

1**All About the Enlightenment: The Age of Reason****Pre-Test**

Directions: Answer each of the following either True or False:

1. The leading figures of the Enlightenment era glorified reason (rational thought). _____
2. Most of the main ideas put forth by the political philosophers of the Enlightenment era were rejected by the leaders of the American and French Revolutions. _____
3. Electricity was studied during the Enlightenment era. _____
4. Science during the Enlightenment era advanced more slowly than during the Renaissance.

5. Deists held religious beliefs that were close to those of Catholics. _____

2

All About the Enlightenment: The Age of Reason**Post-Test**

Fill in the blanks:

1. _____ devised a system for classifying living things.
2. _____ and _____ are credited with developing the "scientific method."
3. Laws of gravity and motion were formulated by _____ in the 1660s.
4. The human ability to _____ was glorified during the Enlightenment.
5. Anton Van Leeuwenhoek and Robert Hooke used _____ in their studies.

Essay Question:

Name and discuss the contributions of the French and English philosophers of the Enlightenment to the development of American democracy.

3**All About the Enlightenment: The Age of Reason****Video Quiz**

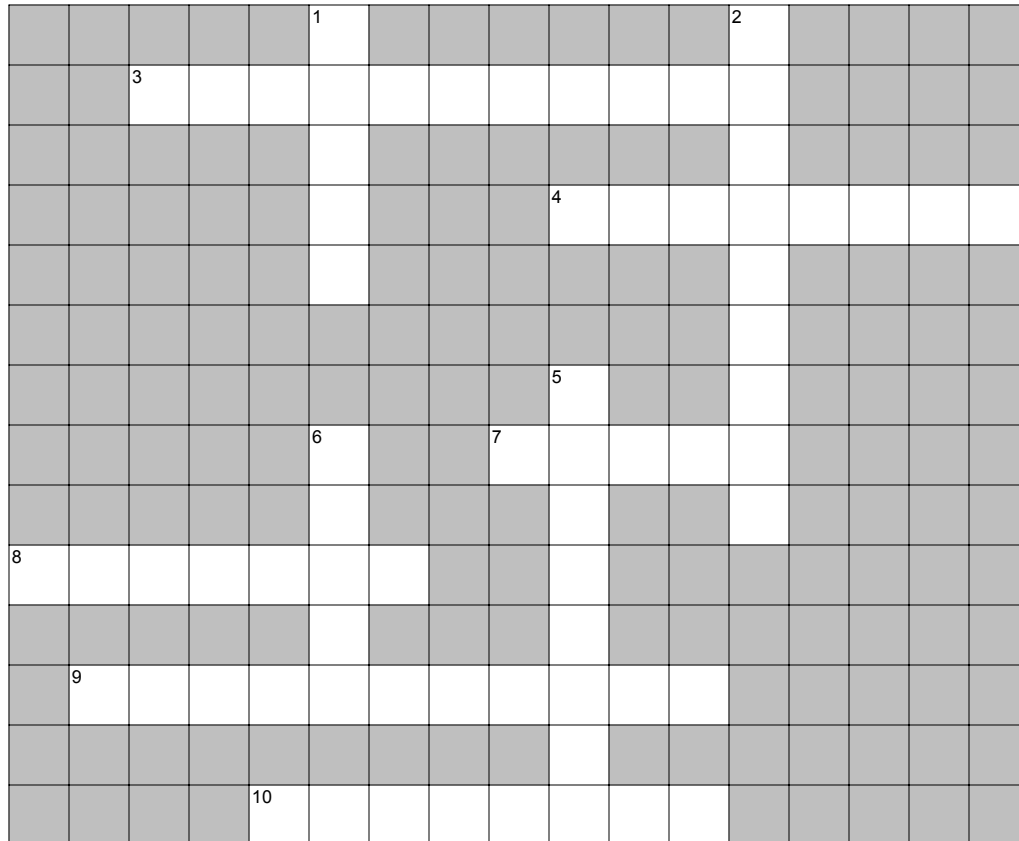
Answer each of the following questions either True or False:

1. True or False? The Age of Reason is another name for the Enlightenment. _____
2. True or False? Deists and Catholics had almost identical ideas about religion. _____
3. True or False? Francis Bacon and René Descartes are considered to be the "Fathers of the Enlightenment." _____
4. True or False? Voltaire invented a system for biological classification. _____
5. True or False? The use of the scientific method improved the quality of scientific study. _____

4

All About the Enlightenment: The Age of Reason

Crossword Puzzle

**Across:**

- The historical period during which the "Scientific Revolution" began.
- A form of mathematics developed by Isaac Newton.
- English philosopher who called for consent of the governed.
- The French writer who published the first encyclopedias in the mid 1700s.
- French philosopher who called for separation of powers in government.
- A Swedish botanist who developed a system for classifying living things into separate groups and subgroups that is still used today.

