

Activity Duration: 30+min

Ages: Middle School (6th-8th)

Theme: Not Just Surviving
but Thriving

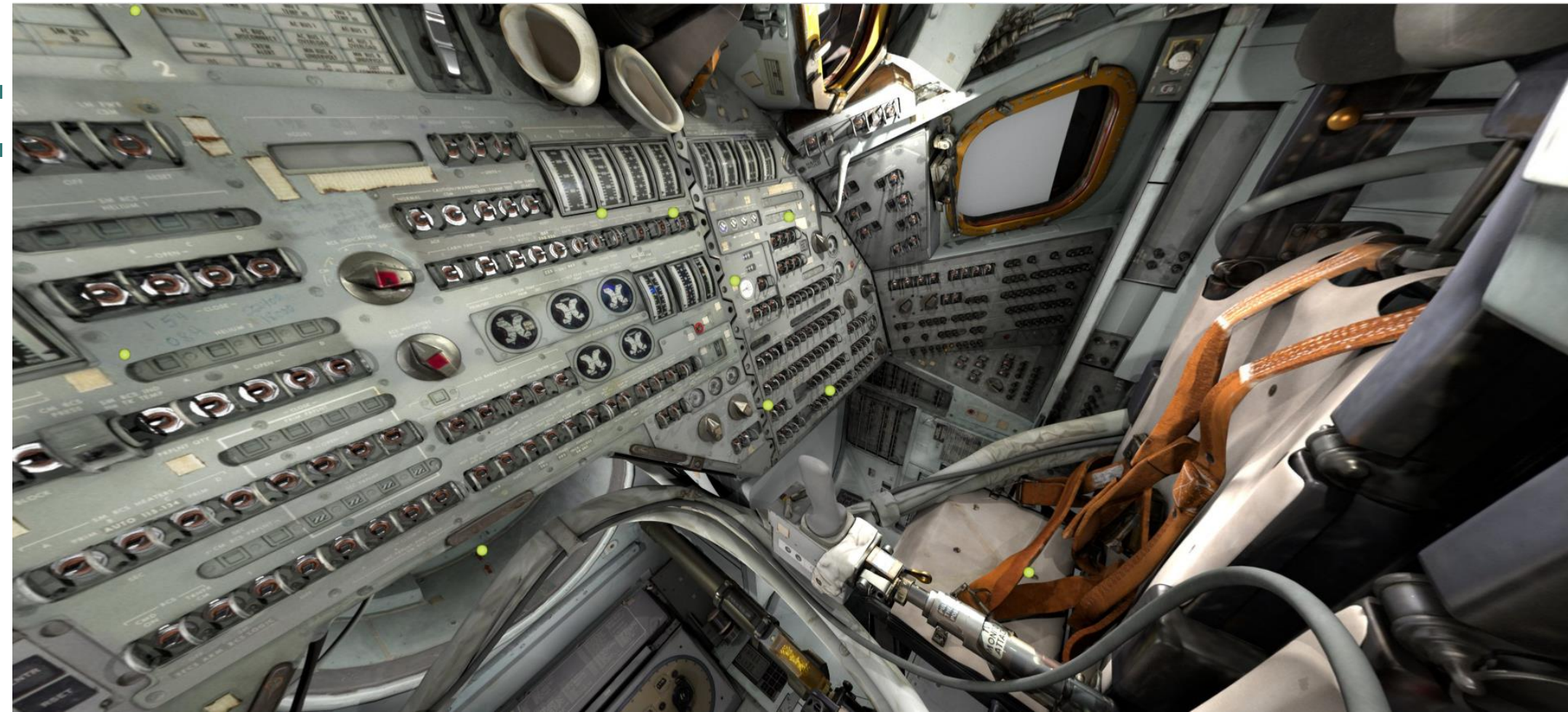
Intermediate Level

Fly Me To The Moon:

What would you take for a week trip around the Moon?



You are going on a trip to the Moon! But you are limited on the items you can take with you. What do you take and why? <https://youtu.be/vPai4c3la-0>



Activity Overview

You just won a trip to the Moon, but there is a catch... You are limited in the number of items you can take. You will first have to bring things that will help keep you alive for a week. What will you bring?

