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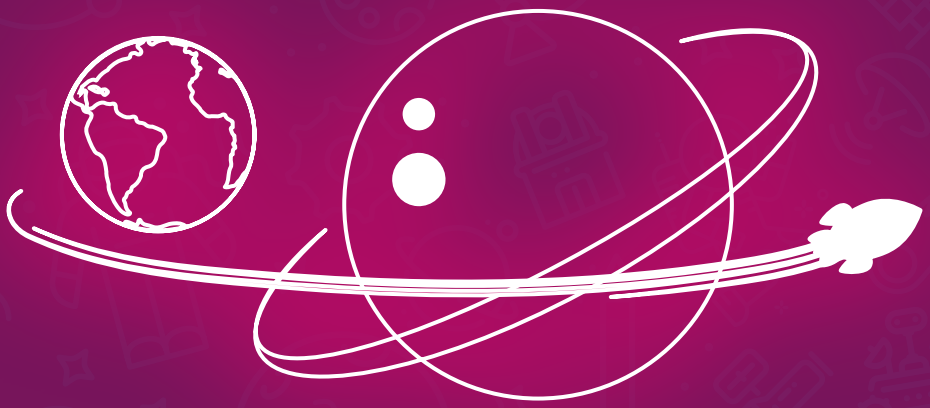

# Moon Base Challenge: Information for Teachers

As part of the Space Explorers programme, we are inviting participating schools to design and build a model of a future Moon base, with the chance to win a fantastic prize for your school.

This document aims to provide an overview of how you might incorporate this challenge into your existing Design and Technology curriculum and offers a suggested lesson structure.

## Materials

Included in your Welcome Pack are some materials to get you started. Your students are free to use these as they wish, and you're welcome to supplement them with other materials and craft supplies.

In your pack you will find the following:

- 20 lollipop sticks
- 35 paper straws
- 11 paper plates
- 10 paper cups
- 1 sheet of gold paper
- 1 sheet of shiny blue paper
- 1 pack of mylar
- 1 sheet of black foam
- 1 sheet of orange felt
- 1 sheet of mirrored tiles
- 6 corks
- 6 pipe cleaners
- 5 silver muffin cases
- 5 gold muffin cases
- 1 roll of silver ribbon
- 7 small plastic cups
- 2 plastic cup lids

## Running the Moon Base Challenge

The Moon Base Challenge can be run as part of your KS2 Design and Technology programme of study. The activity can also be linked to the 'properties and changes of materials' strand of the KS2 science curriculum. You might choose to run the challenge in class, as an extra-curricular activity or as a STEM club.

The suggested structure below is intended to be used alongside the PowerPoint presentation and other resources found here: life.org.uk/moon-challenge and has been designed to fit into a minimum of 2 hours. Feel free to adapt and change this to suit the requirements of your students and timetables.

| | Activity | Resources required | Suggested time |
|---|---|---|---|
| Lesson 1 | Project Introduction | • Powerpoint<br>• Student design brief | 10 minutes |
| | Design and Planning | • Powerpoint<br>• Examples of Moon base concepts<br>• Links to suggested reading | 15 – 30 minutes |
| | Make | • Materials from Welcome Pack | 20 – 35 minutes |
| Lesson 2 | Make (continued) | • Materials from Welcome Pack | 30+ minutes |
| | Evaluate | • Design submission sheet | 30 minutes |

## Project Introduction (10 minutes)

- Sort your students into teams of no more than 5.
- Introduce your students to the Moon Base Challenge.
- Talk through the Design Brief. You could print this off and allow your students to read through it, or show them the slide on the PowerPoint.
- Share the criteria on which their designs will be judged (a more in-depth overview of the judging criteria is included later in this document).
- Introduce the idea of problem, use and user. Students can discuss what these might be in relation to this project.

