year 6 transition work maths

Instructions

Calculate each answer then use the key to shade each section in the correct colour.

Red	0-100
Yellow	101-200
Orange	201-300
Blue	301 or more

Handwritten working (top left):
```
  0,
1056.12
 725.00 -
 ───────
 331.12
```

Handwritten working (top right): 16 × 23

X	10	6
20	200	120
3	30	18

= 368

Handwritten working (right):
```
 129
 147 +
 ───
 276
```

Handwritten working (bottom):
```
956 ÷ 4 = 239

   239
4)9⁵5⁴6
```

Puzzle grid calculations

- 1056.12 − 725
- 129 + 274
- 2507 ÷ 8
- 189.6 + 112
- 16 × 23
- 488 − 152.4
- 726 ÷ 2
- 13 × 32
- 1444.4 ÷ 4
- 254 + 162
- 24 × 29
- 142 + 176
- 124.2 + 179
- 556.8 − 159
- 13 × 3
- 14 × 4
- 126 + 39
- 5³
- 863 − 587
- 195 ÷ 3
- 5268 − 4915
- 13 × 15
- 23 × 9
- 96 ÷ 4
- 132 × 2.5
- 9 × 3 × 12
- 1026 − 696
- 789 − 467
- 756.4 ÷ 2
- 946 ÷ 8
- 122 + 112
- 963 − 592
- 1865 ÷ 5
- 1098 − 687
- 34 × 9
- 1968 ÷ 4
- 174 + 162
- 8652 ÷ 25
- 952 ÷ 2
- 960 ÷ 3
- 933 ÷ 3
- 418 − 394
- 956 ÷ 4
- −58 + 72
- 857 ÷ 5
- 5600 ÷ 25
- 250 ÷ 8
- 337 − 213
- 747 ÷ 621
- 24 × 6
- 6352 − 5917
- 127 + 198
- 14 × 2 × 14
- 4832 ÷ 16
- 7³
- 625 − 313
- 7038 ÷ 23
- 756.8 − 438
- −15 × −2
- 5214 − 4657
- 25 × 13

Maths and Me

I am _____ years old
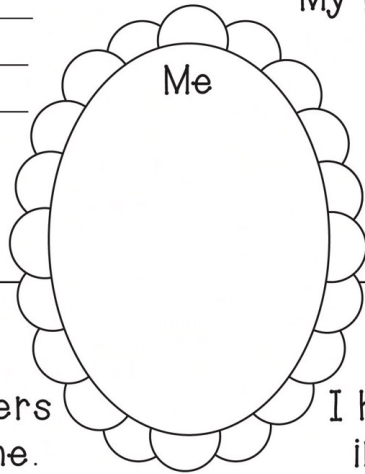
My birthday is on:
___ / ___ / ___

___ + ___ = ___
___ + ___ = ___
___ - ___ = ___
___ - ___ = ___

My favorite number is ____.

Me

My First Name

My Last Name

I have ____ letters in my first name.

I have ____ letters in my last name.

There are ____ people living in my house.

I have lost ____ teeth so far.

____ girls
____ boys

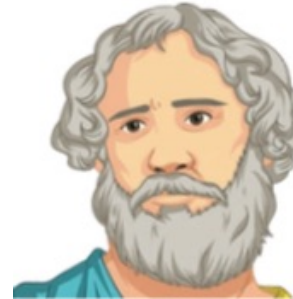I have ____ pets at home.

I wake up at ___:____.
I go to sleep at ___:____.

