**Space Stations (Lesson 2 of 4)**

**Activities that Astronauts do on a Space Station**

**STEM Topics -** Educational opportunities for careers in space, What astronauts do in space

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**Grade Level:** 6-8 Grade

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**Goals**: Learn the daily activities that an astronaut does on a space station.

**Learning Objectives:**

1. SWBAT know some opportunities that can help them pursue a career in space science.
2. SWBAT identify the specific tasks that astronauts are required to perform on a daily basis including hygiene, exercise, working and eating.

**Materials:**

Videos :

1. Dr Liz Warren – Skeletons in Space | Genes in Space

<https://www.youtube.com/watch?v=6-d3qk4I-MU&feature=emb_logo> - 4 min 50 s

2. How to prepare Thanksgiving food in space - <https://www.youtube.com/watch?v=60fxGvNLFtY> - 57 sec

3. The Hadfield Shake – Exercise on the ISS - <https://www.youtube.com/watch?v=Wam7poPzG1w> – 2 min 41 s

4. Kate Rubins : Science on the Space Station - <https://www.youtube.com/watch?v=XFivJfn2Ys4> - 2 min 42 s

5. Space Hygiene: Showering in Space - <https://www.youtube.com/watch?v=tDbbJWKKQu0> – 1 min 48 s

6. Chris Hadfield brushes his teeth in space - <https://www.youtube.com/watch?list=PLUaartJaon3LV-ZQ4J3bNQj4VNVG2ByIG&v=3bCoGC532p8> – 3 min 13 s

7. 5 Mind-Blowing Facts About Spacewalks - <https://www.youtube.com/watch?v=T2dFuEgaKsw> – 1 min 32 s

8. STEMonstrations : Spacewalk Part 1 : Safety and Training: <https://www.youtube.com/watch?v=J8xmbMZEXBk> 4 min 22 s

Power points:

Space Activities.pptx

Documents:

International Space Station Drawing.doc

Links to Space Station Activities.doc

Astronauts Scholarship Foundation Requirements.pdf

Websites:

Astronaut Scholarship Foundation : <https://astronautscholarship.org/aboutasf.html>

Genes in Space Contest : <https://www.genesinspace.org/us-contest/>

HTML – Internet Game Files:

MatchingActivities.html (Matching Space Station Activity Picture to Description)

LINK

<http://kattsustaineducation.com.s3-website.us-east-2.amazonaws.com/Games/MatchingActivities.html>

CardMatching.html (Playing the game MEMORY with a set of 12 pictures (24 total))

LINK

<http://kattsustaineducation.com.s3-website.us-east2.amazonaws.com/Games/CardMatching.html>

Downloaded Games:

Station Spacewalk Game (from NASA website)

<https://www.nasa.gov/multimedia/3d_resources/station_spacewalk_game.html>

**Vocabulary:**

**Dehydration (food):** - methods by which many types of foods can be preserved for indefinite periods by extracting the moisture, thereby inhibiting the growth of microorganisms.

**Extravehicular Activity (EVA):** Any activity done by an astronaut outside a spacecraft beyond the Earth’s appreciable atmosphere.

**Setup:**

* Start the lesson by talking about the opportunities students have in the future to pursue STEM types of careers in space. Have 2 websites ready for them to view that discuss the Genes in Space program and also the Astronaut Scholarship Foundation Websites. Have the Skeletons in Space video ready for them to watch.
* Have the power point Space Activities ready to present along with the Links to Space Station Activities document that gives the youtube links to the videos that are a part of most of the slides in the power point.
* Afterwards have the STEMonstrations Space Walk video prepared for them to watch and also the Station Spacewalk game downloaded and installed on your computer or have one of the students do that on their computer. The game is found on the website link above.
* You should then get the HTML games ready for them to play. They help the students review the several space station activities presented in the Space Activities power point. Go through the games once or twice yourself before they play it. The games should be accessible on the internet. Remember to tell them for the MEMORY game, they need to wait after the cards have disappeared to make another choice if a wrong set was picked.

**Lesson Plan Procedure:**

1.Start the lesson by showing the opportunity to obtain an astronaut related scholarship for 1 year in college from the Astronaut Scholarship Foundation. Go to the website and mention who founded the organization, what the scholarship offers (1 year funding for STEM related major), how contestants are chosen and what qualities/characteristics the foundation is looking for in an applicant. Then go to the adobe acrobat file that mentions the requirements and describe them to the students, work or school related achievements, letter of recommendation, nomination by faculty, personal statement, etc. [5 minutes]

2.Next, bring up another opportunity for astronaut related research by discussing the Genes in Space program for middle and high school students. Go to the website listed above for it. Talk about the criteria to start a project including coming up with your idea, the hypothesis process and using the toolkit materials they offer. You may want to start the discussion by bringing up a topic that has been addressed by the genes in space program already. After you discuss the process of applying/starting a project show the video **Skeletons in Space** from Dr Liz Warren to give them an idea of what topics/projects can be done on the space station. [10 minutes].

3.Start and present the **Space Activities** power point that discusses the daily activities that an astronaut does at the space station. The first slide is an overview slide but the rest of the slides have pictures of the videos you will present after each slide has been reviewed. It may be easier to use the document **Links to Space Station Activities** to open up the youtube videos instead of trying the links within the power point slides. There is no recording for this presentation so review the videos and slide material before presenting. [25 minutes]

4. At the end of the presentation the topic of space walks will be discussed. Take this time to transition into the next topic which is the **station spacewalk game**. First you will show them another video on spacewalking called **STEMonstrations – Spacewalk part 1 – safety and training**. Afterwards introduce the concept of the station spacewalk game by telling them you will do a game where you view the space station from the outside through spacewalking. Load the game and play it for about 5-10 minutes. [15 minutes].

5.Next, have the students play some of the HTML games that were written for this lesson. Tell them that each have pictures of activities that the astronauts do on the space station with some of those activities covered in the power point presentation. First play the picture – description matching game having the filename **MatchingActivities.html**. This should only take them about 10-15 minutes to solve. The next game is a MEMORY type game with the filename **CardMatching.html.** This should take them around 20-25 minutes to complete and figure out. [40 minutes]

6.Have the students draw out the profile of the space station as shown in the document **International Space Station Drawing.doc**. They should be able to do this from a computer screen by downloading the file themselves. The students should use blank white paper with a pencil and pen and colored pencils as well. [20 minutes]