## Design and Planning (15 – 30 minutes)

- Discuss different types of structures, including shells and frames. You can use nearby buildings your students are familiar with as examples.
- If you wish to spend more time looking at structures, we recommend the following online resource as a starting point: https://classroom.thenational.academy/units/structures-freestanding-structures-22b8
- Show examples of Moon Base concepts to provide ideas and inspiration. If your students wish to do some extra reading around the subject, we recommend the following webpages as a starting point:

https://www.dezeen.com/2024/01/19/hassell-inflatable-moon-base-european-space-agency/

https://en.wikipedia.org/wiki/NASA_lunar_outpost_concepts

https://www.sciencefocus.com/space/how-to-build-a-moon-base

- Students need to draw and label at least two different initial designs, before creating a final design to be taken forward. (These designs should be included in the entry submission, and points awarded for showing how ideas have been developed).
- This is a time to think about the materials that will be needed, and how the items provided in the Welcome Pack might be incorporated into the final model. Decide how to allocate the materials between teams and if additional materials can be obtained.
- You might ask your students for a list of additional materials needed at the end of this phase.

## Make (50+ minutes)

- Students spend time building their model, based on their final design.
- Encourage students to take notes and continue to produce sketches as they go. Why have certain decisions been made? What challenges arise at this stage, and how are they overcome? (This information can be included on the submission form and may earn extra credit).
- Feel free to extend this section to give your students more time to develop and test their model.
- If you split this activity across the two lessons, you can encourage your students to continue thinking about their design before the next lesson and come back with fresh ideas!

## Evaluate (30 minutes)

- Give your students time to complete their entry for submission, either through the online form at life.org.uk/moon-entry, or by photocopying the attached form and emailing scanned copies to education@life.org.uk
- Your students should consider what worked, what didn't, and how they overcame problems and challenges.
- They should think about what they might do differently if they carried out the same project again, or what changes they might make without the same limitations on time, materials and cost.
- The final deadline for entries to be submitted is **9am on Tuesday 27th May**.

## Judging Criteria

Your students' designs will be judged on the following criteria. 60 points are available.

| Key features | Marks available | Comments |
|---|---|---|
| **DESIGN (20)** | | |
| **Planning** | **6** | • Two labelled, drawn initial designs (4)<br>• Reasoning for choosing the final design (2) |
| **Final drawn design** | **10** | • Clear, labelled diagram (2)<br>• Meets the requirements of the design brief (5)<br>• Outlines what materials will be used (3) |
| **Problem solving** | **4** | • Description of how the design will solve the problems in the Design Brief (4) |
| **MAKE (20)** | | |
| **Use of materials** | **4** | • Creative use of materials provided in the welcome pack (2)<br>• Efficient use of materials (2) |
| **Use of tools and techniques** | **4** | • Appropriate and creative use of tools and techniques in construction of the model (4) |
| **Final model/ prototype** | **12** | • Build quality of the final model (8)<br>• Explanation of how the model meets the Design Brief (4) |
| **EVALUATE (10)** | | |
| **Challenges** | **4** | • Description of a challenge that was faced and how it was overcome (4) |
| **Reflection** | **6** | • Evidence of reflection on the design process (3)<br>• Consideration of external factors that influenced the design (e.g. cost, time, availability of materials, etc.) (3) |
| **BONUS MARKS (10)** | | |
| **Inclusion of a mechanical or electrical system** | **6** | • Inclusion of a mechanical or electrical system in the drawn design (2)<br>• Inclusion of a mechanical or electrical system in the prototype (2)<br>• Description of the problem the system solves (2) |
| **Wow factor** | **4** | • Creative solutions to the problems in the Design Brief (4) |

**Health and Safety**

Students should always be instructed on how to use tools and other equipment safely. Appropriate risk assessments should always be in place before carrying out a project of this type.

### Terms and Conditions

- Students must be in years 5 and/or 6 (or a mixed KS2 class).
- Students must work in teams of no more than 5.
- Each participating class will receive a box of materials as part of their welcome pack, which can be used to construct your models. You do not have to use all the materials in your box, and basic craft supplies and materials may be used to supplement the box's contents.
- Entries may be submitted using either the online submission form at life.org.uk/moon-entry or by scanning and emailing the attached form to education@life.org.uk
- All entries must be submitted before 9am on Tuesday 27th May.
- 10 shortlisted entries will be selected from participating schools and contacted week commencing 2nd June. If one of your school's entries is shortlisted, the chosen team will be invited back to Life Science Centre for a day of exciting activities, where an overall winner will be chosen by a panel of judges.
- The winning team will receive a prize (please note that this prize is non-transferable).
- Shortlisted entries will be photographed and shared on Life's social media accounts.