

Suggestion for the Earth Science Phenomena Video / Time Lapse Project

Your project should have an introduction title page that includes your name, your class period, and your number. You should identify the Phenomena on this title page. You should indicate with a “credits” (end of the film) page what equipment was used and the date, location, and duration of the phenomena. If you used any special program or information you should be able to explain what you used. You can use any type of device you have access to for capturing the video. If you need help finding a device, considering using school equipment and filming in school during extra help or before school. You will need to upload your videos to some kind of video editing software like iMovie or Windows Movie Maker to edit and render your project. You will not need to purchase any supplies or materials or cameras to complete this project. If you think you need something, ask.

The total length of the video project should be at least 30 seconds but no more than 2:00 minutes. If you have footage or an event that goes above or below this guideline talk to Mr. Abbott about your idea/phenomena to get approval to go beyond this time range.

The footage does not have to be Time Lapse. If you are capturing an extremely fast event, you might choose to use Slow Motion to film the phenomena. You might use actual speed or take observations from different days or even locations to create your footage. Time lapse is an excellent method for condensing extended events into the time requirements for this project.

It is helpful for time lapse images to have some type of movement captured. Consider including a clock (Analog or Digital) in your photos to record the passage of time. If something is changing size you may consider including a measurement scale or an object for scale to show the changes in length. (Shadow, tides, etc.) If something is changing directions include a compass or compass rose if possible. If the temperature is changing consider having a thermometer in the image to record and capture those changes. Other instruments could be recorded as well.

The following list of ideas is **not** meant to be a checklist of what you have to do. There are many other events that you could use to create your video project of an Earth science phenomenon. The best projects created will be the ones that show an actual Earth Science phenomenon that occurs that naturally lead to questions that you want to answer. You should be able to create and explain a model that helps to understand or explain why the phenomenon occurs. You should be able to propose how you could design and perform an investigation that could test the model and its ability to explain/understand the phenomenon. Originality will be rewarded.

Prologue and Earth's Size/Shape/Parts, Latitude, Longitude, Time. Topographic and Isomaps. (Topics 1 and 2)

- Capture events that illustrate how materials with different densities will interact.
- Create a time lapse video of the construction of a 3-D step model from a simple topographic map.
- Create a video that shows and demonstrates the steps needed to draw a profile from a line on a topographic map.
- Create a time lapse of the construction of a topographic map from a plastic shoebox and a landform model.

Astronomy (Topics 3 and 4)

The US Naval Observatory is a great site that has information about times for many astronomical events.

<http://www.usno.navy.mil/USNO/astronomical-applications>

Star trails (Go Pro Camera is supposed to work well)

- Take one hour in each direction
- Film for different number of hours
- Film from the Southern Hemisphere to show that star trails appear to go across the Northern horizon for observers south of the Tropic of Capricorn.

Sunrise / Sunset - look up times in paper or online

- Film and measure the azimuth (use phone compass) to show how the direction and time of sunrise / sunset varies over the seasons

Phases / Moonrise / Moonset – Look up times and directions online

- Film at the same time of day from the same location for several days to show the position and phase of the moon changes

Eclipses

- Create a time lapse for a Solar or Lunar Eclipse event

Tides

- Film a time lapse for a complete tidal cycle (HT to HT or LT to LT)
- Film time lapse for spring and neap tides to show variation based on the phase of the moon

Shadows

- Film a time lapse for a day of the changing length and direction of a shadow.
- Film the changing length and direction of a shadow for different days to show how the altitude and azimuth of the sun changes with the seasons
- Film the noon shadow of an object (building, flagpole, tree, etc.) to show how the altitude of the sun varies with the seasons.

- Film the altitude of a shadow cast by the same height object from different latitudes to show how the angle of the sun varies with the latitude.

Foucault Pendulum

- Film the apparent movement of a Foucault pendulum over an extended time period.

Solar System

- Create a video that shows a scale model of the distance between planets in the solar system.

Energy and Insolation (Topics 5 & 6)

- Film the melting of ice / boiling of water with temperatures indicated and measured. (Ice in a microwave at different power settings?)
- Film the differences in heating of fresh water vs. salt water
- Film the heating of a surface based on the color and or texture of a surface.
- Film the rate of temperature change based on the heating of a light source at various angles.
- Film the convection of materials suspended in a fluid that is being heated. (Hot water as a heat source under a plastic shoe container with dye/food color)
- Film the Rate of evaporation for the same volume of fluid at different surface areas.
- Film the Rate of evaporation for the same volume of fluid at different temperatures.
- Film the movement of different types of waves through a medium. Consider including the interaction of different wave pulses. (Constructive and Destructive interference)
- Film examples of the types of interactions between electromagnetic radiation and different surfaces / materials (RRATS)

Weather (Topic 7)

- Film the approach of a warm front or cold front
- Film a time lapse of Land Breeze and Sea Breeze (Both in the same day would be great). Flag on a flagpole, banners or pennants, or trees might show wind direction. Weather Vane.
- Film the building of a cloud in rising air.
- Film a time lapse of cloud formation on a mountain due to the orographic effect.
- Film the formation or evaporation of fog caused by changes in temperature and relative humidity.
- Film the formation of ice crystals (frost) on a surface over time. (Relate to the dew point temperature)

Climate and Water (Topic 8)

- Film demonstrations about soil water movement characteristics (Porosity, Permeability, Capillarity)
- Capture time lapse video segments to show how surface characteristics (slope, vegetation, rate of precipitation, type of surface, etc.) will change the amount of infiltration or runoff.

Weathering, Erosion, Deposition (Topics 9 & 10)

- Film a time lapse of erosional/depositional features created by a stream table.
- Film the movement of materials/sediments transported by a stream in a meander.
- Film the movement and velocity of water for a stream at various stream discharge levels.
- Film the breakdown or oxidation of a substance at different temperatures.
- Film the effect of shaking time on the abrasion of a material/mineral/substance
- Film the deposition of sediments of different characteristics (Size, shape, density, etc.) in a column of fluid.

Coastal (Included with Topics 9 & 10)

- Film the transport of particles carried down a beach by long shore drift.
- Film or capture the transport of sediments down a beach by saltation
- Film the creation of a placer (lag) deposit by the transport of lighter sediments by the wind.

Rocks and Minerals (Topic 11)

- Create a video that describes and shows different mineral properties (hardness, luster, streak, cleavage, fracture)
- Create a video that explains / shows rock types or classification.

Dynamic Crust (Earthquakes, Earth's Interior, Plate Tectonics) (Topic 12)

- Create a video that shows and explains the steps needed to determine the distance to the epicenter based on a seismogram. (Using ESRT and "wedge method")
- Create a video that illustrates how to use a safety compass, a map with a scale, and epicenter distances from 3 stations to find the exact location of an epicenter.

Geologic History and Landscapes (Topics 13 & 14)

- Create a time lapse video that illustrates the length of different parts of the geologic time scale over a long distance. (Football field, entire hallway at Grand, etc.)