Camps Guide to Meteor Showers
Leonids Meteor Shower - November 17/18, 2015

What is a meteor shower?
A meteor shower is a predictable celestial event in which a relatively large number of meteors streak across the sky on a given night or series of nights. Meteor showers appear to originate from one point (called the radiant) in the night sky, often a constellation. Meteor showers get their name from the constellation from which they appear to originate. Meteor showers are caused by debris called meteoroids entering Earth’s atmosphere at extremely high speeds. This debris usually comes from comets that intersect Earth’s orbit. As Earth orbits the Sun, it collides with the debris left by passing comets and the result are meteors streaking through Earth’s atmosphere. Most meteors are smaller than a grain of sand, so almost all of them disintegrate before having a chance to hit the ground.

In 2015, the annual Leonid meteor shower will peak the night of November 17/18. The Leonids are so named because they appear to originate from the constellation of Leo (the lion). The debris responsible for the Leonids comes from the comet Tempel-Tuttle. It is possible to view about 20 meteors in one hour at the peak of the Leonids meteor shower.

Upcoming Events
Find information and resources about upcoming celestial events and NASA mission milestones to share with your students at http://www.lpi.usra.edu/education/look_up.

Meteor Showers/Comets in Your Camp!
Use the resources below to enable your campers to explore meteor showers. Create a meteor shower program that fits your camp schedule and needs. Consider fitting meteor showers into your ongoing programming. Perhaps design a week-long investigation into meteor showers with hands-on activities, demonstrations, and video clips, presentations by scientists from local colleges or universities, and a culminating meteor shower viewing event. Alternatively, pick one activity for your campers to celebrate the meteor shower and then encourage them to follow the news and explore more on their own!

http://www.lpi.usra.edu/education/look_up
Meteor Shower / Night Sky Viewing Event

Consider holding a meteor shower viewing event at your camp! All you need to view a meteor shower is a comfy chair or a blanket! You can also ask your local astronomical society to bring their telescopes for viewing other astronomical objects. Use the links below to locate a local astronomy club and/or speaker.

Night Sky Network
The Night Sky Network is a nationwide coalition of amateur astronomy clubs bringing the science, technology, and inspiration of NASA's missions to the general public.

NASA/JPL Solar System Ambassadors
http://www2.jpl.nasa.gov/ambassador/directory.htm
Solar System Ambassadors is a nationwide program consisting of volunteers who communicate the excitement of NASA/JPL's space exploration missions and information about recent discoveries to people in their local communities.

Websites

November 17/18, 2015 Leonids Meteor Shower
http://www.timeanddate.com/astronomy/meteor-shower/leonids.html

What is a Meteor Shower?
http://spaceplace.nasa.gov/meteor-shower/en/

Meteor Shower Calendar from the American Meteor Society
http://www.amsmeteors.org/meteor-showers/meteor-shower-calendar/

Information on Comet 55P/Tempel-Tuttle
Debris left in Earth’s orbit by Comet 55P/Tempel-Tuttle is responsible for the Leonid meteor shower.

The Dust Trail of Comet 209P/LINEAR
https://svs.gsfc.nasa.gov/cgi-bin/details.cgi?aid=4159
This NASA animation shows how Earth can pass through debris left behind by comets.

http://www.lpi.usra.edu/education/look_up
Explore meteor showers/comets in your camp with hands-on activities!

**Comet Mystery Boxes**  
Grade Level(s): Elementary School, Middle School

This is an activity about comet composition. Learners will explore the physical characteristics of comets by reaching into a series of boxes and feeling the materials and structures within.

**Comet on a Stick**  
http://epoxi.umd.edu/4education/mod_cometstick/Modeling_Comets_EG.pdf  
Grade Level(s): Upper Elementary School, Middle School, High School: Grades 9 & 10

In this activity, learners replicate the scientific processes of observing, forming an explanation, revising and communicating about a model of a comet.

This and other NASA educational activities, can be found at http://nasawavelength.org.