

# Search for a Habitable Planet

## Supplies

Art supplies: an assortment of items that could be used to create a creature. This can include items like chenille stems, balloon, feathers, wiggle eyes, yarn, pompoms, plastic cups, beads, pieces of foam, plastic wrap, floral wire, milk carton caps, fabric scraps, and more. Your supplies are only limited by what you can find. This is a great way to recycle trash into art.

Tacky glue

Clear tape

Masking tape

Glue guns (a supervised glue gun station works well)

Creature cards (one per group)

Planetary lithographs (pictures)

Object: an ice breaker and to get the girls thinking about what is needed for a habitable planet and what planets are made of.

1. Set the stage by reading the following introduction.

*We are space travelers from a distant star system. The crew of our spaceship includes six different types of creatures who live on different planets in that star system. Our star is expanding and getting very hot. Our home planets are heating up and soon we will need new places to live. It is our mission to find habitable planets for our six different types of creatures with different life requirements. In all we need to find new homes for five billion inhabitants.*

*First we need to know what makes a planet habitable so we can set up probes to measure the characteristics of various planets. The different requirements for life can be related to the characteristics of various planets. What do creatures require to live?*

2. Brainstorm on requirements for life and characteristics of the planets. Encourage free thinking, there aren't any specific right answers, but lead girls to the following topics, among others.

### Life requirements

food to eat

gas to breath

comfortable temperature

ability to move

gravity

### Planet characteristics

surface & atmosphere composition

atmosphere composition

temperature range

surface type (solid, liquid, gas)

size

3. Ask the girls what kinds of probes might be used to measure these characteristics. Answers may range from general to specific and may be based on science fiction. This could be done while the girls are working on their creature.

4. Give each group a creature card (more than one group can design the same creature.) Tell the girls they are to create a creature that fits the characteristics on their creature card. Girls may select art supplies and should be able to finish their creature in 15 minutes. They should name their creature ambassador and be ready to introduce it to all the groups. This will be done during the closing time. Encourage teamwork and creativity!

6. Have a place to display the creature till the closing time. At this time the girls will have the opportunity to introduce their creature.

7. Post the planetary lithographs on a wall if possible. You will be starting with the outermost planet (Pluto). Tell the girls that you will be reading a description of various planets. After each description ask if any group has a creature that could make that planet it's home. The girls can then share their creatures requirements and tell about the creature. Be prepared, it may take the girls longer than you think to introduce their creatures, they get very involved with their creations.

Read the descriptions below to the girls one at a time.

*Today we are traveling through an outer section of the Milky Way galaxy. There are many, many stars. We are approaching a medium-sized star, the type which often has habitable planets. As we draw closer we see that there are nine planets orbiting this star. We will tour this planetary system and use our probes to measure planet characteristics in our search for a habitable planet. Try to find a planet where your groups creature could live.*

*We will now tour this new planetary system, starting from the outside and going toward the star. We are approaching the first planet.*

*The first planet is tiny (2350 km) and made of rock and methane ice. It has almost no atmosphere (just a trace of methane) and is very cold (-203 C),*

*The second planet is medium large (49,500 km) and made of liquid hydrogen and helium. It has a thick atmosphere of hydrogen, helium and methane and is very cold (-220 C).*

*The third planet is very similar to the 2nd except that it has a small ring system. It is medium large (51,000 km) and made of liquid hydrogen and helium. It also has a thick atmosphere of hydrogen, helium and methane and is very cold (-210 C).*

*The fourth planet is large (120,500 km) and has an extraordinary ring system. It has no solid surface, but is a giant mass of hydrogen and helium gas outside and liquid hydrogen inside. it is cold (-180 C).*

*The fifth planet is the largest (143,000 km) in this planetary system. Like the fourth, it is a gas giant made of hydrogen and helium with no solid surface. It is also cold (-150 C) in the upper atmosphere, but increases in temperature and pressure and becomes liquid in the interior.*

*The sixth planet is small (6786 km) and rocky. There is some water ice in polar regions and a thin atmosphere of carbon dioxide. The temperature is moderate (-23 C).*

*The seventh planet is medium small (12,750 km). The surface is made of liquid water and rock with some carbon compounds. The atmosphere is mostly nitrogen and oxygen with some carbon dioxide and water vapor. The temperature is moderate (21 C).*

*The eighth planet is also medium small (12,100 km.) The atmosphere of carbon dioxide is so thick that we can't see the rocky surface beneath it, but need our radar probes. The temperature is very hot (480 C).*

*The ninth planet is tiny (4880 km) and rocky. It has almost no atmosphere (just a hint of helium). Temperatures are generally hot, but extremely variable, ranging from -180 C on the space-facing side to 400 C in the star-facing side.*

*We have now finished our tour and (hopefully) have found possible homes for our creatures.*

<u>Creature</u>	<u>Planet(s)</u>
A	4 & 5 (Saturn and Jupiter), but also 2 & 3 (Neptune and Uranus)
B	8 (Venus)
C & F	7 (Earth)
D	2 & 3 (Neptune and Uranus)
E	6 (Mars)

No creatures can live on planets 1 and 9 (Pluto and Mercury ) because there is no gas to breathe.

8. Everyone will want to take the creatures home. I suggest that each troop get one creature for a mascot. Suggestion put the troop numbers in a hat and draw and then let the leaders pick a mascot.

## Creature Cards

### Creature A

Food - Helium  
Breaths - Hydrogen  
Motion - Flies  
Temperature - Cold

### Creature B

Food - Rock  
Breaths - Carbon Dioxide  
Motion - Flies  
Temperature - Hot

### Creature C

Food - Carbon  
Breathes - Oxygen  
Motion - Walks

### Creature D

Food - Methane  
Breathes - Hydrogen  
Motion - Swims

### Creature E

Food - Water  
Breathes - Carbon Dioxide  
Motion - Walks  
Temperature - Moderate

### Creature F

Food Carbon  
Breathes - Oxygen  
Motion - Swims  
Temperature - Moderate