



CD-404092

JUMPSTARTERS *for*

GRADES
4-8+

Life Science

**SHORT DAILY WARM-UPS
FOR THE CLASSROOM**

ENERGY FLOW

**The HUMAN
BODY**

**The DIVERSITY
of LIFE**

**LIVING
COMMUNITIES**

THE WEB OF LIFE

**LIFE CYCLES
of the Weird
and Wonderful**

BY GARY RAHAM

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Introduction to the Teacher



Scientific investigation uses skills in observation, reading, critical thinking, research, manipulation, math, and learning how to ask questions that can be answered through experimentation. Students need practice in using these skills to investigate the living world around them in a systematic way.

This book provides warm-up activities that will exercise these skills in six broad categories: the diversity of life, energy flow in living communities (ecosystems), the form and operation of the human body, descent and change in living creatures over time, and the impact of human activities on the web of life. Each of the five mini-activities per page can be used at the beginning of class to help focus students on science-related skills. Each page can be copied and the skill activities cut apart for grouping with other subject areas, or the pages can be used “as is” to focus on single skill areas.

Review each section before using to see if you might need any special materials or resources. This applies especially to the “Doing Stuff” section (pages 26–31). The “Finding Out” section might best be done in a media center where students have access to both traditional references and computers for online research. A few teacher resources are listed on page 46.

Students may need extra paper for some sections. A brief review of the metric system appears in the back of the book before the answer key. It would be useful to have a variety of objects in the classroom that students could use as tools and subjects for observation. These might include magnifying lenses, prisms, metric rulers, balances for weighing objects, skulls, bones, fossils, plants, insects, dinosaur models—virtually anything to spark wonder, admiration, and interest in young (and even veteran) scientific explorers.





Life Science Warm-ups: Observing the Diversity of Life



Name/Date _____

Observing the Diversity of Life 1

List five non-human living things you have interacted with in the last 24 hours. This could include creatures like insects, mammals, birds, fish, reptiles, and microbes, as well as plants and fungi. On your own paper, explain how each organism affected your life.

Name/Date _____

Observing the Diversity of Life 2

Next to the living things listed below, write BB if they have a backbone, FS if they make food from sunlight, ES if they have an external skeleton, and D if they help decompose dead organisms.



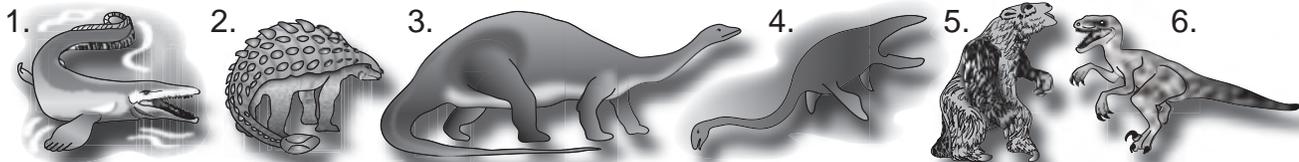
- | | |
|--------------------|-------------------|
| _____ A. pine tree | _____ B. spider |
| _____ C. bat | _____ D. mushroom |
| _____ E. crab | _____ F. dog |

Name/Date _____

Observing the Diversity of Life 3

Biologists like to say “form follows function” because you can tell something about how a creature lives by their body form. Based on their structure, which of the animals below:

- A. lived in the water? _____ B. were predators? _____
- C. ate plants? _____



Name/Date _____

Observing the Diversity of Life 4

Next to each of the following arthropods, write I if it is an insect, S if it is a spider, and N if it is neither (and identify the proper class of arthropod, if you know it).

- | | |
|-------------------------|-------------------------|
| _____ A. Ladybug beetle | _____ B. Tarantula |
| _____ C. Hermit crab | _____ D. Jumping spider |
| _____ E. Grasshopper | _____ F. Millipede |
| _____ G. Orb weaver | _____ H. Bumblebee |

Name/Date _____

Observing the Diversity of Life 5

On your own paper, draw a picture of the plant provided by your teacher and answer the following questions. Does this plant have flowers? Does it produce seeds or spores? How can you tell the difference between a seed and a spore? If your plant has flowers, draw a sketch showing the pistil, stamens, petals, and sepals.





