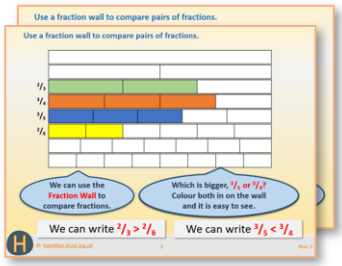
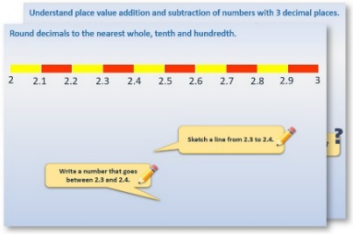
# Week 13, Day 5
# Patterns and sequences

**Each day covers one maths topic. It should take you about 1 hour or just a little more.**

1. If possible, watch the **PowerPoint presentation** with a teacher or another grown-up.




OR start by carefully reading through the **Learning Reminders**.

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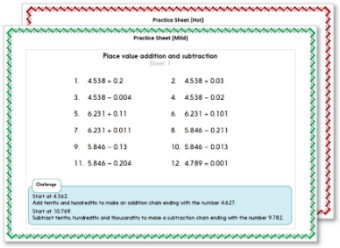
2. Think you've got it? Have a go at the **Investigation** or **Practical Activity**.

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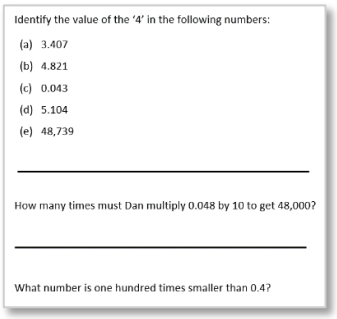
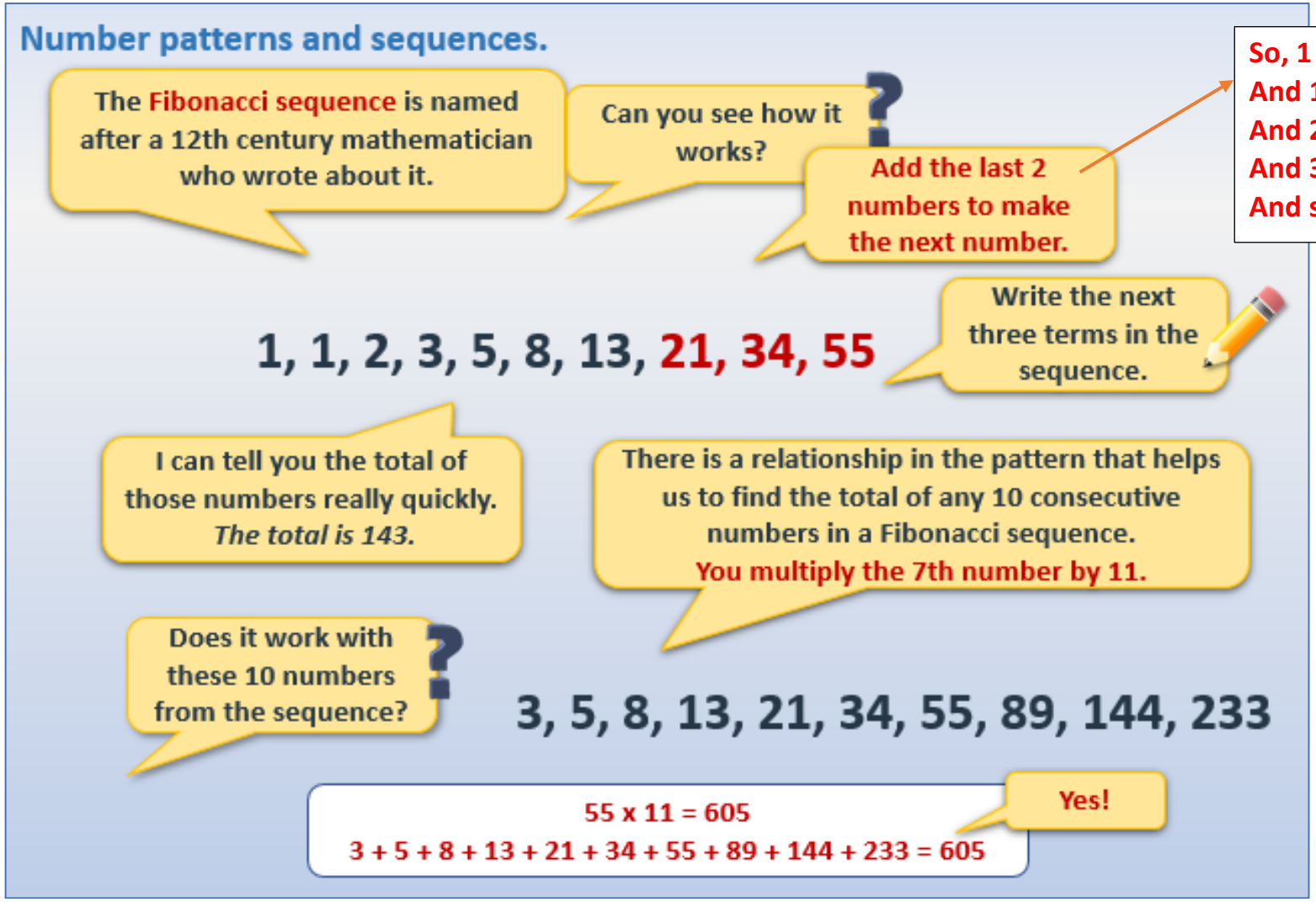
3. Have I mastered the topic? A few questions to **Check your understanding**.
Fold the page to hide the answers!



