


1.1  
**YOU HAVE BEEN CHOSEN AS  
CREW FOR A SPACESHIP**

**What will you need to take with you on the spaceship?**

**Make a list of the 10 most important things you will need.**

**Do you have any questions to ask?**



1.1  
**THE CODE SIGN FOR YOUR  
SPACESHIP IS**

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**Make up a badge or logo for your spaceship. You may use the code sign in the badge**

**You will need to share out these jobs**

- Captain**
- Navigator**
- Engineer**
- Catering Officer**
- Environment Officer**
- Vice-Captain**




1.3  
**THE JOURNEY MAY TAKE  
MANY YEARS.**

**How will you make sure that you have enough**

- food**
- fuel**
- oxygen**
- water**
- ?**

**Can you think of any other problems that you may meet?**



1.4  
**YOU MAY LAND ON ANOTHER  
PLANET AND NEVER COME  
BACK HOME**

**How would you feel about this?**

**What would you miss most ?**

**Would you make any changes to the list of things you will need to take with you?**




1.5  
**PERSONAL  
RELATIONSHIPS**

You will need to think about what  
you will do if

- you get bored
- you get on each other's nerves
- someone falls ill

How would you cope?



1.6  
**YOU MAY MEET ALIENS**



Intelligent beings from a world  
different to your own - they may not  
look like you, speak, see, hear, or  
think like you.

How would you feel?

How would you try to show that you  
are friendly?

How would you try to find out about  
each other?

Suppose they were not friendly ....



1.2

DECISIONS

CREW & CODE SIGN

The members of the crew are:

- 1. Captain .....
- 2. Engineer .....
- 3. Navigator .....
- 4. Catering Officer .....
- 5. Environment Officer .....
- 6. Vice Captain .....

Crew badge/logo:

Name:

Crew code:

1.1

DECISIONS

MAIN NEEDS FOR SPACE VOYAGE

Our main needs for a space voyage of discovery are:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10

Name:

Crew code:

**1.3B  
DECISIONS**

**FUEL & ENERGY SUPPLY**

Our method of providing a safe and reliable power supply for our spacecraft is:

We might have the following problems in using this source of energy

Other possible ways of getting energy are:

Name:

Crew code:

**1.3A  
DECISIONS**

**FOOD REQUIREMENTS**

Our plans to make sure we have enough fuel for the voyage are:

Name:

Crew code:

**1.3D  
DECISIONS**

**PROBLEMS OF A LONG VOYAGE**

Problems of a voyage lasting a very long time might be:

Our suggestions for overcoming these problems are:

Name:

Crew code:

**1.3C  
DECISIONS**

**AIR & WATER SUPPLY**

The ways in which water would be used are:

We could save water in the following ways:

Methods of dealing with waste products would be:

A method of ensuring we had a regular supply of oxygen would be:

Name:

Crew code:

1.5A

DECISIONS

**BOREDOM**

We might get bored because:

We might get on each other's nerves because:

The result of these problems might be:

Our ideas for stopping such problems getting out of hand are:

Name:

Crew code:

1.4

DECISIONS

**SUPPOSE WE DO NOT RETURN**

Our feelings about not being able to return to Earth are:

If we had to live on another planet we would also take with us:

What we would miss most about never returning to Earth would be:

Name:

Crew code:

**1.6  
DECISIONS**

**MEETING WITH ALIENS**

If we met with aliens our first feelings might be:

We would try to show we were friendly by:

We would try to find out about each other by:

If they did not seem friendly at first we would then:

Name:

Crew code:

**1.5B  
DECISIONS**

**HEALTH**

Some ideas for overcoming illness amongst the crew:

The most difficult problem might be:

Name:

Crew code:



