



*Drexel-SDP GK-12 ACTIVITY*

## **Activity: Suiting Up for Space**

**Subject Area(s)** Astronomy  
**Associated Unit** Space, module 3  
**Associated Lesson** embedded  
**Activity Title** Suiting Up for Space  
**Grade Level** 6 (3-8)  
**Activity Dependency** None  
**Time Required** 50 minute lessons  
**Group Size** 2  
**Expendable Cost per Group** approx. \$2

### **Summary**

Students will be introduced to the basic design of a NASA space suit and what is required for life in space. Students will explore the NASA website and learn what is required to be trained as an astronaut.

### **Engineering Connection**

Space exploration would not be possible were it not for the work of engineers. In this activity, students will explore some of the principles involved in the design of space suits, and will engage in the process of designing and testing a space suit to resist the extreme heat and cold of outer space.

### **Keywords**

Space, space suit, astronomy, space exploration, materials science, aeronautical engineer

### **Educational Standards**

- 3.1.7 B Describe the use of model as an application of scientific or technological concepts.
- 3.2.7 A,B,C & D Inquiry & Design
- 3.4.7 C. Identify and explain the principles of force and motion
- 3.6 C. Explain physical technologies of structural design, analysis and engineering, personal relations, financial affairs, structural production, marketing, research and design.
- 3.7 A Describe the safe and appropriate use of tools, materials and techniques to answer questions and solve problems.
- 3.7 B Use appropriate instruments and apparatus to study materials.
- 3.7C Explain and demonstrate basic computer operations and concepts
- 3.7 D Apply computer software to solve specific problems.

**Pre-Requisite Knowledge**

None.

**Learning Objectives**

Students will be able to define what is necessary for a human being to survive in space.  
 Students will be able to identify some of the necessary properties of a space suit.

**Materials List**

- Access to website: <http://edspace.nasa.gov/home.html>
- Laptop cart (or computer room) with internet access
- \*Preferably one student per computer, but could also be done in pairs.
- Student activity worksheet (Space SA-3)

**Introduction / Motivation**

Space exploration would not be possible were it not for the work of engineers. In this activity, students will explore some of the principles involved in the design of space suits, and will engage in the process of designing and testing a space suit to resist the extreme heat and cold of outer space.

Review the background material with the students, discuss the vocabulary, then begin the activity.

**Vocabulary / Definitions**

Word	Definition
Aeronautical engineer	An engineer concerned with the design and construction of aircraft.
astronaut	A scientist who is trained to travel in a spacecraft.
space suit	A system of protective and pressurized clothing, together with environmental equipment, worn by astronauts when in space.

compass	Navigational instrument for finding directions .
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## **Procedure**

### **Background**

Space exploration would not be possible were it not for the work of engineers. In this activity, students will explore some of the principles involved in the design of space suits, and will engage in the process of designing and testing a space suit to resist the extreme heat and cold of outer space.

### **Before the Activity**

Collect and distribute materials.

### **With the Students**

Procedure:

1. Ask class what they think is required to be an astronaut?
2. What do you need to survive in space?
3. What is different about the moon than earth?
4. Why do astronauts need a space suit?
5. Today we are going to learn more about these questions by looking at the NASA website.
6. Give each student the student activity sheet
7. Each student to get a laptop and logon to <http://edspace.nasa.gov/home.html>
8. Students are to independently complete the activity which will guide them through the website.

### **Safety Issues**

- None

### **Troubleshooting Tips**

Help students to navigate the NASA website to the pertinent information.

### **Investigating Questions**

See Activity Embedded Assessment

### **Assessment**

#### **Pre-Activity Assessment**

None

#### **Activity Embedded Assessment**

Print the following questions into a student worksheet:

Space Lesson 3

# Suiting up for Space

Name:

Date:

1. Turn your laptop ON.
2. Go to SAFARI and enter <http://edspace.nasa.gov/home.html>
3. Go into Astronaut flight school. You can check out the different parts of astronaut school first, then click on SURVIVAL training.
4. In survival training complete all of the following modules:  
**Survival gear:**  
What is the nickname for the suits that shuttle astronauts wear during launch?

Name 3 things that can be found in the space suit:

**In-flight bailout:**

What are the four stages to in flight bailout?

**Finding food:**

What three things in the desert environment are edible?

What four things are edible in the mountain environment?

**Finding water:**

How many pints of water should a person drink per day?

Ducks and geese fly \_\_\_\_\_water in the morning and \_\_\_\_\_in the evening.

Space SA-3.1

**Building a fire:**

The best type of fire to build in a desert environment is a \_\_\_\_\_

The best type of fire to build in a mountain forest is a \_\_\_\_\_

**Building a shelter:**

In a desert environment it is important to build a shelter to protect you from \_\_\_\_\_.

In a mountain forest environment many natural shelters are available, such as \_\_\_\_\_

**Navigation:**

The red magnetic arrow on a compass always points \_\_\_\_\_

The direction arrow points \_\_\_\_\_

*Make sure to take a practice bearing reading on a map and in the field.*

5. Check out the Meet the Astronauts and Living in Space sections as well.

Space SA-3.2

# Suiting up for Space

## Teacher answer sheet:

### Survival gear:

What is the nickname for the suits that shuttle astronauts wear during launch? **PUMPKIN SUIT**

Name 3 things that can be found in the space suit:

**Life presever, knife, radio, signal mirror, motion sickness pill, lights, exposure mittens, flare, strobe light, one person raft, sea anchor, bailing cup, sea dye**

### In-flight bailout:

What are the four stages to in flight bailout?

**Post ejection checklist, Water entry position, Raft Ingress, Rescue and recovery**

### Finding food:

What three things in the desert environment are edible?

**Prickly pear cactus ,Desert Lily, Grub**

What four things are edible in the mountain environment?

**Cricket, June beetle, aspen tree, ants**

### Finding water:

How many pints of water should a person drink per day? **4-8**

Ducks and geese fly **TOWARD** water in the morning and **AWAY** in the evening.

### Building a fire:

The best type of fire to build in a desert environment is a

**Trench fire**

The best type of fire to build in a mountain forest is a **Tepee fire**

### Building a shelter:

In a desert environment it is important to build a shelter to protect you from **the SUN.**

In a mountain forest environment many natural shelters are available, such as **a vacant cave (or downed tree)**

### Navigation:

The red magnetic arrow on a compass always points **NORTH**

The direction arrow points **where you are going**

*Make sure to take a practice bearing reading on a map and in the field.*

**Post-Activity Assessment**

Evaluation based upon teacher assessment of student participation during activity as well as completion of the student activity sheet.

**Activity Extensions**

<http://edspace.nasa.gov/home.html>

**Owner**

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