___ + ___ = ___

Facts about Famous Figures

Research the famous mathematicians. What can you tell me about them?
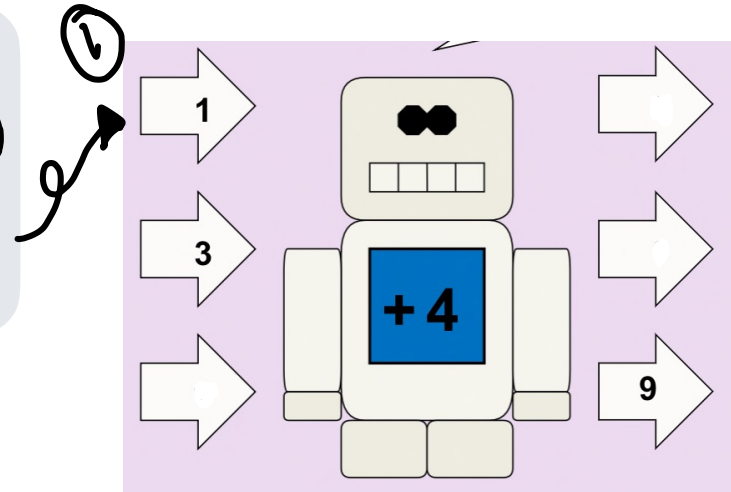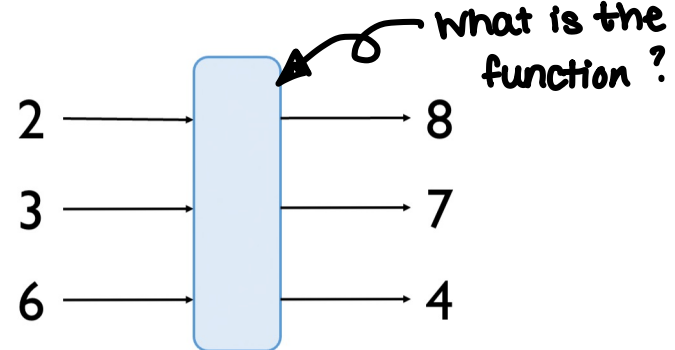
Archimedes

Lovelace

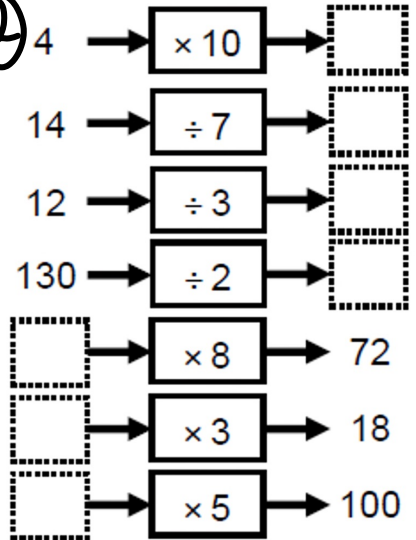**Fibonacci**

an introduction to algebra

Function Machines

1

1 →
3 →
+4
→
→ 9

3

Amir puts some numbers into a function machine.

what is the function ?

2 ——→ [ ] ——→ 8

3 ——→ [ ] ——→ 7

6 ——→ [ ] ——→ 4

What is the output from the function when the input is 16? (use the function above)

2

4 → ×10 → [ ]

14 → ÷7 → [ ]

12 → ÷3 → [ ]

130 → ÷2 → [ ]

[ ] → ×8 → 72

[ ] → ×3 → 18

[ ] → ×5 → 100

4

This function machine gives the same output for every input.
For example if the input is 5 then the output is 5 and so on.

Input ——→ ×2 ——→ [ ] ——→ Output

What is the missing part of the function?

What other pairs of functions can you think that will do the same?

5 Mo has the following function machines.

Input ——→ +2 ——→ −8 ——→ Output

Input ——→ ×8 ——→ ÷2 ——→ Output

Input ——→ ×2 ——→ −8 ——→ Output

Explain which of these can be written as single function machines.

6 Teddy has two function machines.

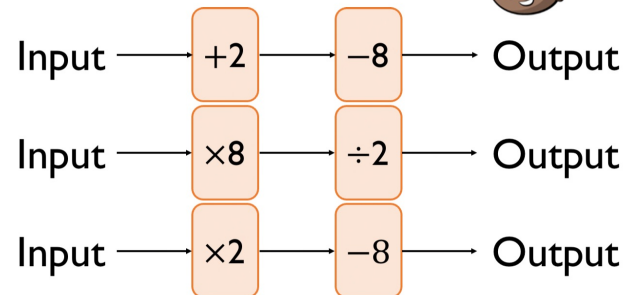Input ——→ +5 ——→ ×2 ——→ Output

Input ——→ ×2 ——→ +5 ——→ Output

He says,

The function machines will give the same answer.
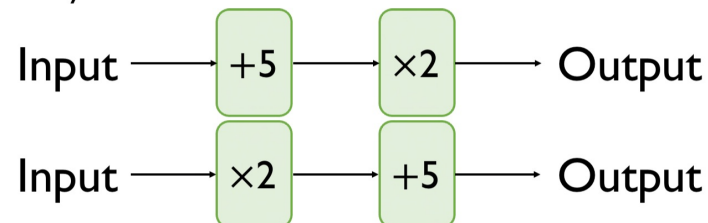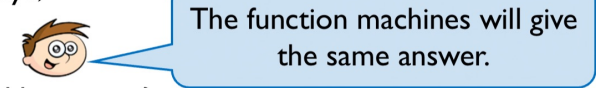
Is Teddy correct?