# BASIC FOOD QUESTIONNAIRE

**CREW CODE:** .....

**NAME:** .....

**SCORE:** .....

1. What is the average daily energy requirement for an active adult ? .....
2. Roughly how many days can a person survive without food? .....
3. Which product of the breakdown of food is expelled from the lungs ? .....
4. Two food rich in carbohydrate are i. .... ii. ....
5. Excess carbohydrate is stored in the body as .....
6. Two food rich in protein are i. .... ii. ....
7. In our diet we also require small amounts of i. .... and ii. ....
8. Kwashiorkor is a disease caused by lack of .....
9. Scurvy is a disease caused by lack of .....  
and it can be prevented by .....
10. Rickets is a disease caused by lack of .....  
and it can be prevented by .....
11. Name three ways of preserving food i. ....  
ii. .... iii. ....
12. Name two important food obtained from live animals i. ....  
ii. ....
13. In order to produce one kilogram of meat, how much protein rich diet would have to be fed to  
i. a chicken ..... ii. a sheep ..... iii. a cow .....
14. Cultivation of plants by nutrient solutions in the absence of soil is called .....
15. Yeast is a micro-organism which converts .....  
into alcohol (ethanol) , ..... and .....
16. A person who does not eat any kind of meat is known as a .....  
If they also do eat any animal product they are known as .....





# ENERGY QUESTIONNAIRE

**CREW CODE:** .....

**NAME:** .....

**SCORE:** .....

1. Name three different kinds of fossil fuels .....
2. Which of these may run out during your lifetime? .....
3. Which fossil fuel has reserves to last probably 200 years? .....
4. Name two different fuels from the biomass .....
- Are they renewable or limited resources ? .....
5. What else is needed for all of these fuels to burn? .....
- What 'greenhouse' gas is produced from the combustion? .....
6. Describe in outline how electricity is produced from a fossil fuel at a power station  
.....  
.....
7. In what way is a nuclear power station similar ? .....
- In what way is a nuclear power station different? .....
8. From what limited raw material is nuclear energy produced at present ? .....
9. In what kind of reactor can the life of this fuel be extended ? .....
10. What environmental problems are associated with nuclear energy ? .....
- .....
11. Describe briefly three kinds of 'renewable' energy sources associated with water  
.....  
.....
12. Describe two ways in which solar energy can be used directly  
.....
13. What is meant by geothermal energy ? .....
14. What problems could be associated with production of electricity from wind farms?  
.....



# AIR & WATER QUESTIONNAIRE

**CREW CODE:** .....

**NAME:** .....

**SCORE:** .....

1. Name two gases which together make up about 99% of air .....
2. Which one of these gases is essential to life, and for anything to burn? .....
- What is the approximate percentage of this gas present in air? .....
3. When this gas is used up in breathing and burning, how does the proportion of this gas in air remain the same ?  
.....
4. Name two other gases which are present in clean, unpolluted air .....
5. How does sulphur dioxide get into the air ? .....
- Why is it regarded as a harmful pollutant ? .....
6. How does carbon monoxide get into the air? .....
- Why is it regarded as a harmful pollutant ? .....
7. What problems might be caused by an excessive build up of carbon dioxide in the atmosphere?  
.....
8. W How would you test whether the atmosphere on a new planet were safe to breathe?  
.....
9. Of which two elements is water made ? .....
10. How can water be formed from its elements ? .....
11. How can water be split up into its elements ? .....
12. In an average household, how much water is generally used by each person in a day? .....
13. List three ways in which this water might be used .....
- .....
14. What happens to most of this water after use? .....
15. How long can a person survive without water? .....
16. Apart from excretion, in what other ways is water lost from our body ? .....

17. Explain briefly how water is purified on a large scale in nature

.....  
.....

18. How can water be purified on a small scale in the laboratory ? .....

19. What are the two main processes in the large scale treatment of water to prevent pollution?

.....

