

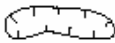


Activity 1: Identify the theme used with each set of features on the worlds below.

<p><i>Craters on Saturn's Moon, Mimas</i> Arthur, Balin, Bedivere, Elaine, Gawain, Gwynevere, Igraine, Merline, Mordred, Morgan, Percivale, Uther</p> <p>THEME:</p>	<p><i>Craters on the Asteroid, Gaspra</i> Bath, Calistoga, Carlsbad, Helwan, Krynica, Loutraki, Mandal, Rio Hondo, Saratoga, Tang-Sha, Yalta, Zohar</p> <p>THEME:</p>
<p><i>Craters on Uranus's Moon, Ariel</i> Agape, Ataksak, Befana, Berylune, Deive, Djadek, Domovoy, Finvara, Laica, Melusine, Rima, Yangoor</p> <p>THEME:</p>	<p><i>Craters on Europa</i> Angus, Balor, Brigid, Camulus, Cliodhna, Dierdre, Elathan, Gwydion, Llyr, Math, Pryderi, Tegid</p> <p>THEME:</p>
<p><i>Eruptive Centers on Io</i> Loki, Masubi, Pele, Prometheus, Surt, Volund</p> <p>THEME:</p>	<p><i>Rupes (scarps) on Mercury</i> Astrolabe, Discovery, Fram, Santa Maria, Vostok, Zeehaen</p> <p>THEME:</p>

Student Handout 1: Mapping the Lunar Surface

Locate and mark the following Lunar surface features on a copy of the Planet Trek map.












Craters 		Rimae 		Vallis 		Rupes 	
Name	Lat Lon	Name	Lat Lon	Name	Lat Lon	Name	Lat Lon
Copernicus	10N 20 W	Dawes	18N 27E	Bohr	12N 87W	Altai	24S 23E
Kirchhoff	30N 39E	Euler	21N 31W	Capella	8S 35E	Cauchy	9N 37E
Plato	52N 9W	Hesiodus	30N 20W	Planck	58S 126E	Kelvin	27S 33W
Tycho	43S 11W	Messier	1S 45E	Schrodinger	26N 51W	Liebig	25S 46W

To locate additional features on your map, access the USGS Lunar Images site at: <http://www.nrl.navy.mil/clementine/clib/features/comp.html> Some other features, and their definitions are in the Figure 3.

Be sure to create a legend for your map showing the symbol you use for each type of surface feature. When you finish, answer the following questions:

1. Which names of these features were most familiar to you? Why? What do they have in common?
2. If new features were discovered on the moon, what names would you give them and why? How do they fit the theme?
3. If you could select one of the places you located on your map for the next Moon mission landing, which would it be and why? (You may have to do a little research for this).
4. Recently NASA has been talking about going back to the moon to establish a colony. Where would you recommend placing it? Why? Mark this on your map.

Figure 3. Other Surface Features and Symbols.

<u>Surface Feature</u>	<u>Description</u>	
Catena	Chain of craters	 catena
Chasma	Deep, elongated, steep depression	 crater
Craters	Circular depression	 depression
Dorsum	Ridge	 depression, narrow
Mare or Maria	“Sea” – large circular plain	 ejecta
Mons	Mountains	 fracture pattern
Reticula	Reticular or netlike pattern on Venus	 furrow, fissure or rimae
Rima or Rimae	Fissure	 mountain
Rupes	Scarp (cliffs from faulting/erosion)	 rille
Sinus	“Bay” – small plain	 scarp base
Tholus or Tholi	Small, domical mountain or hill	 scarp top
Undae	Dunes	
Vallis or Valles	Valley	
Volcano	Mons (mountains) that erupted	

Student Handout 2: Naming and Mapping Your Potato World

For this activity you will need a large potato with lots of “surface features” and a Sharpie and ball point pen, two pushpins, and a blank Planet Trek map.

First, you will mark your potato world as follows:

Find the center of rotation on your potato world and mark your north and south poles along the long dimension (axis) of the potato.

Mark the equator, halfway between the poles.

Decide where you want your “Prime Meridian” and draw this perpendicular to your equator; indicate the 180th meridian halfway around the potato.

Mark lines of equal latitude and longitude on your potato; your teacher will either ask that you draw them every 15 or every 45 degrees - you will have to measure and calculate the correct distances for these lines.