Is there an input that will give the same output for both machines?

algebra puzzles

find the missing values

Top left puzzle:

🐶	🐱	🐱	19
🐶	🐰	🐱	
🐶	🐰	🐰	
27		21	

🐶 =   🐱 =   🐰 =

Bottom left puzzle:

🥤	🥤	🍨	
🥤	🍨	🍨	11
🍰	🍰	🍰	36
26			

🍰 =   🥤 =   🍨 =

Middle puzzle:

🍟	🍟	🍔	🍔	30
🍔	🥤	🥤	🥤	24
🍔	🥤	🥤	🍟	
18				

🍟 =   🍔 =   🥤 =

Challenge

The perimeter of the triangle is 216 cm.

Sides labelled: $5x$, $3x$, $4x$
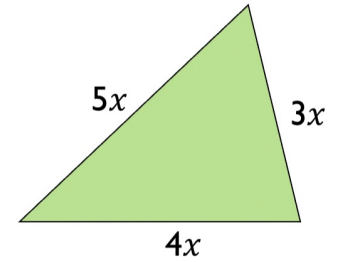
Form an equation to show this information.

Solve the equation to find the value of x.

Work out the lengths of the sides of the triangle.

- Hannah is 8 years old
- Jack is 13 years old
- Grandma is $x + 12$ years old
- The sum of their ages is 100

Form and solve an equation to work out how old Grandma is.

YEAR 7 — ALGEBRAIC THINKING...
Sequences

@whisto_maths

What do I need to be able to do?

By the end of this unit you should be able to:
- Describe and continue both linear and non-linear sequences
- Explain term to term rules for linear sequence
- Find missing terms in a linear sequence

Keywords

Sequence: items or numbers put in a pre-decided order
Term: a single number or variable
Position: the place something is located
Rule: instructions that relate two variables
Linear: the difference between terms increases or decreases by the same value each time
Non-linear: the difference between terms increases or decreases in different amounts
Difference: the gap between two terms
Arithmetic: a sequence where the difference between the terms is constant
Geometric: a sequence where each term is found by multiplying the previous one by a fixed non zero number

Describe and continue a sequence diagrammatically

Count the number of circles or lines in each image

1   3   5

+2   +2

What will the next number be? Can you draw this?

Predict and check terms

3   5   7

+2   +2

CHECK – draw the next terms

9   11   13

Predictions:
Look at your pattern and consider how it will increase.

e.g How many lines in pattern 6?
Prediction - 13
If it is increasing by 2 each time - in 3 more patterns there will be 6 more lines

Sequence in a table and graphically

Position: the place in the sequence

1   2   3

3   5   7

"The term in position 3 has 7 squares"

Term: the number or variable
(the number of squares in each image)

Graphically

In a table

Position	1	2	3
Term	3	5	7

+2   +2

Because the terms increase by the same addition each time this is **linear** – as seen in the graph

Linear and Non Linear Sequences

Linear Sequences – increase by addition or subtraction and the same amount each time
Non-linear Sequences – do not increase by a constant amount – quadratic, geometric and Fibonacci
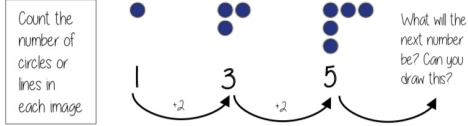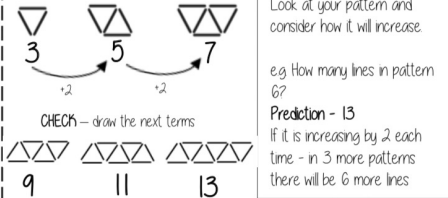- Do not plot as straight lines when modelled graphically
- The differences between terms can be found by addition, subtraction, multiplication or division

Fibonacci Sequence – look out for this type of sequence

0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms

Continue Linear Sequences

7, 11, 15, 19...

