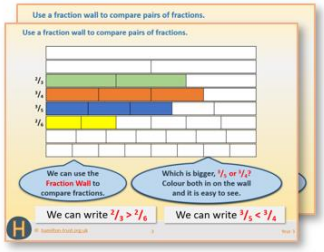
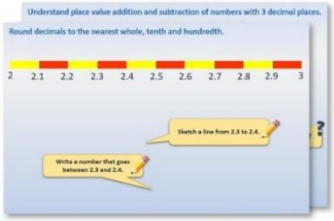
Week 8, Day 5
Fractals

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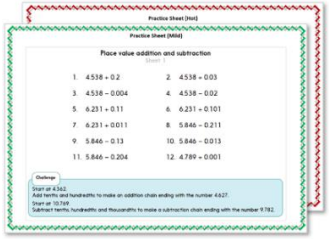
2. Think you've got it? Have a go at the **Practical Activity**.



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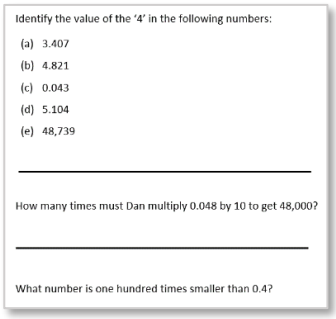
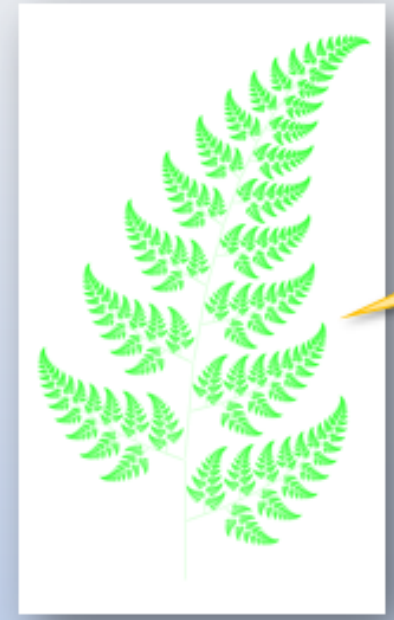
3. Have I mastered the topic? A few questions to **Check your understanding**.
   Fold the page to hide the answers!



Learning Reminders

Fractals.

Benoit Mandelbrot first used the term fractal in 1975 to describe structures "in which smaller and smaller copies of a pattern are successively nested inside each other, so that the same intricate shapes appear no matter how much you zoom in to the whole". He found fractals in nature, in ferns and trees for example, and in the cosmos.



Here is an example from
https://en.wikipedia.org/wiki/File:Bransleys_fern.png

Can you see how see how each frond is like a mini-fern?

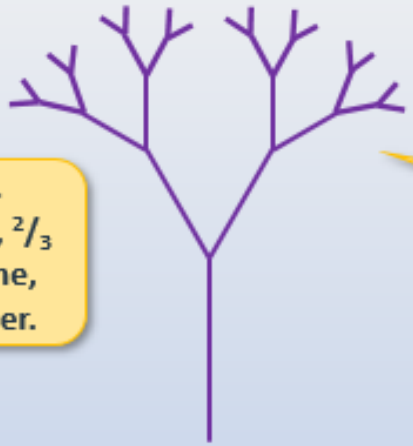
Enter 'fractals in nature' into a search engine and see what other fractals you can find.

Learning Reminders

Fractals.

Today we are going to create our own fractals.

