

# Touchdown to the Moon: Apollo Missions

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**Grade Level** 7  
**Duration** 2 class periods

## National Standards

### GEOGRAPHY

#### Element 1: The World In Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information.

### NEXT GENERATION SCIENCE

MS-ETS1-1 Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.

MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.

## AZ Standards

### ELA

#### Reading

##### Key Ideas and Details

**7.RI.2:** Determine two or more central ideas in a text and analyze their development over the course of the text; provide an objective summary of the text.

**7RI.3:** Analyze the interactions between individuals, events, and ideas in a text (e.g., how ideas influence individuals or events, or how individuals influence ideas or events).

#### Writing

##### Text Types and purposes

**7.W.3:** Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.

#### Speaking and Listening

##### Comprehension and Collaboration

**7.SL.1:** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

### SCIENCE

#### Physical Science Standards

**7.P2U1.2** Develop and use a model to predict how forces act on objects at a distance.

### TECHNOLOGY

#### Strand 1: Innovation Concept 1:

##### Knowledge and Ideas

PO 1. Analyze and Creativity and evaluate information to generate new ideas, processes or products.

## Arizona Social Science Standards

### INQUIRY ELEMENTS

**7.SP4.1** Explain the multiple causes and effects of events and developments in the past and present.

**7.SP4.2** Evaluate the influence of various causes of events and developments in the past and present.

### GEOGRAPHY

**7.G1.1** Use and construct maps and other geographic representations to explain the spatial patterns of cultural and environmental characteristics.

## SIOP Elements

<p><b>Preparation</b> Adapting content <b>Linking to background</b> Linking to past learning Strategies used</p>	<p><b>Scaffolding</b> <b>Modeling</b> Guided practice Independent practice Comprehensible input</p>	<p><b>Grouping Option</b> <b>Whole class</b> <b>Small groups</b> <b>Partners</b> Independent</p>
<p><b>Integrating Processes</b> <b>Reading</b> <b>Writing</b> <b>Speaking</b> <b>Listening</b></p>	<p><b>Application</b> <b>Hands on</b> Meaningful Linked to objectives <b>Promotes engagement</b></p>	<p><b>Assessment</b> <b>Individual</b> <b>Group</b> <b>Written</b> Oral</p>

**Arizona English Language Proficiency Standards**

**Grade 6-8**

**Basic**

**Listening and Reading**

Standard 1 By the end of each language proficiency level, an English learner can construct meaning from oral presentations and literary and informational text through grade appropriate listening, reading, and viewing.

B-1: determine the central idea or theme and explain how they are supported by using some text evidence.

B-2: recount specific details and information in a variety of texts.

**Listening, Speaking, Reading, and Writing**

Standard 6 By the end of each language proficiency level, an English learner can participate in grade-appropriate oral and written exchanges of information, ideas, and analyses, responding to peer, audience, or reader comments and questions.

B-1: participate in discussions about familiar topics and texts.

B-2: participate in written exchanges about familiar topics and texts.

B-5: contribute relevant information and evidence to collaborative oral and written discussions.

Standard 7 By the end of each language proficiency level, an English learner can conduct research and evaluate and communicate findings to answer questions or solve problems.

B-1: gather information from multiple provided resources to answer questions.

B-2: paraphrase observations/information notes with labeled illustrations, diagrams, or other graphics, as appropriate.

B-4: restate the main idea using evidence from text or presentations.

**Overview**

It has almost been 50 years since we first landed on the moon. Much of what we have learned about the moon is from our first hand experience of walking on the moon. Of course, this exploration of the moon and other space projects all involve teamwork—something every child should learn how to do in order to be successful.

**Purpose**

In this lesson, students will learn about the Apollo missions and where the space capsules landed on the moon. Students will then work as a team to build and safely land a spacecraft using the engineering design process. This lesson has adaptations for language learners.

**Key Vocabulary**

**teamwork:** the work done by people who work together as a team

**lunar:** relating to or of the moon.

**crater:** a large round hole in the ground made by something falling from the sky.

**astronaut:** a person who travels in space.

**mission:** a flight by a spacecraft to perform a specific task on the moon

**spacecraft:** vehicle used to travel in outerspace.

**Materials**

- Computer with internet access
- Apollo Mission Worksheet and Answer Keys
- Team Building Activity – Challenge

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- Engineering Design Process for Challenge
- Vocabulary Cards and Test
- Team Evaluation
- Moon map  
[https://geoalliance.asu.edu/sites/default/files/LessonFiles/Cullumber/Touchdown/Moon\\_map.pdf](https://geoalliance.asu.edu/sites/default/files/LessonFiles/Cullumber/Touchdown/Moon_map.pdf)
- Moon Map Answer Key  
<https://geoalliance.asu.edu/sites/default/files/LessonFiles/Cullumber/Touchdown/Moon%20Map.jpg>
- Markers or color pencils
- Small paper or plastic cups
- Bag of large and small marshmallows
- Cardboard (about 4"x5")
- Plastic (about 8"x8") (cut up plastic bag works well)
- Craft sticks
- Index cards – 3"x5"
- Rubber bands
- Ruler
- String
- Tape
- Scissors

### Objectives

The student will be able to:

1. Describe goals of the Apollo Missions.
2. Determine where they landed on the moon and reasons for these locations.
3. Read and interpret maps and significant features on the maps.
4. Draw and label maps, including symbols and legends.
5. Use the Engineering Design Process to work together as a team to analyze and solve a problem.

