

# LIFE, EARTH, AND PHYSICAL SCIENCE

# Section 1: Asking about Life

Pg. 4-7

## Objectives

1. Explain the importance of asking questions in science.
2. State examples of life science at work.
3. List three ways life science is beneficial to living things.



# I. It All Starts with a Question

- A. Life Science is the study of living things.
- B. In your Own Backyard You can ask questions about familiar organisms.
- C. Touring the World The questions you ask about your neighborhood are just a sample of all the questions you could ask about the world.



# II. Life Scientists

Who are life scientists?

**A. Anyone** Women and Men from any cultural background can become life scientists.

**B. Anywhere** Life scientists carry out investigations in laboratories, on farms, in forests, on the ocean floor--even in space!

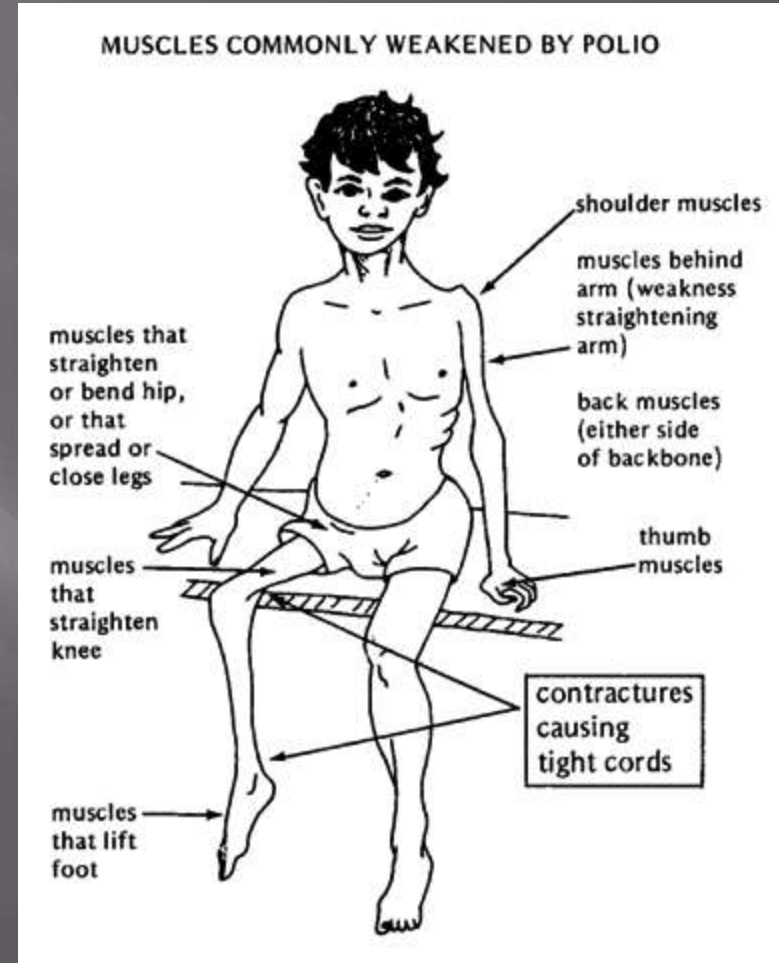
**C. Anything** Life scientists study any thing that is alive, or that used to be alive, that interests them.



# III. Why Ask Questions?

**A. Fighting Diseases** Science has led to many life-saving discoveries, such as the vaccination for polio.

**B. Understanding Inherited Diseases** By learning about how some diseases are inherited and how they affect people, scientists hope to find ways to prevent or cure these diseases.

