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NIGHT WATCHERS

Grades: 3-7 (and older, with modifications)

Time: 2-4 hours late at night

Materials: Invitations; red-light lanterns and flashlights; a Night Watcher costume; small decorated fanny packs (enough for each participant); maps; creature guides; pencils; notebooks; a telescope; chairs (or at least blankets); portable table; several pairs of binoculars; star-shaped cookies; hot chocolate; mugs with celestial bodies on them

Relevant Subjects: Science and Language Arts

Relevant information: This activity is designed for elementary and early middle school students, though it can be adapted for older kids and even adults (especially because it invites a sense of play and imagination). The activity focuses on the nights of the Perseid meteor showers each August, but it could be adapted to be used any time. A general outline of the requirements for doing this activity are included below, followed by a narrated specific example, designed and used by the activity's creator. The activity as created requires numerous details and equipment, but it could easily be modified to be simpler.

Preparation:

1. Find a natural area that you can use for this activity. Ideally it will have a variety of natural habitat and the opportunity to view/hear different kinds of animals at night. It is important that the area includes an open area at which participants will be able to see the stars.
2. Map out a trail along which the Night Watcher will lead participants, taking them through different habitats. The trail should end in an area where they can see the sky, and where you can set up a telescope.
3. Create three kinds of maps (that can be easily reproduced):
 - a. A map that shows the trail to be followed, with made-up names for different areas; label this as Map #1.
 - b. A map of the moon, showing different parts of the moon, and places where humans have landed, where equipment visible with telescope and/or binoculars can be found; label this as Map #2.

- c. A map of the night sky in summer (or whenever you're doing this activity), with selected constellations and other bodies identified. (If you are doing this activity as part of the Perseid showers, be sure to include the constellation Perseus on the map.); label this as Map #3.
 4. Create a "creature guide" with pictures and names of animals that participants are likely to hear and/or see on their trek.
 5. Create and/or gather all the necessary equipment (telescope, fanny packs with "tools," cookies and hot chocolate, invitations, etc.).
 6. Arrange for volunteers to help with this activity.
 7. If you're doing this activity with youth who aren't of driving age, be sure to arrange rides home for the end of the event.
 8. On the day of the event, set up the skywatching spot (leaving someone to "guard" the telescope and other equipment) and the gathering place spot, and then travel the trail, looking for new and/or additional interesting natural wonders you can point out (nests? water features?, etc.).
1. Before the evening of the special Night Watcher event, provide participants with creatively-decorated invitations that offer the relevant information, such as:

You're Invited to Become a Night Watcher

Come explore the mysteries of the night!

Date: August 12, 2009

Time: 11:00 p.m. to 2:00 a.m.

Location: Forest Park, Muir Point Access

Special guests: Luna, Jupiter and the Perseids

Bring warm clothes, and get lots of rest during the day, you'll be up late!

2. On the appointed night, gather everyone together in the appointed gathering spot. Have the Night Watcher explain what will happen and pass out the bags. Be sure that you have adult supervisors at the beginning and end of the line of participants, to ensure no one becomes lost.
3. Lead participants on their night adventure. (See sample detailed outline below.)

Sample Detailed Outline:

The guests arrive at a gathering spot in the woods, lit by lanterns that shine with a red light. They are greeted by a figure in a dark robe, carrying a red-light lantern as well. This is the Night Watchwoman. She is carrying a dark sack, covered in sparkly stars, moons and planets, from which she pulls a number of smaller bags. These are fanny packs, which she hands to each guest. She instructs the guests to open their bags. Inside are red-light flashlights, three maps, a folded "creature guide", a pencil, and a

small blank notebook with stars and moons on the cover. The Night Watchwoman asks the guests to open the map labeled #1. This map will lead them on a night walk to their next destination. The Night Watchwoman tells the guests that tromping around the woods at night might make them a little nervous, but that she and her helpers will guide the group and keep everyone safe. She asks the guests to speak softly, move quietly and use their ears. She tells them to open the folded "creature guide"; on it are the names and pictures of some of the animals they might hear, and if they're lucky, see.

Map #1 leads them down Black Dog Way. Trees loom up on each side of the path, and it's dark. But the Night Watchwoman's red lantern bobs ahead, helping the group to see. There's also a helper with a lantern behind. The guests can hear water running as they walk next to a rushing creek. The Night Watchwoman turns off Black Dog Way onto a little trail heading west. The map shows a structure called the Little Brown Bat House. The Night Watchwoman says that Little Brown Bats roost here during the day in the quiet and dark of the little shelter.