How do I know this is a linear sequence?
It increases by adding 4 to each term
How many terms do I need to make this conclusion?
At least 4 terms – two terms only shows one difference not if this difference is constant (a common difference)
How do I continue the sequence?
You continue to repeat the same difference through the next positions in the sequence

Continue non-linear Sequences

1, 2, 4, 8, 16 ...

How do I know this is a non-linear sequence?
It increases by multiplying the previous term by 2 – this is a geometric sequence because the constant is multiply by 2
How many terms do I need to make this conclusion?
At least 4 terms – two terms only shows one difference not if this difference is constant (a common difference)
How do I continue the sequence?
You continue to repeat the same difference through the next positions in the sequence

Explain term-to-term rule
How you get from term to term

Try to explain this in full sentences not just with mathematical notation.
Use key maths language – doubles, halves, multiply by two, add four to the previous term etc.

To explain a whole sequence you need to include a term to begin at...

The next term is found by tripling the previous term. The sequence begins at 4

4, 12, 36, 108...

x3   x3   x3

First term

---

sticky sequences

I was exploring a puzzle in which headless match sticks had to be moved to make a different number of triangles.

I made one small triangle
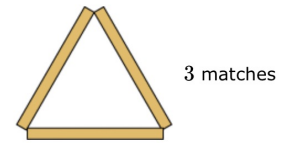
3 matches

I made it into 4 small triangles by adding 6 matches.
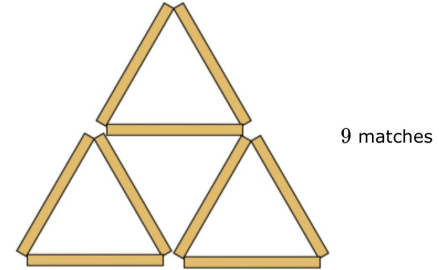
9 matches

I added another row and counted the number of small triangles and counted the matches.
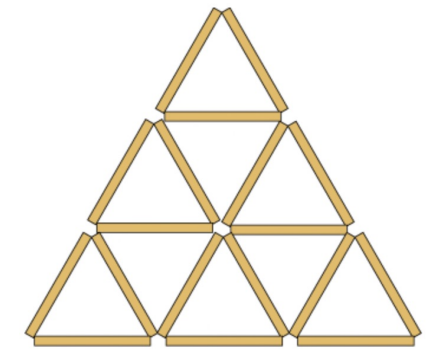
Have a go and see what patterns you can find. You do not have to use match sticks (or cocktail sticks) - drawing lines will do just as well.

an intro into sequences

1

Here is part of a number sequence.

The numbers increase by the same amount each time.

| 750 | 755 | 760 | 765 | 770 |
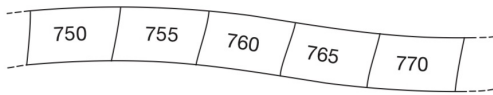
The sequence continues.

Circle **all** of the numbers below that would appear in the sequence.

840 905 989 1000 2051

2

The numbers in this sequence increase by 3 each time.

3 6 9 12 . . .

The numbers in this sequence increase by 5 each time.

5 10 15 20 . . .

Both sequences continue.

Write a number **greater than 100** which will be in **both** sequences.

4

Hayley makes a sequence of numbers.

Her rule is

'find half the last number then add 10'

Write in the next two numbers in her sequence.

36 28 24 ☐ ☐

3

Here is a doubling sequence.

Write the three missing numbers.

☐ →×2→ 38 →×2→ ☐ →×2→ 152 →×2→ ☐

6

Here is a repeating pattern of shapes.

Each shape is numbered.

⭐1 ◻2 △3 ⬠4 ⬤5 ⭐6 ◻7 △8 ⬠9 ⬤10

The pattern continues in the same way.

Write the numbers of the next two **stars** in the pattern.