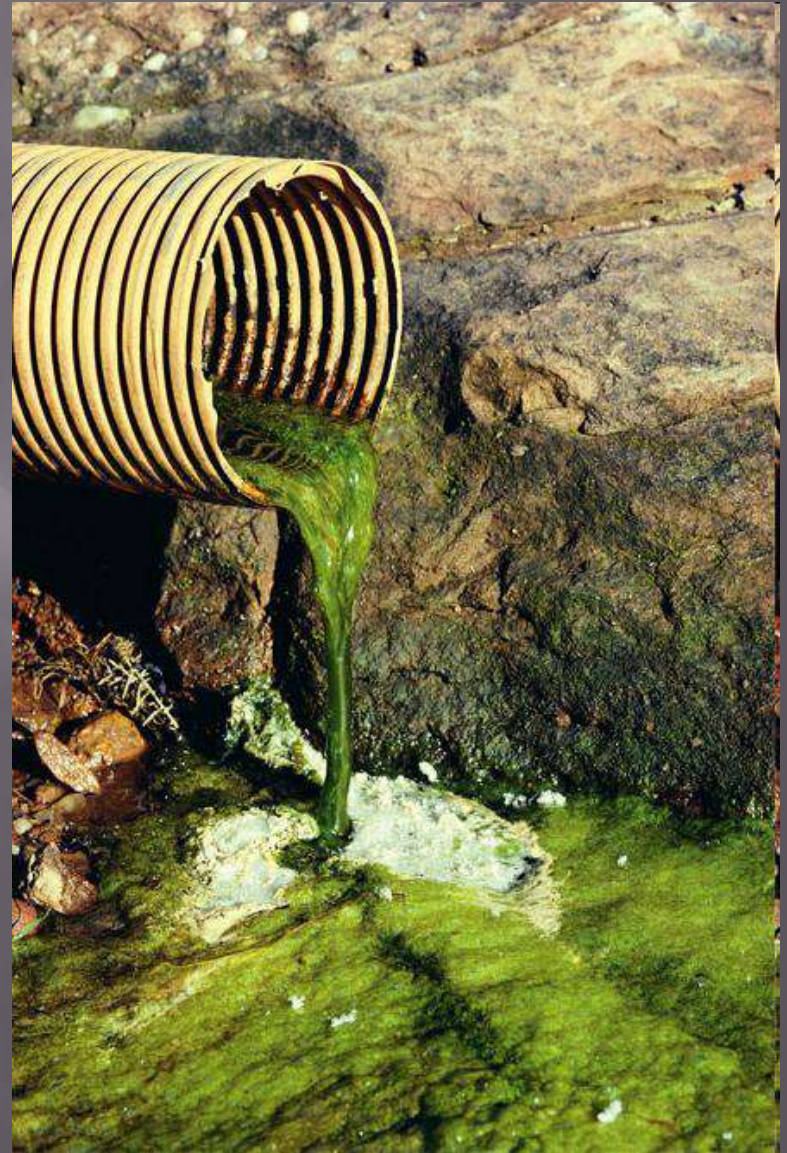


# CRITICAL THINKING TIME!

1. What would be different today if the vaccine for polio had not been discovered?
2. Why is it important for scientists to ask questions?

# Why Ask Questions? *continued*

**C. Protecting the Environment**  
Understanding how we affect the world around us is the first step in finding solutions to problems such as pollution and the extinction of wildlife.



# Critical Thinking Time!

1. What effect did humans have on this body of water?
2. What changes would you recommend to stop this pollution?
3. If you had access to all the resources, how would you deal with the pollution problem?







Chickens have been documented as having various physical deformities, including one bird with a horn in the middle of its head and another with four wings instead of two! Now not all chicken abnormalities are due to bumps in natural evolution; rather, experimentation by man has played a role. Take the case of the [featherless chicken](#), which was created by an Israeli geneticist in 2002 with the purpose of creating a more environmentally-friendly, faster-growing and healthier bird. A cross-breed of a naturally bare neck chicken and a normal boiler chicken, this naked chicken garnered much controversy, with some critics of the process arguing that featherless birds are at a disadvantage compared to their feathered counterparts. More specifically, featherless chickens have experienced difficulties mating and flapping their wings, and been more prone to parasites and mosquitoes. While certainly odd-looking, the featherless chicken raises a very legitimate question: **When does too much science compromise human progress and become bad for the animal?**

**What events lead up to this?**

(Images via: [Farming Pathogens](#), [Anomalies Unlimited](#), [JPHPK](#))



Imagine the surprise of a New Hampshire fisherman a couple of months back when he pulled out of his lobster trap what appeared to be a [blue lobster](#). Just how rare? Turns out that the likelihood of a blue lobster is one in five million.