Next, give your world a name and decide what theme you will use to identify features:

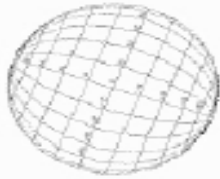
Name of My World: _____

Theme: _____

Using the USGS “Rules” for naming surface features, identify at least 10 “features” on your potato world, then mark them on a copy of the Planet Trek map. List those below:

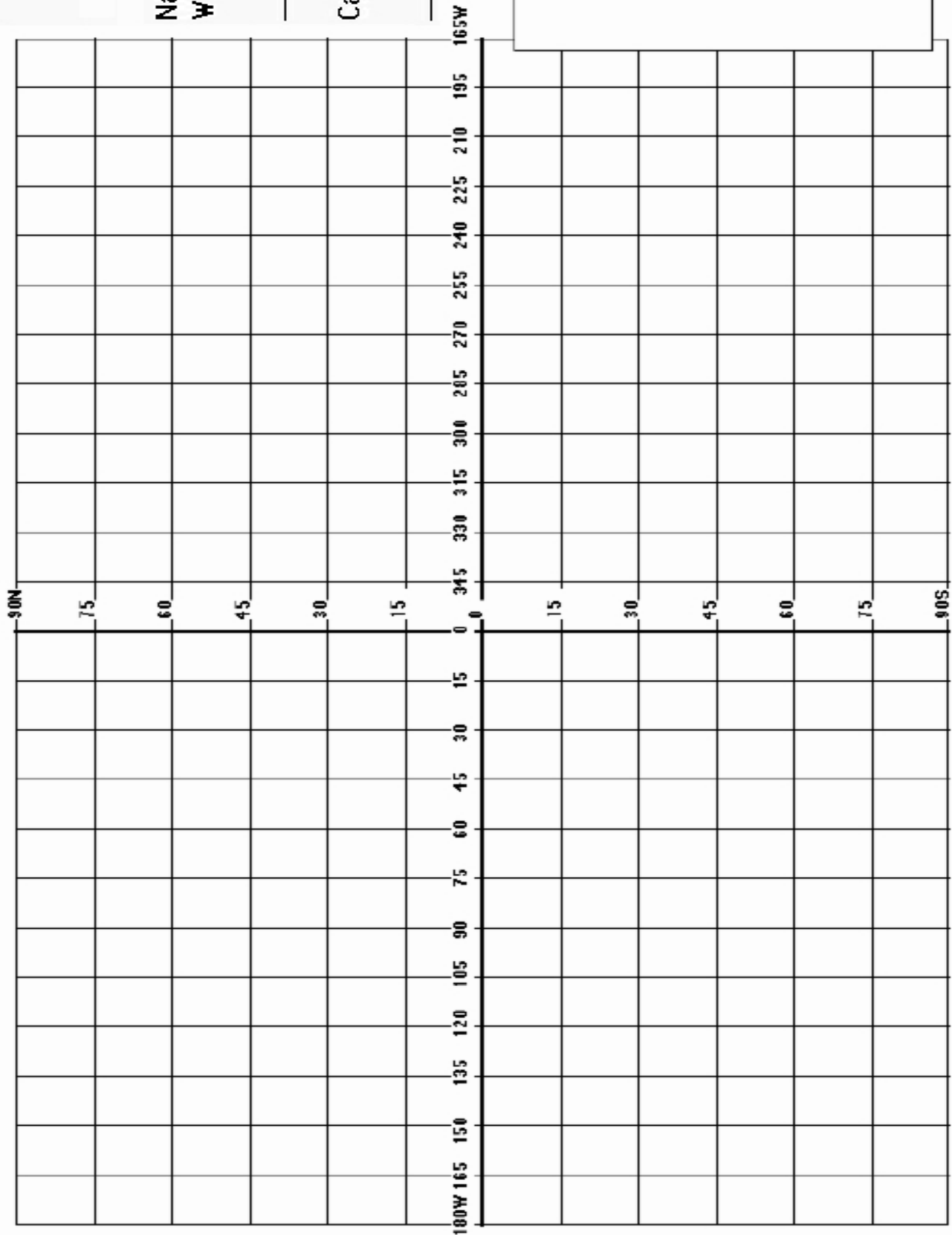
Feature Name	Type	LAT.	LON.	Naming “Rules”
				According to the USGS, these rules include: Keep it simple! Don’t use the same name twice. Keep to the theme. Avoid using names that have political or religious significance. Wait at least three years after someone has died before you name a place after them. Reserve the honor of naming a place for people of high and enduring respect in the international community. Solar system nomenclature should include international themes.

