

Objective:

Students will observe the impact that asteroids make, comparing asteroids of various sizes and various falling heights.

Arkansas State Standards Addressed:

Science

NS.1.3.1 Communicate observations orally, in writing, and in graphic organizers: T-charts, pictographs, Venn diagrams, bar graphs, and frequency tables

NS.1.3.6 Collect and analyze measurable *empirical evidence* as a team and/or as individuals

NS.1.3.7 Make and explain predictions based on prior knowledge

NS.1.3.8 Use simple equipment, age appropriate tools, technology, and mathematics in *scientific investigations* (e.g., balances, hand lenses, microscopes, rulers, thermometers, calculators, computers)

Learning Goals:

Students will...

Understand the relation between the size of an asteroid and the size of the crater created on impact and the relation between the size of the crater and the height at which the asteroid began falling	
Know the definition of an asteroid, comet, meteor, and crater	Do a hands-on demonstration that illustrates the relation between the size of an asteroid/height at which it began falling and the size of the crater

Materials Needed:

- Small jar of cinnamon
- Marbles, small and large
- Aluminum-foil balls
- Ping-Pong balls
- Spoon
- Copy of Craters worksheet (found here: <https://www.scholastic.com/content/dam/teachers/lesson-plans/migrated-files-in-body/rocksprint.pdf>); one for each student
- For each group:
 - 4 cups of salt
 - 4 cups of flour
 - Shoe box

Procedures:

Procedures for this lesson plan can be found on the Scholastic website at this link:
<https://www.scholastic.com/teachers/lesson-plans/teaching-content/magic-school-bus-out-world/>

Additional Resources at the Bentonville Public Library:

The following resources are specifically about the meteors, asteroids, and comets. Accelerated Reading Levels are included when available. All items are available for checkout at Bentonville Public Library; call numbers are included in brackets. Online resources are available through BPL's Student Portal: <http://www.bentonvillelibrary.org/student-portal/>

Books

- *Discover Space Rocks* by Cynthia Pratt Nicolson. AR Book Level: 4.3. Non-Fiction. [JNF 523.5 NIC]
- *G is for Galaxy: An Out of This World Alphabet* by Catherine Collison. AR Book Level: 5.3. Non-Fiction. [JNF 520.3 COL]
- *Meteors* by Melissa Stewart. AR Book Level: 5.1. Non-Fiction. [JNF 523.5 STE]
- *My Friend, the Starfinder*. AR Book Level: 2.6. Picture Book. [PIC Lyon George]
- *Starry, Starry Night* by Bill Scollon. AR Book Level: 1.9. Beginning Reader. [EF Disney]
- *Stink Moody in Master of Disaster*. AR Book Level: 2.9. Beginning Reader. [EF McDonald Megan]

Videos

- *The Magic School Bus: Space Adventures*. 90 minutes. [EVID 500.5 MAG]

Online Resources

- *PebbleGo*. This online encyclopedia has a section for Meteors and Asteroids under Science/Earth and Space Science/Our Solar System.
- *Rosen PowerKnowledge Earth and Space Science*. This online encyclopedia has a section for Comets and Meteors under Space/Space and Our Solar System.

Explore Space Exhibit Information:

Explore Space: A Cosmic Journey, a traveling exhibition for libraries, is part of the STAR Library Education Network (STAR_Net) led by the National Center for Interactive Learning at the Space Science Institute. Exhibit partners include the American Library Association, the Lunar and Planetary Institute, and Afterschool Alliance. Explore Space is supported through a grant from the National Science Foundation.



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CRATERS

Do balls of different weights and sizes leave different size craters? Find out!



Prediction

Which ball will leave the biggest crater? Why?

Objects in Space by Tim

ASTEROIDS are made of stone or stone and metal. Some are hundreds of miles wide.

COMETS are made of rock, dust, and ice. The ice turns to gas when comets get near the sun, and the gas and dust can form a bright "tail."

METEORS are bits of rock and metal. If they come near Earth, most burn up in our planet's atmosphere. Meteors that do hit the ground are called meteorites.



Observations

- Draw the size of your craters below.

From
Crouching



From
Standing

Small Marble

Large Marble

Aluminum-Foil Ball

Ping-Pong Ball

	From Crouching	From Standing
Small Marble		
Large Marble		
Aluminum-Foil Ball		
Ping-Pong Ball		