Apparently, some lobsters are better at processing an antioxidant in their food known as astaxanthin, which apparently causes them to turn (but not feel) blue rather than the normal brownish/red hue that we've all grown accustomed to. Amazingly, the fisherman who caught the blue lobster once caught a white lobster as well. *Update: Before being donated to a local science center, the blue lobster died as a result of hot water temperatures. However, the strange blue lobster has been preserved for researchers to study.*

(Images via: [Ibex Inc.](#))

# Branches of Earth Science

## Section 2.1 pg.36-41

### Objectives

- Describe the four major branches of Earth science.
- Identify four examples of Earth science that are linked to other areas of science.



# I. Geology—Science That Rocks

**A. What is Geology?** The study of the origin, history, and structure of the Earth and the processes that shape the Earth is called geology. Everything that has to do with the solid Earth is part of geology.

**B. Specialized Areas of Geology**  
Most geologists specialize in a particular aspect of the Earth. For example, geologists can specialize in the study of volcanoes, earthquakes, fossils, caves, and more.



## II. Oceanography—Water, Water Everywhere

**A. Oceanography** The scientific study of the sea is called oceanography. Special areas of oceanography include physical oceanography, biological oceanography, geological oceanography, and chemical oceanography.

**B. Exploring the Ocean Floor** Scientists have worked with engineers to build miniature research submarines that can explore much of the ocean floor. An example of a research submarine is the *Alvin*.



# III. Meteorology—It's a Gas

**Meteorology** The study of the Earth's atmosphere, especially in relation to weather and climate, is called meteorology.

- **Hurricanes:** Our lives can depend on meteorologists' forecasts. For example, an early warning of an approaching hurricane can give people time to evacuate an area.
- **Tornadoes:** Meteorologists also study tornadoes to better understand where they will touch down and what path they take.

# Critical Thinking Time!

- ❑ Hurricane Katrina (2005) was the most costly hurricane in history. It flooded 80 percent of New Orleans and destroyed more than 100,000 homes.
- ❑ The first water that flowed into New Orleans was clear clean ocean water from the storm surges. But in a couple of days time, the water turned black and was incredibly foul from raw sewage and dead bodies. People developed rashes on their legs from standing in it.
- ❑ There were a lot of hazards besides the water and wind after Katrina passed through. There were fires and explosions from exposed gas lines and electric wires were down too. A number of people were electrocuted days after the hurricane.
- ❑ Nearly 2,000 people were killed by

1. How would you devise your own way to prevent some of the damage and many deaths caused by this category 4 hurricane?

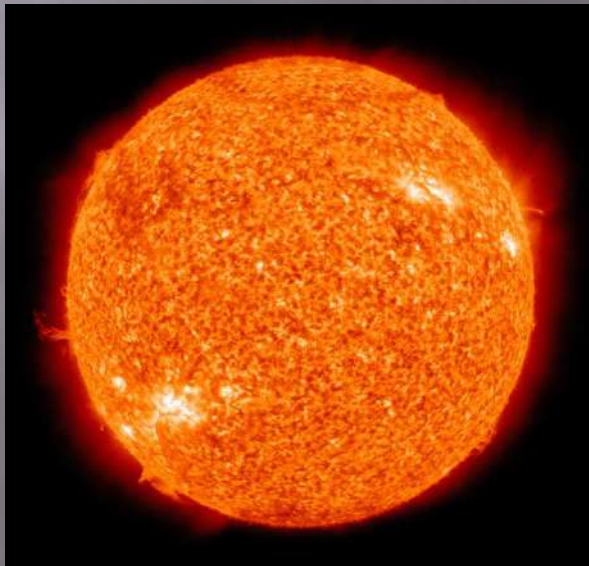


Treasure Bay Casino, before and after Hurricane Katrina

# IV. Astronomy—Far, Far Away

A. **Astronomy** Astronomy is the study of the universe. Astronomers study stars, asteroids, planets, and everything else in space.

