



## Opposable Thumbs Adaptation Lab

Humans, like other living things, are adapted for the things we do. One of our adaptations is our hand. Humans, as well as monkeys, gorillas, and other primates, have a hand that can grasp objects. We can grasp objects because we have an **opposable thumb**. In this lab exercise, you will perform several common actions. Then you will change your hand so that it resembles that of a non-primate animal. You will determine whether or not you can successfully perform the same actions. This will demonstrate how the human hand is adapted for the actions it performs. You will work with a partner to do this exercise.

**Step #1: Question.** *First, scientists must find a problem and ask a question about that problem.*

How does the opposable thumbs adaptation help humans?

**Step #2: Hypothesis.** *Then, scientists make an educated guess about the answer to their question.*

Opposable thumbs help humans because \_\_\_\_\_

**Step #3: Materials.** *Next, scientists make a list of all of the physical items they need to do their experiment.*

- Uniform shirt
- A piece of string
- A shoe
- Scissors
- Paper
- Timer (found on projector)

**Step #4: Methods.** *This is a numbered list of directions that scientists use to perform the steps of their experiment*

1. Work in groups of 2. Do each of the following activities and have your partner time how long it takes you to do each one. Record the times in Table 1.
  - Tie a knot in a piece of string.
  - Remove one shoe and replace it on your foot.
  - Cut a sheet of paper in two.
  - Unbutton two buttons and button them again.
  - Write your name here: \_\_\_\_\_
2. Using masking tape, have your partner tightly tape each of your thumbs to the palm of the hand.
3. After your thumbs are securely taped, try each of the activities listed in Procedure 1 again. Time each activity as you did before and record the time in the data chart. If an activity is not done in two minutes, record the word "unsuccessful."

**Step #5: Results.** *During and after the experiment, scientists write down what happened during the experiment.*

**Table 1: Time Taken To Perform Various Actions**

ACTION	Time (in seconds) to do perform the action with...	
	THUMBS FREE	THUMBS TAPED
Tie knot in string		
Remove and replace shoe		
Cut sheet of paper		
Unbutton and rebutton		
Write name		

**Step #6: Conclusion.** *Finally, scientists summarize what happened in the experiment and say if their hypothesis was right or wrong.*

1. How does the opposable thumbs adaptation help humans?
2. Was your hypothesis right or wrong? Explain.
3. Why are dog and cat paws are not adapted for doing the 5 actions you tested?
4. What are cat and dog paws adapted for?
5. How is your hand adapted for doing the actions that you tested?
6. What is an opposable thumb? What kinds of living things have opposable thumbs?
7. How have human hand adaptations helped to make humans a successful and powerful species?