

Toothpick Experiment

The Importance of Camouflage In Nature

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Discipline / Subject: science/math

Topic: Students will see how colorings and markings make an animal better adapted to its environment

Grade Level: PK-5

Resources / References / Materials Teacher Needs:

- 250 colored toothpicks (green, blue, red, and yellow)
- Graph(s)

Lesson Summary: Students will look for red, yellow, blue and green toothpicks distributed in a grassy area and discover that the green toothpicks are more difficult to find because they are the color of their surroundings.

Standards Addressed: (Local, State, or National)

Alaska state standards:

Science C – Concepts of Life Science

2. A student who meets the content standard should develop an understanding of the structure, function, behavior, development, life cycles, and diversity of living organisms

Statistics and Probability Performance Standards

M6.1.1 Collect, record, organize, display, and explain the classification of data

M6.1.2 Describe data from a variety of visual displays including tallies, tables, pictographs, bar graphs, and Venn diagrams

Learning Objectives:

The student will:

- conduct an experiment with toothpicks to show how important camouflage is to certain types of animals
- learn that protective coloring often helps animals hide from their predators

Method of Assessment for Learning:

Teacher observation

Procedural Activities:

1. Explain to students that you are going to distribute 250 green, red, yellow, and blue toothpicks in a designated grassy area (any area will work, the area I use is approximately 30'x40'.)
2. Ask students to predict which color will be easiest to find in the grass and explain why. Then ask which color will be the most difficult to find in the grass and why. Last of all; ask if they can predict if they will be able to find all 250 toothpicks. (I've never had a group find them all!)
3. Distribute toothpicks in grassy area while students remain in the classroom.
4. Prior to going outside to collect toothpicks give these instructions.
 - Put students in groups of four.
 - Give each group two graphs and a red, yellow, blue, and green marker to show the

number of red, yellow, blue, and green toothpicks they find.

- Students will only be given 10 seconds to collect toothpicks on their first attempt.
 - Students must wait for the "Go" signal and must "Stop" collecting at the end of 10 seconds
 - Each group is to tally collectively the number of toothpicks they find.
 - Emphasize the importance of working together. Suggest that each member of the group count one of the colors and graph the results. That way each member of the group has a job. Encourage them to check each other's work in a kind and positive manner. Instruct each group to count the total number of toothpicks found.
5. Have all the groups come together and share their results. Were fewer green toothpicks found? Would it be easy for a predator to see a well-camouflaged animal if he was walking through this grassy area?
 6. As a class, add the number of toothpicks each group found together. Subtract that number from 250. That's the number of toothpicks they now need to find!
 7. Give the class five minutes to look for the rest of the toothpicks.
 8. Return to the classroom and complete the second graph combining the number of toothpicks found during the first 10-second hunt and the second 5-minute hunt. Direct each group to complete the graph and count the total number of toothpicks collected.
 9. Once again add the total number of toothpicks collected by all the groups. Subtract that number from 250. Did your class find 250 toothpicks?
 10. Conclude this experiment by reading the book *Gone Again Ptarmigan*. Please refer to the art lesson that goes with this experiment and book -- "Willow Ptarmigan – The Master of Disguise."

Materials Students Need:

- 2 graphs for each group of four students
- red, yellow, blue, and green markers for each group
- container for collecting toothpicks

Technology Utilized to Enhance Learning:

Other Information:

Modifications for Special Learners/ Enrichment Opportunities

Younger students can sort toothpicks by color and count them for the 10-second search. After the 5-minute search have younger students sort toothpicks by color and place them on a tray. As a class, count the total number of each color and graph the results. The teacher can calculate the total number of toothpicks and tell the students if they were able to find 250.