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Tania Chung
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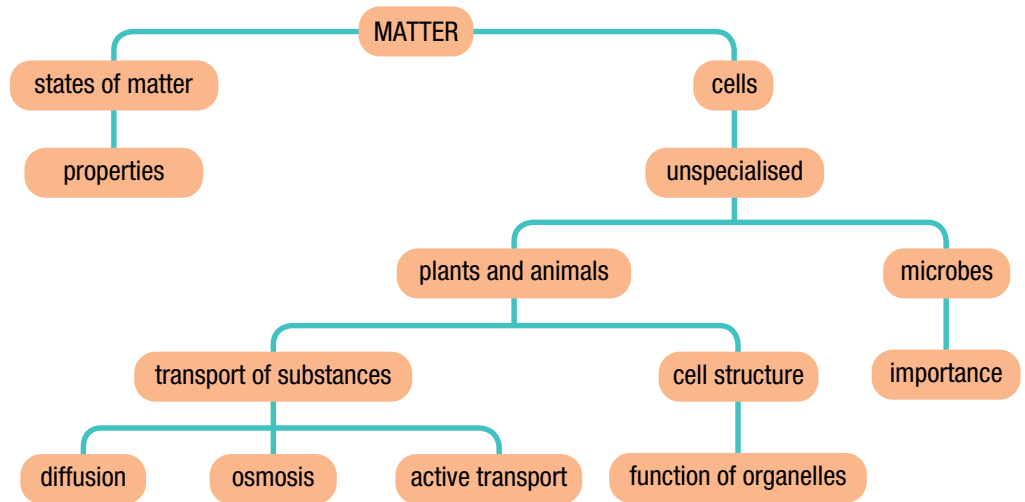
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1 Matter

By the end of this chapter you should be able to:

- ✓ define the term matter;
- ✓ compare the properties of the different states of matter;
- ✓ explain the processes involved during the changing of states;
- ✓ state that the building units of living things are cells;
- ✓ distinguish between a plant cell and an animal cell;
- ✓ identify the organelles common to an unspecialised plant and animal cell;
- ✓ explain the functions of the main organelles of an unspecialised plant and animal cell;
- ✓ draw and label the structures found in an unspecialised plant and animal cell;
- ✓ define the terms diffusion and osmosis;
- ✓ explain the importance of diffusion and osmosis in transporting substances in and out of the cell;
- ✓ discuss the importance of microbes.



matter >

What is matter?

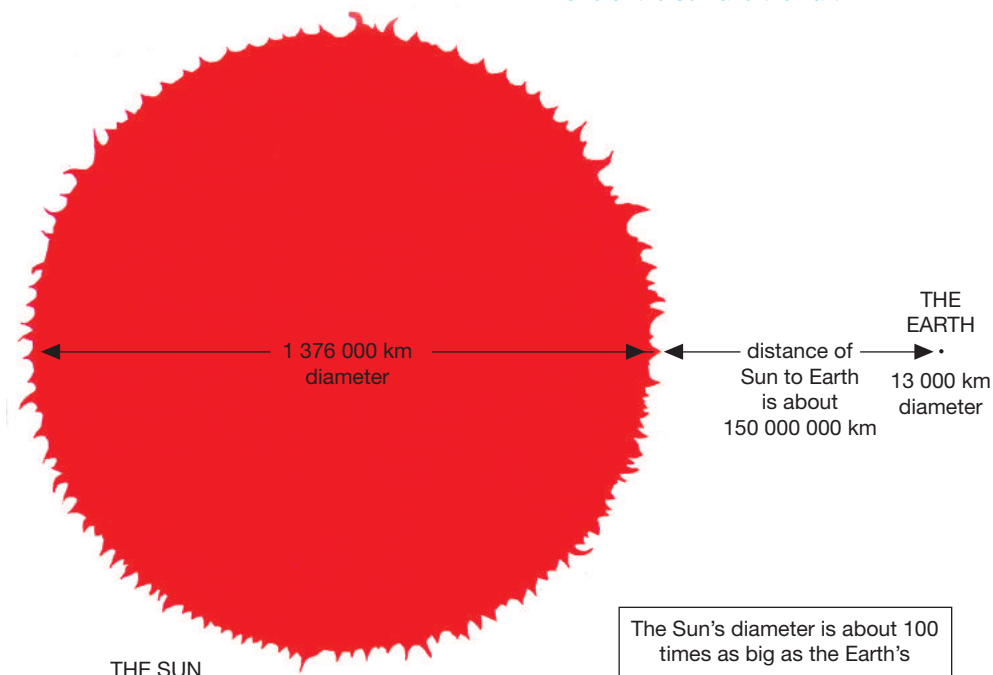
Everything that exists, whether living or non-living, is matter. Therefore, you are also matter! **Matter** is defined as anything that has mass and takes up space. Atoms, molecules and ions are the functional building blocks of all matter that exists in our universe. These particles can join together to form larger structures. For example, atoms can join together to form cells, which are the building units of living organisms.



How many Earths could fit inside the volume of the Sun?

Suggest one change that might take place on the Earth if the distance to the Sun was to shrink to 130 000 000 km.

Figure 15.6 Comparison between the size of the Sun and the Earth.



How many planets are in our solar system?

Which planet is the largest?

Which planet is the smallest?

Which planet is closest to the Sun?

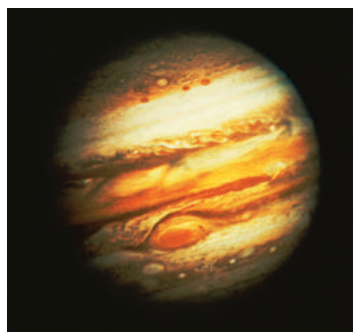
What is the relationship between the distance of the planet from the Sun and the time taken to complete one orbit?

Name of planet	Diameter (km)	Average distance from the Sun (km)	Time taken to complete one orbit around the Sun
mercury	4960	60 million	88 days
Venus	12320	110 million	226 days
Earth	12640	150 million	365¼ days
Mars	6720	230 million	687 days
Jupiter	142400	780 million	12 years
Saturn	120000	1430 million	30 years
Uranus	51200	2870 million	84 years
Neptune	44800	5900 million	165 years

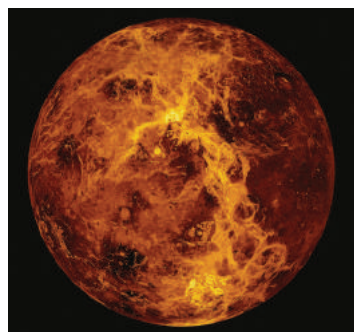
Table 15.1 The planets in order of distance from the Sun.



Look at Table 15.1. What is the relationship between the average distance from the Sun and the period?



(a) Jupiter – the largest planet in the solar system and the fourth from the Sun.



(b) Venus – sometimes referred to as the morning or evening star. It is the second brightest object in the sky.



(c) Saturn – best known for its ring system which was discovered by Galileo Galilei in 1610.



(d) Earth – the only planet to support life and the largest of the terrestrial planets.

Figure 15.7 Planets in the solar system.