Activity Background

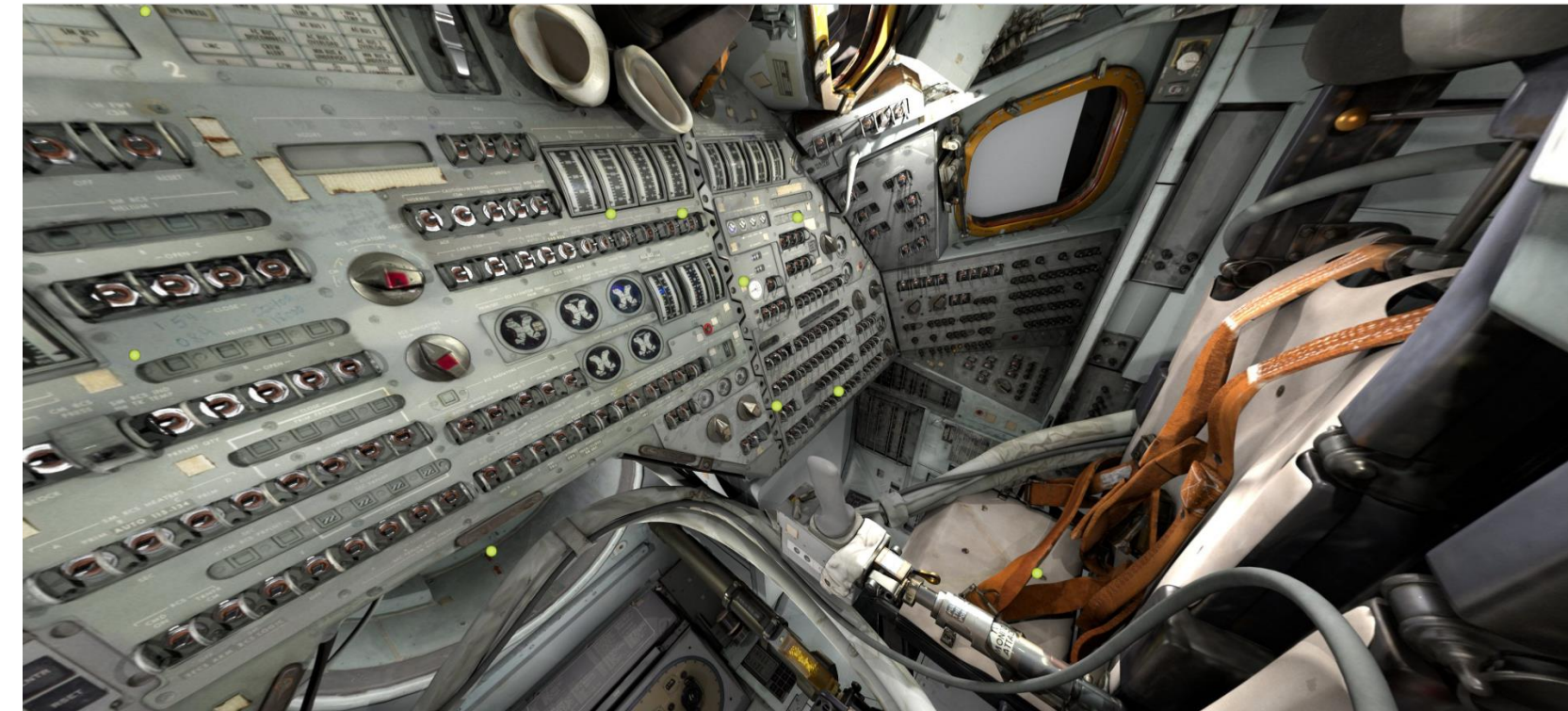
The **volume** of the inside of the **space capsule** that first took a person to the **Moon** was about the size of a 4-person tent (10 ft x 10 ft)

(<https://www.youtube.com/watch?v=-wrlbcLgVsY&feature=youtu.be>).

There was a great deal of thought that was put into what was needed on a **trip to the moon**. Take a look at the inside of the **Apollo capsule** and decide what to take (<https://www.patreon.com/user?u=29726054>). How to use Museum https://youtu.be/0X_H1dspMmM

Some people weigh less than others. The lighter the person, the more supplies he/she can take to the moon. Also the smaller you are, the less you consume; so the fewer supplies you will need to bring. Consider this, it costs about \$9,100 to get 1 pound of anything into Orbit and even more to get that weight on a trajectory to the Moon:

- ***How much does what you decided to take weigh?***
- ***After you decide what you are bringing to the Moon, calculate the total weight, and if you can, figure out whether you can reduce the weight of those items.***



See some of these articles related to taking stuff to space:

<https://www.businessinsider.com/spacex-rocket-cargo-price-by-weight-2016-6>

Instructions: See the list of materials below. You can simply use paper and pencils, OR if you are up to the challenge, you can use your favorite computer software and create your own version of the items that you are taking to the Moon

Intermediate

- Same materials as the beginners
- List of Weights
- Scale
- Calculator
- Tinkercad account (how to make one <https://youtu.be/YBkYkm0lJaQ>)
- Tinkercad Teacher Account - <https://youtu.be/XpNseC5IWAA>
- Set Up Students to use TinkerCad - <https://youtu.be/rFphPdwuQDM>
- Create with TinkerCad - <https://youtu.be/JDvdhjMSyX8>

If you are creating online accounts for the Tinkercad challenge, make sure to follow the guidelines if the student is under 13 years old.

Intermediate

Objective: Based on weight, chose what you would take to the Moon. They will only pay for \$2,000,000... The rest you have to pay.

NASA's Engineering Design Process

- Watch the following [video https://youtu.be/LMEDvHSLVVo](https://youtu.be/LMEDvHSLVVo) and discuss what is required to make the journey to the Moon.