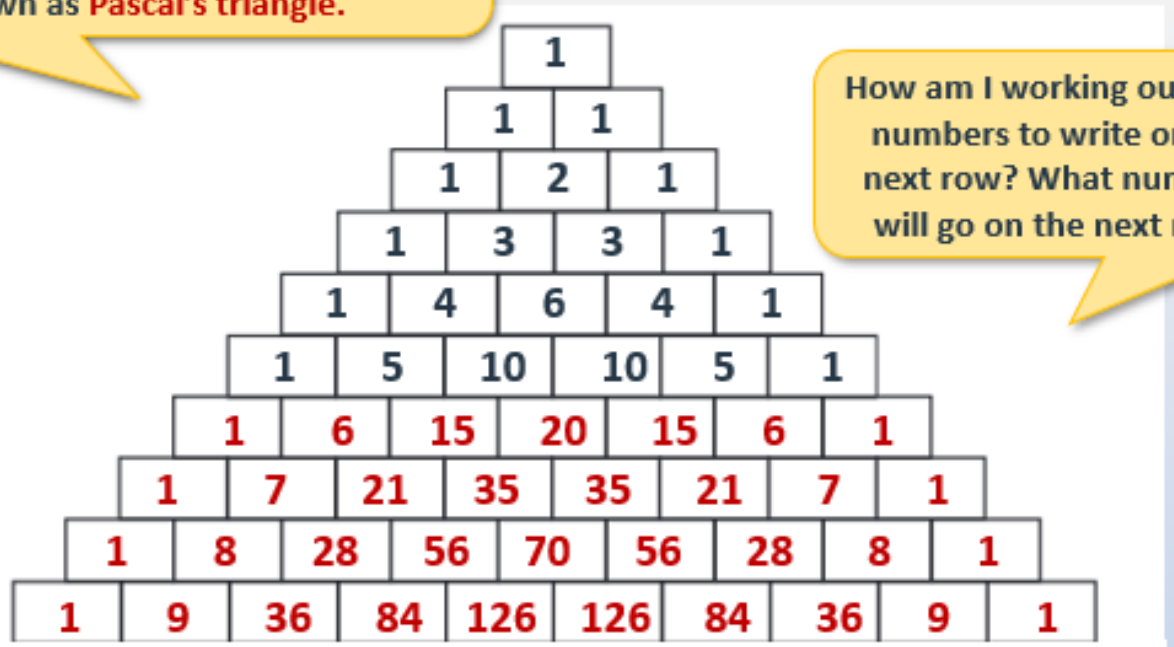
# Learning Reminders



# Learning Reminders

## Number patterns and sequences.

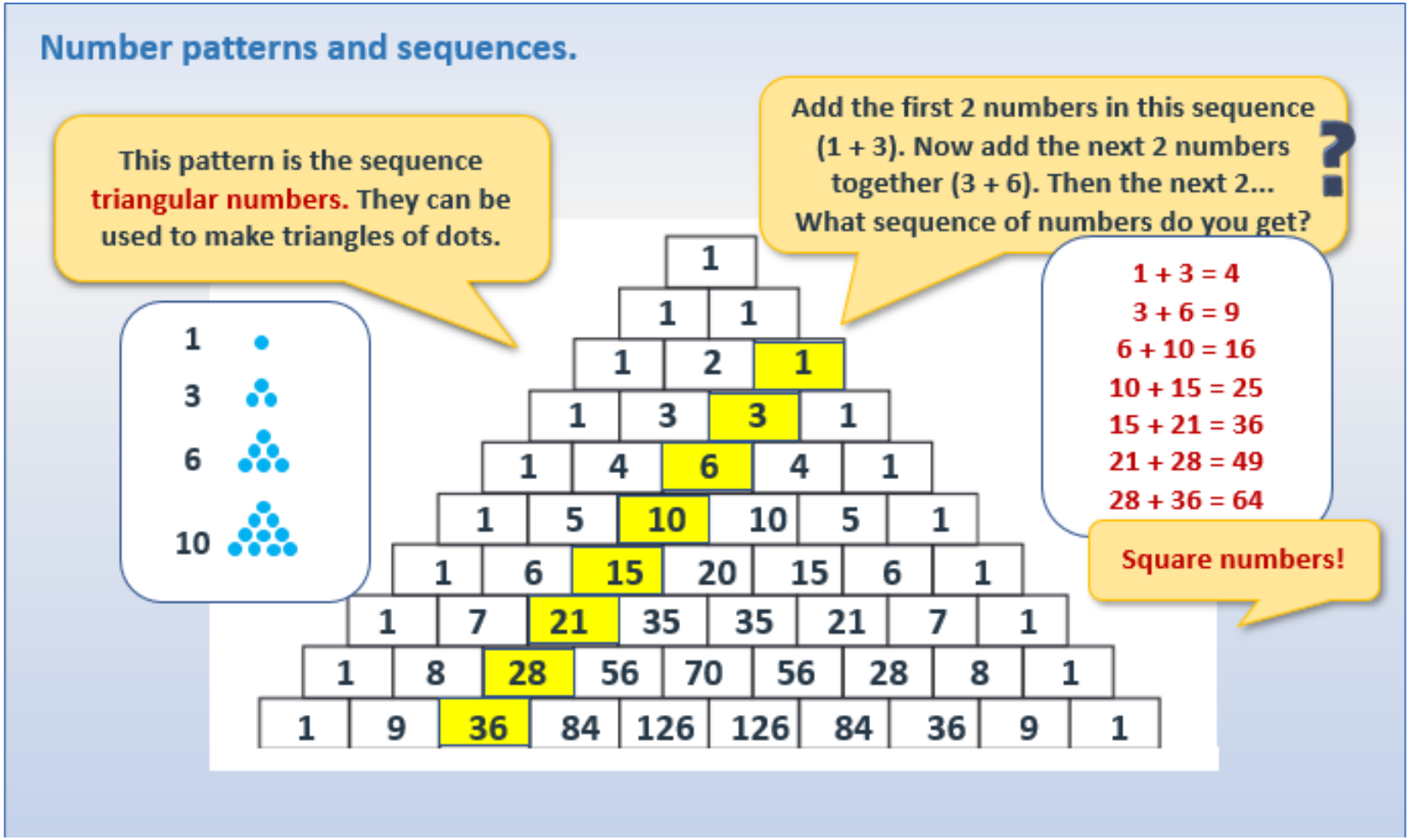
Patterns have intrigued mathematicians for centuries. Blaise Pascal (1623–1662) discovered new patterns in what is now known as Pascal's triangle.