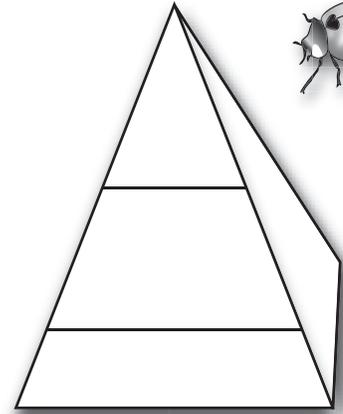
Life Science Warm-ups: Observing Energy Flow in Living Communities

Name/Date _____

Observing Energy Flow in Living Communities 1

If you arrange organisms in an **energy pyramid**, **producers** like plants that create their own food form the base, **first-order consumers** eat producers, and **second-order consumers (predators)** eat those consumers. Put the letters of the following creatures in their proper spots in the energy pyramid.

- A. hawk
- B. prairie dog
- C. insect
- D. grass
- E. sagebrush
- F. coyote
- G. buffalo



Name/Date _____

Observing Energy Flow in Living Communities 2

On your own paper, make a list of all the forms of energy you have used in the last 24 hours. Which forms ultimately depend on the energy of sunlight? Did you use any nuclear or geothermal energy sources? Which sources of energy can be replenished in your lifetime?



Name/Date _____

Observing Energy Flow in Living Communities 3

A **food chain** consists of the sequence of producers (usually green plants) and the animals that eat them and each other. On your own paper, draw a food chain that includes you and the various plants and animals you eat when you order your favorite pizza. (Don't forget the components of the sauce and the crust).



Name/Date _____

Observing Energy Flow in Living Communities 4

Food webs consist of all the inter-linked food chains in an ecosystem. Create a food web built from at least six plants and six animals that live near you. In what way are you "outside" the local food web? Draw the food web on your own paper.



Name/Date _____

Observing Energy Flow in Living Communities 5

Keystone species are organisms so important to an ecosystem that the system would fall apart without them. On your own paper, make a list of several plants and animals that might be considered keystone species where you live. Explain your choices. In what ways are common soil microbes (**decomposers**) keystone species?



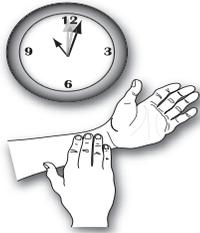
Life Science Warm-ups:

Observing the Organization of the Human Body

Name/Date _____

Observing the Organization of the Human Body 1

You will need a watch or a clock with a minute hand. Place an index finger either below and just behind your ear or on your wrist until you feel the throb of your pulse. Count the number of pulses per minute three different times.



- A. sitting _____
- B. standing _____
- C. after running in place for 30 seconds _____
- D. How did your pulse change?

- E. What causes your pulse?

Name/Date _____

Observing the Organization of the Human Body 2

Hold your hands about three inches away from your eyes, and touch your two index fingers together. Now focus on a distant wall while you move your fingers about a half-inch apart. Glance back at your fingers and you will see a “floating finger” between your index fingers! See if you can explain this optical illusion.

Name/Date _____

Observing the Organization of the Human Body 3

Cut a strip of paper about 2.5” wide and 6” long. Hold the paper with your left hand at the top corner of a narrow end. Place your right thumb and forefinger on either side of the bottom of the paper without holding it. Release the paper with your left hand. You should have no trouble catching it with your right hand. Hold the paper a second time with someone else’s hand ready to catch it. Release the paper without telling them when you are going to do it, and it will probably slip through their fingers. Why?

Name/Date _____

Observing the Organization of the Human Body 4

Using a mirror, open your mouth and look at your teeth. The four front ones on top and bottom are called **incisors**. The pointed teeth just behind them are called “eye teeth,” or **canines**. The rest of the teeth are **molars**. On your own paper, sketch the shape of these different teeth. Based on their size and shape, what different “jobs” do they have when you eat?



Name/Date _____

Observing the Organization of the Human Body 5

You will need water, two cotton balls, and rubbing alcohol. Moisten one cotton ball with water and rub on your left forearm. Moisten the other cotton ball with rubbing alcohol and rub on your right forearm. Which forearm feels cooler? Why? Why might a doctor have prescribed an “alcohol bath” for someone in the past?





Life Science Warm-ups: Observing Life Cycles of the Weird & Wonderful

Name/Date _____

Observing Life Cycles of the Weird & Wonderful 1

Look carefully at the close-up pictures of an adult and immature butterfly. Mark each statement below as true (T) or false (F).



- ___ A. Butterflies and their caterpillars eat different things.
- ___ B. Butterflies show incomplete metamorphosis.