☐ and ☐

Janine says:

"Shape number 35 will be a circle"

Explain why Janine is correct.
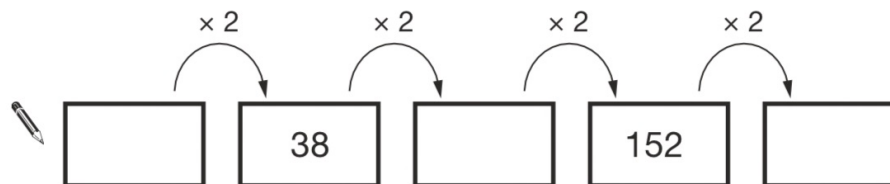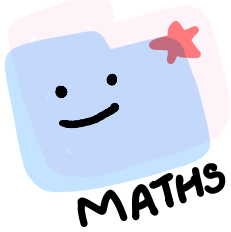
Maths and Money

Instructions

Use the key to calculate the value of each word, in pounds. The first question has been completed for you.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
50p	£1.03	£0.62	£0.15	10p	72p	22p	£0.15	£0.08	£1.21	£2.50	£1.08	42p	£0.78	£0.05	£1.65	£3.00	45p	68p	£0.18	95p	£0.27	£1.11	£1.85	£2.05	£2.88

#	Word	
1	NUMBER	£0.78 + 95p + 42p + £1.03 + 10p + 45p = £3.73
2	ALGEBRA	
3	PROBABILITY	
4	STATISTICS	
5	GEOMETRY	
6	RATIO	
7	MEASURE	
8	OPERATION	
9	ADDITION	
10	SUBTRACTION	
11	MULTIPLICATION	
12	DIVISION	

45 + 101		67 – 34		1088 + 478		4506 – 216	
23 + 27		98 – 55		2056 + 789		9997 – 658	
68 + 43		104 – 89		295 + 498		2054 – 417	
112 + 45		256 – 87		312 + 714		1081 – 804	
145 + 62		567 – 314		896 + 747		670 – 487	
132 + 98		312 – 49		409 + 6802		248 – 119	
43 + 56		687 – 563		608 + 7897		902 – 675	
98 + 35		981 – 607		2145 + 421		9783 – 406	
114 + 232		604 – 239		3987 + 318		8962 – 434	
101 + 98		345 – 268		803 + 746		786 – 387	
85 + 67		938 – 412		1043 + 157		962 – 908	
42 + 55		656 – 437		952 + 986		4894 – 1394	
109 + 156		298 – 131		475 + 9042		561 – 416	
246 + 398		385 – 215		1037 + 2498		896 – 516	
312 + 497		1085 – 617		5682 + 492		7845 – 2478	
458 + 984		2567 – 678		632 + 1084		2398 – 1304	
1092 + 48		9875 – 567		783 + 209		9987 – 4377	
456 + 86		2050 – 498		6013 + 549		9832 – 984	
549 + 290		114 – 89		619 + 8014		736 – 698	
236 + 641		262 – 119		378 + 504		295 – 117	
1032 + 1067		562 – 229		409 + 656		8978 – 3659	

Sequence:

Term:

Rule:

Linear:

Non-Linear:

Fibonacci:

Geometric:

· Axes

· Difference

· Ascending

· Descending

Maths Riddles

- I am a cube number and a square number below 100.
- 8, 4 and 16 are factors.

What number am I?

- I am a square number.
- I am an even number.
- I am between 20 and 50.

What number am I?

- I am a prime number.
- I am less than 20 and I have two digits.
- If you double me and subtract 9, you get a square number.

What number am I?

- I am a square number.
- I am an odd number.
- I am between 20 and 50.
- 7 is one of my factors.

What number am I?

- I am an even number.
- I am more than 80 but less than 90.
- 6, 12 and 7 are some of my factors.
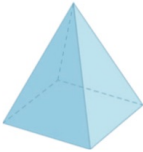
What number am I?

a

$3.9 \times 30 =$

c

$1\frac{3}{4} + \frac{1}{2}$

Write your answer as a mixed number fraction.

e

Two of the angles in a triangle are 60° and 50°.

Logan says, 'The triangle must be isosceles.'

Explain why Logan is **not** correct.

a

A book has 316 pages. Ameena reads $\frac{1}{4}$ of the pages.

How many pages does Ameena have **left** to read?

c

Here is a drawing of a 3D shape.

Identify the number of faces, vertices and edges which the shape has:

faces:

vertices:

edges:

What is the name of this 3D shape?

e

Identify all the common factors of both 12 and 28.

f

There are 24 students in a class.

The teacher has 8 litres of blackcurrant squash.

They pour 275 millilitres of blackcurrant squash for each student.

