

# PLANET EARTH AND BEYOND

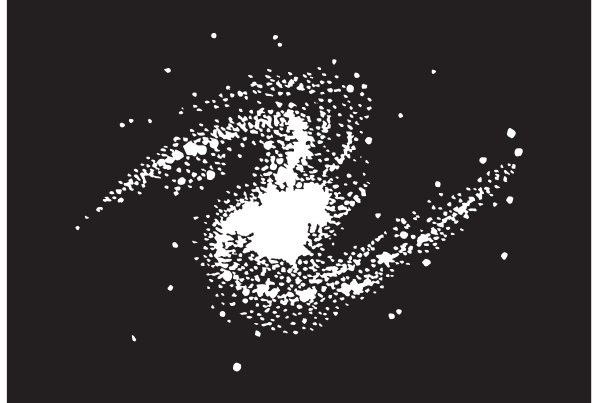
## ASTRONOMY

### Unit 1 – Exploring the universe

#### *Big, empty space*

The universe is everything that exists. We call the universe 'space' because it is mostly empty space between the stars. Beyond the solar system, outer space is huge beyond our imagination. The universe has no edge, it goes on forever.

The Earth is a speck circling the Sun, which is one of 100 billion stars in our Milky Way **galaxy**. Scattered throughout the universe are over 100 billion billion stars, grouped in galaxies. On a dark night you can only see about 2 500 of these stars.



The distances in space are enormous. The star nearest to our Sun is called *Proxima Centauri*. If you could travel there in a jet plane, it would take you 4 million years to reach *Proxima*.

Distances in outer space are so large that they are measured in **light years**, instead of in kilometres. A light year is the distance that light travels in space in a year. *Proxima Centauri* is 4.2 light years from Earth, so its light takes 4.2 years to reach us.

#### *Astronomical numbers*

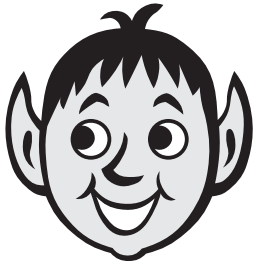
##### Activity

Match these numbers to the correct sentence:

9	100 billion	150 million kilometres	100 000 light years	2 500
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1. Number of stars in the Milky Way \_\_\_\_\_
2. Distance from the Earth to the Sun \_\_\_\_\_
3. Width of the Milky Way galaxy \_\_\_\_\_
4. Number of planets in our solar system \_\_\_\_\_
5. Number of stars you can see on a dark, cloudless night \_\_\_\_\_





Did you know that Neil Armstrong's name, when written backwards, is Gnorts Mr Alien!



### Technology in space

An astronaut wears a specially designed suit as protection from the dangers in space. Space dangers:

- **Low temperature** – extreme cold (about  $-270\text{ }^{\circ}\text{C}$ ).
- **Zero atmosphere** – no air to breathe.
- **Meteorites** – piece of rock or dust flying through space.
- **Zero gravity** – no gravity to stop you floating away.

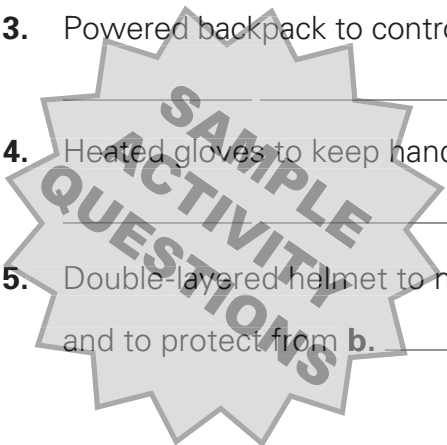
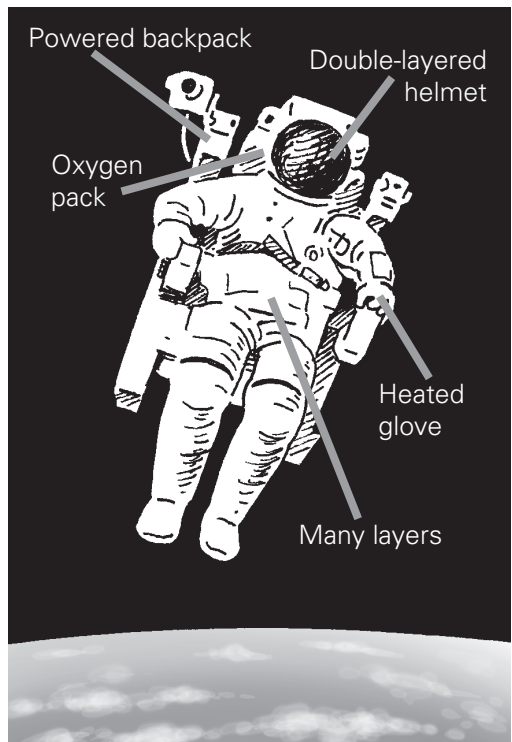
### Surviving in space

#### Activity

The diagram shows the survival features of a space suit.

