



**Jargie the
Science Girl**

*Recommended for
Ages 6 to 11
Grades 1-5*

A Reproducible Learning Guide for Educators

This guide is designed to help educators prepare for, enjoy, and discuss **Jargie the Science Girl**. It contains background, discussion questions and activities appropriate for ages 6 to 11.

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About Jargie

Jocelyn Argueta (Co-Creator, Writer, and Performer) is a quirky biochemist eager to share her love for science, theatre, oxidative stress-induced mitochondrial dysfunction, and the color pink. She received her Bachelor's degree in Biochemistry and Molecular Biology from the University of California, Irvine and has taken an active role in Neurobiology research focusing on neurodegeneration and aging diseases. Her work in Alzheimer's disease and Down syndrome cell characterization was recently published in the *Journal of Alzheimer's Disease*. She worked in the private sector, researching allergy diagnostics, with a patent pending in chemistry customization, after which she discovered her passion for arts education as a K-8 science instructor at a private academy. In addition to touring as Jargie, Argueta wanders around the University of Southern California, where she is pursuing her Ph.D. in Neuroscience.

Scientist Spotlight: Caroline Herschel

Born in Hanover, Germany in 1750, Caroline Herschel was an astronomer who discovered many new nebulae and star clusters. She was the first woman to discover a comet (she discovered eight in total) and the first to have her work published by the Royal Society. She was also the first British woman to get paid for her scientific work, when her brother, who had been named the king's personal astronomer after his discovery of Uranus in 1781, persuaded his patron to reward his assistant with an annual salary. After William's death in 1822, Caroline retired to Hanover. There she continued her astronomical work, compiling a catalogue of nebulae—the Herschels' work had increased the number of known star clusters from 100 to 2,500. She died in 1848 at age 97 after receiving many honors in her field, including a gold medal from the Royal Astronomical Society.



Read more online at:

www.smithsonianmag.com/science-nature/ten-historic-female-scientists-you-should-know-84028788/#4UVWuqFxFKQx4Dyzi.99

Try it at Home!

Weather Experiment - Make a cloud in a bottle! Ask your parents to help you out!

Materials:

- 2 Liter clear plastic soda bottle
- Matches
- Warm water



Directions:

1. Fill the clear plastic 2-liter bottle one-third full of warm water and place the cap on. As warm water evaporates, it adds water vapor to the air inside the bottle. This is the first ingredient to make a cloud.
2. Squeeze and release the bottle and observe what happens. You'll notice that nothing happens. Why? The squeeze represents the warming that occurs in the atmosphere. The release represents the cooling that occurs in the atmosphere. If the inside of the bottle becomes cover with condensation or water droplets, just shake the bottle to get rid of them.
3. Take the cap off the bottle. Ask one of your parents to carefully light a match and hold it near the opening of the bottle.
4. Have your parent drop the match in the bottle and quickly put on the cap, trapping the smoke inside. Dust, smoke or other particles in the air is the second ingredient to make a cloud.
5. Once again, slowly squeeze the bottle hard and release. What happens? A cloud appears when you release and disappears when you squeeze. The third ingredient in clouds is a drop in air pressure

Why does this work?

Water vapor, water in its invisible gaseous state, can be made to condense into the form of small cloud droplets. By adding particles such as the smoke enhances the process of water condensation and by squeezing the bottle causes the air pressure to drop. This creates a cloud!

Find this experiment and more online at www.weatherwizkids.com/weather-experiments.htm.

Vocabulary

Atmosphere – the layer of gas that surrounds Earth.

Atmospheric Pressure - the weight of the air as felt at any given spot on Earth.

Gravity - a pulling force that works across space. Objects do not have to touch each other for the force of gravity to affect them.

Hypothesis – an idea or explanation that you then test through study and experimentation

Kinetic Energy – Kinetic energy is the energy an object has due to its motion.

Potential Energy – Potential energy is the stored energy an object has because of its position or state. A bicycle on top of a hill, a book held over your head, and a stretched spring all have potential energy.

