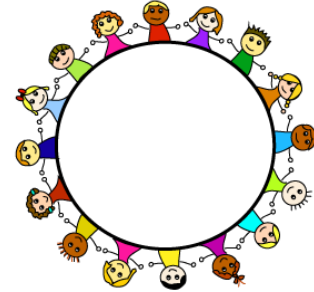


## **Supplement A-** Pass the Energy

**Equipment** Two hula hoops, different sizes

**Objective** To help students understand that everything in nature is connected.



### **Story**

1. Inform students that they are different parts of the Chesapeake Bay watershed natural environment. Some students are the sun, some are oak trees that produce acorns, some are gray squirrels that eat the acorns and others are foxes that eat the squirrels. Explain how energy moves between species: a plant gets energy from the sun, then another animal can get energy from that plant, and then a carnivorous animal can get energy by eating another animal. In this activity, the students must try to pass the energy between species so that it reaches all students, and returns back to the start location.

### **Instructor Information**

1. This activity requires the instructor to spot the students who are working with the hula hoop. It is best to spot from the outside of the circle.
2. Only attempt to send both hula hoops around the circle if the students can successfully pass one hoop all the way around.

### **Activity Instruction**

1. Have the students begin in a large circle, holding hands.
2. Place one hula hoop between two students and have them rejoin hands.
3. Instruct the students to pass the hula hoop around the circle without letting go of hands.
4. If the students are successful, add a second hoop, moving “energy” the opposite direction of the other hoop.

### **Discussion Questions**

1. How does energy pass from species to species?
2. Can humans get all of their energy directly from the sun?
3. Are we all connected?
4. How might humans affect the transfer of energy in this circle?

## **Supplement B- Bats and Moths**

**Equipment:** One blindfold

**Objective:** To have each student participate as a bat and as a moth.



### **Story**

Have the students imagine that it is late at night and there is a very hungry bat inside the cave. Ask the students if anyone knows why the bat would be awake this late? (They are nocturnal, which means they eat at night). There are also some moths in the cave as well, a great food source for the bat. Explain that bats track down and capture a moth using echolocation, or listening to responses. In this game, the bat sends out a call to see if there's anything out there. The sound bounces off the moth(s) and returns to the bat. It takes good concentration to be a successful bat. Let the students know that they will each have a chance to be both bat and moth.

### **Instructor's information**

1. Ask the students to form a large circle and join hands. Tell them to imagine they are forming the walls of a cave.
2. Make sure students know they are preventing students in the middle from going out of the circle
3. The instructor should always be watching the bat in the middle as that student will be blindfolded.

### **Activity Instruction**

1. Choose a member of the circle to be the bat, then have him or her come to the center of the circle. Blindfold the student who will be the bat.
2. Designate one student to be a moth and ask them to also come to the center of the circle.
3. The bat's goal is to tag the moth. In order to do this, the bat calls out "Bat!" Whenever the bat calls out "Bat!" the moths call back "Moth!" (Similar to the pool game Marco Polo).
4. Once a bat tags a moth, the round is over.
5. The tagged moth can then become the new bat and a new student will become the moth.

### **Discussion Questions**

1. Do all animals eat at the same time? In the same way?
2. What adaptation does the bat have that helps it survive? (*Bats use sound to find food because it cannot see well enough*).

## **Supplement C- Oh Deer!**

**Equipment** Two jump ropes

**Objective** The group will learn the essential components of a habitat.



### **Story**

*(The following is for 8 students per group. If there are more than 8, select more students to be deer).*

Select two students and inform them that they will be “deer.” Let the other students know that they will be “habitat components.” Explain that in front of them is a large empty field. On one end of the field is a suitable space for the deer to live. On the other end of the field are abundant resources they need: food, water and shelter. The field in between however is a dead wasteland. In order to survive, the deer must race across the field and find the resource that they need most.

### **Instructor Information**

- Mark two parallel lines on the ground 30 feet apart using two ropes.
- Students should not push/shove each other in order to get a habitat component.

