

Civil Air Patrol's ACE Program



A is for Astronaut!

Kindergarten Academic Lesson #8

Topics: vocabulary, spacesuit, astronaut (language arts, science)

Lesson Reference: [Astronaut Toilet Paper Roll Craft](#) from DLTk's website

Length of Lesson: 50 minutes

Objectives:

- Students will analyze the word "astronaut" in terms of letters and sounds.
- Students will define astronaut.
- Students will identify 2 purposes of a spacesuit.
- Students will follow directions while making an astronaut craft.
- Students will practice their coloring, cutting, and gluing skills.



Next Generation Science Standards:

Disciplinary Core Ideas

ESS3.A: Natural Resources

Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

Crosscutting Concepts

Connections to Engineering, Technology, and Applications of Science

Influence of Engineering, Technology, and Science on Society and the Natural World
People depend on various technologies in their lives; human life would be very different without technology.

Science and Engineering Practices

Obtaining, Evaluating, and Communicating Information

Communicate solutions with others in oral and/or written forms using models and/or drawings that provide detail about scientific ideas.

CCSS ELA:

RI.K.1 With prompting and support, ask and answer questions about key details in a text.

Background Information:

When astronauts do extravehicular activities (EVAs), when they work outside the spacecraft or the International Space Station (ISS), they need special spacesuits to protect them. This lesson presents two of several reasons special spacesuits are essential for surviving in the vacuum of space. As background, though, some reasons astronauts need spacesuits are 1) to provide oxygen; 2) to protect from extreme temperatures of space, about -150 degrees Fahrenheit to 250 degrees Fahrenheit (about -100 degrees Celsius to 120 degrees Celsius); 3) to protect from radiation; 4) to maintain appropriate pressure; and 5) to protect from micrometeoroids and other debris that may be floating in space.

For additional spacesuit information and activities, go to: [Suited for Spacewalking Educator Guide](#).

Materials:

- picture of astronauts (included)
- toilet paper tubes (one per student)
- astronaut patterns (one per student)
- scissors
- crayons
- glue or glue sticks

Lesson Presentation:

1. Tell students that you have a mystery word to share with them. Write the word "astronaut" on the board. Ask students to count how many letters there are in the word. Ask students to name any letters that appear more than once. (a and t) Have students say each letter as you point to it starting with the letter "a" at the beginning of the word and ending with the letter "t" at the end of the word. Have students sound out each letter of the word as you point to it. Ask students if they have any idea what this mystery word is.
2. Confirm or reveal that the pronunciation of the word is astronaut. Ask students if they know what an astronaut is. Confirm that it is the name given to American people who go far past the Earth's sky, and out into space. (If students are unfamiliar with the term "space," explain that it is a huge place past Earth's sky that we cannot see from the ground, or even in an airplane. Our planet, Earth, is one of many planets that are out in space. Show a picture of the solar system. Tell students that if they could launch in a rocket and keep going up, up, up, they would be in space.) Confirm that we call American people who go into space "astronauts."
3. Show students the pictures (page 78) of an astronaut in the orbiter and working out in space. Ask students to describe what they see in the pictures. Why do students think that the astronaut who is outside the orbiter is wearing a big, bulky spacesuit? Help students understand 2 reasons why astronauts wear a big spacesuit when they are working outside their spaceship (doing an extravehicular activity- and EVA).
 - a. There is no air in space. Astronauts wear a spacesuit that contains air for them to breathe. The air supply is located in the astronaut's backpack attached to the spacesuit.
 - b. Also, the temperature in space is not like it is here on Earth. If astronauts did not have on a spacesuit, they would freeze in the shadow of the sun because it is very, very cold in the darkness of space. If they were in the sunlight, they would burn to a crisp because the temperature in the sunlight of space is very, very hot!!! Spacesuits help keep the temperature inside the spacesuit just right so the astronauts are comfortable - not too hot and not too cold.

Tell students that they will make an astronaut craft today.

4. Distribute a toilet paper tube and pattern to each student and help them complete the astronaut craft instructions.

ASTRONAUT CRAFT INSTRUCTIONS

- 1) Color the parts of the spacesuit.
- 2) Cut out the template pieces.
- 3) Glue the large rectangular piece on first to cover the tube.
- 4) Glue the thin strip around the middle as a belt.
- 5) Glue the oxygen tank onto the back.
- 6) Glue on the head, arms, and boots.



Summarization:

Ask a student volunteer to explain what an astronaut is. Pick two students to share a reason why astronauts must wear a special spacesuit when they are out of their spaceship working in space.

Character Connection: Tell students that before people became astronauts, they had to go to school, just like the students in the room. The future astronauts tried hard to do a good job and make good grades. They had to eat right, exercise, and get plenty of rest. They did all the things that the students are supposed to be doing right now. Only people who work hard and who can work well with others can become astronauts. Express that even if the students don't think they want to be an astronaut, when they see pictures of an astronaut, it should remind them of working hard and working well with others. That's the right thing to do. Encourage students to always do their best and get along with others. Express that you hope their astronaut craft will help them remember the interesting things they learned today about astronauts and spacesuits. Erase the mystery word and see if students can help spell the word astronaut again. Congratulate them on a job well done.