Planet Trek: Mapping New Worlds



Name of World: _____

Cartographer: _____



Mapping Alien Worlds

- Donna Governor

Answers to the Themes Exercise :

Craters of Mimas:

Characters from Arthurian legend and folklore

Craters of Gaspra:

Famous spas and resorts from around the world

Craters of Ariel:

Benevolent spirits of folklore/myth

Craters of Europa:

Celtic and Gaelic gods, goddesses and legends

Eruptive Centers on Io:

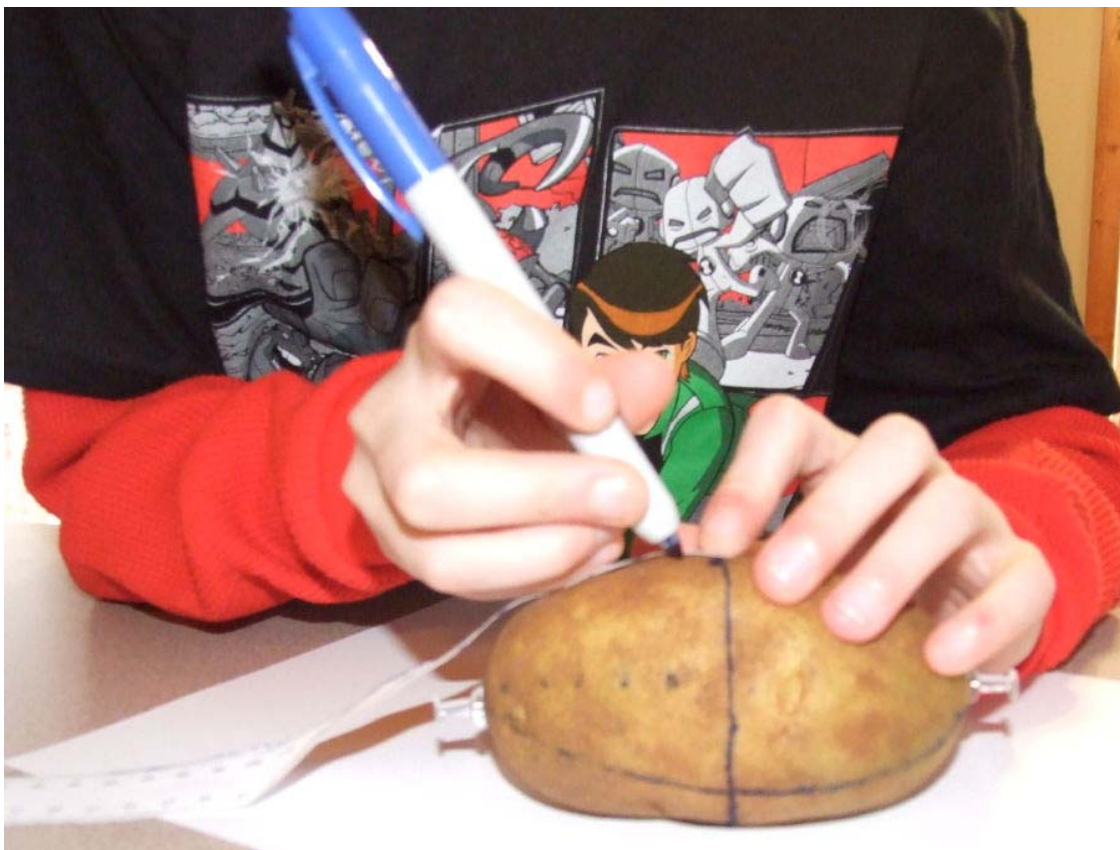
Fire, blacksmiths and volcano gods from around the world

Rupes on Mercury:

Famous explorers' ships

You may wish to expand Activity 1 by exploring the USGS Astrogeology Research website (<http://planetarynames.wr.usgs.gov/>) to discover new themes, research existing themes or download images of surface features.

After completing Activity 2, students may want to add other features by accessing the USGS Lunar Images site at: <http://www.nrl.navy.mil/clementine/clib/features/comp.html> and use a real Moon map and photos to find these locations, compare to their map drawings, and locate others.



This worksheet is adapted from the article Mapping Alien Worlds by Donna Governor, in the Spring 2010 issue of *The Classroom Astronomer*. These materials are copyright 2010, *The Classroom Astronomer*, Hermograph Press, part of the To Teach The Stars Network, Atlanta, GA All rights reserved. Permission is granted to classroom teachers to make copies for use in their own classrooms only and may not be posted online or in any archives or other storage media for retrieval without the express written permission of the publisher.