

11 Review Warm Up

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The Scientific Revolution

- ▶ The time period in Europe during the 1500s-1600s of rapid advances in science, math, and political thinking

Changing Idea: Scientific Method

Old Science

Scholars generally relied on ancient authorities, church teachings, common sense, and reasoning to explain the physical world.

New Science

In time, scholars began to use observation, experimentation, and scientific reasoning to gather knowledge and draw conclusions about the physical world.

Causes of the Scientific Revolution?

- ▶ Renaissance & Reformation
 - ▶ Rebirth of culture & learning
 - ▶ Significant changes in the church
- ▶ Printing press invented
- ▶ New ways of thinking
 - ▶ More universities, advanced ideas...
- ▶ Thinkers questioning many aspects of life & religion



Historical Background

- Diffusion of Knowledge
 - After the Dark Ages, European scholars began to gain access to Islamic academic advancements & knowledge
 - Translated texts from Arabic into Latin & other European languages
 - More people had access to this knowledge
 - Increase in universities = increase in learning and understanding
 - Increased trade also led to the spread of new ideas and learning

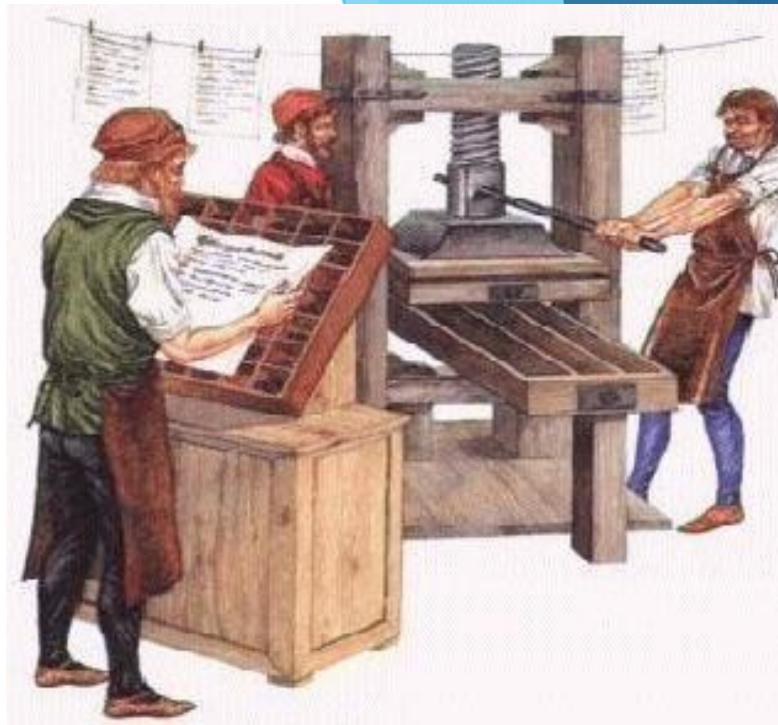
Historical Background

- The Geocentric Theory - sun, moon, and planets revolve around the Earth (Ptolemy's idea)
- The Catholic Church supported Geocentric Theory.
 - Based on belief that God created the heavens & earth and deliberately placed the earth in the center.



Historical Background, Printing Press

- ▶ German inventor Johannes Gutenberg (1440)
- ▶ The inventor's method of printing from movable type, with metal molds, ink, and a press
- ▶ Effect → first mass production of printed books, which facilitated the spread of ideas in Europe and an increase in literacy.



