

Science Tellers: Escape from Earth.



## SCIENCE TELLERS

Escape from Earth

*Recommended for ages 7 to 11*

*Grades 2 to 5*

### A Reproducible Learning Guide for Educators

This guide is designed to help educators prepare for, enjoy, and discuss Science Tellers: Escape from Earth. It contains background, discussion questions and activities appropriate for ages 7 to 11.

### Programs Are Made Possible, In Part, By Generous Gifts From:

The Nora Roberts Foundation  
DC Commission on the Arts & Humanities  
Smithsonian Youth Access Grants Program

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## About the Show

Two curious kids venture into the forest to investigate a meteor shower and find themselves mixed up with a family of visitors from another planet! They risk everything to rescue their new friends and get them to their spaceship before it's too late. All the while, audiences get to learn the exciting science behind the show's out-of-this-world special effects.

## Our Solar System

Where is our Solar System located? What does it consist of? How big are the planets?



Our solar system is located in the outer spiral arm of the Milky Way Galaxy. The Sun, our major star, sits at the center of our system. The planets are bound to the sun because of gravity. Orbiting around the sun are 8 planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Each of the different planets range vastly in size, Jupiter being the largest and Mercury being the smallest. It would take over 100 earth's to get to the size of Jupiter but it would take 4 mercury's to make the earth.

## Science Experiments to Try at Home!

### How Do Planets Orbit the Sun?

The following activity can be used to show how planets orbit the sun. The Earth's rotation around the sun is the reason that

#### Materials:

- Orange Playdough
- Blue Ball
- Pie Tin

#### Instructions:

1. Flatten the orange playdough (the Sun) in the center of the pie tin.
2. Place the blue ball (the planet) in the pie tin
3. Try and tilt the pie tin so that the planet orbits around the sun!



Read more about this experiment here:

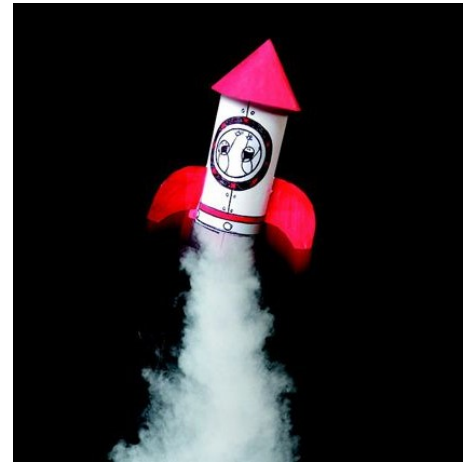
[www.giftofcuriosity.com/how-planets-orbit-the-sun-a-montessori-inspired-activity/](http://www.giftofcuriosity.com/how-planets-orbit-the-sun-a-montessori-inspired-activity/)

## Make Your Own Rocketship!

Using household materials, design and build your own rocket!

### Materials:

- Scissors
- tape
- glue
- rocket fuel (Alka-Seltzer® tablets)
- water
- rocket motor (an empty 35mm Fuji Film canister)
- rocket plans (make your own crazy designs and see which work best)



### Instructions:

1. Design your rocket. A simple cylinder, nose cone, and a pair of fins will suffice. Your final rocket should stand about six inches tall and be approximately  $1 \frac{3}{8}$  inches in diameter.
2. Cut out your rocket components (e.g., cylinder, nose cone, and fins), tape/glue them together, and test-fit your assembly over the film canister cap.
3. Open the film canister and drop one-half of an Alka-Seltzer tablet into the bottom portion.
4. Fill the canister half full of water and snap the canister cap into place. Slide the rocket over the cap, place the assembly cap-down, and get back. Pop, fizz, whoosh! Houston, we have lift-off.

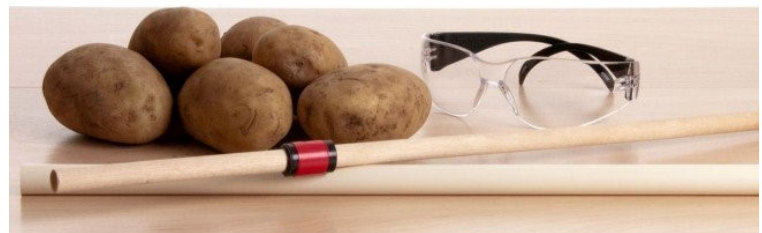
Read more about this activity here: <https://www.popsci.com/diy/article/2008-08/5-minute-rocket/>

## Make a Potato Launcher using Boyle's Law!

Boyle's Law states, "Under constant temperature, the volume of gas is inversely proportional to the total amount of pressure applied." Using a broomstick, a PVC pipe, and a potato test Boyle's Law and launch a potato!

