



# HUMANS ON THE MOON

## FULL DAY SESSION PLAN TEACHER RESOURCE

FARLabs *Humans on the Moon* 1-day planning session. This session planner consists of:

1. Curriculum mapping
2. Teacher preparation required ahead of the session including booking the labs
3. Session plan- this is only a guide and can be update to suit your class room activities. The Full day plan can be broken up into 4 individual classroom sessions if preferred. Session 1: Introduction to the task, Session 2 FARLabs Radiation Turntable Experiment; Session 3: Design and Build and Session 4: Moon base presentation.

### HUMANS ON THE MOON: CURRICULUM MAPPING

#### Learning Objectives

- Understand there are three distinct types of radioactive particles
- Appreciate the penetrating power of these different radioactive particles:
  - Alpha radiation is easily stopped by thin barriers. It is not very penetrating.
  - Beta radiation is moderately penetrating. It is very sensitive to the thickness of the barrier.
  - Gamma radiation is very penetrating and goes through just about anything.
- Explain and predict the behaviours of alpha, beta and gamma radiation.
- Understand what physicists do in their job- teaching, research.
- Understand that scientists collaborate to generate solutions to problems.

#### Science Inquiry Skills Curriculum Strand Link

**Questioning and Predicting:** Identify questions and problems that can be investigated scientifically and make predictions based on scientific knowledge.

**Planning and conducting:** Measure and control variables, select equipment appropriate to the task and collect data with accuracy.

**Processing and analysing data and information:** Construct and use a range of representations, including graphs, keys and models to represent and analyse patterns or relationships in data using digital technologies as appropriate; Summarise data, from students' own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions based on evidence.

**Evaluating:** Use scientific knowledge and findings from investigations to evaluate claims based on evidence

**Communicating:** Communicate ideas, findings and evidence-based solutions to problems using scientific language, and representations, using digital technologies as appropriate

#### Key Vocabulary

radiation	solar wind	ionizing	photon
magnetic field	northern lights	nucleus	absorber

## HUMANS ON THE MOON: TEACHER PREPARATION



Students

- working in groups – students should be split into 6 groups
- each group of students will need to have one laptop or computer with internet access



Classroom

- tables arranged for collaborative learning as per student groups noted above
- projector for the MS Teams call by La Trobe staff/able to connect to MS Teams or Zoom with camera



Materials

- construction materials: alfoil, cardboard cylinders, boxes, paper cups, straws, paddle pop sticks, pipe cleaners, plastic bottles etc



Provided by LTU

- Zoom/MS Teams Calendar invite
- FARLabs access codes
- Printed *Humans on the Moon* booklets for each student

## HUMANS ON THE MOON: OUTLINE FOR THE DAY

Time*	Activity	Resources Required
9:10 – 9:30	<p><b>PART A</b>  <b>Presentation</b>  <b>LTU Academic</b></p> <ul style="list-style-type: none"> <li>- What physicists do, who they work with, and what are some of the problems they try to solve</li> <li>- How we use the scientific method</li> <li>- Understanding Space (radiation and human needs in Space) and the problem we will be solving today</li> </ul> <p>Students should be answering the <i>Part A</i> questions in their booklets.</p>	<ul style="list-style-type: none"> <li>• Webinar broadcast</li> <li>• <i>Humans on the Moon</i> booklet distributed to students</li> <li>• Students seated in 6-8 groups. Groups of 3 is ideal for this program.</li> </ul>
9:30-9:35	<b>Brain break</b>	
9:35 – 9:55	<p><b>PART B</b>  <b>Using FARLabs- students need access to one laptop/PC per group</b></p> <ol style="list-style-type: none"> <li>1. Watch webinar to show how to use FARLabs</li> <li>2. Teacher will allocate the below experiments to the corresponding groups and provide them with the access code.            Group 1: Alpha Experiment            Group 2: Alpha Experiment            Group 3: Beta Experiment            Group 4: Beta Experiment            Group 5: Gamma Experiment            Group 6: Gamma Experiment</li> </ol> <p>Students should complete their own Booklet while doing the experiment.</p> <p>Note: Teachers should have registered and booked the Turntables on the FARLabs website prior to this session and have the access code available for the students (<a href="https://www.farlabs.edu.au/teacher/registration-booking/">https://www.farlabs.edu.au/teacher/registration-booking/</a>).</p>	<ul style="list-style-type: none"> <li>• How to use the Radiation Turntable Webinar</li> <li>• <i>Humans on the Moon</i> booklet</li> <li>• Students seated in 6-8 groups</li> <li>• Each group of students should have a laptop/computer with internet access</li> <li>• Teacher to provide students with access code for FARLabs</li> </ul>
9:55 – 10:30	<p><b>PART B continued</b>  <b>Jigsaw</b>  <b>LTU &amp; Teacher</b></p> <ol style="list-style-type: none"> <li>1. Teacher will mix groups so that there is at least one of each type</li> </ol>	<ul style="list-style-type: none"> <li>• <i>Humans on the Moon</i> booklet</li> </ul>

	<p>of radiation expert present in the 6 groups.</p> <ol style="list-style-type: none"> <li>Teacher will instruct students to share their experiment notes so that every student has the answers for all three experiments in their Booklets.</li> <li>Teachers can check for student understanding via a group discussion of their results OR run a KAHOOT. (Students will be in their table groups and work as a team to do the Kahoot on their laptops).</li> </ol>	
10:30-10:58	<p><b>PART B continued</b>  <b>Unknown Source Race</b>  <b>LTU staff</b></p> <ol style="list-style-type: none"> <li>Students should be seated in original groups.</li> <li>Teacher will recap knowledge of alpha/beta/gamma to give students an opportunity to fill in their booklets.</li> <li>Students will work in their groups to run the 'Unknown Source' Experiment Race</li> <li>The team with the correct answer needs to justify their chose.</li> </ol>	<ul style="list-style-type: none"> <li><i>Humans on the Moon</i> booklet</li> <li>Students seated in 6 groups</li> <li>Each group of students should have a laptop/computer with internet access</li> </ul>
10:58 – 11:36	<b>Recess</b>	
11:36-1:32	<p><b>PART C</b>  <b>Design Process</b></p> <ol style="list-style-type: none"> <li>Students should remain in their original groups.</li> <li>LTU webinar will present on the Design Process and the next steps to completing Part C in their Booklets and set students off to design their moon base in their table groups.</li> </ol> <p><b>PART C continued</b>  <b>Design and Construction</b>  <b>Teacher</b></p> <ol style="list-style-type: none"> <li>Teacher to distribute construction materials or provide access to computer modelling programs (TinkerCAD/MineCraft etc).</li> <li>Teacher to instruct table groups to work on their designs and ensure that their moon bases.</li> <li>Each group should have allocated at least one presenter and a scribe noting down the thinking behind their moon base design and the materials they would use.</li> </ol>	<ul style="list-style-type: none"> <li>Design Process webinar</li> <li><i>Humans on the Moon</i> booklet</li> <li>Students seated in 6 groups</li> <li>Each group of students should have a laptop/computer with internet access</li> <li>Construction materials</li> </ul>
1:32-2:12	<b>Lunch</b>	
2:12-3:00	<p><b>PART C</b>  <b>Present to Class</b></p> <p><b>Students will be given time to complete their constructions.</b></p> <p><b>Class Presentation at 2:30.</b></p> <p>Students will present their prototypes to the class and Teacher who will provide feedback to each prototype.</p> <p>Q&amp;A</p>	<ul style="list-style-type: none"> <li><i>Humans on the Moon</i> booklet</li> <li>Students seated in 6 groups</li> </ul>