Down:

- The first Englishman to suggest rational steps for a "scientific method."
- The French "Father of the Enlightenment" who was a brilliant mathematician.
- French philosopher who called for freedom of speech.
- The man who gave cells, the basic units of life, their name.

All About the Enlightenment: The Age of Reason

Timeline and Timeline Activity

- 1561** - Francis Bacon is born in England. He will come to be considered one of the "Fathers of the Enlightenment."
- 1590** - The microscope is invented in Holland.
- 1596** - René Descartes is born in France. Along with Bacon, he will come to be considered a "Father of the Enlightenment."
- 1599** - Construction begins on Shakespeare's Globe Theatre in London.
- 1605** - Francis Bacon publishes *The Advancement of Learning*.
- 1607** - The first English settlement is established in Jamestown, Virginia.
- 1608** - The telescope is invented in Holland.
- 1610** - The Italian scientist Galileo improves the telescope and proves the theories of Copernicus.
- 1628** - William Harvey describes the circulation of blood.
- 1632** - John Locke, famous political philosopher of the Enlightenment era, is born.
- 1637** - Descartes publishes his famous book on reason (rational thought).
- 1642** - Isaac Newton is born. Galileo dies. English Civil War begins.
- 1649** - Execution of King Charles I of England. The Puritan Oliver Cromwell begins to rule the Commonwealth of England as its "Lord Protector."
- 1651** - Harvey's book on embryology is published.
- 1658** - Oliver Cromwell dies; his son rules England.
- 1660** - The Restoration of the Monarchy in England. King Charles II ascends to the throne.
- 1665** - Bubonic Plague ravages England. Newton begins an intense 18-month period of scientific work that results in the invention of calculus, the discovery of the laws of motion and gravitation, the development of the mathematical method called the binomial expansion, as well as important discoveries in optics, in the measurement of the masses of the sun and planets, and in the motion of comets. Robert Hooke publishes his book, *Micrographia*, and names the basic biological units cells.
- 1670** - King Charles II establishes the Hudson's Bay Company.
- 1680** - Clocks are equipped with minute hands for the first time.
- 1681** - King Charles II grants the lands of Pennsylvania to Quaker William Penn, making Penn its absolute lord for an annual royal rent of two beaver skins.
- 1685** - The great composer Johann Sebastian Bach is born.
- 1686-87** - Newton publishes what many consider to be the greatest book in the history of science called *Philosophiæ Naturalis Principia Mathematica*, which outlines his scientific insights.
- 1688** - "The Glorious Revolution" establishes the supremacy of the Parliament over the monarchy in England.
- 1689** - Isaac Newton becomes a member of Parliament in the House of Commons for Cambridge. Montesquieu, the great French political philosopher, is born.
- 1694** - The great French writer Voltaire is born.
- 1696** - The English deist John Toland publishes his influential book, *Christianity Not Mysteries*.
- 1704** - Isaac Newton publishes his book called *Opticks*.
- 1706** - Benjamin Franklin is born.
- 1707** - Carolus Linnaeus is born.
- 1714** - Gabriel Fahrenheit invents a mercury thermometer.
- 1719** - Daniel Defoe's book *Robinson Crusoe* is published.
- 1727** - The earliest steam engines are used.
- 1732** - George Washington is born in Virginia.
- 1735** - Carolus Linnaeus publishes his great book on the classification of living things called *Systema Naturae*.
- 1743** - Thomas Jefferson is born.
- 1748** - Montesquieu publishes his famous book, *The Spirit of the Laws*.
- 1751** - Denis Diderot's "encyclopedia" begins appearing in installment volumes.

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Timeline and Timeline Activity (continued)

1755 - Dr. Samuel Johnson publishes the first real dictionary of the English language.

1756 - Wolfgang Amadeus Mozart is born in Austria.

1760 - King George III of England begins his 60-year reign.

1763 - France is forced to give up its North American territories.

1765 - James Watt invents a highly improved steam engine.

1766 - Henry Cavendish discovers the element hydrogen, which he calls "inflammable air."