### Materials:

- A broomstick or wooden dowel rod
- PVC pipe
- Duct tape
- Potatoes



### Instructions:

1. Form a stopper by wrapping a 12-inch strip of duct tape around the dowel rod approximately 6 inches from the end of the rod.
2. Place the potato on a flat surface. If the potato is very thick, you might want to cut it in half lengthwise. Hold the potato securely with one hand while pushing the end of the pvc pipe through the potato with the other hand. Pull the tube out of the potato to see your "potato plug."
3. Use the dowel to move the piece of potato to the other end of the tube (the tape stopper will actually position the potato plug a few inches from the other end).

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4. Position the potato securely on a flat surface again while pushing the empty end of the tube into the potato again. Now both ends of the potato tube are plugged.
5. The dowel will go into the end where the first potato plug is a few inches from the end of the tube.
6. Push upward with the dowel on the bottom piece of potato until the top potato piece pops out of the tube. POW!

Read more about this experiment here: <https://www.stevespanglerscience.com/lab/experiments/launch-potatoes/>

## Space Objects to Know

**comet**- an orbiting body with a center of ice and rock and a visible tail of gas and dust

**meteor**- a space object that enters Earth's atmosphere that appears as a streak of light due to the friction and heat in the atmosphere

**planet**- a large celestial body orbiting around a star

**star**- a ball of hot gases in space; an example would be our very own Sun

## Smithsonian Connections



The **National Air and Space Museum** on the National Mall has many different exhibits related to space travel. The exhibit ***Moving Beyond Earth*** explores the recent history of human spaceflight and considers the possibility of the future in space travel. ***Space Race*** offers students the opportunity to get a glimpse into the U.S.-Soviet race to outer space and its aftermath. The museum is currently undergoing renovations but does remain open to visitors (however, many galleries are closed).

Now is a great time to visit the **Steven F. Udvar-Hazy Center** in Chantilly, Virginia! Learn more about the science of vehicles that travel to space in the **Space Science** exhibit. Don't forget to take a picture with the Discovery space shuttle!

If you can't wait to get back to the Smithsonian, try using some of the online resources available for students and educators! The **Smithsonian Science Education Center** (<https://ssec.si.edu/>) has many different STEM resources for teachers to use in their classroom covering topics such as Life Science, Earth and Space Science, Physical Science and Engineering. Through the National Museum of Natural History, **the Smithsonian Science How** (<https://naturalhistory.si.edu/education/distance-learning>) webcasts also cover many different science education topics. While there might not be any space science videos right now, students and teachers can explore many topics related to Life Science!

Check out the Smithsonian Learning Lab for *Science Tellers* here:  
[www.learninglab.si.edu/q/ll-c/nW7D2H7bJhLB6AgU](http://www.learninglab.si.edu/q/ll-c/nW7D2H7bJhLB6AgU)

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# Smithsonian Institution

## OUR MISSION: "THE INCREASE AND DIFFUSION OF KNOWLEDGE"

Smithsonian Associates advances the Institution's mission through life-enriching educational and cultural experiences inspired by the Smithsonian's research and collections for DC-region students, families, and adults, and for learning communities nationwide.

Discovery Theater has been presenting DC-area children with live educational performances for almost 40 years. With programs that enrich the Smithsonian experience for nearly 50,000 children annually, Discovery Theater is a gateway to the exhibits, collections, and themes contained in the museums and galleries on the National Mall and beyond. We explore American history and cultures, folk tales from around the world, and exciting, accessible science and math programs in the company of puppeteers, storytellers, dancers, actors, and musicians. Discovery Theater performances unite ideologies, enact themes that reflect the diversity of its audiences, open avenues of self-reflection, and offer an enjoyable means for parents and teachers to demonstrate life's lessons. There's so much to do and explore at the Smithsonian—and Discovery Theater is the ideal place to begin!



### Our Location

The S. Dillon Ripley Center, 3rd Sublevel  
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