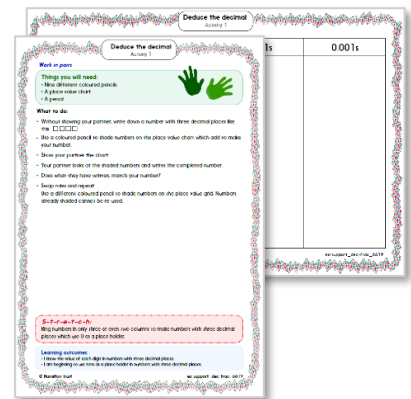
1. Start by reading through the **Learning Reminders**.
   They come from our *PowerPoint* slides.

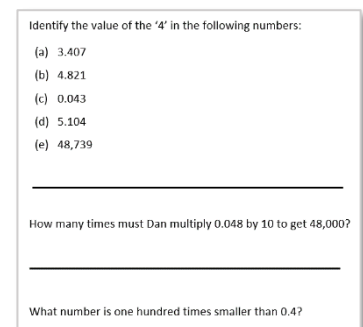2. Tackle the questions on the **Practice Sheet**.
   There might be a choice of either Mild (easier) or Hot (harder)!
   Check the answers.

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!

Learning Reminders

Extend and describe linear number sequences.

1, 8, 15, 22, 29...

Write the next three terms in this sequence.

Can you describe the pattern?

95, 89, 83, 77...

Write the next three terms in this sequence.

Can you describe the pattern?

Extend and describe linear number sequences.

1, 8, 15, 22, 29, 36, 43, 50

The difference between the terms is 7.

The pattern increases in steps of 7.

95, 89, 83, 77, 71, 65, 59

The pattern decreases in steps of 6.

The difference between the terms is 6.

Learning Reminders

Look at this sequence – we call each card a '<u>term</u>' in the sequence.

| 2 | 5 | 8 | 11 |

How would we describe it? *It goes up in 3s… The difference is 3.*

What would the next term be? *It would be 14…*

Let's draw a table.

n is the **number** of the term in the sequence	1	2	3	4	5	6	7	8	9	10
t is the value of the **term** in the sequence.	2	5	8	11	14	17	20	23	26	29

So, when **n** = 3, we can see that t = 8.   When **n** = 7, we can see that **t** = 20.

Can we predict what **t** will be, when **n** = 20?

Look at the sequence again.

- It goes up in 3s. The difference between each term is **3**
- That is like the 3x table
- But each answer is **1** less than a multiple of **3**

We can write a way of getting from **n** to **t**.

- Multiply **n** by **3** then **subtract 1**
- Write this as a formula **3n – 1 = t**
- Try it out

> **Example**
> Find the 20th term:
> 3 x 20 = 60
> Subtract 1 = 59
> 20th term is **59**

Here's a different sequence

| 5 | 9 | 13 | 17 |

What is the difference between the terms? *The difference is 4*

This is like the 4x table.

But each answer is 1 more than a multiple of 4.

We can write the way of getting from **n** to **t**.   It's **4n + 1 = t**

Use this to find the 11th term.

Now count to check. 5, 9, 13, 17, 21, 25, 29, 33, 37, 41, **45**   *BINGO!*

> **Example**
> Find the 11th term
> 4 x 11 = 44
> Add 1 = 45
> 11th term is **45**

Practice Sheet Mild
Sequences

1. This is part of a number sequence. The numbers increase by the same amount each time. Write the next three numbers.

   18, 26, 34, 42, 50, _____, _____, _____

2. Circle ALL of the numbers which will appear in this number sequence:

   25, 75, 125, 175, 225, etc.

   250, 275, 425, 550, 800, 1025

3. Write the missing numbers in this sequence.

   – 9 , – 7 , – 5 ☐ , – 1 ☐ , 3 , 5 , ☐ , 9

   Write one other number which would appear in this number pattern.

4. Write the next three numbers in this sequence.

   1.2, 2.4, 3.6, 4.8, 6, ___, ___, ___

5. Describe this sequence.

   ___, ___, ___, 80, 73, 66, 59, 52, 45, ___, ___, ___

   Write the missing numbers before 80 and after 45 in this pattern.

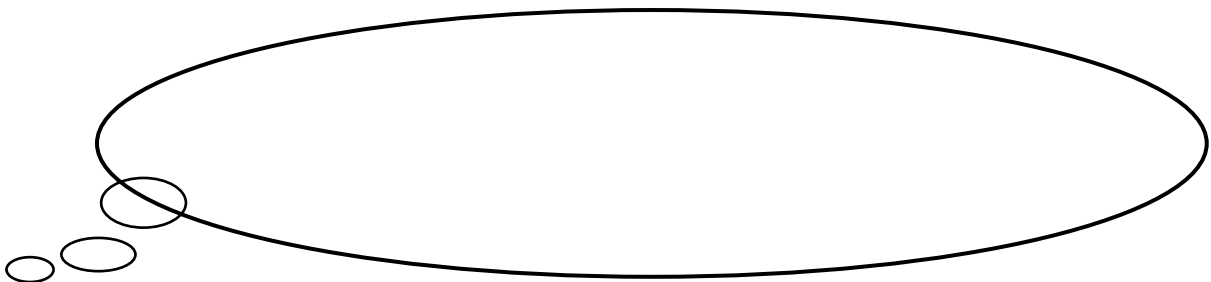6. Write the first two numbers less than zero in this sequence.

