Name_____ Class_____ Date_____

CHAPTER 13 SECTION 5

Note Taking Study Guide

THE SCIENTIFIC REVOLUTION

Focus Question: How did discoveries in science lead to a new way of thinking for Europeans?

As you read this section in your textbook, complete the following to identify main ideas about the Scientific Revolution in Europe.

Thinkers of the Scientific Revolution												
Developed sun-centered universe theory												
Nicolaus Copernicus												

Name_____ Class_____ Date_____

CHAPTER 13 SECTION 5

Section Summary

THE SCIENTIFIC REVOLUTION

READING CHECK

What did Isaac Newton call the force that keeps planets in their orbits around the sun?

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In the mid-1500s, a big shift in scientific thinking caused the Scientific Revolution. At the heart of this movement was the idea that mathematical laws governed nature and the universe. Before the Renaissance, Europeans thought that Earth was the center of everything in the heavens. In 1543, Polish scholar **Nicolaus Copernicus** proposed a **heliocentric,** or sun-centered, model of the solar system. In the late 1500s, the Danish astronomer **Tycho Brahe** provided evidence that supported Copernicus's theory. The German astronomer and mathematician **Johannes Kepler** used Brahe's data to calculate the orbits of the planets revolving around the sun. His calculations also supported Copernicus's heliocentric view.

Scientists from different lands built on the foundations laid by Copernicus and Kepler. In Italy, **Galileo** assembled a telescope and observed that the four moons of Jupiter move slowly around that planet. He realized that these moons moved the same way that Copernicus had said that Earth moves around the sun. Galileo's findings caused an uproar. Other scholars attacked him because his observations contradicted ancient views about the world. The Church condemned him because his ideas challenged the Christian teaching that the heavenly bodies were fixed in relation to Earth, and perfect.

VOCABULARY STRATEGY

What does the word *contradicted* mean in the underlined sentence? The prefix *contra-* means "against." Use the meaning of the word's prefix to help you figure out what *contradict* means.

Despite the opposition of the Church, a new approach to science had emerged, based upon observation and experimentation. To explain their data, scientists used reasoning to propose a logical **hypothesis,** or possible explanation. This process became known as the **scientific method.** The new scientific method was a revolution in thought. Two giants of this revolution were the Englishman **Francis Bacon** and the Frenchman **René Descartes.** Both were devoted to understanding how truth is determined, but they differed in their approaches. Bacon stressed experimentation and observation. Descartes focused on reasoning.

READING SKILL

Identify Main Ideas How did Copernicus's proposed model of the solar system differ from earlier beliefs?

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The 1500s and 1600s saw dramatic changes in many branches of science. English chemist **Robert Boyle** explained that matter is composed of particles that behave in knowable ways. **Isaac Newton** used mathematics to show that a single force keeps the planets in their orbits around the sun. He called this force **gravity.** To help explain his laws, Newton developed a branch of mathematics called **calculus.**

Review Questions

1. What assumption was at the heart of the Scientific Revolution?

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2. Why did the Church condemn Galileo?

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