1769 - Joseph Cugnot of France builds a steam-powered vehicle that can carry four people at the speed of two-and-one-quarter miles per hour.

1770 - Ludwig Von Beethoven is born.

1771 - Luigi Galvani discovers the role of electricity in causing muscular contraction.

1776 - Americans declare their independence from England. Thomas Paine publishes *Common Sense*. Famous economist Adam Smith publishes *The Wealth of Nations*.

1778 - Antoine Lavoisier, considered to be the "Father of modern chemistry" discovers that air consists of two different gases: one that can be used in respiration that he called oxygen and another, called nitrogen, that cannot. France joins America as an ally in the War of Independence. The great French philosophers Voltaire and Rousseau both die.

1779 - The first bicycles, called velocipedes, appear in Paris.

1783 - The Treaty of Paris recognizes an independent United States of America.

1785 - The power loom is invented for weaving thread into cloth. The first balloon crossing over the English Channel.

1789 - The French Revolution begins. The first steam-powered cotton factory opens in Manchester, England. William Herschel completes his great reflecting telescope.

1791- Mozart dies a pauper at the age of 36. The Bill of Rights (first ten amendments to U.S. Constitution) is ratified in December. The metric system of measurement is proposed.

1793 - King Louis XVI is executed. The world's first professional society of chemists is established in Philadelphia. Jean Batiste Lamarck argues that fossils are the remains of organisms that at one time were alive. Eli Whitney invents the cotton gin, this invention revolutionizes agriculture.

1794 - The famous chemist Lavoisier is executed in France by a radical faction of the French Revolution.

1796 - Edward Jenner performs the first inoculation for smallpox.

1799 - George Washington dies at Mount Vernon, Virginia. The Rosetta Stone is discovered in Egypt, which turns out to be the key to unlocking the mystery of ancient Egyptian hieroglyphics. Napoleon Bonaparte seizes power in France, ending the French Revolution.

1800 - Chlorine is used to purify water for the first time.

Timeline Activity

By consulting the Timeline, fill in the correct year:

1. Montesquieu publishes his book, *The Spirit of the Laws*: _____
2. Hydrogen is discovered: _____
3. The French Revolution begins: _____
4. A mercury-based thermometer is invented: _____
7. Clocks have minute hands for the first time: _____
8. Oxygen discovered: _____
9. Cells are named: _____
10. Harvey's book on embryology is published: _____
11. First steam powered vehicle in use: _____
12. Link between muscular contraction and electricity discovered: _____

All About the Enlightenment: The Age of Reason

Vocabulary List and Activity

Age of Reason - Period of history from the mid 1600s to around 1800. This was a time of a growing belief in the supreme goodness and power of reason as a means of realizing human potential, as well as a period of rapid growth in science.

analytic geometry - A branch of mathematics devised by René Descartes. Geometric figures are studied using algebraic techniques. It makes use of a coordinate system (graphing).

Bacon, Francis - A philosopher born in England in 1561 who advocated the use of reason and who came up with the fundamental ideas behind the scientific method: namely the steps of observation, experimentation, and generalization.

biology - The science of living things or life.

Bubonic Plague - A deadly disease spread by rats and fleas.

calculus - A branch of mathematics devised by Isaac Newton.

cells - The "basic units of life" named by early microscopist Robert Hooke.

checks and balances - The idea behind the separation of the powers of government into legislative, executive, and judicial branches so that the power of any one branch is not exceeded or abused.

chemistry - The study of the changes that occur in matter.

Civil War (English) (1642-1649) - The overthrow of the English monarchy by a force of mostly Parliamentarians led by Oliver Cromwell.

classification - The act of naming things and placing them into groups.

colony - A territory distant from the state that has political control over it.

commonwealth - After the abolition of the English monarchy in 1649, a commonwealth was established. It only lasted 10 years until the monarchy was restored in 1660.

Copernicus, Nicolas (1473-1543) - Polish astronomer who concluded that the Earth and planets revolve around the sun.

Cromwell, Oliver (1599-1658) - A Puritan who ruled England under the title of "Lord Protector" from 1649-58.

Diderot, Denis (1713-84) - An important French writer who published the first encyclopedias starting in the mid-1700s.

deism - A popular 18th century philosophy that rejected traditional religions in favor of a view in which God is thought of as a sort of "cosmic clockmaker" who builds a complex mechanical universe, sets it in motion, and then does not interfere with its actions. Ben Franklin, Thomas Jefferson, and Thomas Paine were all strong supporters of deism.

