Craters of the Moon_Kliewer

Objectives:

- Students will be introduced and hopefully excited about citizen science
- Students will actively make measurements and calculations which astronomers use as one tool to date astronomical objects
- Students will develop a deeper understanding of how astronomers obtain information about planets like Mars

Procedure:

1. Students will first create an account at moon zoo
2. Watch youtube tutorial on crater marking and take notes on what they will be doing
3. Students will have set amount of time to make it through as many moon frames as possible.

Questions:

- **Why might it be important to count the number of craters on the moon?**
- **What might a computer not be able to analyze these pictures as well as a human?**
- **How does citizen science help the scientific community?**

4. Students will go to Google moon and pick two locations to draw a polygon: one in lighter, white colored regolith and the other in a dark mare area.
5. Draw a polygon in each region and record the area of the polygon.
6. Count the number crater impacts in each plot and record.
7. Estimate the area covered by craters using a polygon for each crater.

	Mare	Highlands
Plot Area		
# of craters		
Area covered my craters		

8. Calculate the number of craters per plot area and the area covered by craters per plot area.

	Mare	Highlands
Craters per area		
Area of craters per area of plot		

Questions:

- How could this information be used to determine the relative age of the mare versus the highlands? Be specific and justify response.
- Which region did you find is older? Which one is younger?
- Do some research on the Mare regions versus highlands. What are each composed of? How did each form? Does your data support the accepted age difference?
- What are some limitations with calculating age using this technique?

Alternative:

Students can do the same activity on Mars picking a plot near Olympus Mons and a plot in a plains region.