Living in Space

1 Have you ever looked up into the sky on a dark, starlit night? At night, the sky looks like a black, velvety blanket sprayed with thousands of tiny, sparkling jewels. Of course we are not looking at a twinkling blanket. We are gazing into space. We know the tiny sparkles are in fact stars. We know space is huge and the stars and planets are a great distance away from Earth. But how did we learn all these things about space?

2 Scientists and astronomers have been studying space for hundreds of years, trying to solve its many mysteries. They have developed telescopes to view deep into space. They have sent out manned and unmanned spacecraft. They have even landed men on the moon, and gathered samples of rocks and dust to bring back to Earth. More recently, they have built stations in space where astronauts can stay for long periods of time to learn more about the universe.

3 Can you imagine living in space? Right now, in the skies above you, astronauts are working and living in space on a space station. Space stations are like large laboratories that orbit Earth. Scientists and astronauts live and work there for several weeks or months. They conduct experiments to help us learn about space. They study the stars and planets.

4 The International Space Station (ISS) is the largest space station ever to be built. When it is completed it will be as long as a football field. More than fifteen countries have worked together to build the ISS. The first module was launched in 1998 and it has had crews of astronauts - usually three at a time - living on board since 2000. Crews spend about ninety days on board. Fresh supplies and new crews are carried to the space station by the space shuttle and other similar spacecraft.

5 It is not easy to live in space. There is no air. There is no gravity. Temperatures change from extremely cold to extremely hot. Scientists have had to think of ways to make living in space possible. With each new mission to the ISS our understanding of living in space improves.

One of the major problems of living in space is weightlessness. Weightlessness makes astronauts feel as if they are falling over all the time. It can make some astronauts feel sick. Astronauts need to be fit and strong to cope with this.

6 Weightlessness also makes everything float. Everything has to be held in place with straps, suckers or magnets. Can you imagine trying to eat your dinner when all your food is floating off your plate? In space, food is kept in pouches. Drinks are squirted into mouths from a bottle. At mealtime, the astronauts use a meal tray to hold their food containers while they eat. All food on board the space station is precooked or processed. Some meals may need to have water added or be heated.

Even sleeping can be a problem in space. Astronauts must sleep zipped up in sleeping bags that are strapped to the wall. If they aren't strapped in they may float around and bump into things while they sleep. Arms must also be strapped, so they don't float above the astronaut's head while he or she is sleeping.

7 Humans can't live without water, so water on board the space station is precious. Astronauts are careful not to waste a drop. No long, hot, steamy showers for them! Astronauts wash using moist sponges. All water is recycled and reused. Even the moisture in the air is collected and water is reclaimed and purified from wastes, such as urine!

Water is not wasted on washing clothes, either. Astronauts bring all the clothes they need for their mission with them. They don't change their clothes as regularly as we would on Earth and when an item of clothing has been worn as many times as possible, it is placed in a bag and stored as rubbish.

8 Doctors monitor the space station astronauts carefully. This provides information about how the human body reacts to long periods in space. Scientists have found that astronauts' bones and muscles become weak in space. They have had to devise exercises to help astronauts keep strong and healthy. There are treadmills for the astronauts to exercise on. They are also given "days off" so they have a chance to relax and have some fun. On their days off, the astronauts can watch movies, read books, play card games or do some exercise. They can also spend

some time enjoying the amazing view of the sparkling blue Earth below them.

9 Every new mission on board the space station provides scientists with more information about what it is like to live in space and how humans cope with the problems of living in space. Astronauts conduct lots of experiments while on the space station. They need to investigate ways to stay in space for long periods. For example, astronauts might conduct experiments about growing plants in space to see if it would be possible to grow food while travelling in space. This helps them to plan future long-term missions where astronauts may even travel to other planets.

At present this is not possible. But one day, who knows, maybe we will all be able to travel in space - and take our holidays on Mars!

Questions

1 What do scientists and astronomers look through to view deep into space?
- a unmanned spacecraft
- b telescopes
- c space stations

2 What work do scientists and astronauts do on space stations?
- a conduct experiments to learn about space
- b collect moon rocks
- c cook meals

3 How long was the International Space Station being built before crews lived on it?
- a three years
- b two years
- c one year

4 A major problem of living in space is
- a the ISS.
- b weightlessness.
- c sleeping.

5 What is recycled on board a space station?
- a food
- b sleeping bags
- c water

6 The work scientists do in space stations
- a help us develop better ways for people to live in space.
- b teach us about new ways of having fun.
- c show us what it would be like if we were aliens from another planet.

Vocabulary

Find words in the text that match the meanings below. The word is in the section shown in brackets.

7 Smooth and soft in appearance (1)
8 To do or carry out a task (3)
9 Something that is of great value and importance (7)
10 Made pure and clean (7)
11 Soft items full of small holes (7)

Grammar

The words in BLUE appear in the text. Match them by writing the correct synonym shown in RED.
E.g. under / below

12 gazing	finished
13 samples	exceedingly
14 completed	examples
15 extremely	staring

Back To The Text...

16 Key words are important words that help you understand the main ideas. Which of the following is a key word in section 6?
- a extremely
- b weightlessness

17 What would be a good sub-heading for section 3?
- a Healthy Astronauts
- b Busy Astronauts

18 The main purpose of this text is
- a to persuade the reader to live in space.
- b to inform the reader about life in space.

Think About This

19 In which section do we learn how precious water is on the space station?
- a four
- b five
- c six
- d seven

20 What part of speech is the word *fresh* in section 4?
- a verb
- b noun
- c adjective

21 The word *treadmills* is used in section 8. What pet is associated with treadmills?
- a hens
- b mice
- c horses
- d fish

22 The image on page 3 shows an astronaut
- a ready for take off.
- b on a moon walk.
- c on a space walk.

23 Study the image on the front of the card carefully. It probably represents a scene from space
- a in the past.
- b in the present.
- c in the future.

Challenge Option

Research: Find out what year the USSR launched the satellite, Sputnik 1.