### **Activity Instructions**

1. Explain that in this game, the deer need to find food, water, and shelter in order to survive in their environment. If they do not then they will die.
2. When the “deer” is looking for food, it should clamp its hands over its stomach. When a “deer” is looking for water, it should put its hand over its mouth. When a “deer” is looking for shelter, it holds its hands together over its head.
3. A “deer” can choose to look for only one of its needs during each round of the activity. Emphasize that the “deer” cannot change what it is looking for once they turn around. They can only change what they’re looking for at the beginning of each round.
4. The “habitat components” choose what they want to be at the beginning of the round. They show their choice in the same way as the “deer”. Emphasize to these students that they cannot change what component they are during a round. They can only change at the beginning of each round.
5. Ask all students to demonstrate the signs—hand over stomach, mouth, or head.
6. Send the “deer” and the “habitat components” to opposite lines of rope and have them line up behind it facing AWAY from the other group.

7. Emphasize that students should choose one of the symbols in their head before turning around to face the other group.
8. When the students are ready, tell them to "GO!" At this time each "deer" and each "habitat component" turns to face the opposite group holding their sign clearly.
9. When the "deer" see the "habitat component" that matches what they need, they are to run to it. Each "deer" must hold the sign of what it is looking for until getting to the matching "habitat component."
10. Once the "deer" find their correct component they should take it back to their line, and the "habitat component" becomes a "deer". Any "deer" who fails to find its "habitat component" dies, and becomes a "habitat component" on the other side.
11. "Habitat components" not taken by a "deer" continue to be "habitat components".
12. Play several rounds, giving students time to understand the effect of:
  - Too many deer
  - Not enough resources
  - Not enough deer
  - Too many resources
13. After each round ask students what happened and what they think will happen next.
14. Variations include introducing hunters, disease and predators to the game.
  - If you introduce disease, pick two habitat students who are now disease. When the deer run across the space, disease can tag the deer before they get to the habitat. If they are tagged once, the deer must slow down and act like zombies. If they are tagged a second time, they die. Dead deer become disease.
  - If you introduce predators or hunters, again choose two habitat students (or if you have a small group, the instructor can play the hunter) to be either hunters or wolves. When the deer run across the space, the hunters/wolves can tag the deer, killing them. Dead deer become either wolves or hunters.

### **Discussion Questions**

1. What are the four essential components of habitat?
2. What factors affected the deer population?
3. What decreased the deer population the most? The least?
4. What are some ways humans impact habitats in both positive and negative ways?

## **Supplement D- Habitat Crossing**

**Equipment** 3-4 boards of various sizes, 2 hula hoops

**Objective** The group must cross a specified distance by stepping only on the three-four boards and not on the ground.



### **Story**

Explain to the students that they are all members of an endangered species. Unfortunately, their habitat (the hula hoop with the boards) has been destroyed by excess pollution from human activities. The boards are all that remains of their destroyed habitat. Each board is an important component of a habitat, (shelter, food, water and space) which the species need to survive. The other hula hoop is a location where the species can survive. However, in between the two hula hoops is toxic and polluted waters! The students' only hope for safety, is to cross the water bringing the habitat components to ensure survival.

### **Instructor's Information**

1. The goal of this activity is for the participants to develop a plan in which the entire group crosses the waters together.
2. In order to complete the activity, the group will have to make a plan of how to shuttle themselves and the boards from start to finish
3. The instructor is the primary spotter.
4. For groups of over 10 students, the group should be split in half and two playing fields should be set up.

### **Activity Instructions**

1. Set up two hula hoops about 20 feet apart. Place wooden boards next to one of the hula hoops.
2. Students, as a group, must get from one hoop to the other using the boards.
3. Students must develop a plan before attempting to cross.
4. Students may not step off the boards and touch the ground while crossing. If someone touches the ground, the entire group must restart at the original hoop.
5. Students should not leap from board to board
6. Students may not hold onto a board and try to slide it forward
7. All participants must reach the opposite side, bringing the boards with them.
8. Boards should NEVER be above the students' heads.

### **Discussion Questions**

1. Did the students' plan get everyone across together?
2. What was challenging about this activity?
3. What, as humans, can we do to prevent pollution and ensure stable habitats?