

ACTIVITY GUIDE: ASTROTOTS TO THE MOON! & SPACEWALK PLAY

Children are naturally curious, which leads them to explore the world with wonder and delight. Curiosity is also at the heart of science. As you engage your child’s curiosity in activities like the one listed here, encourage your child to ask questions, make observations, describe what they see, compare and contrast objects, and make inferences. This exploration helps build what are often called “science process skills.” Exploring and practicing science process skills can not only better prepare children for school, but additionally encourage them to learn new words, count with numbers, make plans, communicate, and solve problems – the basics for reading, writing, mathematics, and more.

Purpose: Creating and role-playing with costumes can help children imagine themselves as scientists while offering practice with language, as well as fine motor and science process skills.

Museum Connection: The Denver Museum of Nature & Science aims to be a catalyst, igniting the community’s passion for nature and science, including space science.

Recommended Age: 3-5 years

Background Information: When astronauts leave their spacecrafts – such as the International Space Station (ISS) – while they are in orbit, they must wear a spacesuit to keep themselves safe. Spacesuits function like small spacecrafts as they protect astronauts from the dangers of being outside in space. Without adequate atmosphere, the temperature in space can be too hot (from the sun) or too cold (from no sun) for the astronauts. Spacesuits also provide astronauts oxygen to breathe or water to drink while they are working in space. The helmets have special gold-lined visors to protect eyes from the bright rays of the sun, which are far more intense in space than they are here on Earth after passing through our atmosphere.

The spacesuits additionally protect the astronauts from space dust and debris. For example, the ISS travels at 17,500 miles per hour as it orbits the Earth. When an astronaut is on a spacewalk outside of the ISS, they are also moving that fast! If they encounter space dust or debris, their spacesuit can protect them from serious injury.

Activity Time:

20-30 minutes, open-ended

Prep:

Gather all the needed materials listed on the next page

Materials:

Item	Quantity
Brown Paper Grocery Bag	1-2 for each child
Art Supplies: crayons, markers, color pencils, paint, etc.	As preferred
Scissors	1 pair per supervising adult
Glue Stick	1 per supervising adult
Paper	Several sheets, as needed
Gloves	1 pair for each child
Activities such as puzzles, shape sorters, latch and lock boxes (see images below)	1 or more

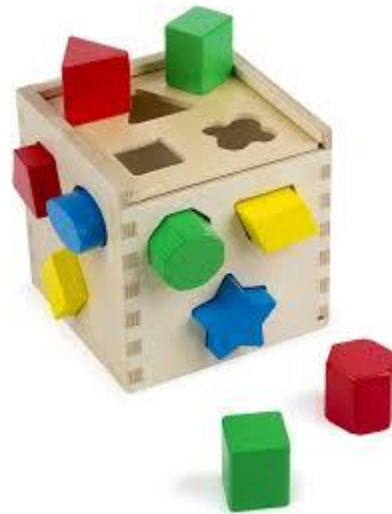
Step-by-Step Instructions:

1. Each child receives a brown paper grocery bag to create a space helmet.
2. With adult assistance, use the scissors to cut a circle on one side of the bag to be the face hold. *See image below.*
3. Cut two semicircles at the top of the bag to serve as the “shoulder rests” of the helmet. *See image below.*
4. Let child/children decorate their helmet(s) using art supplies.
5. If you have extra brown paper grocery bags, spacesuit vests can also be made. Cut a line up the center of one side of the bag; cut armholes on either side; and cut a circle in the bottom of the bag for the neck and head. *See image below.*
6. Use the extra paper, help child/children to make nametags, mission patches, an oxygen tank, or other spacesuit and helmet decorations. Cut accessories out and glue them onto the helmet and/or spacesuit vest.
7. Have child/children put on their helmet, vest, and gloves.
8. Play astronaut! Place various puzzles out for child/children to try to do with their space gloves on. Have children engage with one another to play-pretend and use teamwork to solve problems as astronauts do in space. **Bonus:** If participating in an Astrotots program through the Museum, have students wear their spacesuits for the virtual event!

Suggested questions or guidance:

1. Ask child/children to explain why they think astronauts need to wear spacesuits or why specific elements of the suit are necessary.
2. Guide child/children to come up with decorations they can add to their helmet and/or vest that could help keep them safe if they were in space.
3. Have your child describe the things they put on their helmet and/vest to practice using descriptive language, make observations or comparisons, and practice space-related vocabulary.
4. Ask your child to describe ways that wearing their helmet, vest, and/or gloves make their work more difficult!

Puzzle ideas:



Picture of Project:

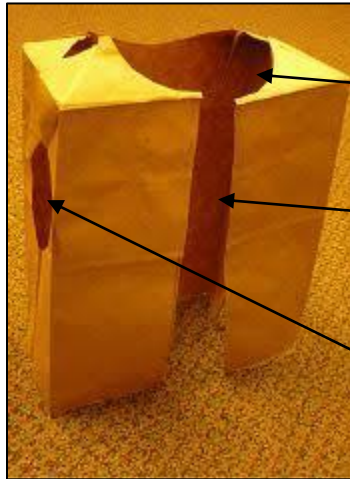
Steps 1-4 (Helmet):



Cut circle for face on one side of the bag

Cut two semicircles, one on each short side of the top of the bag

Step 5 (Vest):



Cut circle in bottom of bag to become neckline of vest

Cut line up center of one wide side of the bag to be the front of the vest

Cut a circle on each narrow side of the bag to be armholes

Background information of spacesuit basics:

Spacewalk Spacesuit Basics. NASA, 17 Jul. 2020, <https://www.nasa.gov/feature/spacewalk-spacesuit-basics>

2020 Colorado Academic Standards:

- **Preschool – Standard 1 – Physical Science**
 1. Recognize that physical properties of objects and/or materials help us understand the world.
 2. Recognize there are cause-and-effect relationships related to matter and energy.
- **Preschool – Standard 2 – Earth Science**
 1. Recognize that living things have unique characteristics and basic needs that can be observed and studied.
- **Preschool – Standard 3 – Space Science**
 1. The acquisition of concepts and facts related to the Earth materials and their uses.
 2. The acquisition of concepts and facts related to the natural and physical world and the understanding of naturally occurring relationships.

Some Early Childhood Development Milestones posed this activity:

- **Age 3:** Engages in basic back-and-forth conversation, does simple tasks when shown how, can put on some clothes by self (like jacket)
 - *Important Milestones: Your Child By Three Years*. Centers for Disease Control and Prevention, 13 Dec. 2022, <https://www.cdc.gov/ncbddd/actearly/milestones/milestones-3yr.html>
- **Age 4:** Pretends to be someone/something thing else during play, says sentences of four or more words, answers simple questions such as “what is a coat for?”, can name some colors, holds utensils with finger and thumb (not a fist), and maneuver some tasks/fasteners (such as buttons or zippers)
 - *Important Milestones: Your Child By Four Years*. Centers for Disease Control and Prevention, 6 Dec. 2022, <https://www.cdc.gov/ncbddd/actearly/milestones/milestones-4yr.html>
- **Age 5:** Takes turns while playing games, can sing/dance/act for you, recognizes some simple rhymes, counts to ten, has a concept of time
 - *Important Milestones: Your Child By Five Years*. Centers for Disease Control and Prevention, 6 Dec. 2022 <https://www.cdc.gov/ncbddd/actearly/milestones/milestones-5yr.html>