Reactant – a substance that takes part in and undergoes change during a reaction

Weather - the daily state of the atmosphere, or air, in any given place.

Scientific Method Activity

The scientific method is a way to conduct experiments. It has six steps:

1. Ask a question
2. Make a hypothesis
3. Test the hypothesis
4. Analyze the results
5. Draw a conclusion
6. Communicate your results



Using the questions below—or one of your own—follow the steps of the scientific method in everyday life!

- What is the fastest route from my house to school?
- What breakfast food gives me the most energy throughout the day?
- What is the most popular lunch in the cafeteria?

Find this activity and more online at www.flocabulary.com/lesson-scientific-method/

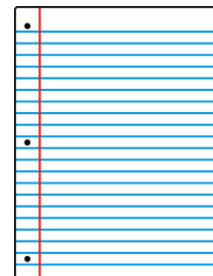
Gravity and Energy Experiment

Dropping Things of Different Weight

1. Take a piece of paper in one hand and a stone in the other.

Which is heavier? Which do you think will fall faster? Why?

2. Roll the piece of paper up into a tight ball.
3. Drop the stone and paper from the same height at approximately the same time.

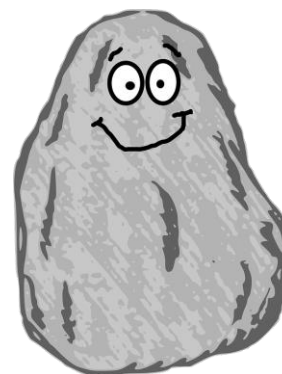


On account of the air resistance surrounding the Earth the lighter object may fall very slightly slower. If this activity was done where there is no air, (e.g. in Space, on the Moon, or in a vacuum) then they would reach the ground at exactly the same time.

Which landed on the ground first? Why?

Because gravity is the same for all weights!

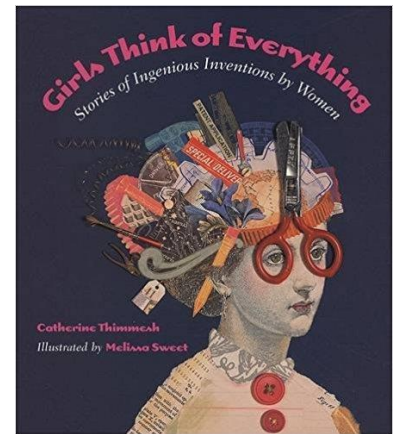
Find this activity and more online at www.primaryscience.ie.



READ...

Girls Think of Everything: Stories of Ingenious Inventions by Women
Written by Catherine Thimmesh with illustrations by Melissa Sweet.

In kitchens and living rooms, in garages and labs and basements, even in converted chicken coops, women and girls have invented ingenious innovations that have made our lives simpler and better. Their creations are some of the most enduring (the windshield wiper) and best loved (the chocolate chip cookie). What inspired these women, and just how did they turn their ideas into realities?



WATCH...

"It's Okay to be Smart"

This is a show about science. But it's probably not about science the way you're used to it. Hosted by Joe Hanson, Ph.D., author of the science blog, It's Okay to be Smart. Part of the PBS Digital Studios network. Watch online for free at:

<https://www.pbs.org/show/its-okay-be-smart/>.

VISIT...

The National Museum of Natural History!

The National Museum of Natural History is part of the Smithsonian Institution, the world's preeminent museum and research complex. The Museum is dedicated to inspiring curiosity, discovery, and learning about the natural world through its unparalleled research, collections, exhibitions, and education outreach programs. Opened in 1910, the green-domed museum on the National Mall was among the first Smithsonian building constructed exclusively to house the national collections and research facilities. The museum features more than 126 million natural science specimens and cultural artifacts.



The National Museum of Natural History is open daily from 10am to 5:30pm.

For more information, visit www.naturalhistory.si.edu



Smithsonian Institution

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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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