- **Star Struck** The sun is the closest star to the Earth. For this reason, astronomers have studied the sun more than other stars.



<http://content5.videojug.com/4f/4f36b196-793e-483e-e14e-ff0008c94d89/what-is-a-comet.WideSmall.jpg>



# Physical Science

## Section 3.1 pg.66

### Objectives

- ▣ **Explain** that science involves asking questions.
- ▣ **Describe** the relationship of matter and energy to physical science.

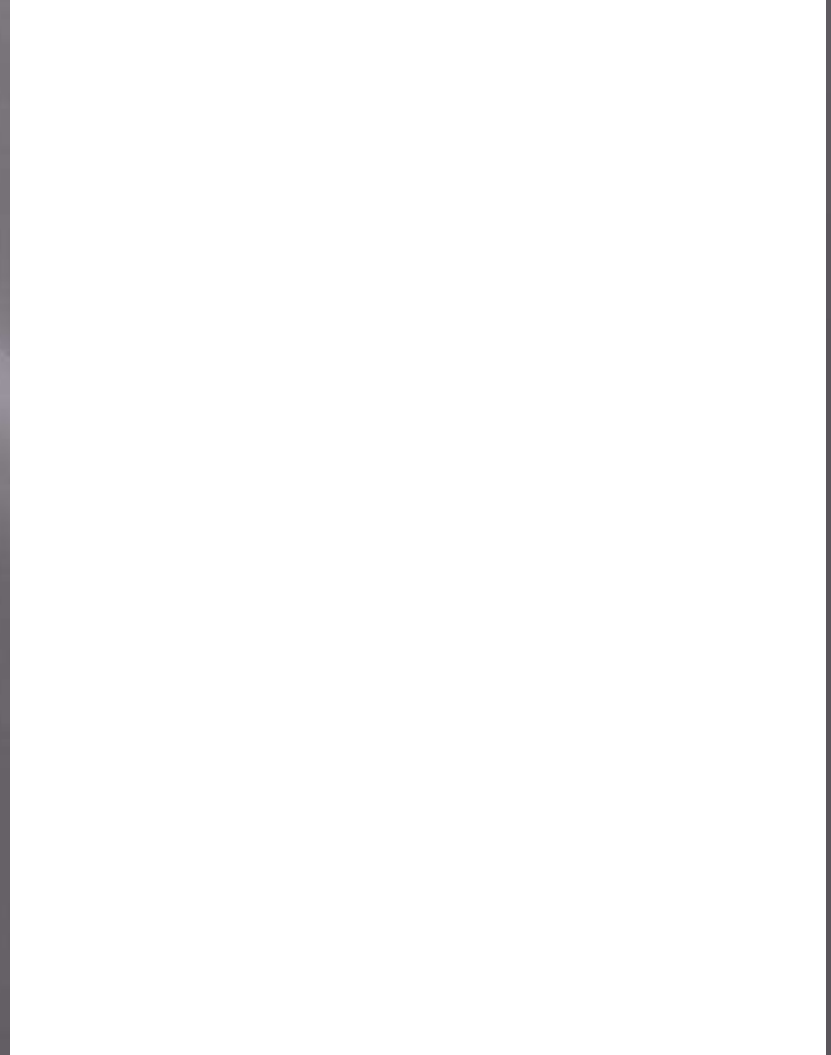
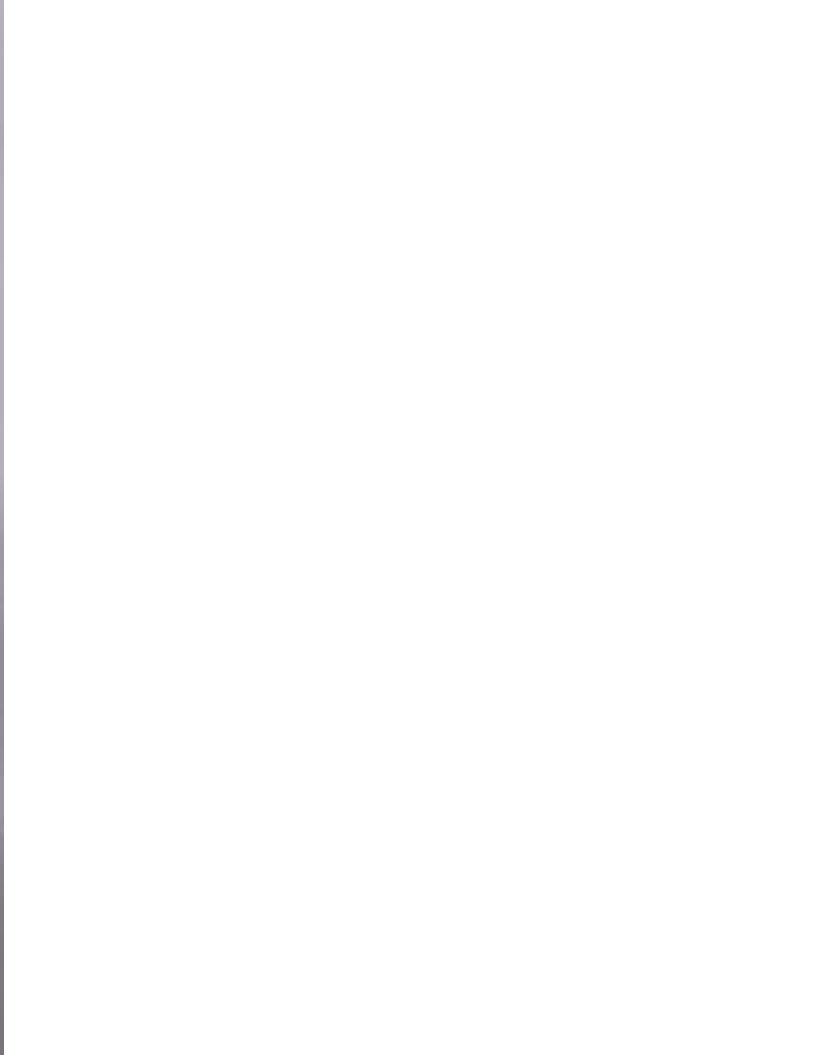
# That's Science!

