

Build your own Spacesuit!

Activity Rundown:

Since we can't leave our homes too often during the pandemic, we'll do the next best thing: GO TO SPACE! Well, maybe we won't actually step out into the great vastness of space. However, by using our imagination and creativity we will be able to create and wear our very own spacesuits by completing this week's activity!

You will need:

- + Various clothing and accessories
- + Tape
- + Be creative! You can also use household items such as tongs from the kitchen or swim goggles.

Let's do it!

- 1. Head over to the background and pick a planet within our solar system that you would want to visit!
- 2. Once you have your planet picked out, take some time to design your spacesuit. Keep in mind the climate, dangers, and other conditions of your planet.
- 3. Gather whatever you have at home and start building your spacesuit! You may need someone's help to tape some accessories if needed.

Examples of clothing/accessories you can use:

- Is the planet known to rain often? Maybe you should bring an umbrella!
- Does the planet have oxygen for you to breathe? You might want to bring an oxygen tank! Use your imagination to make your own oxygen tank. We've used cereal boxes taped to our backs in the past!
- Want to collect rock samples on the planet? Maybe some tongs would help with that!
- Does the planet have gravity similar to the Earth's? If not, you may want to grab some gravity-boots! Snow boots or rain boots with extra weights taped to them.





Background:

More information on spacesuits:

- Spacesuits supply astronauts with oxygen to breathe and water to drink during spacewalks!
- They protect astronauts from being injured from impacts of small bits of space dust and debris.
- Spacesuits also protect astronauts from radiation (energy that moves from one place to another) in space.
- The suits even have visors to protect astronauts' eyes from the bright sunlight!



Planet information:

<u>Mercury</u>

- Mercury is the **closest planet to the Sun** at a distance of 57 million kilometers.
- Mercury is the **smallest planet** in our solar system.
- The planet is **primarily made out of rocks.**
- Mercury is the **second-densest planet** in the Solar System after Earth (meaning it is



very compact).

- The surface of Mercury is similar to the Moon, there are a lot of craters!
- Temperatures on Mercury are both hot and cold (430°C during the day and -180°C at night.
- Mercury has a **very thin atmosphere** called an exosphere that is made out of oxygen, sodium, hydrogen, helium, and potassium.
- Frozen water exists on its surface.
- One day on Mercury is **59 Earth days.**
- Mercury circles the Sun once every 88 Earth days. If you would live on Mercury, you'd have a birthday every three months!
- Mercury has the **shortest year** of any planet.



<u>Venus</u>

- Venus is the second planet from the Sun, and the sixth-largest planet in the Solar System.
- Venus and Mercury are the only planets in the Solar System that **do not have a moon.**
- Venus is the **second brightest object** in the sky after the Moon, and the Sun.
- Venus is at a distance of **108 million km away** from the Sun.
- One day on Venus lasts for about **243 Earth days.**
- Venus has **mountains, valleys,** and tens of thousands of **volcanoes**.
- The average temperatures on Venus have been estimated to be at around **465°C** (this is hot enough to melt lead).



- Venus is the **hottest planet** in our solar system.
- Venus has gases and **clouds of sulfuric acid** that traps the heat and keeps Venus toasty warm.
- Much of the surface is covered by lava flows.
- On Venus, the Sun rises once every 117 Earth days.
- Venus is **Earth's sister** since it has a similar size, density, a similar internal structure, mass, volume, and atmospheric components of carbon dioxide and nitrogen.



<u>Earth</u>

- You should be pretty familiar with this planet; we live here! (Maybe you should pick a different planet to explore and create a spacesuit...)
- Earth's average distance from the Sun is **149 million kilometers.**
- Earth is the **fifth largest planet** of the Solar System.
- The surface of Earth is **covered by water** (around 71%) and only 29% of Earth's surface is covered by land.
- The mixture of gases commonly known as air are **nitrogen**, **oxygen**, **argon**, **and carbon dioxide**. Without them, we couldn't live.
- Earth has the **greatest density** out of all the planets in our Solar System. This means it is very compact.
- It is currently the only known location where life is present.
- One day on Earth, or the period in which the planet rotates once on its axis, is **23.9** hours.



- One Earth year or the period it takes for a celestial body to orbit the Sun once, takes about **365.25 days.**
- Earth's temperature ranges from -88 to 58° C.



<u>Mars</u>

- Mars is the fourth planet from the Sun and the **second-smallest planet** of the Solar System.
- Mars is 227.9 million kilometer away from the Sun.
- Mars is around two times smaller than Earth.
- Mars is the outermost terrestrial (rocky) planet.
- The atmosphere on Mars is thin, mostly composed of **carbon dioxide**, **nitrogen**, **and argon gases**.
- The tallest volcano/mountain in the Solar System is located on Mars. It is named Olympus Mons, and it is three times bigger than the largest mountain on Earth, Everest.
- Mars also has the biggest canyon in the solar system. It is named Valles Marines. It is 4000 km long and reaches depths of 7 kilometers.
- The average temperature on Mars is -60° Celsius.
- Mars is widely known as the **Red planet.** Its reddish appearance is caused by the presence of **rusty iron in the ground.**
- In many ways, Mars can be considered **Earth's brother.** It has seasons, polar ice caps, volcanoes, canyons, and weather.