Name/Date _____

Observing Life Cycles of the Weird & Wonderful 2

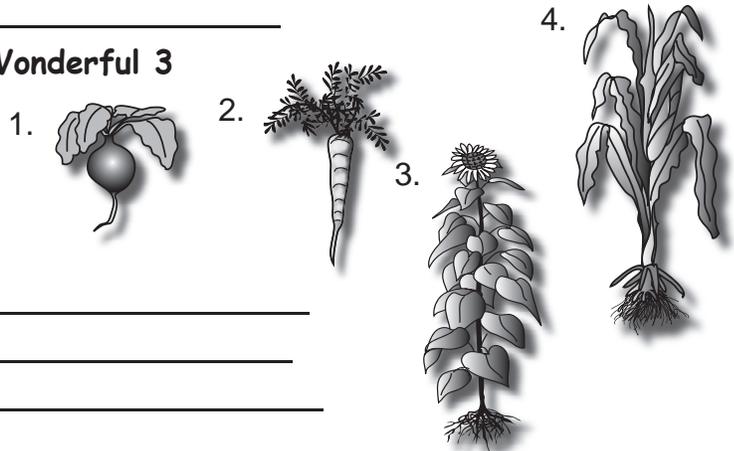
Research the life cycle of a chinch bug and a ladybug. Which insect shows a kind of development called complete metamorphosis?

Explain what that term means. _____

Name/Date _____

Observing Life Cycles of the Weird & Wonderful 3

Look at the illustrations of four different plants showing their roots, stems, leaves, and flowers.

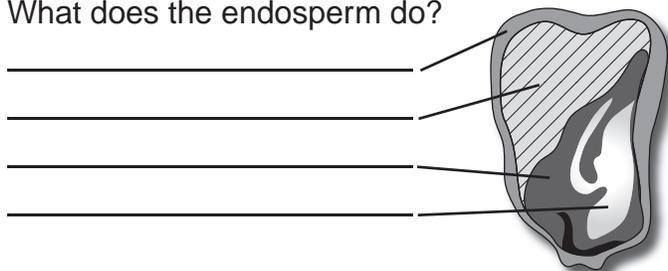


- A. Which plants have roots we can eat? _____
- B. Which plant has the biggest flower? _____
- C. Which plants have seeds we can eat? _____
- D. Which plant has finely divided leaves? _____

Name/Date _____

Observing Life Cycles of the Weird & Wonderful 4

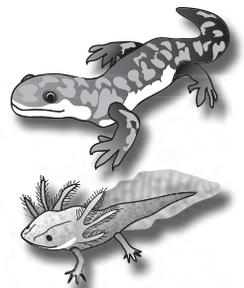
Label the parts of a corn seedling shown below. What does the endosperm do?



Name/Date _____

Observing Life Cycles of the Weird & Wonderful 5

Look at the pictures of an adult tiger salamander and a young or larval tiger salamander (called an **axolotl**). Where do you think the axolotl lives? Explain your answer on your own paper.





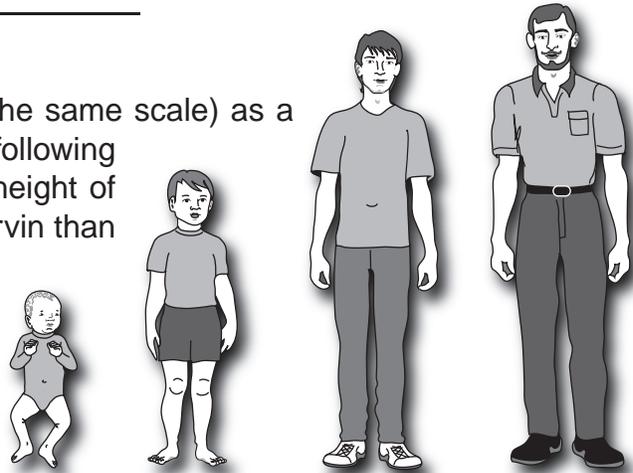
Life Science Warm-ups: Observing Descent & Change Over Time



Name/Date _____

Observing Descent & Change Over Time 1

Look at the four pictures of Marvin (all drawn to the same scale) as a baby, a child, a teenager, and adult. Answer the following questions on your own paper. Measure the total height of each figure. How many times taller is the adult Marvin than baby Marvin? Measure the height of Marvin's baby head and divide by the baby's height. Do the same for the other figures. Explain how body proportions change with age.



