

Kansas Meteorite Museum
NewsDepth, April 23, 2009
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Overview:

A nearly four pound chunk from a meteor that fell from space earlier this year has been sold to the Kansas Meteorite Museum in Haviiland. Weighing in at around 1,700 grams, the newest addition to the museum is said to be the largest piece of meteor that broke up near the Texas town of West. Seventy-seven-year-old L.B. Etter discovered the meteorite 11 days after it fell to earth while driving his tractor along his farmland. Stimpson noted that because it was discovered so quickly, it hadn't weathered. Students will learn more about comets, meteors and meteorites.

Grade Level: 7-8

Subject: Science

Standards:

Students will demonstrate an understanding of how the concepts and principles of energy, matter, motion and forces explain Earth Systems, the solar system and the universe.

Students will describe the effect that asteroids or meteoroids have when moving through space and sometimes entering planetary atmospheres (e.g., meteor-“shooting star” and meteorite).

Classroom Activities:

1. Activity #1 When You Wish Upon A Star (10-15 minutes)

- Read the following excerpt from Samuel Taylor Coleridge's Rime of the Ancient Mariner:

“The upper air burst into life!
And a hundred fire-flags sheen,
To and fro they were hurried about!
And to and fro, and in and out,
The wan stars danced between
And the coming wind did roar more loud,
And the sails did sigh like sedge;
And the rain poured down from one black cloud;
The Moon was at its edge.”

- What do you think he was referring to? What were the hundred fire-flags?
- How many of you have seen a shooting star or a shower of stars?



- Most of you have “wished upon a shooting star”. Any of you care to share what you may have wished for? What was that shooting star?
Shooting stars are actually meteors, and if they are big enough, they may make it all the way to the ground in which case the remaining pieces are meteorites. The speed of a fireball, angle of entry, mass and makeup of the original meteor determine how much survives. Unfortunately most meteors burn up entirely when they hit the atmosphere. Tons of meteoric material makes it to the Earth every year, and the vast majority of it is never found.
- Provide students with this site which is the Meteor Shower Calendar for 2009 in case they would like to prepare in advance for their next “Wish Night”.
<http://www.imo.net/calendar/2009>

2. Activity #2 Won't You Buy My Meteorite?" (30 minutes +)

- Why would anyone collect or buy and sell meteorites? How much do you think the Kansas Meteorite Museum paid for their new prize? Visit the following site which reveals the Iron Meteorites for sale and the going prices.
<http://www.meteoritemarket.com/Iron.htm>
- Assign students a partner or a small group. Their task: They have just found a meteorite. Using the following website and their imaginations, they are to determine what kind of meteorite they have found, its characteristics and its asking price.
<http://www.meteoritemarket.com/mmhome.htm>
- They are to prepare a 30 second commercial attempting to sell their “prized meteorite”. Included in their commercial should be a motivational appeal, a fair price and vivid description of the meteorite. These can be videotaped and played back for the students.



3. Activity# 3 Where'd That Hole Come From?

- Ask students if they can explain what a meteor looks like and where they can see one.
- Ask students “What is the difference between a meteor and a meteorite?”.
A meteor is an object that is in the atmosphere and is falling toward the planet. Explain that a meteorite is an object that impacts or strikes the planet.
- Explain that today the class is going to perform an experiment to see how impact craters are formed and how the size and weight of an object affects the size and shape of the hole that is left behind.
- Materials: Aluminum baking trays, sand, small rock, small block of wood, regular marble, large marble, ruler, paper, pencil
- Divide the class into groups of three and tell each group to assign one student to be the recorder, one student to drop the object, and one student to measure the size of the hole with a ruler.
- Have one member from each group come to the teacher and get an aluminum pan containing a pencil, sheet of paper, wooden block, rock, small and large marble and a ruler.
- Tell students to remove the objects in the pan and lay the pan on the floor.

- The teacher will fill each pan with about two inches of sand.
- Explain that the student in charge of dropping each object is to begin with the wooden block then proceed with the rock, small marble and finally the large marble. Explain that the student dropping the objects is to stand over the pan and drop each object from chest height.
- After the object is dropped the student with the ruler will measure the hole produced in centimeters and tell this information to the recorder.
- The recorder is to write down the name of each object and record the impact crater made in cm.
- When all the objects are dropped the students are to return their items to the teacher. Each member of the group is then to use the information gathered to produce a bar graph of the results and turn this in at the end of the experiment.

4. Activity #4 Meteoroids and the Craters They Make

- This activity can be a classroom activity, or as you will see when you visit the site, it can be a family activity. It is considered an “at home activity” by the site providers. It investigates the formation of craters. You'll see how the size, angle, and speed of a meteorite's impact affects the properties of craters. In addition, your family will become familiar with the terms meteor, meteoroid, and meteorite.
- http://cse.ssl.berkeley.edu/AtHomeAstronomy/activity_05.html
- This activity consists of 3 Experiments
 - Testing the Size of the Meteoroid
 - Testing the Speed of the Meteoroid
 - Testing the Angle of Impact.

Online Lesson Plans:

<http://www.nytimes.com/learning/teachers/lessons/20030513tuesday.html>

“Mapping meteorites” – a New York Times Lesson Plan

Using triangulation to locate meteors in the sky and on land. In this lesson, students explore how locations around a meteorite provide information about the meteorite's orbit.

<http://www.nytimes.com/learning/teachers/lessons/19981117tuesday.html>

‘Constellation Prizes” – a New York Times Lesson Plan

In this lesson, students learn about meteors, meteorites, and comets by reading and discussing a related New York Times article about the Leonid meteor showers and the methods that scientists are using to learn from these meteors. Students then create and observe a comet in their classroom.

http://solarsystem.nasa.gov/educ/docs/Follow_Meteor.pdf

“Follow the falling meteorite.” (math oriented lesson)

Additional Resources:

<http://epswww.unm.edu/meteoritemuseum/teacherac.htm>

Educational outreach activities from the University of New Mexico Meteorite Museum

<http://sse.jpl.nasa.gov/planets/profile.cfm?Object=Meteors>

This is the NASA Solar System Exploration site

<http://search.nasa.gov/search/search.jsp?nasaInclude=meteors>

NASA's meteor links

<http://meteorites.lpl.arizona.edu/>

This site is titled Meteorites and their properties. It is a good site for general information.

<http://www.bbc.co.uk/science/space/solarsystem/meteors/index.shtml>

BBC Nature and Science site with information about meteor showers

<http://www.iki.rssi.ru/solar/eng/meteor.htm>

Meteors and meteorites with included Educator's Guides