Assessment:

- teacher observation
- student answers to class discussion questions
- completed astronaut craft

Additional activity ideas to enrich and extend the primary lesson (optional):

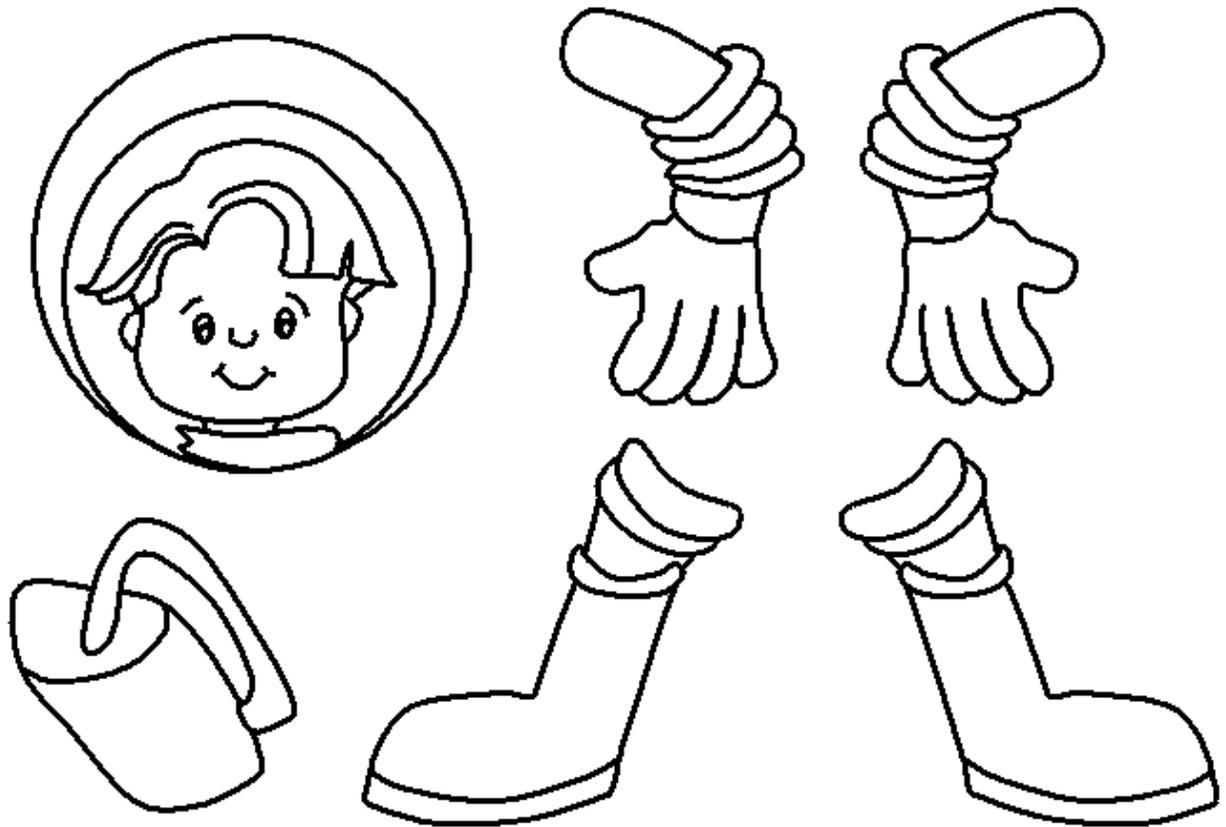
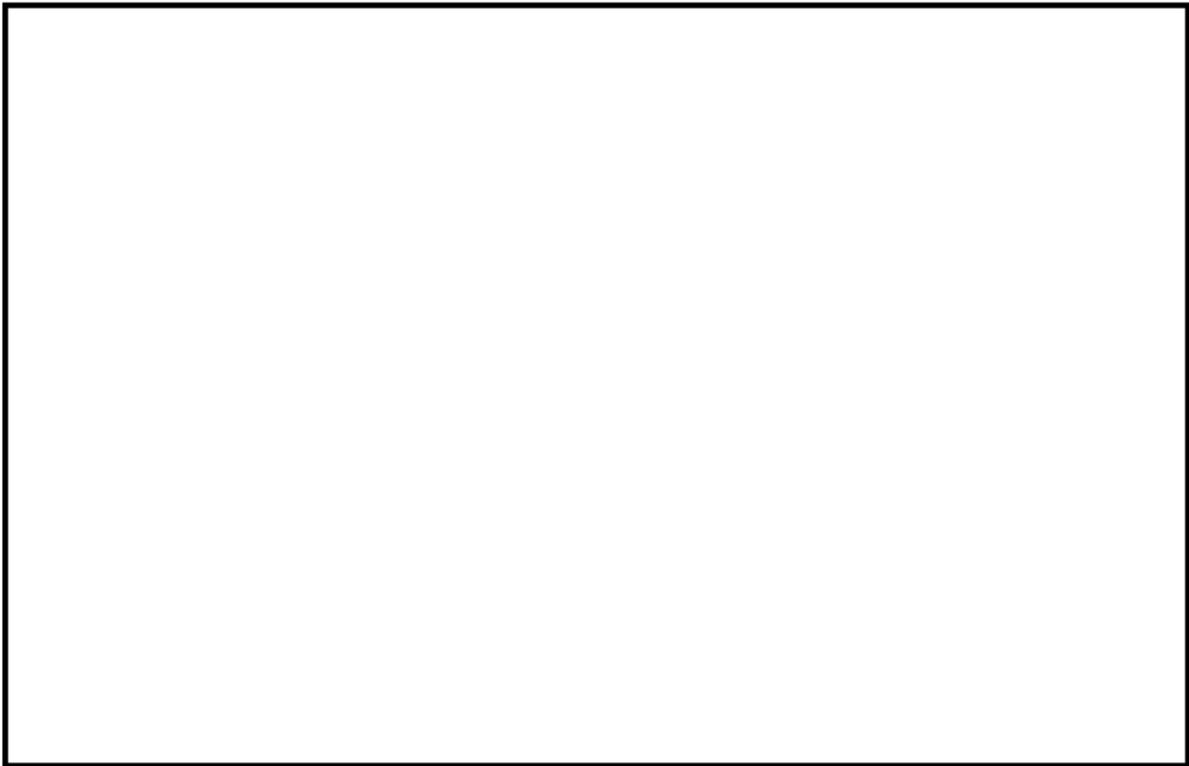
- Allow students to dress an online figure as an astronaut at [NASA: Dress Me for Space](#).
- Tell students that just like astronauts wear a special spacesuit to keep them safe, students must wear special clothing too sometimes. Ask them what kind of special clothing they might wear and why. (When they ride their bicycle, they should have a helmet. When they are outside at night, they should have something bright on them or something that reflects light so that they can be seen. In the winter time, they may need to wear heavy coats, gloves or toboggans. They might wear goggles to protect their eyes in the pool. They might wear a raincoat to keep them from getting wet in the rain. People on earth wear special clothes too!)
- Allow students to color the "A is for astronaut" picture.
- For an alternate [coloring page by a former ACE student](#).
- For a quick explanation watch "[Spacesuits](#)."