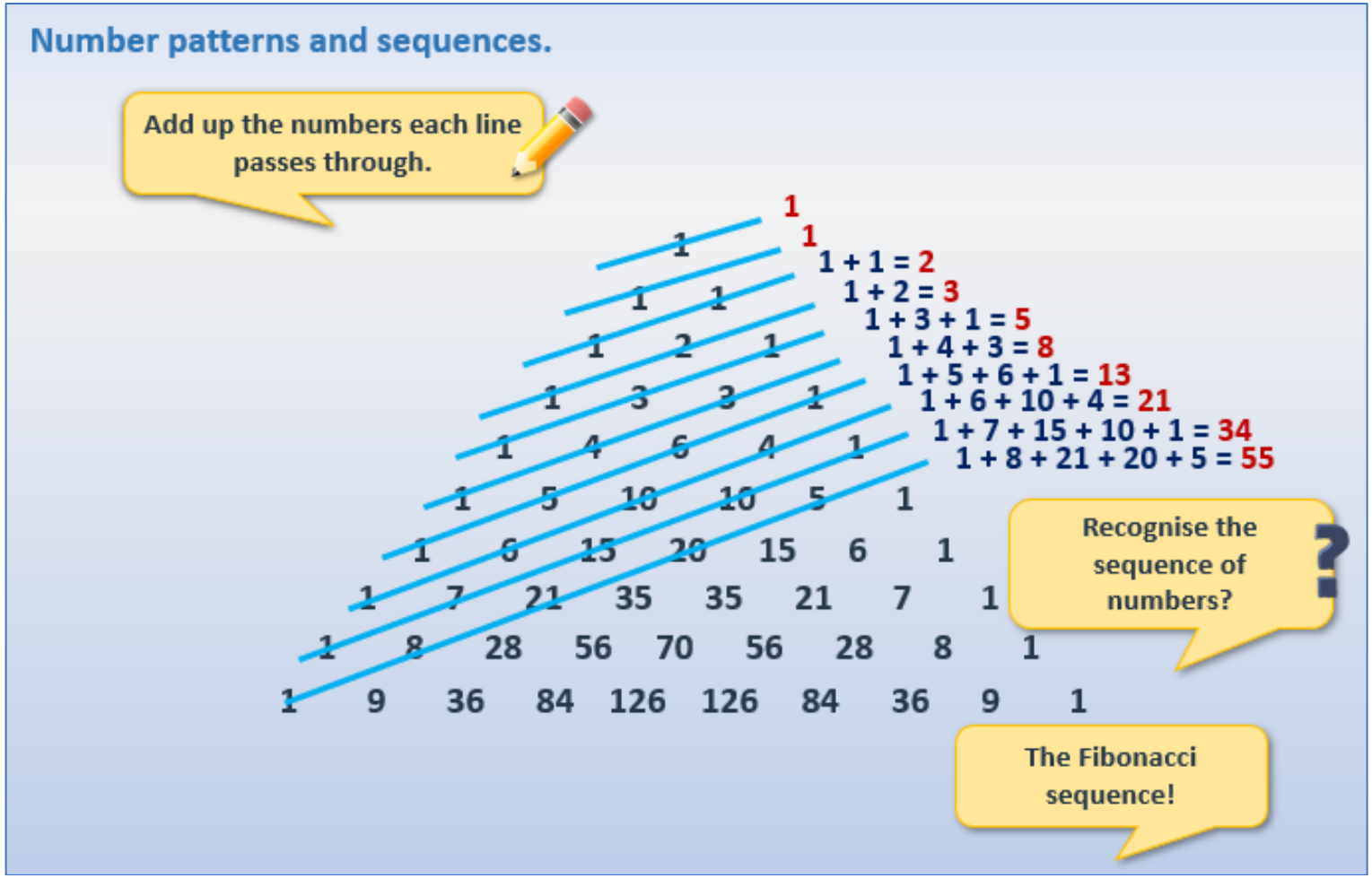

How am I working out what numbers to write on the next row? What numbers will go on the next row?

Can you see any patterns?

