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extracts from
**100 Things to Know About
Science**

Written by various contributors

Published by
Usborne Publishing Ltd

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3 All life on Earth...

can be traced back to the same starting point.

Scientists classify living things into different groups called **kingdoms**, shown here in capitals. These all evolved from one original kingdom, a group of organisms known as **prokaryotes**.

ANIMALS

First appeared about **580 million** years ago.

Invertebrates

(animals without backbones)

The oldest types of animals.

Number of known species: **1.2 million**



Vertebrates

(animals with backbones)

First appeared around **525 million** years ago.

Number of known species: **0.07 million**



PLANTS

First appeared about **480 million** years ago.



Number of known species: **0.3 million**

FUNGI

First appeared about **1,500 million** years ago.



Number of known species: **0.05 million**

PROTISTA

(very small living things such as algae and plankton)

First appeared about **1.7 billion** years ago.



Number of known species: **0.03 million**

PROKARYOTES

(incredibly tiny creatures such as simple bacteria)

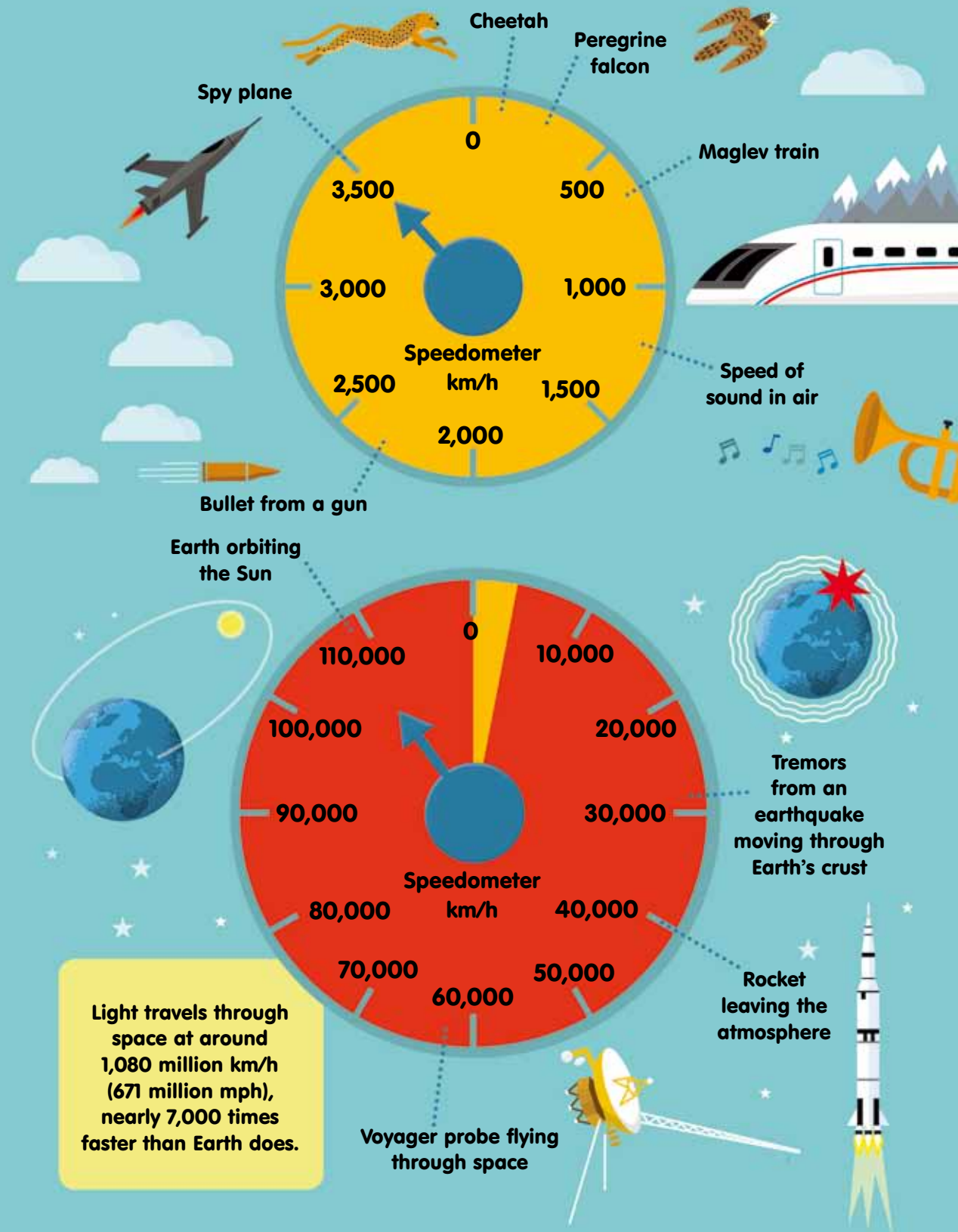
Prokaryotes first appeared about **3.8 billion** years ago.

