Teacher Resource

Moon Base

Focus Questions

Discuss the BTN story as a class and record the main points of the discussion. Students will then respond to the following:

1. Where will NASA build its Moon Base?
    a. Lunar South Pole
    b. Lunar North Pole
2. What will astronauts need to live on the Moon Base?
3. What does phase 3 of the Moon Base program involve?
4. What countries other than the US are building Moon bases?
5. What did you learn watching this story?

Activity: Curious about the Moon?

Are you curious about the Moon and the possibility of astronauts living on the Moon? Students will make a list of questions they have about the BTN story. As a class, students will brainstorm as many questions as they can and organise them under these headings…

- Living on the Moon
- Staying safe
- Building the Moon Base
- Science and exploration
- Daily life

Students will become space researchers and investigate their own question in more detail. Students will locate, collect and evaluate information from digital sources. Below are some example questions...

- *What will the Moon Base look like?*
- *How many astronauts will live there at one time?*
- *How will astronauts sleep on the Moon?*
- *What happens if there is an emergency on the Moon Base?*
- *Could plants be grown on the Moon?*
- *Is there water on the Moon?*

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KEY LEARNING
Students will explore the challenges of living and working on the Moon. Students will think like engineers to design and build a model of a moon base.

CURRICULUM
Science – Year 5
Scientific understandings, discoveries and inventions are used to solve problems that directly affect peoples' lives.

The Earth is part of a system of planets orbiting around a star (the sun).

Science – Years 5 & 6
Scientific knowledge is used to solve problems and inform personal and community decisions.

Science – Year 6
Describe the movement of Earth and other planets relative to the sun and model how Earth's tilt, rotation on its axis and revolution around the sun relate to cyclic observable phenomena, including variable day and night length.

Science – Year 7
Model cyclic changes in the relative positions of the Earth, sun and Moon and explain how these cycles cause eclipses and influence predictable phenomena on Earth, including seasons and tides.

Activity: Create a Moon Base

In this activity, students will explore the challenges of living and working on the Moon. Students will then think like engineers to design and build a model of a moon base. Students can design and build their moon base individually or in small groups.

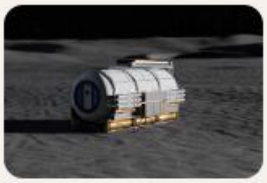
Class discussion

Before starting this activity ask your students to imagine they are one of the first humans sent to live on the Moon. What would you need to survive on the Moon? Discuss the following:

- There is no breathable air
- Extreme temperatures
- Limited resources
- Need food, water, power and transportation.

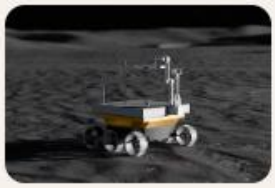
Research phase

Before designing their moon base, students will consider and research the following structures to be included in their model. If working in small groups each student will choose one structure to research and design.



Surface habitats

What living quarters will astronauts need to sleep, eat and conduct experiments? Astronauts will need shelter from radiation, extreme temperatures and small meteoroids.



Lunar rovers

How will astronauts explore the Moon's surface? The Moon's surface is particularly rugged in the South Polar region.

Hopping drones

How will astronauts explore the difficult terrain including deep craters? A hopping drone moves by hopping across the Moon's surface.

Power systems

How will astronauts get power? Parts of the lunar South Pole receive near-continuous sunlight.

Resource extraction technology

How could astronauts mine water ice that is trapped in craters on the Moon? Ice can be turned into drinking supplies.

Planning phase

Things to for students to think about before building their model:

- What do the different structures on your moon base look like? Explore the NASA website to learn more about the parts of a moon base.
- Sketch a diagram of your moon base and label important features.
- What will the size and scale of your model be?
- What materials or found objects will you use to make your moon base? Find recycled objects to construct your model.
- What tools will you need to build your moon base? Make a list.

Building phase

Students will create a model of their moon base using the materials they have collected and display them in the classroom. Alternatively, students may want to create their moon base using Minecraft.

Source: *NASA*

Further challenge

- Where on the Moon will your base go? Explore NASA's interactive map of landing sites for possible locations to put your moon base. Find the lunar North and South Pole. What is the best spot to build your permanent moon base? Why is it a good location? Give 2-3 reasons.
- What will you name your rovers and landers? What do you notice about the names of NASA's rovers and landers (they're all inspirational). Find an inspiring name.

Activity: Launch with TEDEd

What would it be like to live on the moon?
Watch this TEDEd video to learn more!

The moon illusion
Watch this TEDEd video to learn more!

BTN Space Science collection

Visit BTN's collection of stories which focus on Space Science. Look for BTN stories with the pencil icon to find supporting teacher resources all linked to the Australian Curriculum. BTN – Space Science Collection

Useful Websites

- Artemis 2 Launch – BTN
- Design your own Mission to the Moon! (teacher's guide) – Australian Space Agency
- NASA has revealed its plan to live on the Moon. Here's how it would work – ABC News
- Moon Base – NASA
- Artemis III – NASA