20. Describe in detail how impure or waste water is purified on a large scale for re-use in the mains water supply.

## **BASIC FOOD QUESTIONNAIRE**

### **Answers**

1. Average daily energy requirements : 2.500 kcal (10,000 kJ) More for active man,
2. A person can survive 5 - 7 weeks without food, depending on initial health & condition.
3. Carbon dioxide expelled from lungs
4. Sugar, bread, potato are examples of carbohydrate rich foods
5. Excess carbohydrate is stored in the body as fat
6. Protein rich foods include meat, eggs, cheese, soya
7. We also require small amounts of vitamins and minerals in our diet.
8. Kwashiorkor is a disease caused by lack of protein
9. Scurvy is caused by lack of vitamin C, and can be prevented by eating enough fresh fruit & vegetables
10. Rickets is caused by a lack of calcium or vitamin D and can be prevented by including milk or cheese, for example, in our diet.
11. Ways of preserving food include, canning, pickling, freezing, salting, drying, radiating.
12. Milk and eggs are two foods obtained from live animals.
13. To produce 1 kg of meat one would need to feed a chicken 5 to 6 kg, a sheep or a cow 20 to 25 kg of protein rich food.
14. Cultivation of plants by nutrient solutions in the absence of soil is called hydroponics
15. Yeast converts sugar into alcohol & carbon dioxide .
16. A Vegetarian does not eat meat, a vegan does not eat any animal product.

## **ENERGY QUESTIONNAIRE**

### **Answers**

1. Coal, oil & natural gas are fossil fuels
- 2, 3 Oil and natural gas reserves are far more limited than coal, which may last for 200 years or more.
4. Wood & alcohol are examples of biomass fuels.
5. Oxygen is needed for combustion. Carbon dioxide is produced when any of these fuels is burnt.
6. At a power station, fossil fuels are burnt to change water into steam, which drives the turbines.
7. Steam is produced by heating water from the energy of nuclear fission. Nothing is burnt.
8. Uranium is the 'fuel' for a nuclear power station.
9. The 'life' of the enriched uranium can be extended in a 'fast-breeder' reactor.
10. The waste from a nuclear power station remains radioactive for thousands of years. Safe disposal of radioactive waste is a problem. The possibility of radioactive material falling into the hands of terrorists also has to be considered a real threat.
11. Fast flowing water from rivers, or water stored in dams, and the ebb and flow of sea water in tides can all be used to drive turbines. Oscillation of water in the motion of waves can also be made to drive a turbine.
12. The sun's energy can be used to generate electricity from photovoltaic cells, or used to heat water .
13. Rocks deeper in the Earth's crust are hotter than at the surface. This geothermal energy can be used to heat water pumped down in pipes. (In volcanic areas, this energy appears at or close to the surface).
14. The wind is not always blowing, so other back up electricity generation will always be needed. The noise from very large rotating turbine blades may be a problem in an inhabited area. There is also concern about harm to birds.

# AIR & WATER QUESTIONNAIRE

## Answers

1. Nitrogen and oxygen make up about 99% of air.
2. Oxygen, which makes up about 21% of air, is essential for life & combustion
3. Photosynthesis by plants & ozone in upper atmosphere help maintain the proportion of oxygen
4. Other gases in clean air include carbon dioxide, water vapour, and the noble gases (argon, neon, etc).
5. Burning of sulphur impurities in coal and oil gives sulphur dioxide which causes acid rain.
6. Incomplete combustion of fuels can produce carbon monoxide, which is a poisonous gas.
7. Carbon dioxide can trap reflected infra-red rays from the sun, causing 'greenhouse' effect leading to global warming.
8. e.g. old method in mining - see if a caged canary can survive. Perform a chemical analysis of the air.
9. Water is a compound of hydrogen and oxygen
10. Water is formed when hydrogen gas or an organic compound burns.
11. Water can be split into its elements by electrolysis (e.g. of acidified water).
12. Up to 30 gallons - over 130 litres - of water can be used by each member of a household.
13. Flushing a toilet, washing (self, clothes, dishes, car, etc.), cooking, drinking.
14. Most of this water ends up in the drains.
15. A person can only survive a few days without water.
16. Apart from going to the toilet, water is also lost from our body by perspiration and breathing.
17. Water can be purified by distillation.
18. In large scale water treatment, some form of filtration, and then treatment with chlorine are two key processes.
19. Diagrams of sewage works and description of processes are readily available.