Plan

- Watch the following video https://youtu.be/0X_H1dspMmM to learn how to use the Apollo 11 Interactive Virtual Exhibit.
- Take an interactive tour of the interior of the Apollo 11 Capsule <https://www.patreon.com/user?u=29726054>
- List the materials that you plan to take. You can check the Scouts BSA list (later in this activity plan) of what to take Camping to give you some ideas.
- Use the chart for some key supply weights (later in this activity plan) to determine the weight of your basic survival supplies based on your own body weight (watch this video to learn how to calculate the basic supply weight <https://youtu.be/HvLwJFnHWg>)
- If you want something not on the list, or if the weight is not on the chart, find the value like in this <https://www.youtube.com/watch?v=CdwYJp9nlyQ&feature=youtu.be>.
- Describe what you will take. Explain why you need to take it or why you would like to take it.
- Think which objects will be used to support life or to support a function in Space.
- If you also have the chance to bring souvenirs back to give to your friends or sell them on E-Bay, what would you bring back from the Moon?
- Once you finish with the sketch talk to someone and explain your plan
- You can use Tinkercad to create the items you are want to bring to the Moon - <https://youtu.be/JDvdhjMSyX8>
- Make a video of your items (create your items in a drawing or Tinkercad) and tell us why you are taking them with you to the Moon. Be creative! You can add music, color, a poem, a song or whatever you feel like to express yourself.

Video

- The video should be at maximum 2 minutes long. You will be explaining why you chose each object.
- Think how your object will be used. How many versatile functions can the object perform on board the Spacecraft for 7 days?
- If you do not have the object, draw a few sketches or create the object with materials you have in you home

Submit your artworks to SciArt Exchange (https://contest.sciartexchange.org/XpandYourHorizon-2020-001-design-your-habitat/entry_form/)

Total Supplies for Survival Per Day (base on an average person of 70 Kg)

Supply	Kilograms	Pounds
Oxygen	.84 kg	1.87 lbs
Solid Food	.62 kg	1.37 lbs
Water in Food	1.15 kg	2.54 lbs
Food Preparation Water	.76 kg	1.68 lbs
Drinking Water	2 kg	4.4 lbs
Total	5.37	11.86 lbs

Videos Explanations

- You Won a Trip to the Moon! <https://youtu.be/vPai4c3la-0>
- You will live here for 7 Days <https://www.youtube.com/watch?v=-wrlbcLgVsY&feature=youtu.be>
- How to Use the Museum for FREE https://youtu.be/0X_H1dspMmM
- What you need to take to the Moon https://youtu.be/dfZ5580db_M
- Weight what you bring to the Moon <https://www.youtube.com/watch?v=CdwYJp9nlyQ&feature=youtu.be>.
- What do you want to take to the Moon <https://youtu.be/41Hq89svypc>
- Interactive Virtual Spacecraft Museum <https://www.patreon.com/user?u=29726054>
- Cost to get to Space <https://www.businessinsider.com/spacex-rocket-cargo-price-by-weight-2016-6>
- Tinkercad tutorials <https://www.tinkercad.com/learn/designs>
- Setting up your Personal account - <https://youtu.be/YBkYkm0lJaQ>
- Setting up a teacher account - <https://youtu.be/XpNseC5IWAA>
- Setting up your students Account - <https://youtu.be/rFphPdwuQDM>
- How to Make Something - <https://youtu.be/JDvdhjMSyX8>

Materials and Method



Here is a Checklist from Scouts BSA of what to take Camping. Astronauts have said going to the moon was like camping and used that mindset for HABITAT ISSUES. So consider this list when deciding what to take to the Moon. (Some of these ideas won't relate to your journey. You need to decide.)

- **Water Bottle** - can prevent dehydration, heat exhaustion and heatstroke.
- **Trail Food** - is good for maintaining your energy. Bring more than you think you'll need in case you get stuck (or lost) in the woods.
- **First Aid** - A few items will allow you to treat scratches, blisters and other minor injuries. They should also allow you to provide initial care while waiting for help for more serious injuries.
- **Pocket Knife** - can be handy in a wide variety of situations. It's useful for tasks as large as building an emergency shelter or lighting a campfire with poor fuel, or as small as repairing a damaged backpack.
- **Flashlight** - headlamp or a rugged penlight is important for finding your way in the dark. Bring extra batteries, too.
- **Matches/Fire Starter** - may be used to light fires for heat, or for signaling for help. Store matches or lighters in resealable plastic bags.
- **Map and Compass** - are probably the most important tools you can carry in case you get lost.
- **Sun Protection** - might include sunblock, sunglasses, lip balm and a wide-brimmed hat.
- **Extra Clothing** - match the weather. Multiple layers are better than a single massive jacket, because layered clothing is adaptable to a wide range of temperatures.
- **Rain Gear** - very important. Rain can come in a hurry, and getting your clothes drenched is more than just uncomfortable, it can lead to hypothermia, a potentially fatal condition.



Materials and Methods

Here is a Worksheet of how to figure out what to take.

 Your Title! 		
Make a list of all the items that you will need for your trip in space. Remember to write all of your weight in POUNDS.		
Name of Item	Weight (Lbs)	Cost
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
Total	_____	_____