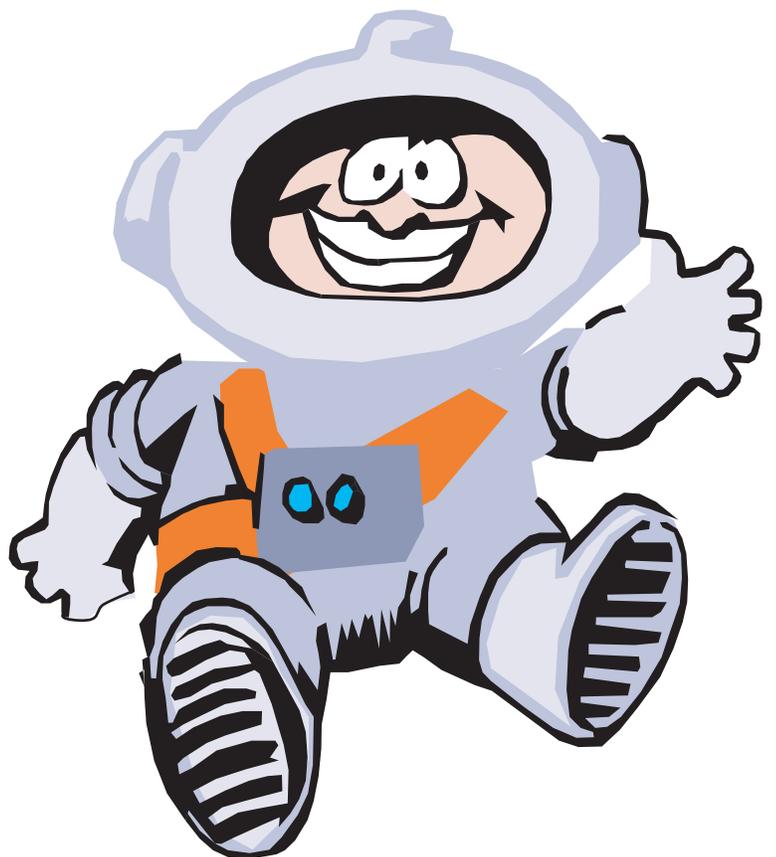


Martian Masterchef

The World Around Us

ICLs: Where I Live | Needs and Wants
Year 6/7



Cross Curricular Skills displayed/developed in this assessment task:

Communication	- Talking and Listening
Thinking Skills and Personal Capabilities	Managing Information Thinking Problem Solving and Decision Making Being Creative Working with others - Self Management

What It's About

French chefs have come up with 11 tasty dishes that could be grown, cooked and served on a Martian base. These dishes are important because astronauts who arrive on Mars have now got to be self-sufficient. Oxygen, food and water will need to be produced on Mars, because if reserves from Earth were taken with them, the rocket would never get off the launch pad. This task challenges the children to explore the conditions for plant growth by designing investigations and exploring their life cycles.

Where It Fits

Interdependence

- Interdependence and the natural world
- Interdependence of people and the environment
- Interdependence of people, plants, animals and place

Key Question

- How do living things survive?

Suggested Learning Intentions

- To express opinions and give reasons based on what has been read.
- To use an appropriate vocabulary to express ideas and opinions.
- To make some attempt to explain these ideas and opinions.
- To compare each others approaches.
- To know the main stages of plant growth and life cycles.
- To understand how learning in science relates to news in the world around us.

Discussion Starters

- When the children are thinking about the three space ships:

What sorts of problems do you think could occur on a long space journey?

- When the children are planning their investigation:

What could be the advantages and disadvantages of growing plants for food?

- When the children are considering plant lifecycles:

Are all lifecycles the same?

Running the Activities

1. Use the illustrations of the three spaceships on page 1 as a stimulus. Discuss in groups of 3 or 4 the idea of which of the three options shown in the spaceships would be the most suitable for providing food on a long journey and when a new planet is reached. This could be organized as a whole class or group activity with the children producing lists of the pros and cons for each option.
2. Use the introductory paragraph on page 2 as a stimulus. Encourage the children to identify various factors that could affect plant growth and then plan and carry out an investigation into one of the factors they have come up with. Use the planning cycle on page 2 as a basis for helping the children to discuss and make decisions about the various stages in their investigation.

