

I'm not robot!

Name _____ Date _____

The Study of Life

Section 1.2 The Nature of Science

Main Idea _____

Details _____

Scan the title, boldfaced words, pictures, figures, and captions in Section 2. Write two facts you discovered about the nature of science as you scanned the section.

- Accept all reasonable responses.
- _____

Review Vocabulary Use your book or dictionary to define investigation.

investigation careful search or examination to uncover facts

New Vocabulary Use your book or dictionary to define each term.

ethics set of moral principles or values

forensics field that applies to science fields such as archaeology and botany, as well as to matters of legal interest

metric system units of measurement with divisions that are powers of ten

peer review process by which scientists in the same field or who conducted similar research evaluate an experiment's procedures and results

science body of knowledge based on the study of nature and its physical setting

SI International System of Units, which are the unit standards of the metric system

theory explanation of a natural phenomenon supported by many observations and experiments over time

Academic Vocabulary Define unbiased to show its scientific meaning.

unbiased to be objective, impartial, or fair

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Symbiotic Relationships

All of the relationships in the table below are symbiotic. If they are symbiotic, what can you tell me about the 2 organisms involved?

What are the 3 types of symbiotic relationship? What are the ☺, ☹, ○ symbols for that relationship? Remember - ☺ = organism is benefitted; ☹ = organism is harmed; ○ = organism is unaffected

- _____
- _____
- _____

Instructions: In the chart below, read about organisms involved in each relationship. From that information, write the symbol (☺, ☹, ○) for each organism, then decide which type of symbiotic relationship is occurring between the organisms.

| Organisms | Comments | Symbols | Type of Symbiosis |
|-------------------------------|---|-----------------------|-------------------|
| Ex. barnacle, whale | Barnacles create home sites by attaching themselves to whales. The relationship neither harms nor benefits the whales. | Barnacle ☺ Whale ○ | Commensalism |
| 1. remora, shark | Remoras attach themselves to a shark's body. They then travel with the shark and feed on the leftover food scraps from the shark's meals. The shark is unaffected. | | |
| 2. yucca plant, yucca moth | Yucca flowers are pollinated by yucca moths. The moths lay their eggs in the flowers where the larvae hatch and eat some of the developing seeds. Both species benefit. | | |
| 3. hermit crab, snail | Hermit crabs live in shells made and then abandoned by snails. The hermit crabs are protected by the shells. This relationship does not harm or benefit the snails. | | |
| 4. mouse/ flea | A flea feeds on a mouse's blood. This hurts the mouse. | | |
| 5. wrasse fish/black sea bass | Wrasse fish feed on the parasites found on the black sea bass's body. Both species benefit. | | |

NAME _____

FERN GULLY: THE LAST RAINFOREST

READ THE QUESTIONS BEFORE VIEWING THE MOVIE. ANSWER THEM AS YOU WATCH.



1. WHAT IS ONE (OR) THE SETTING OF THIS MOVIE TAKE PLACE? _____

2. WHAT DOES BATTY SAY THAT THE FAIRIES COMMUNICATE WITH? _____

3. DESCRIBE THE MAJOR PROBLEM (WATER, FIRE, BATTY, & BROTHER BOYS) FACE WITH THEIR ENVIRONMENT. _____

4. CREATE A FOOD WEB OF THE ANIMALS & PLANTS SEEN IN THE MOVIE (WITH AT LEAST 4 ORGANISMS)

5. DESCRIBE AT LEAST 2 DIFFERENT TYPES OF RELATIONSHIPS THAT ARE SHOWN IN THE VIDEO. (I.E. COMMENSALISM, PARASITISM, MUTUALISM, COMPLICATION)

| ORGANISM #1 | ORGANISM #2 | TYPE OF RELATIONSHIP |
|-------------|-------------|----------------------|
| | | |
| | | |

Creating Chains and Webs to Model Ecological Relationships

Overview

This hands-on activity supports the HHMI short film *The Guide* and the 2015 Holiday Lectures on Science: *Patterns and Processes in Ecology*. Students will identify producers and consumers in the savanna ecosystem of Gorongosa National Park in Mozambique. Using a set of "Gorongosa cards," they will then create a food chain to show the flow of energy in that system, introduce an ecological force or disturbance (e.g., fire), and predict how that force would impact energy flow. Lastly, students will construct a more complex model of the flow of energy by depicting multiple relationships in a food web and again make a prediction about the impact of introducing an ecological force.

Key Concepts and Learning Objectives

- All organisms need energy to survive that they obtain from their environment, including by eating other organisms.
- Ecosystems are dynamic, experiencing shifts in population composition and abundance and changes in the physical environment over time, which affect stability and resilience of the entire system.
- Ecological forces or disturbances can have natural or anthropogenic causes.
- An ecosystem can be represented by different types of models, each of which may have different strengths and drawbacks.

Students will be able to

- Classify organisms based on their roles in the transfer of energy in an ecosystem.
- Create a model (e.g., a food chain) showing feeding relationships among organisms.
- Evaluate different models that depict relationships among organisms in a community.
- Predict how ecological forces or disturbances may impact their models and justify their claim with evidence.

Curriculum Connections

| Curriculum | Standards |
|----------------------|---|
| NGSS (November 2013) | MS-LS2-1, MS-LS2-4, MS-LS2-2, HS-LS2-1, HS-LS2-2, HS-LS2-4, HS-LS2-6 |
| AP Biology (2012-13) | 2.A.2, 2.A.3, 2.C.2, 2.D.1, 2.D.3 4.A.5, 4.A.6, 4.B.3, 4.B.4, 4.C.3 |
| IB Biology (2009) | 5.1.4, 5.1.5, 5.1.6, 5.1.7, 5.1.8, 5.1.10, 5.1.11, 5.1.12 |

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