

I WILL SURVIVE!

*This lesson is from The Mailbox Magazine – March/April 2003 issue –
Exploring Ecosystems – Page 28*

Objective:

- Students will construct a food web.
- Students will demonstrate the flow of energy through a food web.

Standards: (from the 5th grade standards/curriculum)

- 4.6.7.A
- 4.6.7.B

Teacher Resource: Mailbox March/April 2003 page 28

Materials Needed:

Popcorn	1 13-gallon garbage bag
3 1-gallon plastic bags	sandwich baggies (enough for all but 4 students)
3 paper armbands	pinch clothespins (enough for all but 4 students)
Index cards	pencils
Stopwatch	whistle
4 orange safety cones	yardstick
Lab sheets (see attached)	Poster with data table (see page 28)

Preparation:

- Pop 6 regular-sized bags of popcorn
- Label the 13-gallon garbage bag - HAWK
- Label the 3 1-gallon plastic bags - BIRD
- Label 3-paper armbands - BIRD
- Label the sandwich baggies GRASSHOPPER and put an index card in each the bag
- Mark off a 50-foot-square area outside with the safety cones and scatter the popcorn in the area
- Recreate the data table on a poster – see page 28

Activity:

- Give 1 student the HAWK bag.
- Give 3 students the BIRD bags and armbands.
- Give each remaining student a clothespin and a GRASSHOPPER bag.
- Explain to the class that each bag represents an animal's stomach.

ROUND 1 OF THE ACTIVITY:

- Send all of the grasshoppers into the marked area with their clothespins and their bag.
- Give them 20 seconds to pick up popcorn pieces with their clothespins and place the pieces in their bags.
- Have each student count the pieces of popcorn they picked up and record the number on his card.
- The teacher will also record the total number of grasshoppers and popcorn pieces collected on the poster. Share results with the class.
- If a student does not have any popcorn, pronounce them dead and they will sit out!

ROUND 2 OF THE ACTIVITY:

- Play as round 1, this time send the birds in five seconds after the grasshoppers.
- The birds should tag the grasshoppers.
- Once a grasshopper is tagged – they will place their bag inside the larger bag of the bird and sit out because the bird ate them!
- After 20 seconds – blow the whistle and record the results from the surviving grasshoppers and birds. Share the results with the class.
- If a bird does not have any grasshoppers, pronounce them dead and they will sit out!

ROUND 3 OF THE ACTIVITY:

- Play as round 2, this time send the hawk in five seconds after the birds.
- The hawk should tag the birds.
- Once a bird is tagged – they will place their bag inside the hawk's larger bag and they will sit out because the hawk ate them!
- After 20 seconds – blow the whistle and record the results from the surviving grasshoppers and birds. Share the results with the class.

ROUND 4 OF THE ACTIVITY:


- Repeat steps in Round 3.

Conclusion:

- Discuss the activity and the result poster with the class.
- As an evaluation of student comprehension, each student will complete the attached lab sheet.

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Concept: Flow of energy through a food chain

Make it easier for students to understand food chains with an outdoor simulation that's full of grasshoppers, birds, and a hawk "oh my!" Just follow the directions shown. After Round 4, have students answer the questions below. 

Materials:

- 4 regular-sized (3,5 oz.) bags of popped microwave popcorn
- 12 gallon plastic garbage bag, labeled "Hawk"
- 3 gallon-sized resealable plastic bags, each labeled "Bird"
- 7 crepe-paper armbands, each labeled "Bird"
- swatch-sized resealable plastic bags, each labeled "Grasshopper" (enough for all but five students)
- pinch clothespins (enough for all but five students)
- class supply of index cards
- class supply of small pencils
- stopwatch
- whistle
- 4 orange safety cones
- yardstick
- sheet of paper labeled with the data table shown
- pencil



Round	Grasshoppers	Popcorn Pieces Collected by Grasshoppers	Birds	Grasshoppers Eaten by Birds	Popcorn Pieces Collected by Birds	Birds Eaten by Hawk	Popcorn Pieces Collected by Hawk
1							
2							
3							
4							

Getting ready: Place an index card and pencil inside each plastic "Grasshopper" bag. Use the safety cones to mark off a 50-foot-square area outside. Scatter the popcorn throughout the marked area. Then give one student the bag labeled "Hawk." Give three other students the "Bird" bags and armbands. Give each remaining student a clothespin and a "Grasshopper" bag. Explain that each plastic bag represents an animal's stomach.

Round 1: Send the grasshoppers into the area with instructions to pick up popcorn pieces with their clothespins and place the pieces in their bags. After 20 seconds, blow the whistle and call the grasshoppers to the sidelines. Have each grasshopper count the popcorn pieces in his bag, record the total on his card, and report the total to you. Calculate and record the total number of grasshoppers and popcorn pieces collected. Share the results with the students. If a grasshopper doesn't have any popcorn, pronounce him dead and send him to the sidelines permanently.

Round 2: Play as in Round 1, except send in the birds five seconds after the grasshoppers. Instruct the birds to tag the grasshoppers. Have each tagged grasshopper place his bag inside the larger bag of the bird that tagged him and then go to the sidelines permanently as an eaten grasshopper. Blow the whistle after 20 seconds. Then have the birds and surviving grasshoppers go to the sidelines to count, record, and report to you. Share the new totals with the students. If a bird never tags a grasshopper, pronounce him dead and send him to the sidelines permanently.

Round 3: Play as in Round 2, except send in the hawk five seconds after the birds. Have the hawk tag the birds. Have each tagged bird place his popcorn bag into the hawk's larger bag and then join the eaten grasshoppers on the sidelines as an eaten bird. Conclude the round as before and share the new totals with the students.

Round 4: Repeat Round 3.

Questions:

1. What represents the producers in the simulation? (*popcorn*)
2. What food chain is represented in this simulation? (*popcorn → grasshopper → bird → hawk*)
3. Which part of this food chain needs the most energy to live? (*hawk*)
4. Which consumer in the food chain starts with the largest population? (*grasshoppers*)
5. Do the consumers increase or decrease as you move up the food chain? (*decrease*)
6. What happens to the energy when a plant or animal dies? (*It eventually ends with decomposers, such as bacteria and fungi, that break down dead plant and animal material into nutrients that enrich the soil.*)