Total number of species: **unknown**



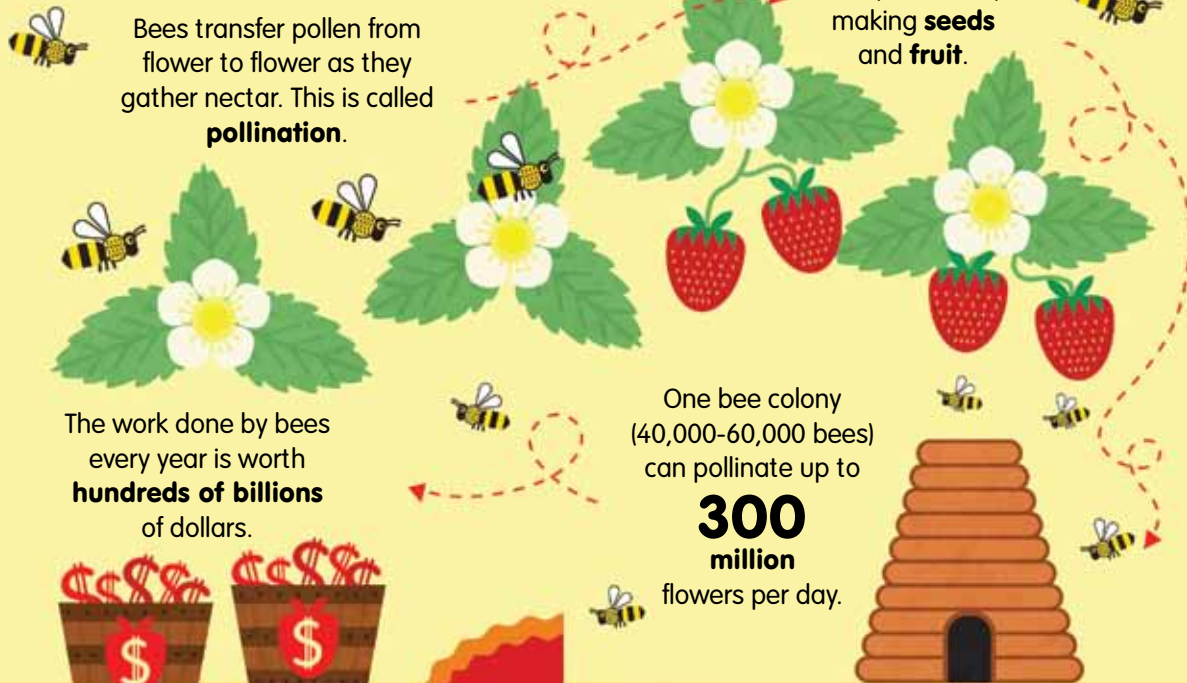
4 The Earth moves faster...

than anything on Earth.



46 Honey bees...

help feed the planet.

