

Finger Challenge

Materials Needed:

• Marbles • Pennies • Paper Clips • Stop Watch • Recording Sheet • Roll of Masking Tape • Pencils/Pens • Paper • Several lengths of string in 12 inch sections

Grade Level: Fifth

Objectives:

- 🌐 Students will be able to explain in their own words the meaning of the word “adaptation”.
- 🌐 Students will be able to explain in their own words the differences between a physical and a behavioral adaptation.
- 🌐 Students will be able to explain what an opposable thumb is in their own words.
- 🌐 Students will be able to give 2 or 3 examples of animals that have opposable thumbs.
- 🌐 After playing the finger challenge game, students will be able to articulate in their words, two advantages of having opposable thumbs.
- 🌐 Students will be able to state in their own words how animals’ benefit from having opposable thumbs.

Engagement:

- 🌐 Begin the class by showing PP photos of various animals. Make this statement: “I’m going to be showing your various pictures of animals. I want you to carefully look at each picture. After the last picture, I want you to tell me the characteristics that all of these animals have in common.” The students will probably mention several traits (all of the pictures are of mammals): All have fur, teeth, eyes, ears, etc.
- 🌐 Explain that all of the traits that they have mentioned are essential for the survival of the animal in its environment. Ask if anyone knows the term that is applied to these traits (adaptation). Explain that the traits are physical adaptations, that is, they are characteristics of the body of the animal. Ask the question: “Is there other kind of adaptations beside physical adaptations?” The students may struggle to answer this question but you can solicit a response by pointing out various behaviors of animals (the answer is behavioral adaptation). You can point out that some animals are active at night while others are active by day, etc. Mention to the students that the class will focus on physical adaptations.
- 🌐 Show a few of the slides again. Explain that there is another physical adaptation that these animals have in common that they have not mentioned (opposable thumbs). This adaptation isn’t as obvious as the others and was probably not mentioned in the first list. If no one is able to answer, show a photo of a primate hand with an opposable thumb to see if they can guess the answer.

Exploration

- 🌐 To demonstrate the unique ability of the opposable thumb, students will participate in two activities.

- ④ First, divide the class into groups of four students. Give each group a roll of masking tape, 4 pencils or pens, 4 pieces of scrap paper and a length of string for each student.
- ④ Ask the students to use the masking tape to tape the thumb of their writing hand to their palm. Students may require the assistance of another student/facilitator to do this.
- ④ After each student has taped their thumb, give the student a pencil and ask them to write their name two or three times on a piece of paper. Next, give each student a length of string and ask them to tie a bow knot in the string.

Explanation

- ④ Ask the students a series of questions about their experience with the string and the pencil.
 - Was it easy or hard to write your name and tie the knot?
 - Why was it harder?
 - After your experience, what are some of the advantages that an animal with an opposable thumb would have?
 - Why is an opposable thumb important for many human activities?
 - What would life be like for humans without an opposable thumb?

Elaboration

- ④ Students will participate in an experiment to test the dexterity of the thumb and fingers in passing objects back and forth.
- ④ Keep the students in the groups of four that were chosen earlier.
- ④ Explain that each student in the group will be participating in the experiment. One person will be the recorder, one person the timekeeper and the other two will conduct the experiment.
- ④ The two people engaged in the experiment from each group of four will receive a penny that will be used to pass back and forth between them.
- ④ Give each group the “finger challenge” recording sheet. Let each group design their experiment by picking four of the possible six finger combinations that they will use to pass the penny. Write the chosen combinations on the appropriate lines on the sheet. Example finger combinations include pinkie-index, thumb-ring, index-middle, etc.
- ④ Each group will be given one minute to experiment with each finger combination. The recorder will record on the sheet the number of successful passes that take place in a one minute interval for each combination. The timekeeper will keep track of the time for each test.
- ④ At the conclusion of the experiment, generate a time of discussion among all of the groups.
 - Which finger combinations were the most successful? Why?
 - Which finger combinations were the least successful? Why?
 - Was the thumb involved in the most successful combinations?

Evaluation

- ④ Ask the students questions about the value of opposable thumbs to the various primates (i.e., chimps, oranges, langurs, mandrills, etc.) and other animals (i.e., koala, panda, opossum).

State Indicators for Fifth Grade

Doing Scientific Inquiry

1. Select and safely use the appropriate tools to collect data when conducting investigations and communicating findings to others (e.g., thermometers, timers, balances, spring scales, magnifiers, microscopes and other appropriate tools).
2. Evaluate observations and measurements made by other people and identify reasons for any discrepancies.
3. Use evidence and observations to explain and communicate the results of investigations.
4. Identify one or two variables in a simple experiment.
5. Explain why results of an experiment are sometimes different (e.g., because of unexpected differences in what is being investigated, unrealized differences in the methods used or in the circumstances in which the investigation was carried out, and because of errors in observations).