Descartes, René - Brilliant French philosopher and mathematician. Along with Francis Bacon, Descartes is considered to be a "Father of the Enlightenment."

embryos - Developing organisms.

experimentation - The careful testing of a scientific theory.

French Revolution (1789-1799) - A period in which the French monarchy was replaced by a series of revolutionary governments.

Galilei, Galileo (1564-1642) - Late Renaissance Italian mathematician, scientist, and astronomer. His work in astronomy helped prove the Copernican system; Galileo also invented the first thermometer.

Glorious Revolution (1688) - A revolt in England that resulted in the Parliament having more power than that of the monarch.

Goethe, Johann (1749-1832) - Great German poet, scientist, and public official during the Age of Reason.

gravity - The physical attraction between objects (gravitational pull).

Harvey, William - English scientist who analyzed the circulation of blood and who studied embryos.

Hooke, Robert - English scientist who discovered and named cells.

hypothesis - An idea to be tested; a supposition made as a basis for reasoning.

Jefferson, Thomas (1743-1826) - A major figure of the Enlightenment who championed the cause of the perfectibility of mankind through education and science. Jefferson was a deist and the principle author of the Declaration of Independence. He became the third President of the U.S.

All About the Enlightenment

Vocabulary List and Activity (continued)

Johnson, Dr. Samuel (1709-84) - Compiled the first comprehensive English dictionary in 1775.

kingdom (biological) - The most generalized level of biological classification (such as Animal Kingdom or Plant Kingdom). Currently five kingdoms are recognized.

Linnaeus, Carolus (Karl Von Linne) (1707-78) - Swedish botanist who developed the first successful system for classifying living things into similar groups, a system that is still used today.

Leeuwenhoek, Anton Van - Enlightenment era biologist who discovered micro-organisms.

Locke, John (1632-1704) - Great English political philosopher of the Enlightenment era.

logic - The science of reasoning, drawing conclusions from basic premises.

microscope - Scientific tool used for looking at very small things.

monastery - A building in which monks live.

Montesquieu (1689-1755) - Great French Enlightenment-era political philosopher who proposed a government based on a separation of powers between the executive, judicial, and legislative branches.

natural philosopher - An Enlightenment-era scientist.

Nature's God - The deist concept of an all-powerful spiritual force that created the universe and everything in it, but then left it alone.

Newton, Sir Isaac (1642-1727) - English scientist and mathematician often considered to be the greatest figure in the history of science.

observation - The examination of an event or and object very closely and with impartiality.

orrery - A popular 18th century scientific toy made of pulleys and spheres that could be cranked to mimic the way the heavenly bodies move around the sun.

optics - The study of light.

Pilgrims - A band of English religious "Separatists" from the Church of England who founded the Plymouth colony in 1620.

philosopher - A seeker of knowledge and wisdom.

physics - The study of the physical laws that govern the universe.

Philosophiae Naturalis Principia Mathematica - Isaac Newton's most famous scientific book of 1686-87; the mathematical principles of natural philosophy.

Puritans - A religious group that wanted to purify the Church of England of certain Catholic practices which they considered to be irreligious.

rational thought - Thought based on reason or logic.

reason - To think coherently, rationally, and logically; to draw conclusion from the facts.

Restoration - The return of the institution of the Monarchy in England in 1660. The period of the reign of King Charles II (1660-85).

scientific method - A rational, stepwise approach to scientific research developed by Francis Bacon and René Descartes and improved upon by Isaac Newton. It is based on three essential points: observation, generalization, and experimentation. This method replaced the more mystical approach to science that had existed during the Middle Ages and the Renaissance and resulted in a spectacular growth in scientific research.

Scientific Revolution - The rapid growth of science that began in the Renaissance with Copernicus.

Stuart, Charles - King Charles I of England, executed in 1649 by the Parliamentarians at the end of the English Civil War.

Voltaire (1694-1778) - A foremost French writer and philosopher of the Age of Reason. He was a deist, champion of rationality and free speech, and was very much opposed to absolute monarchy.

Vocabulary Activity:

Directions: By consulting the vocabulary list find the correct word (or words) to fill in the blank.

1. The rapid growth in science that began in the Renaissance is called the _____.
2. _____ is the science of reasoning.
3. A supposition made as a basis for reasoning is called an _____.
4. The first _____ were invented by Denis Diderot.
5. _____ are people who seek to discover knowledge and wisdom.