   200, 175, 150, 125, 100, 75

7. Josh started writing this sequence of numbers:

   6, 11, 16, 21, 26, 31, 36

   Will the number 94 appear in this sequence? Circle yes / no.
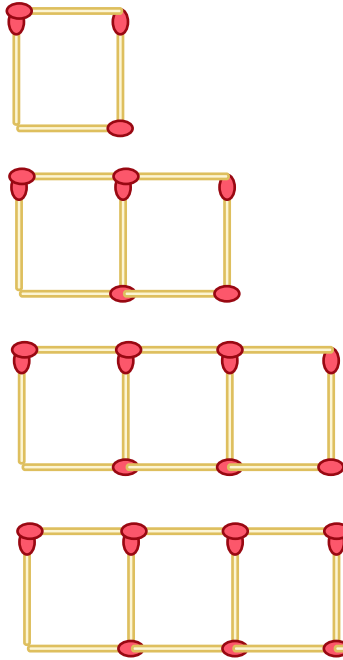
   Explain how you know.

Practice Sheet Hot
Sequences

1. The numbers in this sequence increase by the same amount each time. Write in the missing numbers.

   2 , ☐ , ☐ , ☐ , 26

2. Here is a sequence made from squares. Complete the table.

Number of squares	Number of matchsticks
1	4
2	7
3	
4	
5	
10	

How many matchsticks will be in the pattern which has 20 squares? _____

3. Here is a sequence of patterns made from triangles and circles. Complete the table.
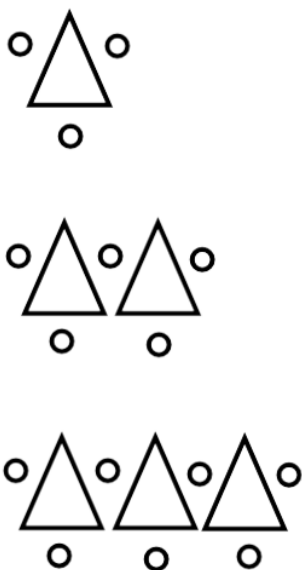
Number of triangles	Number of circles
1	3
2	5
3	
4	
5	
10	

How many triangles will be in the pattern which has 41 circles? _____

Practice Sheets Answers

Sequences (mild)

1. 18, 26, 34, 42, 50, 58, 66, 74

2. 275, 425 and 1025 will also appear in the sequence.
   The sequence contains any number which ends in 25 or 75.

3. -9, -7, -5, -3, -1, 1, 3, 5, 7, 9
   11 would also fit in the number pattern.

4. 1.2, 2.4, 3.6, 4.8, 6, 7.2, 8.4, 9.6

5. Describe this sequence. 80, 73, 66, 59, 52, 45   Subtract 7 each time.
   Write the missing numbers before 80 and after 45 in this pattern.
   101, 94, 87   38, 31, 24.

6. -25 and -50 are the first two numbers less than zero in the sequence.

7. No, 94 will not appear in the sequence.
   Sequence is an increase of 5 each time, numbers will proceed:
   41, 46, 51, 56, 61, 66, 71, 76, 81, 86, 91, 96

Sequences (hot)

1. 2, 8, 14, 20, 26

2.

Number of squares	Number of matchsticks
1	4
2	7
3	10
4	13
5	16
10	31

There will be 61 matchsticks in the pattern which has 20 squares.

3.

Number of triangles	Number of circles
1	3
2	5
3	7
4	9
5	11
10	21

20 triangles will be in the pattern with 41 circles.

A Bit Stuck?
Sibling sequences

Describe each sequence, then calculate the 6th term.

Can you estimate the 10th term? Count on in steps to check.

The sequences are in pairs. Can you see how each pair is related?

Sequence	Step size	6th term	10th term
10, 20, 30, 40, 50….			
11, 21, 31, 41, 51…			
5, 10, 15, 20, 21…			
6, 11, 16, 21, 26…			
4, 8, 12, 16, 20…			
5, 9, 13, 17, 21…			
8, 16, 24, 32, 40			
9, 17, 25, 33, 41			

S-t-r-e-t-c-h

Be a sequences superhero!

Can you estimate what the 100th term might be for any of these sequences?

Check your understanding
Questions

Write the 10th term in this sequence: 2, 5, 8, 11, 14…

Here is a pattern of number pairs:

n	*m*
1	8
2	13
3	18
4	23

Complete the rule for the number pattern:

$m =$ ☐ x $n +$ ☐

The rule for a number sequence is

$s = \frac{1}{2}t + 5$

What is the value of *s* when *t* = 12?

What is the value of *t* when *s* = 9?

Answers on the next page

Check your understanding
Answers

Write the 10th term in this sequence: 2, 5, 8, 11, 14…

29   Children may notice that the sequence is the multiples of 3, minus 1. The 10th term is (10 x 3) – 1.

Here is a pattern of number pairs:

n	*m*
1	8
2	13
3	18
4	23

Complete the rule for the number pattern:

$m =$ 5 x $n +$ 3

5 is the difference between each of the *m* values and +3 is the adjustment needed to create the sequence.

The rule for a number sequence is

$s = \frac{1}{2}t + 5$

What is the value of *s* when *t* = 12?   11

What is the value of *t* when *s* = 9?   8