

# Adaptations Worksheet

## Activity A. Opposable Thumbs

Data Table A

Task	Time with Thumbs (seconds)	Time without Thumbs (seconds)
Make a paper airplane out of scratch paper		
Cut out the heart stencil using scissors		
Hook and unhook 3 LARGE paper clips		
Hook and unhook 3 SMALL paper clips		
Untie and tie a gym shoe		
Create your own activity (optional) Describe activity here:		

### Post-Lab Questions

- How does an opposable thumb assist in everyday tasks?
  
- Consider the time it took to complete a task with the use of your thumbs versus the time without thumbs.
  - Which tasks, if any, took more time without the use of your thumbs?
  
  - If any of the times for a task with and without thumbs were similar, how did the quality of the task compare?
  
- How does an opposable thumb give humans an advantage over other organisms?
  
- When your thumbs were taped, were you able to behaviorally adapt at all? Explain.

**Activity B. Stereoscopic Vision****Data Table B-1**

	<b>Right Eye Covered (hit/miss)</b>	<b>Left Eye Covered (hit/miss)</b>	<b>Normal Vision (hit/miss)</b>
<b>Trial 1</b>			
<b>Trial 2</b>			
<b>Trial 3</b>			

**Data Table B-2**

<b>Trial</b>	<b>Right Eye Covered</b>			<b>Left Eye Covered</b>			<b>Normal Vision</b>		
	<b>Ball #</b>	<b>Correct</b>	<b>Incorrect</b>	<b>Ball #</b>	<b>Correct</b>	<b>Incorrect</b>	<b>Ball #</b>	<b>Correct</b>	<b>Incorrect</b>
<b>1</b>									
<b>2</b>									
<b>3</b>									
<b>4</b>									
<b>5</b>									

**Post-Lab Questions**

5. How does binocular vision differ from monocular vision?
  
6. Use the description of monocular vision and binocular vision and the activities performed to answer the following questions:
  - a. Which types of organisms would benefit from monocular vision?
  
  - b. Which types of organisms would benefit from binocular vision?
  
7. Use the data from the two activities to determine when you most accurately judged distance.
  
8. Based on the two activities, infer the advantage of stereoscopic vision for humans.

## Activity C. Camouflage

Data Table C

Toothpick Color	Number of Times Selected by Partner 1	Number of Times Selected by Partner 2	Total Number of Times Selected
Red			
Blue			
Green			
Yellow			
White			

### Post-Lab Questions

9. In Activity C, what does each material listed below represent in nature?
- Wrapping paper
  - Toothpicks
  - Partner 1 or Partner 2
10. Which toothpick color was selected most often? Why do you think that is?
11. What is the advantage of camouflage for:
- a predator?
  - a prey?
12. Suppose that after partner 1 and partner 2 finished selecting toothpicks (20 total trials), each toothpick not chosen was able to “reproduce.” For each toothpick not chosen, another toothpick of that same color was added. After several rounds (generations) of choosing toothpicks and adding more of the remaining colors only, how do you think the population of toothpicks would change? *Hint:* Use the idea of natural selection from the *Background* section.

**Activity D. Feathers****Data Table D**

<b>Time (minutes)</b>	<b>Water Temperature (°C)—Bottle without Feathers</b>	<b>Observations</b>	<b>Water Temperature (°C)—Bottle with Feathers</b>	<b>Observations</b>
0				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

**Post-Lab Questions**

13. Based on the background information for Activity D, what types of turkey feathers were used? Give evidence for your answer.
14. Describe the arrangement you and your partner chose for the feathers around the bottle.
15. How would you rearrange the feathers if you had time to repeat the activity?
16. Graph the data for both bottles. Be sure to title the graph, label the  $x$  and  $y$  axes, include units, and include a key.
17. Based on the data, what is an advantage of having feathers?