Name/Date _____

Observing Descent & Change Over Time 2

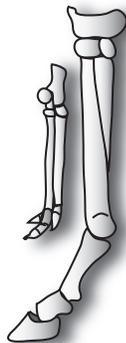
A population of moths has some light-colored forms and others that are dark. If the trunks of all trees in a forest are blackened during a fire, which color moth will survive in greater numbers? How will this change the frequency of white and dark moths in the next generation? Answer on your own paper.



Name/Date _____

Observing Descent & Change Over Time 4

Modern horses are different from ancient horses. Look at the scale drawings of the leg bones of modern and ancient horses, and name at least two things that have changed.



1. _____
2. _____

Name/Date _____

Observing Descent & Change Over Time 3

Use the Internet or other resource to compare the skeleton of *Tyrannosaurus rex* with the following modern animals: a bird, an amphibian, and a cat. Which does the *T. rex* skeleton most resemble? In China, fossils of small dinosaurs have been found with the impressions of feathers. Does this fact support your choice?



Name/Date _____

Observing Descent & Change Over Time 5

In eastern Colorado, the following fossils are commonly found near the prairie town of Pueblo: giant clams, squid-like creatures, fish, and giant sea reptiles. Mark the following statements as true (T) or false (F).

- ___ A. Colorado's climate has always been the same.
- ___ B. Colorado must have had an ocean at one time.
- ___ C. The prairie would be a good place to find living clams.



Life Science Warm-ups: Observing Humans in the Web of Life



Name/Date _____

Observing Humans in the Web of Life 1

Human population growth has increased over the last 300 years. At the same time, the number of mammal and bird extinctions has also increased. List three reasons for this relationship.

- A. _____
- B. _____
- C. _____

Name/Date _____

Observing Humans in the Web of Life 3

Sally is sick with food poisoning, caused by bacteria in undercooked food. Elwood has the flu, which is caused by a virus. Mark the following statements as true (T) or false (F).

- ___ A. Sally's illness is infectious.
- ___ B. Elwood's flu can be cured with antibiotics.
- ___ C. Seymour may have caught the flu by touching something Elwood touched.
- ___ D. Getting the flu will protect Elwood from food poisoning.

Name/Date _____

Observing Humans in the Web of Life 5

Parasites live at the expense of other organisms. **Symbionts** are two or more creatures that live together and benefit each other. **Commensals** live together, but don't have much interaction otherwise. Identify the relationship between humans and the following organisms.

- A. *L. acidophilus* bacteria _____
- B. Flu viruses _____
- C. Head lice _____
- D. Dogs _____

How might these relationships change over time? _____

Name/Date _____

Observing Humans in the Web of Life 2

On your own paper, make a list of the clothes you are wearing today. How many different animals and plants were used to create your clothing? What were any plastics made from? Where might metals have been mined? Where would you look to find the answers to these questions?



Name/Date _____

Observing Humans in the Web of Life 4

On your own paper, make a list of what you ate yesterday. Put a check mark next to items grown within 10 miles of home, an X next to items grown somewhere in the United States, and an O next to items grown outside our country. How might your eating habits change if airplane traffic or delivery trucks were grounded for a week?





Life Science Warm-ups: Asking About the Diversity of Life



Name/Date _____

Asking About the Diversity of Life 1

Write the letter of the correct answer for the following questions about the classification of living things.

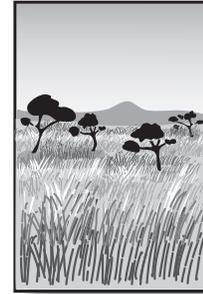
- _____ 1. What kingdom of creatures has no chlorophyll, reproduces with spores, and consists of mostly decomposers?
 - _____ 2. What phylum of creatures has jointed legs, segmented bodies, and external skeletons?
- A. Arthropoda B. Protista C. Fungi

Name/Date _____

Asking About the Diversity of Life 2

On your own paper, write questions that have the following answers.

- A. A biome
- B. An estuary
- C. A deciduous forest
- D. Grasslands

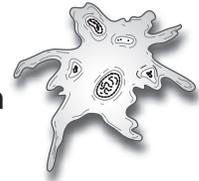


Name/Date _____

Asking About the Diversity of Life 3

Write the letter of the living thing from the list provided that best answers each riddle.

