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| **Design an astronauts’ menu** |
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| Selecting and comparing foods for a spaceflight to the moon |
| **Subject(s):** Design and Technology, Cooking and Nutrition**Approx time:** 55-80 minutes |  | **Key words / Topics:** * food preparation
* freeze dried/dehydrated foods
* menu
* moon
* nutrition
* space travel
* spoilage
* testing
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| **Stay safe** Whether you are a scientist researching a new medicine or an engineer solving climate change, safety always comes first. An adult must always be around and supervising when doing this activity. You are responsible for:• ensuring that any equipment used for this activity is in good working condition• behaving sensibly and following any safety instructions so as not to hurt or injure yourself or others Please note that in the absence of any negligence or other breach of duty by us, this activity is carried out at your own risk. It is important to take extra care at the stages marked with this symbol: ⚠ |
| **Suggested Learning Outcomes**  |  |  |
| * To understand the main considerations when designing a menu for astronauts
* To know the types of food that are suitable for space travel
* To be able to test and develop ideas for a menu for astronauts going to the moon
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| **Introduction** |  |  |
| This is one of a series of resources that are designed to allow learners to use the theme of football on the moon to develop their knowledge and skills in Design & Technology and Engineering. This resource focusses on learners designing a menu that astronauts could eat. |
| **Purpose of this activity**In this activity learners will make use of the theme of travelling to the moon to design a menu that is suitable for astronauts. They will experiment with different types of food and test their suitability for space travel. They will then create a menu that includes breakfast, lunch and dinner for space travellers. This activity could be used as a main lesson activity to develop testing and design skills within cooking and nutrition. It could also be used as part of wider scheme of learning focussed on the engineering challenges associated with living and eating on the way to, and on the moon. |
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| **Activity** |  | **Teacher notes** |
| **Introduction (5-10 minutes)**Teacher to introduce the activity and the theme of the lunar travel and exploration. **Starter (5-10 minutes)**Learners to watch the video <https://www.youtube.com/watch?v=AZx0RIV0wss> Why do astronauts eat tortillas instead of bread?**Design brief (5-10 minutes)**Teacher to use slide 4 of the presentation to discuss requirements for food in space.Teacher to use the presentation (slide 5) to introduce and discuss the design brief with learners.**Designing the menu (40-60 minutes)**Learners to follow the steps shown on slides 7-12 of the presentation to experiment with ideas for foods to use in their menu, and then design their final menu. Learners to record their responses on the worksheet handout.* Step 1 - Mind map the kinds of foods that the astronauts could take into space. The foods must meet the needs of the design brief. For example, freeze dried foods would be long lasting.
* Step 2 - Get into small groups. Place the foods (given or brought in – see teacher notes) on a table for discussion. Discuss why these foods were chosen.
* Step 3 - As a group, list different ways in which the food items suitable for spaceflight. Record this on the worksheet. Take it in turns to share thoughts.
* Step 4 - What tests could be used to check if the food can be taken into space? Write down ideas for these tests.
* Step 5 - Test each item of food. Which food items are suitable for use in space? Which are not? Why?
* Step 6 - Use the results of the tests to design your menu for astronauts going to the moon.
 |  | **Starter**One of the favorite foods of the astronauts is the tortilla. They are nutritious. Tortillas contain large amounts of carbohydrates.They are easily stored since they lay flat and they don’t take up too much room. They are the perfect space foods because they do not produce crumbs.Crumbly or loose foods can float and damage equipment.**Design brief**Additional questions to support discussion:How do astronauts eat in space?Is eating in space the same as eating on Earth?How do the astronauts make sandwiches?How do the astronauts drink?What if astronauts want ketchup on their food?Can you eat chips in space?What do food packages on Earth look like?**Testing**This whole section is about identifying what types of food are suitable for space – i.e. no crumbs as they could contaminate the controls. The learners are then going to test the food against the criteria identified.**Designing the menu**Prior to step 2, the teacher will have needed to ask learners to bring in portioned foods from home that could be suitable for use in space. Alternatively, the teacher could provide some relevant examples.Teacher could set groups (3-4 maximum) or learners could select their own depending on the class.Step 4 could be skipped for weaker learners, with the teacher giving the tests that could be used in line with the examples shown. |
| **Differentiation** |  |  |
| **Basic** |  | **Extension** |
| * Provide partially completed menu ideas to guide learners.
* Provide premeasured ingredients to reduce the chance of errors when designing the menu.
* Provide foods that are suitable rather than asking learners to bring examples in from home.
 |  | * Design packaging for each of the food items in your menu.
* Discuss ways of storing the packaged food on a spacecraft, so it is kept safe on the way to the moon.
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| **Resources** |  | **Required files** icon-docicon-pdficon-ppt |
| * Pens and pencils
* Zipper seal bags of all sizes
* Aluminium foil
* Plastic wrap
* Recyclable storage containers
* Plastic shopping bags
* Masking tape
* Markers
* Portion sizes of food for tasting
 |  |  Presentation – Design an astronauts’ menuicon-doc Activity sheet - Design an astronauts’ menu |
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| **Additional websites** |  |  |
| * **Eating in space :** https://spacecenter.org/solving-space-cooking-in-space/
* **Chris Hadfield’s space kitchen:** https://www.youtube.com/watch?v=AZx0RIV0wss
* **YouTube - How do astronauts eat and drink in space?:** https://www.youtube.com/watch?v=8R7cOlSkay0
* **Moving water in space:** <https://www.youtube.com/watch?v=H_qPWZbxFl8>
* **YouTube - Why do astronauts eat tortillas instead of bread?** <https://www.youtube.com/watch?v=AZx0RIV0wss>
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| **Related activities (to build a full lesson)** |  |  |
| **Starters** (Options) * Watch the video <https://www.youtube.com/watch?v=AZx0RIV0wss> . Why do astronauts eat tortillas instead of bread?
* Discuss the requirements for a healthy balanced diet.
 | **Plenary*** Share their ideas peers and produce a class menu.
* Class vote for favourite from each menu created.
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| **The Engineering Context**  |
| * Travelling and potentially living on the moon presents all sorts of challenges for engineers to overcome. For example, how will we breathe, how will we cope with much lower gravity, how will we eat and prepare food, how will we develop the facilities to live happy, healthy and fulfilling lives?
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| **Curriculum links** |
| **England: National Curriculum**Design and technology - Food* Taste, evaluate and refine their ideas and dishes against specified needs, taking into account the views and requirements of the intended consumer (including sensory and dietary analysis).
 | **Northern Ireland Curriculum**The World Around Us – Science and Technology* Technology challenges of living in Space, for example, how to survive in Space.
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| **Scotland: Curriculum for Excellence**Physical activity and health* I can explain the links between the energy I use while being physically active, the food I eat, and my health and wellbeing.
* HWB 2-28a / HWB 3-28a
 | **Wales: National Curriculum** Design and technology* When carrying out a fair test, the key variables that need to be controlled and how to change the independent variable whilst keeping other key variables the same.
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| **Assessment opportunities** |
| * Formal teacher assessment of completed activity sheets and menu designs.
* Peer and/or self-assessment of completed activity sheets and menu designs.
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