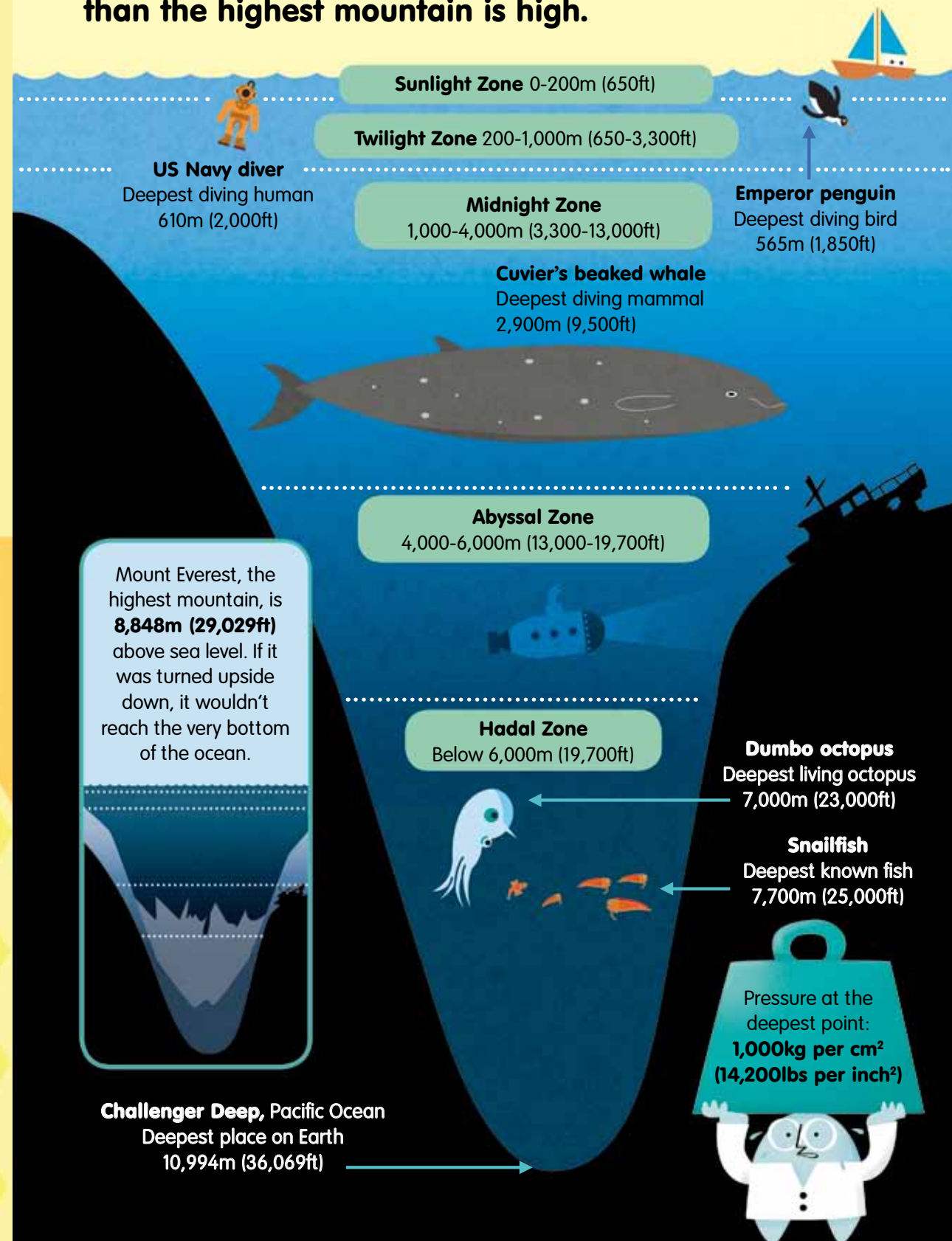


As much as **25%** of all the food we eat depends on pollination by honey bees.

Global honey bee populations have fallen rapidly in recent years. Nobody knows exactly why...



47 The deepest ocean is deeper... than the highest mountain is high.



86 A Victorian scientist...

designed a mechanical, steam-powered computer.

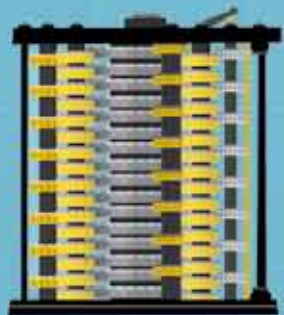
The first-ever programmable computer, called the Analytical Engine, was designed by English scientist Charles Babbage in the 19th century. Sadly, it was never completed.

The plans for the Analytical Engine called for tens of thousands of metal cogs, wheels, nuts and bolts, combining to make a machine over **4m (13ft) tall** and **6m (20ft) long**.

The Engine would have been able to solve complex mathematical equations. Like modern computers, it had separate **processing** and **memory** units, and ways of entering **data** and printing results.

This illustration shows part of the plan of the Analytical Engine, as seen from above.

Seen from the side, the Analytical Engine might have looked something like this.



A **steam engine** would have been used to turn the machine's heavy columns of interlocking gears and wheels.



What was it for?

Astronomers, navigators and **engineers** relied on books of mathematical tables. But the tables were calculated by hand, and were full of errors. The Analytical Engine would have made these calculations more quickly and accurately.

Babbage only built part of the Engine during his lifetime. He was still perfecting the design when he died.

87 The first computer programmer... was an English countess.

Augusta Ada King, Countess of Lovelace, was a keen amateur scientist. She quickly grasped the potential of the Analytical Engine.

The Engine was meant to be programmed using cards with holes punched through them. In 1843, Ada published a sample program for these cards.



Had the Engine been completed, Ada's program would have enabled it to calculate a famously complex series of numbers known as the **Bernoulli numbers**.

This is widely considered to be the first ever computer program.