Use the words in bold above (associated with space dangers) to complete the labels:

1. Oxygen pack because of \_\_\_\_\_.
2. Many layers of strong material to protect from \_\_\_\_\_.
3. Powered backpack to control movement in \_\_\_\_\_.
4. Heated gloves to keep hands flexible in \_\_\_\_\_.
5. Double-layered helmet to maintain air pressure in **a.** \_\_\_\_\_, and to protect from **b.** \_\_\_\_\_.



# LIVING WORLD

## BOTANY

### Unit 1 – Plants

#### Leaves

1. Oxygen.
2. Sunlight.
3. Carbon dioxide.
4. Water.

#### Experiment 1 – Stomata

Answer: The petroleum jelly stopped the leaf breathing.

#### Technology – useful leaves

- |             |             |             |
|-------------|-------------|-------------|
| 1. Flax.    | 2. Parsley. | 3. Tea.     |
| 4. Lettuce. | 5. Tobacco. | 6. Spinach. |



### Unit 2 – Fungi

#### Fungi are not plants

1. Food needed to live.
2. Break down material.
3. Kind of furry fungi.
4. Tiny body used by fungi to reproduce.
5. Poisonous, harmful.

#### Mushrooms

1. Cap.
2. Gills.
3. Spores.
4. Stem.
5. Mycelium.

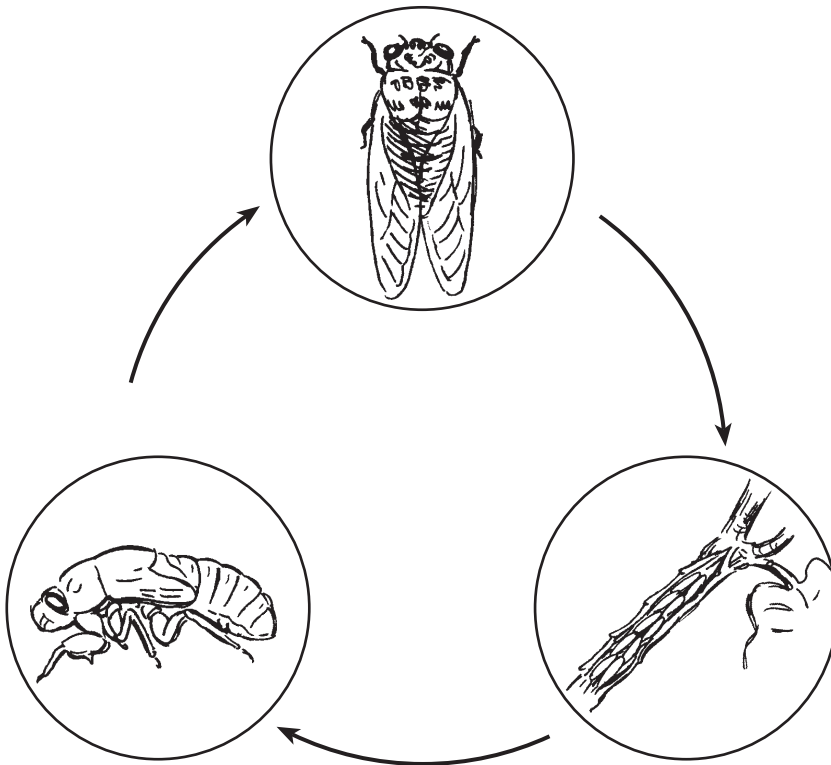
# Unit 5 – Life stages

## Complete metamorphosis

1. Egg.
2. Larva.
3. Pupa.
4. Adult.

## Incomplete metamorphosis

Missing stage is a **cicada nymph**.



### Stage names

Huhu beetle → Grub

Monarch butterfly → Caterpillar

Head louse → Nymph

Tree frog → Tadpole

Blowfly → Maggot

Honey bee → Larva

### The worker bee

Time	Jobs of a worker bee
Week 1	Cleaner, nurse, feeder, royal attendant
Week 2	Builder, store-worker
Weeks 3 to 6	Guard, flying collector