### Procedures

**Prerequisite:** Students should have a knowledge of basic map skills, such as locating information and how to use symbols and a legend.

*Note: If computers are not available for all students, teachers can go on the [Google.com/moon](https://www.google.com/moon/) site and make a hand-out for each mission. Follow the steps on the Apollo Mission worksheet for students. Once you click on a mission, zoom in and find #1. This is the landing site for the mission and gives information for the hand-out. You can choose other information from the mission to include with the hand-outs for small group work.*

#### SESSION ONE

#### Engage:

1. Begin the lesson by explaining that in 2019, it was 50 years ago when a man, an American astronaut, first stepped on the moon. Show the Apollo 11 video clip of the first steps on the moon. **(Integrating Processes: Listening)**  
<https://www.youtube.com/watch?v=RMINS7MmT4>
2. Have students then Quick Write in their notebook: What would it be like to travel there as an astronaut? What would it be like to be the first person to step on the moon? **(Preparation: Linking to background, Integrating Processes: Writing)**.
3. Discuss as a class their responses and introduce the vocabulary cards. Have students identify which of the vocabulary cards were already mentioned in today's lesson. **(Integrating Processes: Listening, Speaking)**

#### Explore:

1. Divide students in groups of 2-4. Tell each group they will be exploring the Apollo missions to the moon. Go over worksheet. **(Integrating processes: Listening)**
2. For each team, hand out the moon map and Apollo Mission Worksheet. Explain to students that they will be assigned one of the Apollo Missions #11-16. They need to complete their worksheet and locate the landing site on their moon map. Teams will go onto <https://www.google.com/moon/> and find the mission they are assigned. **(Grouping Option: Small groups)**
3. Teams will follow the directions on the Apollo Mission Worksheet and locate their landing on the moon map. Allow them time to explore the various interactive parts of their mission. **(Integrating Processes: Reading, Writing)**
4. After completing the worksheet. Teams will locate their Apollo mission on the classroom map. As a class, have each group share at least one thing they learned about their mission. **(Integrating Processes: Speaking; Grouping Option: Whole class)**

#### SESSION TWO

#### Explain:

1. Explain to class that landing on the moon took lots of team work and cooperation from the astronauts. Review the Apollo missions that the teams located on the moon map. **(Integrating Processes: Listening)**

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2. Ask students: Why did the missions pick these landing sites? Have them quick share with a neighbor. (**Grouping Option: Partners**).
3. Discuss these reasons as a class and explain the need for astronauts working together to not only to the moon but to also land safely on a flat moon surface. (**Grouping Option: Whole Class**)

### Elaborate:

1. Explain to class that they will be working in groups of 3-4 to build a shock absorbing system that will safely land a manned spacecraft on a lunar surface. (**Integrating processes: listening**)
2. Assign students their groups. Distribute the Team Building Activity – Challenge and review the instructions with the students. (**Grouping Option: Small groups; Integrating Processes: Listening**)
3. Have students use the Engineering Design Process for Challenge worksheet to design, and build their model spacecraft. (**Grouping Option: Small groups; Application: Hands On, Promotes Engagement**)

### Evaluate:

1. After completing the construction, each group will test their spacecraft to see if it lands safely with the astronauts (marshmallows) inside. (**Grouping Option: Small group; Application: Hands-on**)
2. Teams will evaluate and improve their designs and re-test their crafts. (**Application: Hands-on, Promotes Engagement**)
3. Teams will then complete the questions and the Team Evaluation on themselves and their teammates. (**Assesment: Written, Individual, Group**)
4. Give Vocabulary and Short Answer test (**Assessment: Written**)

## Assessment

### ELA and Social Science

The Apollo Missions Worksheet can be graded using the answer key. Mastery will be considered a score of 80% or higher. (**Assessment: Group**)

The Vocabulary Test can be graded using the answer key. Mastery will be considered a score of 80% or higher. (**Assessment: Written**)

### Science

The Team Building Activity can be measured using the Engineering Design Process for Team Building Challenge worksheet and the Team Evaluation. Mastery will be considered a score of 80% or higher. (**Assessment: Individual, Group**)

### Geography

Geography knowledge can be measured using the last two questions on the Apollo Missions Worksheet. Students should have identified two patterns and plausible reasons for these patterns. Mastery will be considered a score of 75% or higher. (**Assessment: Individual, Written**)

## Extensions

Have students read the journal entries on the [google.com/moon](https://www.google.com/moon) site and then write a journal entry as if they were one of the astronauts stepping onto the moon.

Host a contest for a successful launch from the highest point and the astronauts survived.

## Sources

Apollo Mission Website:

<https://www.google.com/moon/>

Video:

<https://www.youtube.com/watch?v=RMINS7MmT4>

Touchdown Activity:

<https://www.jpl.nasa.gov/edu/teach/activity/touchdown/>

Moon map

[https://geoalliance.asu.edu/sites/default/files/LessonFiles/Cullumber/Touchdown/Moon\\_map.pdf](https://geoalliance.asu.edu/sites/default/files/LessonFiles/Cullumber/Touchdown/Moon_map.pdf)