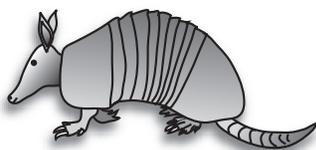
- 1. What takes any shape it wants, is only one cell big, and likes to ooze? _____
 - 2. What lives on rocks and belongs to two kingdoms? _____
 - 3. What is smaller than a blood cell, bigger than a virus, and sometimes has a "tail" called a flagellum? _____
- A. mushroom B. lichen C. spore
D. amoeba E. bacterium



Name/Date _____

Asking About the Diversity of Life 4

Pair up with a classmate. Each of you write the name of an animal on a piece of paper and place it in an envelope. Take turns asking questions that can be answered by a "yes" or a "no." The first one to correctly guess the other's animal wins. How is asking "yes" or "no" questions similar to designing a scientific experiment?



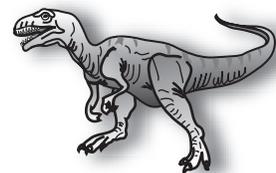
Name/Date _____

Asking About the Diversity of Life 5

A paleontologist discovers a new dinosaur in your backyard. What questions might you ask:

- A. to find out what the dinosaur ate?
- B. to find out in what kind of habitat it lived?
- C. to find out to which modern animals it is most closely related?

Write your questions on another sheet of paper.





Life Science Warm-ups: Answer Keys



Observing the Diversity of Life (Page 2)

- Variable answers
- A. FS B. ES C. BB D. D
E. ES F. BB
- A. 1, 4 B. 1, 6 C. 2, 3, 5
- A. I B. S C. N (Crustacean)
D. S E. I F. I G. S
H. I
- Seeds have a food source for the developing plant embryo; spores do not. Variable drawings.

Observing Energy Flow in Living Communities (Page 3)

- Producers (base): D. grass, E. sagebrush
First-order consumers (middle): B. prairie dog, C. insect, G. buffalo
Second-order consumers (top): A. hawk, F. coyote
- Variable answers, but nearly all will depend on the sun. Hydroelectric, wind, and solar power can be replenished; fossil fuels cannot.
- Producers: wheat, tomatoes, pineapple, oregano, olives, etc.
Consumers: cows, pigs, seafood, humans, etc.
- Variable answers
- Without decomposers, the rest of the ecosystem would collapse from lack of resources.

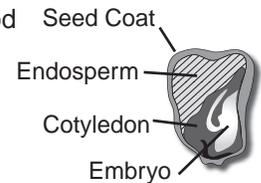
Observing the Organization of the Human Body (Page 4)

- Pulse will be higher standing than sitting and higher running than standing. Pulse results from the beating of your heart.
- By focusing at a distance, the images from right and left eyes don't merge completely, but partially overlap instead.
- The second person must observe you drop the paper, then react. This takes longer than getting "release" and "catch" impulses from the same brain.
- Incisors cut and shear like scissors. Canines puncture and tear. Molars crush food.
- The right forearm feels cooler because the alcohol evaporates faster, carrying more heat away. Alcohol baths were used to reduce fevers.

Observing Life Cycles of the Weird & Wonderful (Page 5)

- A. T B. F
- The ladybug has complete metamorphosis with four distinct stages: egg, larva, pupa, and adult.
- A. 1 & 2 B. 3 C. 3 & 4 D. 2

- The endosperm provides food for the growing seedling.



- The axolotl lives in the water, as evidenced by gills and a fish-like tail.

Observing Descent & Change Over Time (Page 6)

- An adult is about 3.5 times the size of an infant. A baby's head is about one-fourth of his total length, whereas an adult is 7 or 8 "heads" tall.
- The black moths will survive better on dark trunks because they are harder to see. The frequency of dark moths will increase.
- Birds are believed to be the living descendents of *T. rex* and other theropod dinosaurs.
- Horse legs have lengthened and the number of toes has decreased.
- A. F B. T C. F

Observing Humans in the Web of Life (Page 7)

- Loss of habitat, killing for food or pleasure, death through pollution, climate and/or habitat change
- Variable list of clothes. Plastics are made from hydrocarbons. Encyclopedias and web search engines can provide basic information.
- A. F B. F C. T D. F
- Variable responses, but a large part of food from grocery chains comes from non-local sources.
- A. Symbiont B. Parasite C. Parasite
D. Symbiont or Commensal
Answers will vary. Relationships could change if the host of a parasite dies, or the environment in which a relationship takes place changes.

Asking About the Diversity of Life (Page 8)

1. C 2. A
- Variable answers.
 - Biomes are environments with similar climates and ecological communities.
 - Estuaries are where fresh and salt water mix.
 - A deciduous forest is made up of trees that annually shed their leaves.
 - Grasses are the dominant community plant in grasslands. Annual rainfall is between 25 cm and 75 cm in grasslands.
1. D 2. B 3. E