- There is evidence of liquid salty water in the ground, especially on hillsides.
- One Mar year lasts about **687 Earth days** or almost twice as long as a year on Earth.
- A day on Mars is a little longer than a day on Earth. It lasts about **24.6 hours.**



<u>Jupiter</u>

- Jupiter is the fifth planet from the Sun and the **biggest planet** of our Solar System.
- Jupiter is a **gas giant!** It is made out of swirling gases and liquids such as 90% **hydrogen, and 10% helium** (very similar to the Sun).
- The envelope of gases (atmosphere) surrounding Jupiter is the largest planetary atmosphere in the Solar System. It makes up almost the entire planet. **Basically, it doesn't have a true surface, it's just gas!** (But it may have a solid core about the size of Earth at its center.)
- Jupiter is on average about **150 million kilometers** away from the Sun.
- In a way, **Jupiter is the Solar System's vacuum cleaner**, because of its powerful gravity which attracts many of the comets and asteroids to hit it rather than other planets.
- Jupiter is covered in swirling cloud stripes and has **enormous storms like the Great Red Spot**, which has been going on for hundreds of years.
- A day on Jupiter goes by very fast, It only lasts for about **10 hours.**
- One year on Jupiter is equal to **11.8 Earth years.**



• Jupiter's surface temperature is about -108°C.



<u>Saturn</u>

- Saturn is the sixth planet from the Sun with the **largest planetary rings** in the solar system. It's also the **second largest planet** in our solar system.
- **Periodic storms** are present on Saturn and they are large enough to be seen from Earth. **They are named White Spots**
- Saturn doesn't have a solid surface. It is enveloped by swirling gases and liquids the further down you go.
- It is possible that Saturn may have a core, it would be at least twice the size of Earth and it would be composed of metals like iron, and nickel.
- The temperature on Saturn's upper atmosphere is on average at around **-175° Celsius.** However, below its clouds, it gets considerably hotter.
- Saturn has the **lowest density of all the planets.** It is lighter than water and if placed on it, the planet would float.
- The planet is largely made up of gases such as hydrogen and helium.



- Saturn is nicknamed the "Ringed Planet" it has more than 30 ring systems around it. It isn't the only planet with rings, but it definitely has the most beautiful and visible ones. The rings of Saturn are made out of chunks of ice and rock.
- A day on Saturn goes by very fast. It takes only **10.7 hours** for Saturn to complete a single day.
- One Saturn year happens every **29 Earth years.**
- The presence of ammonia gives Saturn a yellow appearance, ammonia hydrosulfide orange, and water white.



<u>Uranus</u>

- Uranus is the seventh planet from the Sun, and the **third-largest planet** in the Solar System It is the biggest of the ice giants.
- Uranus is **2.9 billion kilometers** away from the Sun.
- Uranus has the **coldest planetary atmosphere** in the Solar System. Temperatures are on average at around **-224° Celsius.** It is the coldest planet!
- Uranus has a similar atmosphere to Jupiter and Saturn in its primary composition of hydrogen and helium. However, it contains more "ices" such as water, ammonia, methane, and traces of other hydrocarbons.
- The reason why Uranus is **blue** is due to the **presence of methane**.
- Uranus is made of **water, methane, and ammonia fluids** above a small rocky center. The thick atmosphere is made of hydrogen and helium like Jupiter and Saturn.



- Uranus has **13 known rings** surrounding it but they are difficult to observe.
- Some of the **wind speeds recorded on Uranus were among the most powerful** ever witnessed in the Solar System.
- One day on Venus only lasts **17 hours.**
- One year on Uranus is equivalent to 84 Earth years.



<u>Neptune</u>

- Neptune is the farthest planet from the Sun at an average distance of **4.5 billion** kilometers.
- Neptune is the fourth-largest planet in the Solar System and the **smallest of the gas** giants.
- Neptune is also an ice giant, just like Uranus.
- Wind speeds on Neptune are among the fastest recorded in the Solar System. They are five times stronger than the strongest winds on Earth.
- Neptune's average surface temperatures are around -214° Celsius.
- Neptune has a total of **6 ring systems** surrounding it.
- Uranus is Neptune's near twin in size and composition.
- The planet is basically a thick fog of water, ammonia, and methane over an Earth-sized solid center.



- The weather on Neptune is very active. Sometimes dark spots form in the atmosphere, which are basically storms the size of Earth.
- One day on Neptune only lasts for **16 hours.**
 - One year on Neptune is equal to **165 Earth years.**





Resources:

https://www.nasa.gov/audience/forstudents/nasaandyou/home/spacesuits_bkgd_en.html https://nineplanets.org/



Reach out!

We would love to hear from you about all the amazing STEM projects you are doing at home! Show us your finished products on any of the following social media platforms by tagging us or by using the following hashtags. We hope these projects have brought some excitement to your day during these difficult times.

Let us know how we did! Please <u>click here</u> to fill out a short survey on how well we did and what you would like to see more of in the future. Thank you!

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