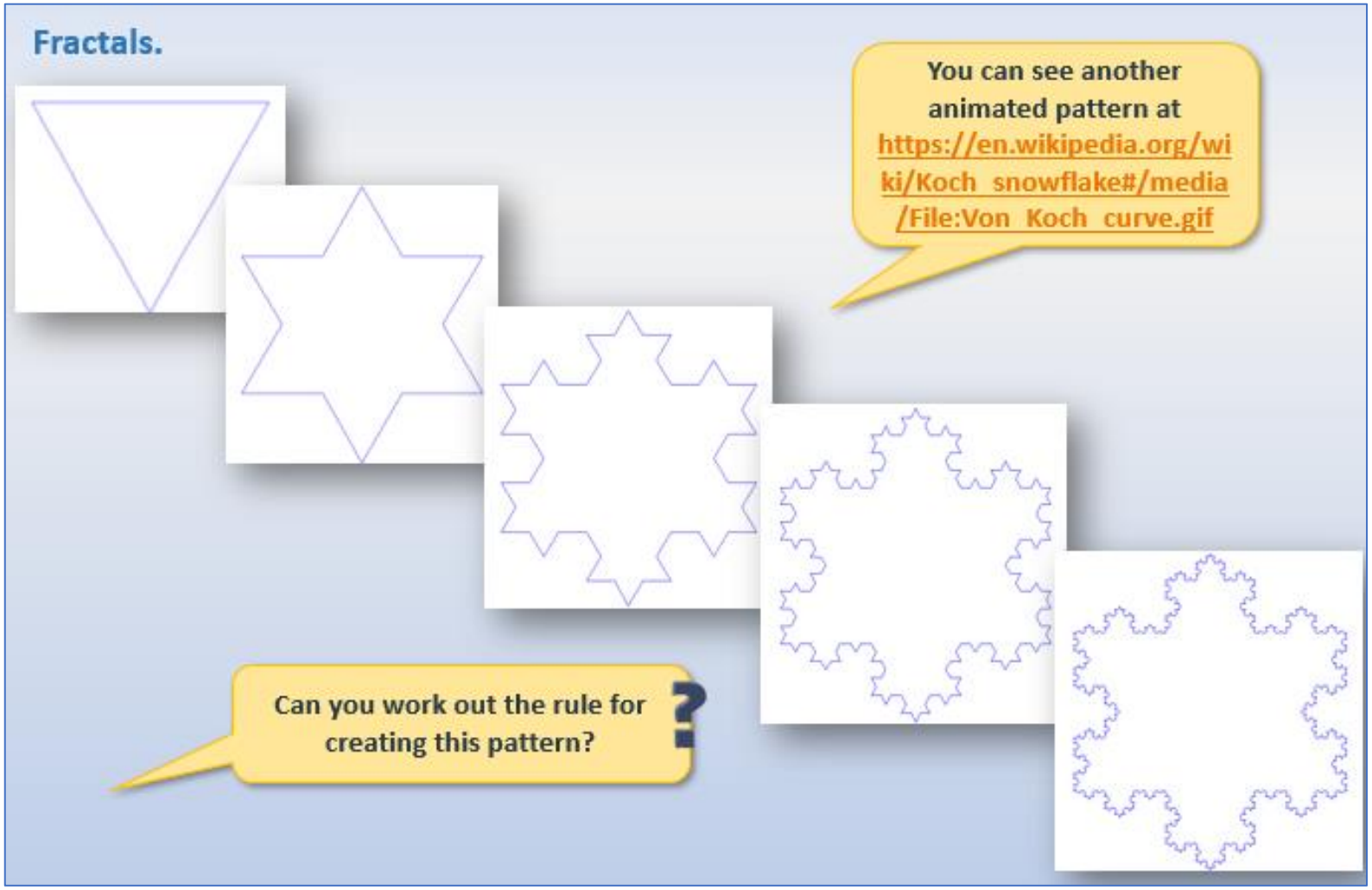
Can you see how the pattern develops?



First a line is drawn. Then 2 lines are drawn, $^{2}/_{3}$ the length of the 1st line, and at 60° to each other.