Spacesuit of astronaut working outside in space doing an extravehicular activity (EVA)



Spacesuit of an astronaut within the protection of space plane or International Space Station.



Template from [DLTK's Astronaut Toilet Paper Roll Craft](#)

Civil Air Patrol's ACE Program

Floating Space Food

Kindergarten Academic Lesson #9

Topic: food preparation, space environment (science, language arts)

Length of Lesson: 45 minutes

Objectives:

- Students will demonstrate how foods are made and eaten in the micro-gravity environment of space.
- Students will classify items as liquids or solids.

Next Generation Science Standards:

Disciplinary Core Ideas

ESS3.A: Natural Resources

Living things need water, air, and resources from the land, and they live in places that have the things they need. Humans use natural resources for everything they do. (K-ESS3-1)

ETS1.A: Defining and Delimiting an Engineering Problem

Asking questions, making observations, and gathering information are helpful in thinking about problems.

CCSS ELA:

SL.K.3 Ask and answer questions in order to seek help, get information, or clarify something that is not understood.

Background Information: (from NASA's [Space Food and Nutrition](#) Educator's Guide)

In many ways, living in space is not very different from living on Earth. In other ways, it is quite different. Astronauts in orbit above Earth must do the same things inside their spacecraft to live as we do on Earth. They have to eat, work as a part of a team, exercise, relax, maintain hygiene, and sleep. The only significant differences from living on Earth are that they operate in the confined space of a spaceship and that everything inside the spaceship appears to "float," which is an effect of *microgravity*.

Microgravity refers to an environment in which the local effects of gravity have virtually been eliminated by freefall. For example, imagine that you and a friend are riding in an elevator car when the elevator cable breaks. As you plummet down the elevator shaft, you and your friend experience microgravity. In other words, you are falling together inside the car. This makes both of you appear to float. Of course, gravity has not really gone away when you fall, but its effects inside the elevator car have.

Because microgravity affects spaceships in orbit around Earth, as a spaceship is in a state of "freefall" around the Earth, some jobs become a little more difficult, like handling tools, as the tools will "float away" if not handled correctly. Other jobs, however, become easier. Moving up and down and all around through a spaceship is very easy. Moving massive objects is easier, too, because the objects feel much lighter in space. Once you get a massive object moving, it keeps on going until something stops it. If not careful, objects will collide with the inside walls of the spacecraft with the same force used to get them moving!

