

# Plant Adaptations Inquiry Activity

## The Question:

What adaptations do plants from two different ecosystems have to help them survive in their habitats?

## Objectives:

Students who successfully complete this inquiry will be able to:

- Plan and conduct an observational investigation about plant adaptations.
- Observe and describe plant adaptations found in specific habitats.
- Record detailed observations of living things.
- Recognize patterns in observation data.
- Explain how plant adaptations reflect the environment in which the plants evolved.
- Defend scientific claims using evidence.

## Background

The orangutans you saw this morning in the Simon Skjodt International Orangutan Center have several adaptations that make them ideally suited for life in their habitat: the arboreal canopy of tropical rain forests in Borneo and Sumatra. Many of these traits make these animals poorly suited for life in another type of ecosystem. Orangutans would struggle to survive in grasslands.

There are many other examples of this close connection between adaptations and habitat. What you may not have noticed is the importance of adaptations in plants. In this inquiry, you will explore the White River Gardens and other exhibits in the Zoo to find EVIDENCE of the adaptations that help plants survive in the environments in which they evolved.

Your observations will compare the plants in two different “ecosystems.” There are several sections of the White River Gardens that you can choose for one of these ecosystems, and you will also select one ecosystem from a few different other habitats found inside the Zoo. The list of potential ecosystems includes:

### White River Gardens

“Sun Garden”  
“Shade Garden”  
Tropical greenhouse

### Indianapolis Zoo

Desert Dome  
Grasslands Biome  
Forest Biome  
Bamboo forest

## **PRE-TRIP ACTIVITY**

**Prediction/Hypothesis** – Record in your project notebook!

Select two ecosystems to study: \_\_\_\_\_ from the White River Gardens

and

\_\_\_\_\_ from the rest of the Zoo

**Predict:** What kind of traits would you EXPECT to see in the plants in each of these ecosystems?  
(Make a list of at least 3 for each ecosystem)

**Hypothesize:** WHY do you think you would find these traits? What advantage would these traits give the plants in the ecosystems you selected? Give a rationale that tries to explain the reasons you would see these traits.

## **FIELD TRIP ACTIVITY**

### **Testing Your Prediction/Hypothesis**

Go into the White River Gardens, and look for examples of plants that have the traits you predicted. Draw or take pictures to share with the group. Take notes about that patterns in traits you see. **MAKE SURE YOU TAKE PICTURES OF TRAITS YOU FOUND TO SUPPORT YOUR CONCLUSIONS!**

**Observations:** Use your project journal to record your observations and drawings. Refer to the pictures in your observations.

**Discussions:** While still at the Zoo, meet with your group to talk about the observations and photos your recorded. Take notes about patterns you see, important examples, and some first-attempt conclusions.

## **POST-TRIP ACTIVITY**

### **Analysis**

Compile the data within your group, and discuss the patterns you found, comparing your results to your prediction/hypothesis!

### **Conclusions**

Write a new description of the adaptations of plants in each ecosystem, and provide likely explanations for these traits. (What role do they play in the survival of the plant in this specific ecosystem?)

Plants in \_\_\_\_\_ ecosystem:

Plants in \_\_\_\_\_ ecosystem:

Describe the adaptations of plants in the ecosystems you chose, including pictures or drawings to illustrate the traits you found. If you have support from other websites or books, include information from those references and cite your sources!

### **Communicate**

Create a poster, presentation, or write a paper to share with the class! Make it neat, and include enough detail for anyone who reads it to understand your thinking.

### **Grading:**

Both your journal and the presentation your group makes will be graded. The rubric on the next page will be used to evaluate your inquiry. Use the rubric as you plan and create your work!

## Plant Adaptation Inquiry Rubric

Names:				Total Points
Indicators	Unsatisfactory	Satisfactory	Exemplary	Earned Points
<b>PRE-LAB</b>	0 points	1 points	2 points	
Habitats	Failed to select one ecosystem from each of the two areas.	Identified one ecosystem from botanical garden one from zoo grounds.		
Predicting	Predictions only address plants in one of the two ecosystems, or do not meet the minimum number of predictions.	Lists the minimum number of adaptations, and includes adaptations from both ecosystems.	Lists more than the required number of adaptations, compares plants in both ecosystems, and gives details that clearly define the adaptations.	
Hypothesis	No rationale or background information given for the predictions.	Gives rationale or background information for predictions, but lacks detail, or does not connect to prior topics in this class.	Rationale includes explanation of how each predicted adaptation helps the plant survive in its habitat; ties ideas to topics covered in the class	
<b>FIELD TRIP</b>	0-1 points	2-3 points	4-5 points	
Journal Entries	Observations recorded in journal are incomplete, may not address each of the predictions; only one type of information included (notes, photos, drawings)	Observations address each of the predictions, and are complete enough to give details needed to write conclusions. Includes more than one type of data in observations recorded in the journal.	Journal entries address every prediction, and include other observations that may not have been predicted; uses drawings, notes, and photos that clearly describe plant adaptations	
Organizing	Observations are not labeled with headers, and are not organized in a way that makes them easy to read	Observations are recorded in an organized way, but may need more labeling or details.	Observations clearly labeled, and organized in a manner that makes comparison of each ecosystem easy. Uses labels, tables, and headers to organize information.	
<b>POST-TRIP</b>				
<b>Analysis</b>	0-1 points	2-3 points	4-5 points	
Discussion notes	Journal has no notes about the analysis discussion	Journal has some notes about analysis discussion, but needs more detail comparing data to predictions.	Journal has detailed notes about analysis discussion, including details about both ecosystems and comparison of data to predictions.	
<b>Conclusions</b>	0-1 points	2-3 points	4-5 points	
Claims	Claims about plant adaptations are incomplete or do not address the predictions	Claims are clear and address predictions, but leave out some features of plants in one or both ecosystems	Claims include important features of plants in both ecosystems, address the predictions, and are presented in clear concise language.	
Evidence	Does not support claims with evidence, or the evidence shared does not support the claims.	Uses some evidence to support claims, but some claims need additional support; evidence not clearly explained	All claims are supported with multiple types of evidence, and clearly stated to support the claims.	
Reasoning	Conclusions do not include discussion of how the adaptations described help plants survive; includes important scientific inaccuracies.	Conclusions discuss the role of the adaptations in survival of the plants, but explanation needs more details or has some scientific inaccuracies.	Conclusions include accurate descriptions of the role of each adaptation in plant survival in both ecosystems.	
<b>Presenting</b>	0 points	1 points	2 points	
Sources	Does not use any sources to support conclusions; does not cite any sources used.	Uses only one source to support conclusions; sources cited inconsistently.	Uses multiple sources to support conclusions, and cites sources in a consistent format.	
Quality	Presentation not well organized, messy, or does not work (if electronic)	Presentation could be neater, or has some errors or glitches (if electronic)	Presentation is neat, well organized, and checked for spelling/grammar and works smoothly (if electronic).	

**Comments:**