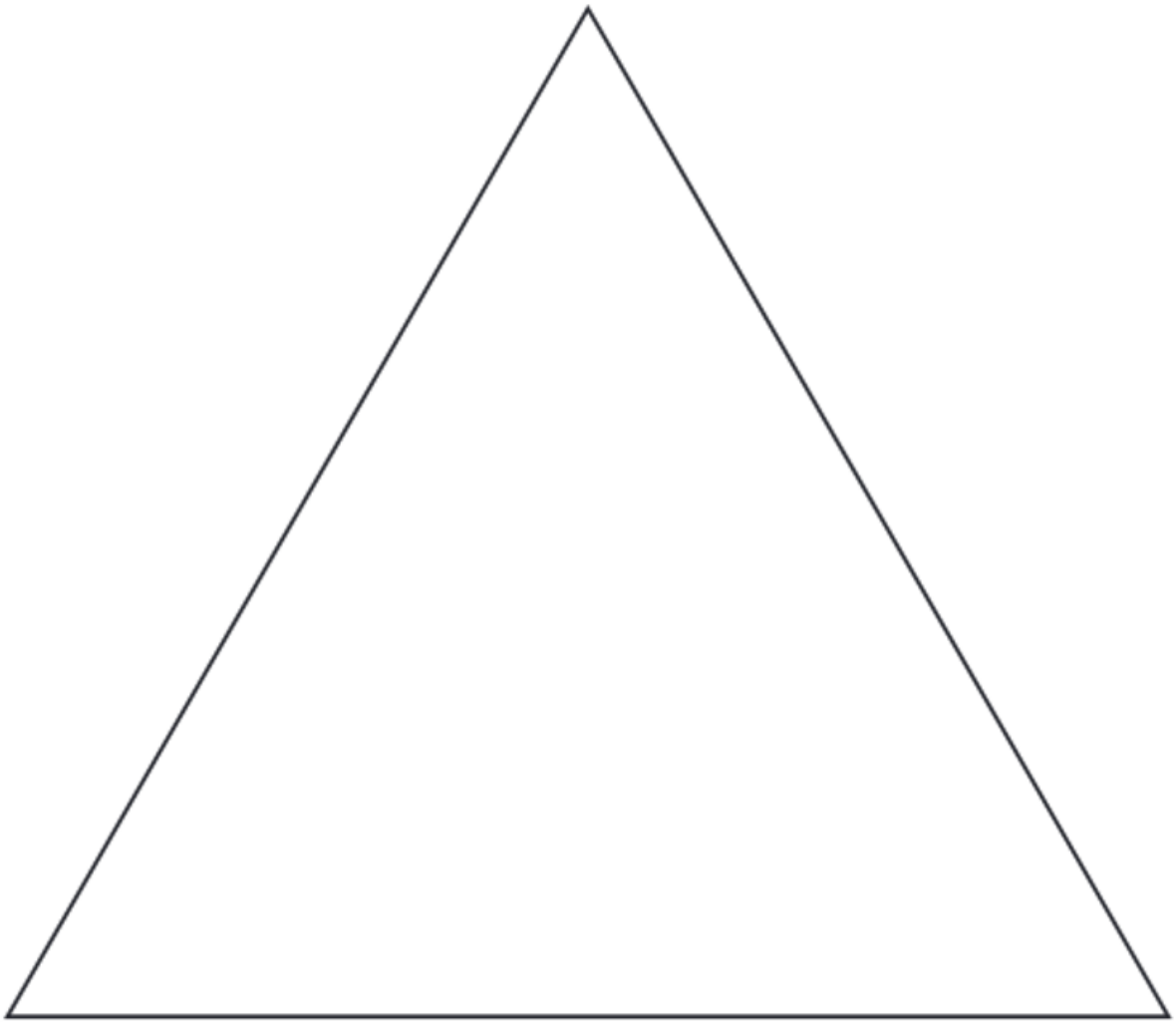
This 'rule' is then used to draw the repeating pattern.

Learning Reminders



Practical Activity
Create a fractal

Starting a shape



Check your understanding

Questions

Draw triangles to match each description. Name each triangle.

i. With a right angle and the shortest side is 3cm
ii. Two sides and two angles are equal
iii. No equal angles; one side twice as long as one other side

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True or false

i. The angles inside a triangle add up to 200˚.
ii. Each angle in an equilateral triangle is 60˚.
iii. A triangle can have three obtuse angles.
iv. A triangle can have one obtuse angle and two acute angles.

Draw a line 10cm long.

Now draw a line half this length.

Draw a line half the new length.

Now draw line 0.7cm longer than the previous line.

Now draw a line 4mm shorter.

Answers on the next page

Check your understanding

Answers

Draw triangles to match each description. Name each triangle.

i. With a right angle and the shortest side is 3cm Check it has a right angle.
ii. Two sides and two angles are equal Check it is isosceles.
iii. No equal angles; one side twice as long as one other side Check the lengths of sides and that it is scalene.

Check children's drawings. For accurate drawings they should be using a sharp pencil and ruler. Can children name the triangles?

True or false

i. The angles inside a triangle add up to 200˚. False
ii. Each angle in an equilateral triangle is 60˚. True
iii. A triangle can have three obtuse angles. False
iv. A triangle can have one obtuse angle and two acute angles. True

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Draw a line 10cm long. Check the length.

Now draw a line half this length. Check that the length is 5cm.

Draw a line half the new length. Check that the length is 2.5cm.

Now draw line 0.7cm longer than the previous line. Check that the length is 3.2cm.

Now draw a line 4mm shorter. Check that the length is 2.8cm.