(**Tip:** producing a class list of various factors that could be changed in the investigation will help small groups to plan their investigations as fair tests. The Mars Fact File on page 3 could give some ideas about factors to change.)

3. Use the illustration on page 4 as a stimulus to help the children discuss the various stages in a plant's lifecycle. Challenge the children to think about the conditions that would be needed for the seeds to start growing and for the plants to grow well. If appropriate, discuss ways in which pollen can be transferred between plants.
4. Challenge the children to discuss and explain how the conditions on Mars might affect plant growth and how the problems might be overcome. The children could use the Mars Fact File on page 3 to get some information about the conditions on Mars.

Web links

www.bbc.co.uk/schools/revisewise/science/physical/

A look at a range of science topics exploring the different facts children would like to know about physical processes. There are activities, fact sheets and quizzes on electricity for children.

www.bbc.co.uk/schools/revisewise/science/living/

A look at a range of science topics exploring the different facts children would like to know about living things, including plants. There are activities, fact sheets and quizzes on plants chains for children.

www.esa.int/esaCP/index.html

European Space Agency website

www.nasa.gov/audience/forstudents

NASA website

Assessment for Learning Smart Grid*

Use the Smart Grid to help the class review their learning. For additional information about how to use a Smart Grid view the 'How to use' guide.

Thumbs Up	We were great at the task because...		We were clear about the question we would investigate		Next time we will...
			we made a prediction about what would happen in our investigation.		
Thumbs Sideways	We were good at the task because...		we knew how to set up the investigation as a fair test, e.g....		
			we knew what results we would collect and how we would record them, e.g....		
Thumbs Down	We were OK at the task because...		we came up with several things that could affect how well plants would grow on Mars.		
		we could suggest some ways to overcome the problems of growing plants on Mars, e.g. ...			

* Smart Grids are part of the Smart Science series developed by the Centre for Science Education, Sheffield Hallam University

Science at your Fingertips

How could food be provided for a long space journey?

Taking pre-packed food for the journey could mean that the space ship would be just too heavy to take off. Similarly, if live animals were taken their food supplies would need to be provided, increasing the take-off weight. Growing plants on the journey could be one way to solve the problem of reducing take-off weight as small plants or seeds could be taken on board.

What are the main things that could affect how well a plant grows?

Like other living things green plants need food to grow but they have the advantage of being able to make their own food. Water taken in through their roots and carbon dioxide from the air are joined to make food. Sunlight is needed to provide the energy for this process which is called photosynthesis. Anything that reduces light, water or carbon dioxide levels will slow down growth. Plants also need warmth to grow well.

What do seeds need to start growing?

Seeds need water, air and a suitable temperature to start growing. However, they don't need light; this is because as the tiny plant starts to grow it uses the food store from the seed rather than making its own food.

How is pollen carried from one plant to another?

There are two main ways in which pollen is transferred. Some plants produce lots of tiny pollen grains that are blown in the wind. (Grass pollen is carried in this way and is one of the main causes of hayfever!) Other plants produce larger pollen grains that are spiky or sticky. Insects visiting the plants to collect nectar get covered in pollen that they carry to other plants.

Connecting the Learning

Design an astronaut's dinner

What should a vegetarian meal for an astronaut be like? What fruits and vegetables would be interesting to eat? How would you make sure that the astronaut was getting a balanced diet? Could you come up with a 3-course dinner menu for an astronaut?

Martian Weather Forecast

In some ways conditions on Mars are similar to Earth but in other ways they are quite different. Use the information in the Mars Fact File and research information to write and present a weather forecast for Mars.

Interview for an astronaut

If you were choosing a person to be an astronaut what qualifications, skills and personality should they have? Draw up a list to help select the type of person you think would be ideal. Compare your list to the profiles of real astronauts.

Measure up!

You've been asked by a Space Agency to provide details of the average body dimensions of a person your age so that they can design a space suit which would be the right size. Work with a partner to measure the dimensions of your body, e.g. head circumference, inside leg length, arm length, waistline etc. Then calculate your class average.

Out of this World

In October 2006, this CCEA/CITB resource was sent to all primary schools across Northern Ireland. In 'Out of this World' children design and create a 3D model of an environmentally friendly hotel in a bid to encourage space tourism.