How much squash is **left** over? Give your answer in litres.

b

Molly completes this calculation:

```
    8 5
  -  6 8
    1 7
```

Write an **addition** calculation she could use to check her answer.

d

Jamie has £300. He spends 65% of the money on a new bike.

How much does Jamie spend on his new bike?

f

The numbers in this sequence **decrease** by the same amount each time.

204 718, 203 718, 202 718, 201 718, 200 718

What is the next number in the sequence?

b

The temperature in the fridge is 6°C.

The temperature in the freezer is -22°C.

What is the **difference** between the two temperatures?

d

$0.1 \div 100$

a

$0.25, \frac{75}{100}, \frac{14}{100}, 0.5, \frac{3}{12}$

Which two numbers from the list are equivalent to $\frac{1}{4}$?

c

$\frac{1}{4} \div 2$

e

$8^2 - 45 \div 5$

a

Round 82 275 to the nearest:

i.   10

ii. 100

iii. 1000

iv. 10 000

c

Draw all the lines of symmetry on the diagram below.

e

$6082 - 467.002$

b

Here are four number cards:

| 6 | 1 | 7 | 5 |

i. Ava uses each card once to make a four-digit number. She places:
   • 5 in the hundreds column;
   • 6 so that it has a lower value than any of the other digits;
   • The remaining 2 digits so that 1 has the higher value.
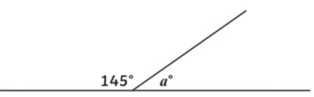
   What is Ava's number?

ii. Ava was given an extra card. When she multiplied the number on the card by 1576, the result was 15 760.

   What number was on the card?

d

Elijah buys 4 large crates of oranges and 3 small crates of oranges.

Each large crate has 32 oranges and each small crate has 16 oranges.

Elijah would like to give 1 orange to each student in his year group.

If there are 180 students in his year group, does he have enough oranges so that every student receives 1 orange each?

f

Calculate 99% of 500

b

Calculate the missing angle, a.

145° $a°$

d

A farmer is packing eggs.

Each box holds six eggs.

The farmer has 860 eggs to pack.

i. How many boxes can the farmer fill?

ii. How many eggs will be left over?

f

A bag contains 7 red beads, 4 blue beads, 5 orange beads and 2 pink beads.

If a bead is picked at random, what is the probability of getting:

i.   A red bead?

ii. A blue or pink bead?

iii. Not an orange bead?

guided READING

5 What does 'calculate' mean? (line 3)

6 What type of word is 'however'? (line 3)

10 Choose two verbs in the text and find a synonym you could replace them with.

1 Who are the Fibonacci numbers named after?

2 When was the sequence earlier described?

**3** Give 3 examples of where Fibonacci numbers are used or seen...

4 What does each diagram show?

SEQUENCES

Written by @missolivemaths

Fibonacci numbers are named after Italian mathematician Leonardo of Pisa, later known as Fibonacci. In his 1202 book Liber Abaci, Fibonacci introduced the sequence to Western European mathematics, using it to calculate the growth of rabbit populations. However, the sequence had been described earlier in Indian mathematics, as early as 200 BC in work by Pingala on enumerating possible patterns of Sanskrit poetry formed from syllables of two lengths.

Fibonacci numbers appear unexpectedly often in mathematics and are used in computer algorithms and random number generators. They also appear in biological settings, such as branching in trees, the arrangement of leaves on a stem, the fruit sprouts of a pineapple, the flowering of an artichoke, an uncurling fern, and the arrangement of a pinecone's bracts.
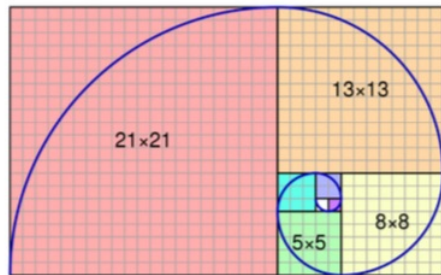
The Fibonacci spiral: created by drawing arcs across squares whose side lengths are successive Fibonacci numbers: 1, 1, 2, 3, 5, 8, 13, 21...

Examples of the Fibonacci spiral in the natural world.

11 Summarise this text in 2 sentences.

12 Continue the Fibonacci sequence for 19 more terms.

9 What word could replace 'unexpectedly'? (line 6)?

7 What is a 'syllable'? (Line 5)

8 What do you think is the root of the word 'enumerating'? (line 5)