



# Peppered Moth Simulation

Objective: Simulate changes in moth population due to pollution and predation, and observe how species can change over time.

Go to: <https://askbiologist.asu.edu/peppered-moths-game/play.html> and read each section before you play the game, answer the questions as you go.



## Peppered Moth

1. Where do peppered moths live? \_\_\_\_\_
2. How do the moth larvae survive predators? \_\_\_\_\_
3. What do the moths do during the winter? \_\_\_\_\_
4. What colour is the "typica" version of the moths? \_\_\_\_\_  
What colour is the "carbonaria" version? \_\_\_\_\_
5. How do adult moths survive predation? \_\_\_\_\_

## Natural Selection

6. What was the industrial revolution? \_\_\_\_\_
7. What was causing the change in the colour of the moths? \_\_\_\_\_
8. What is natural selection? \_\_\_\_\_
9. Why would dark moths have an advantage? \_\_\_\_\_

## Dr. Kettlewell

10. What is an entomologist? \_\_\_\_\_
11. How do scientists test theories? \_\_\_\_\_
12. Dr. Kettlewell predicted that clean forests would have \_\_\_\_\_ coloured moths,  
and polluted forests would have \_\_\_\_\_ coloured moths.
13. How did Kettlewell test his hypothesis? \_\_\_\_\_
14. How did Kettlewell determine if moths lived longer than others? \_\_\_\_\_

## Play the Game



15. Complete the data table for the light forest and the dark forest.

	Light Forest			
	Starting Population		Final Populations	
Trial	Dark	Light	Dark	Light
1	50%	50%		
2	50%	50%		

	Dark Forest			
	Starting Population		Final Populations	
Trial	Dark	Light	Dark	Light
1	50%	50%		
2	50%	50%		

## Final Analysis (Full sentences please!)

16. Explain how the colour of the moths increases or decreases their chances of survival depending on their environment.

17. Explain the concept of **natural selection** using your moths as an example. Hint: you should have 5 things here.

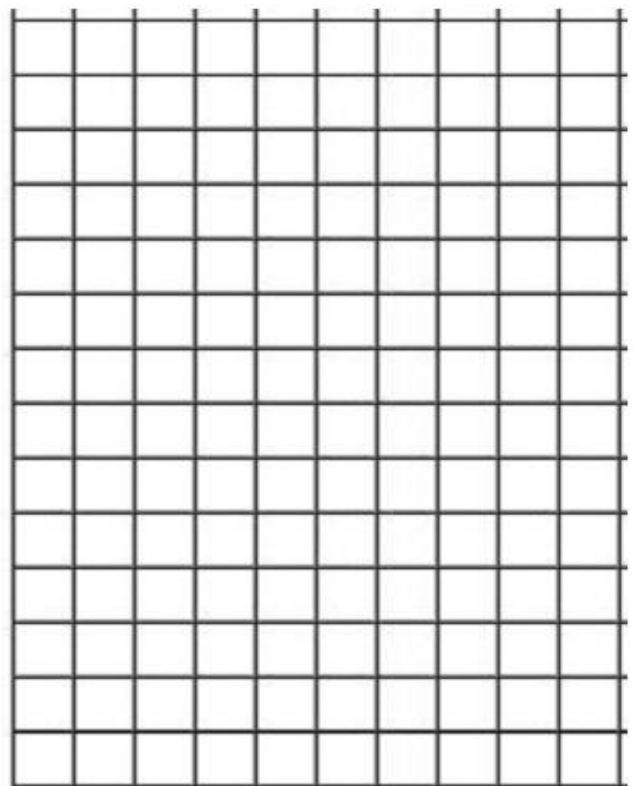
18. Predict what would happen if there were no predators in the forest. Would the moth colours have changed? Why or why not?

19. Efforts to reduce pollution began occurring later in the century. If pollution near factories was reduced, what would happen to the colour of the moths? Explain your answer.

20. Kettlewell's experiment is included in most biology texts as an example of **evolution** occurring. How do we know that the moths evolved?

21. You are a **scientist capturing moths** to study their changes over time. Examine the table and construct a graph. Plot the years of the study on the X-axis, and the number of moths captured on the Y axis. You should have 2 lines on your graph - one for light moths, and one for dark moths. Give your graph a title and label both axes. Draw a best fit line for your data.

Year	# Light Moths Captured	# Dark Moths Captured
1	537	112
2	484	198
3	392	210
4	246	281
5	225	337
6	193	412
7	147	503
8	84	550
9	56	599



22. What does the graph show? What type of environment do you think these moths live in? Explain your answer.