

Alien Bacteria

You need: a calculator or a spreadsheet

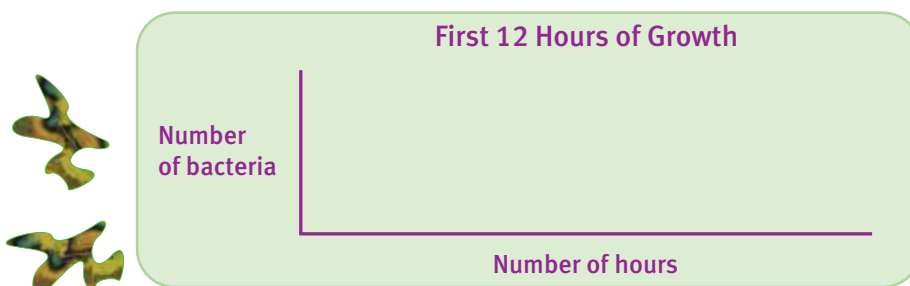
ACTIVITY

One spore of a deadly alien bacterium has entered the Earth's atmosphere on a meteorite. The spore germinates and produces a bacterium, which in turn produces two new bacteria. These then multiply and produce new bacteria. The bacteria are doubling in number every hour!

1. a. Copy and complete the table for the number of bacteria up to 12 hours.

Hours	Number of bacteria
1	2
2	4
3	8
4	16
5	32
6	

- b. When the bacterium count gets above 1 000, plant life that comes into contact with it will be affected.
In how many hours after the spore's arrival will the bacterium count reach that level?
- c. When the bacterium count passes 100 000, humans who come in contact with it will not survive. In how many hours after the spore's arrival will the bacterium count reach that level?
- d. Draw a graph of the first 12 hours of growth:



2. A mathematician works out a formula to find the number of bacteria given the number of hours: $\text{Number of bacteria} = 2^{\text{number of hours}}$
This means that 2 to the power of the number of hours gives the number of bacteria.
For example, $2^5 = 2 \times 2 \times 2 \times 2 \times 2$
 $= 32$.
- a. Check that the formula works for other values. Use a calculator or spreadsheet if possible.
- b. Write out the full working for 2^{10} .
3. What is the bacterium count after 24 hours?
4. When the bacterium count reaches 1 000 000 000, the bacteria will be impossible to contain.
How many hours do Earth's scientists have to find and destroy the bacteria?