- ❑ **What Is Science?** Science is a process of gathering knowledge about the natural world.
- ❑ **Everyday Science** Everyday actions such as timing the microwave popcorn and using the brakes on your bicycle use your knowledge of science. You learned how to do these things by making observations and asking questions.



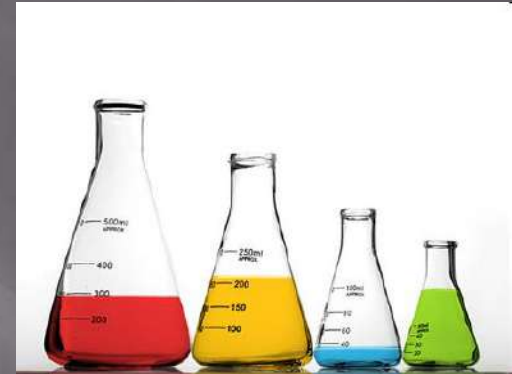
# Critical Thinking Time

## Matter Versus Energy



## II. Branches of Physical Science

**A. Chemistry – A Matter of Reactions!** Chemistry is the study of all forms of matter, including how matter interacts with other matter. Chemistry looks at the structure and properties of matter.



**B. Physics – A Matter of Energy** Like chemistry, physics deals with matter. But physics looks mostly at energy and the way that energy affects matter.



# III. Physical Science: All Around You

**A. Meteorology** The study of Earth's atmosphere, especially in relation to weather and climate, is called meteorology.

**B. Geology** The study of the origin, history, and structure of Earth is called geology.

**C. Biology** Students are often surprised that life science and physical science are related. But chemistry and physics explain many things that happen in biology.



# Cloud Types Based on Form and Altitude



**Cumulus clouds** look like piles of cotton balls.



**Stratus clouds** are not as tall as cumulus clouds, but they cover more area.



**Cirrus clouds** are made of ice crystals.