The Diffusion of the Movable Type Printing Press

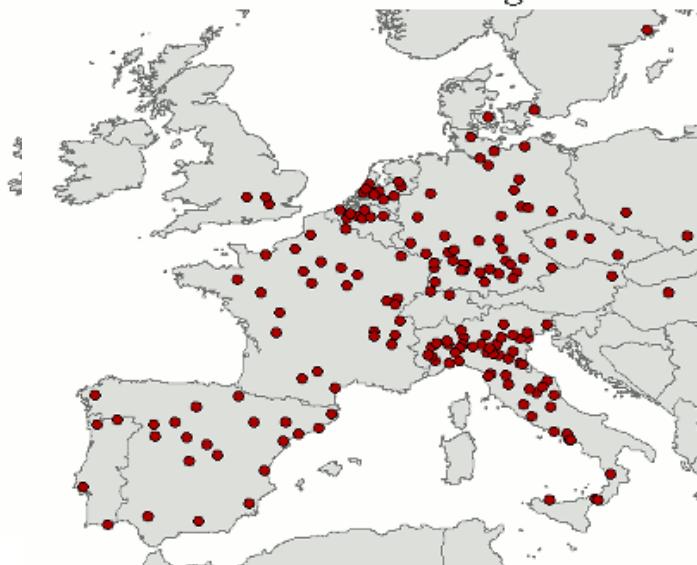
A: Cities with Printing in 1450



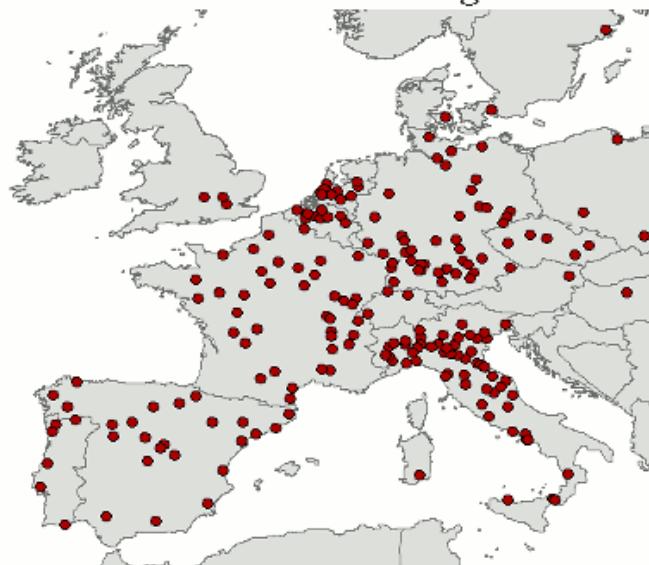
B: Cities with Printing in 1460



E: Cities with Printing in 1490



F: Cities with Printing in 1500

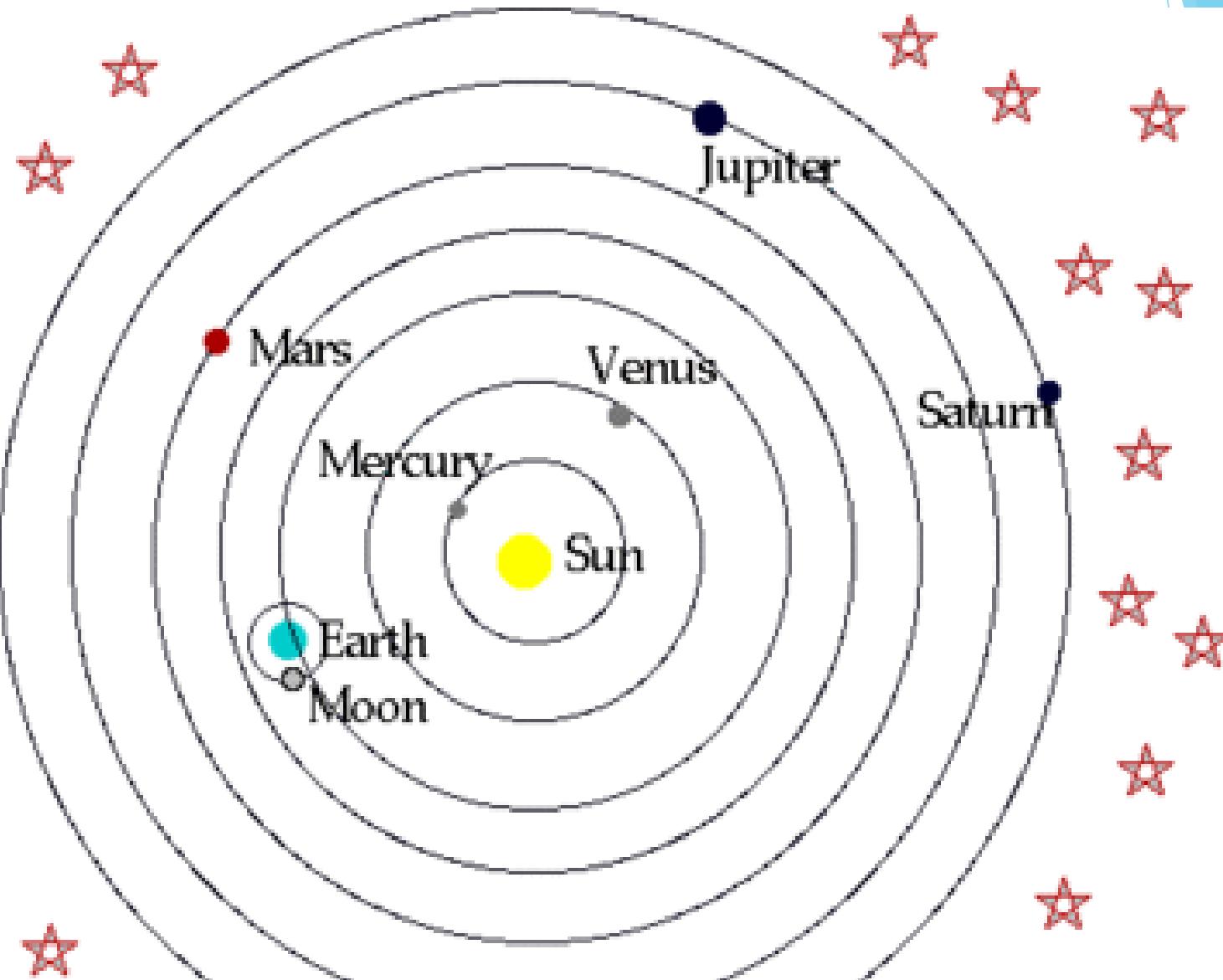


Scientists who changed it all

Copernicus

- ▶ Polish scientist
- ▶ Heliocentric theory: the sun, not the earth, was the center of the solar system
 - ▶ The earth was really insignificant in the context of the universe.
 - ▶ He hesitated to make his theories public because they conflicted with teachings of the Roman Catholic Church.
 - ▶ His book, *Revolution of the Heavenly Spheres*, was published in 1543 after he died.

Heliocentric theory

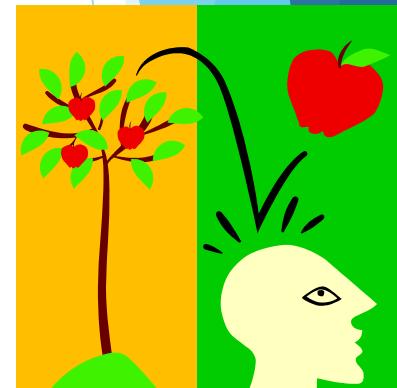


Galileo

- ▶ In 1613, he proved that the sun was the center of the solar system.
- ▶ Said you must use observation to determine facts
- ▶ Objects of different masses fall at the same velocity.
- ▶ Discovered a telescope
- ▶ His views were NOT supported by the Roman Catholic Church because they conflicted w/the Bible
 - ▶ Ordered to abandon the heliocentric theory
 - ▶ Jailed & tried by the Inquisition (Church court) in 1616 for heresy.
 - ▶ *Heresy: belief or opinion against a religious (especially Christian) doctrine*
 - ▶ Video clip

Isaac Newton

- ▶ Explained universal gravitation, that all matter attracts other matter.
- ▶ 3 laws of motion including "for every action there is an equal and opposite reaction."
- ▶ Instead of explaining natural occurrences as the actions of a powerful (and sometimes angry) God, Newton applied reason and logic to the natural phenomenon and showed how all matter was part of a whole.



Robert Boyle

- ▶ English physicist and chemist
- ▶ Discovered the nature of elements and compounds, the basis of modern chemistry.
- ▶ challenged the existing theories that the earth consisted of 4 elements (air, earth, fire and water) or just three (salt, sulfur and mercury).
- ▶ This was ground-breaking!



Effects of the Scientific Revolution

- ▶ Increase in science/secular worldview
- ▶ Catholic teachings questioned
- ▶ Expanded use of scientific method
- ▶ People wanted evidence and proof of information
- ▶ Some tensions between church/scientists

Next up: Printing Press DBQ