# Learning Reminders



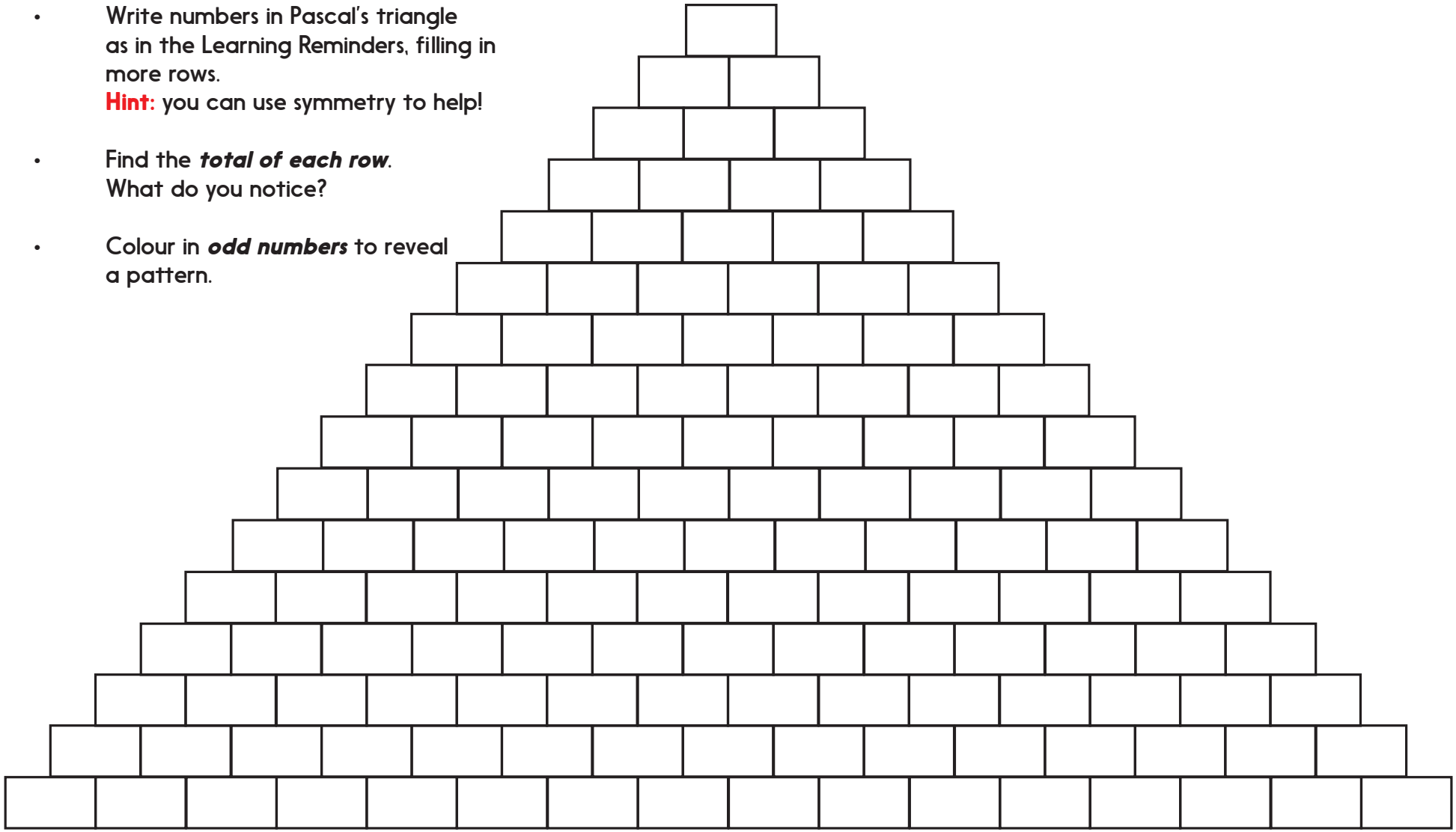
# Learning Reminders




**There is a choice of two investigations to complete...**

# Investigation 1
## Pascal's triangle

- Write numbers in Pascal's triangle as in the Learning Reminders, filling in more rows.
  **Hint:** you can use symmetry to help!
- Find the ***total of each row***.
  What do you notice?
- Colour in ***odd numbers*** to reveal a pattern.



# Investigation 2
## Explore Fibonacci-style sequences

- Choose any two numbers less than 10. These are the first two numbers of a sequence.
- Add them together to form the next number in the sequence, then add the last two numbers together to give the next number, and so on to form your own Fibonacci sequence of 10 numbers.
- Remember the strategy for finding the total of the 10 numbers in a Fibonacci sequence?
  Multiply the 7th number by 11.
  Does this strategy work for your sequence?
- Try different starting numbers, not necessarily less than 10.

# Check your understanding

## *Questions*

The fourth term of a sequence is 18, the fifth is 23 and the sixth is 28.
Write the next four terms.
Then write the first three terms.
Describe the sequence.

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The third term of a sequence is 4, the fifth is 16 and the seventh is 64.
Write the next four terms.
Then write the first two terms.
Describe the sequence.

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Write the $10^{th}$ term in this sequence: 1.5, 3, 4.5, 6, 7.5…

*Fold here to hide answers.*

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# Check your understanding

## *Answers*

The fourth term of a sequence is 18, the fifth is 23 and the sixth is 28.
Write the next four terms. 33, 38, 43, 48
Then write the first three terms. 3, 8, 13
Describe the sequence. It starts at 3 and increases by 5 each time. Some children may notice that each term is a multiple of 5, subtract 2. The nth term is 5n – 2.

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The third term of a sequence is 4, the fifth is 16 and the seventh is 64.
Write the next four terms. 128, 256, 512, 1024
Then write the first two terms. 1, 2
Describe the sequence. It starts at 1 and doubles each time.
(Primary children aren't expected to see this, but this sequence is the sequence of powers of 2: $2^0$, $2^1$, $2^2$, $2^3$, $2^4$… Then nth term is $2^{n-1}$.)

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Write the $10^{th}$ term in this sequence: 1.5, 3, 4.5, 6, 7.5… 15
Some children may have spotted that each term is 1.5 x its position in the sequence. The nth term is 1.5n.