The group turns to the south onto a trail called Flying Squirrel Footpath. They turn again and head west, down Bobcat Hill. They all stop in a clump when they hear a high-pitched screech as a large shape flies over. The Night Watchwoman tells them not to worry -- it's the Barn Owl who hunts rodents in the grassy areas to their north.

They look at their map and see that they are on the Coyote-Deer Highway. They hear a crash in the trees off to their left, and the Night Watchwoman tells them that it's one of the resident deer who use this highway, trying to avoid our traffic jam. They continue on over another creek -- which their map says is Donkey Creek -- and they stop to listen to the water trickling over the rocks. As the group quiets down, a frog starts to croak, and another answers -- soon the noise is deafening. And then they hear a yipping and howl in the distance, which the Night Watchwoman tells them is a coyote calling to his family. They too, use this highway.

The group troops through a grassy area. Two large shapes loom up in the night, and begin a loud grating, honking noise. Everyone is startled and wants to know what that horrible racket is. The Night Watchwoman tells them to look at their maps -- they see they are in Donkey Wood. They realize it's two donkeys, braying at them. The group hurries on, away from that noise, towards the sound and smell of water. They hear a chorus of croaking that stops even though they move quietly. They gather around the Mosquito Ponds, and in the moonlight, they can see small forms fluttering and swooping above the water. The Night Watchwoman wonders if anyone knows what they are, and several shout out "Bats!" She asks, "I wonder what they're doing?"

The group then goes through a gate into a large grassy area. The three quarter moon is rising higher, bathing the field in a soft white light. There's a large cylindrical object pointing at the sky; it's a telescope, and there are chairs with blankets around it. On a table are many pairs of binoculars.

The Night Watchwoman tells them this second part of their night journey involves exploring the night sky. She asks them to take out the map labeled #2. It's a map of the moon, also known as Luna, and it even shows places where astronauts have landed. The Night Watchwoman says they can find things using the map, if they want to. Or they can just explore, and make up their own names for what they see on the moon. They also have the option of recording their observations, sketches and impressions in their notebooks. Using the binoculars, and taking turns at the telescope, they look at the moon's craters, mountains and maria, which means "seas" in Latin. They look for equipment and other things left behind by astronauts.

Then the Night Watchwoman tells them to take out their last map, #3. It's a map of the night sky in summer. It can help them locate individual stars, constellations, nebulae, and galaxies. Many of these objects can be seen with binoculars. There are lots of wonderful things to look at tonight: the planet Jupiter with its four moons, the Pleiades star cluster, the Andromeda Galaxy, the Ring Nebula.

And for the grand finale of the adventure: On the map is a constellation called Perseus. Tonight, from that constellation, comes the Perseid meteor shower. The later it gets, the more meteors they will see, especially after the moon sets. While they wait and watch comfortably in the chairs, the guests eat star-shaped cookies and drink hot chocolate from celestial mugs that they can take home as a reminder of their journey. (Along with their fanny pack of "tools".)

Questions and topics that might arise:

- *Why the red lights?* To preserve your night vision.
- *What is the moon made of?* Pieces of the earth that broke off in a collision with an asteroid or other planetary body during earth's formation.
- *What is the man in the moon?* Some of the features on the moon can look like a person, a rabbit, or a frog. Many different cultures talk about some kind of figure in the moon.
- *The phases of the moon:* The phases are what happens when the sun, earth and moon are in different alignments.
- *How much stuff is on the moon?* About 375,000 pounds -- unmanned lunar spacecraft and tons of equipment left behind.
- *Why does the moon matter?* Besides being fun to look at, the moon affects our tides because of gravity. When the moon is full, it exerts the highest gravity and "pulls" the water higher out of its basins. That's high tide.
- *What is a meteor?* Dust and debris from a comet, in this case the comet Swift-Tuttle. Usually the pieces are the size of a grain of sand, but sometimes pea or gravel sized. And sometimes really big, like the one that landed in a Nebraska field in 1948 that weighed nearly 2,500 pounds.
- *Will we find a meteor?* Not likely; of the thousands that make it through earth's atmosphere, most then burn up. Maybe give per year are found.

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