SRC ☑

Moth Mothers

Topic **Adaptation (Pollution)**

Objectives
- Describe the changes in a population.
- Identify some of the factors leading to adaptations.
- Infer implications of a changing environment.

Duration 25 minutes, if material 'kits' are ready - 40 minutes, if not

Assessment Type Summative

This activity demonstrates why the pepper moth had to adapt to survive England's industrial revolution. Because the effects of environmental changes often occur slowly and slightly over extensive time, students may not realize the link(s) to biological evolution. Few species can adapt quickly enough to survive the rapid impacts of human activity.

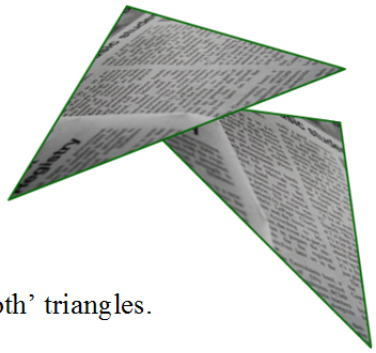
Set-up

Tell (or have students research) the pepper moth evolution during the Industrial Revolution in England.

Assign 2-3 students to a team: 1 = moth parent, 2 = hungry bird, 3 = recorder (optional)

Materials

- ☐ Newspaper (2 full spreads per team)
- ☐ Scissors (1 pair per student) or pre-cut moth sets
- ☐ Timer (clock with a second hand or stop watch)



Instructions

1. Using one of the sheets of newspaper, cut out 100 1½-inch 'moth' triangles.
2. Lay the other sheet of newspaper on the floor.
3. Moth Parent: While your partner is not looking, sprinkle 50 moths on the newspaper. This is the first generation of moths.
4. Hungry Bird: Your partner is now a bird. From a standing position, he or she has 10 seconds to pick up as many moths as possible by repeatedly swooping down, and standing all the way back up. **Moths must be caught one at a time.**
5. At the end of 10 seconds, count and record the number of moths collected. Subtract this number from the beginning number to figure the number of survivors.
6. Add as many new moths to the newspaper as there are survivors. The survivors have reproduced forming the second generation.
7. Repeat steps 4 through 6 three more times for each partner for a total of four generations each.

Notes

Timesavers! Save each group's final materials (moths and habitats) in zip-bags for re-use. It can be fun to host a 'moth-making session' to cut out triangles and assemble material bags. A butterfly die punch (scrapbooking tool) makes really nice looking 'moths' quickly!

Each team needs to log their results. The following table is a good arrangement to suggest if students are not well organized.

Generation	# Eaten	# of Survivors	# of Offspring	Notes
1				
2				
3				
4				
5				
6				
7				
8				

Discussion Questions

1. Look at the number of moths in each generation. What can you say about the trend in this data?
2. What is the difference in coloration between the moths eaten and those that survived?
3. What would have happened to the moths if they were not adapted to their environment?
4. What would happen to the birds that ate the moths if the moths became extinct?
5. What would happen in Generation 8 if you used the Sunday comics as background for Generation 7?
6. What would happen in Generation 8 if you folded the newspaper page in half to simulate habitat destruction for Generation 7?

Reality Check! Evaluation

- ☐ Did students identify key factors leading to adaptations?
  - Did they recognize the importance of camouflage?
  - Did students infer factors leading to/preventing species extinction?
- ☐ Did students generate reasonable data?
  - Was the procedure followed closely?
  - Were the counts conducted accurately?
  - Was the data recorded practically?
- ☐ Were students able to draw conclusions from data?
  - Could students describe the changes in a population over time?
  - Did they realize the impact of habitat destruction?