

NAME:

BLOCK:

CENTRAL HISTORICAL QUESTION:

TO WHAT EXTENT WAS THE SCIENTIFIC REVOLUTION A REVOLUTIONARY PHENOMENON?

DIRECTIONS: Use the documents to fill out the attached graphic organizer, and ultimately, to write the outline of a claim with your partner in response to the central historical question above.

THE SCIENTISTS OF EUROPE (MODIFIED)

DOCUMENT A: DESCARTE'S INDEPENDENCE



"I seek no the knowledge that which I might find within myself, or perhaps in the book of nature."

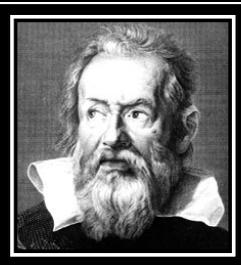
SOURCE: Renee Descartes But the most important contribution Descartes made were his philosophical writings; Descartes, who was convinced that science and mathematics could be used to explain everything in nature, was the first to describe the physical universe in terms of matter and motion, seeing the universe as a giant mathematically designed engine.

DOCUMENT B: NEWTON AND GALILEO'S VIEW OF GOD & NATURE



"This most beautiful system of the sun, planets and comets could only proceed from the counsel of dominion of an *intelligent being*."

SOURCE: Newton discovered many of the laws and theories that not only furthered our understanding of the universe, but also gave future scientists the tools to discover how to enter space. He discovered gravitational force and established the three Universal Laws of Motion. This was huge in many ways as he proved definitively the heliocentric model first proposed by Copernicus.



"God is no less excellently revealed in Nature's actions than in the sacred statements of the Bible."

SOURCE: After 1610, the Catholic Church condemned his theory heliocentrism as "false and contrary to Scripture." When he later defended his views that the sun, not the earth was at the center of the universe, he was tried by the Inquisition, found "vehemently suspect of heresy," forced to recant, and spent the rest of his life under house arrest.

DOCUMENT C: PASCAL'S WAGER

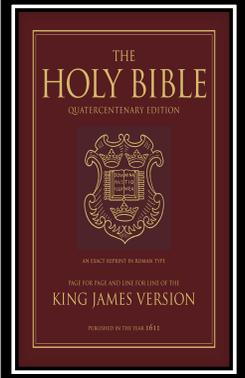
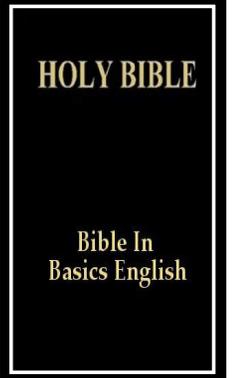


- 1.) "God is, or He is not"
- 2.) A Game is being played... where heads or tails will turn up.
- 3.) According to reason, you can defend neither of the propositions.
- 4.) You must wager. (It's not optional.)
- 5.) Let us weigh the gain and the loss in wagering that God is. Let us estimate these two chances. If you gain, you gain all access to the heaven; if you lose, you lose nothing in the nothingness of death...(yet) I am frightened by the infinite silence of space...
- 6.) Wager, then, without hesitation that God exists. (...) There is here an infinity of an infinitely

happy life to gain, a chance of gain against a finite number of chances of loss, and what you stake is finite. And so our proposition is of infinite force, when there is the finite to stake in a game where there are equal risks of gain and of loss, and the infinite to gain....

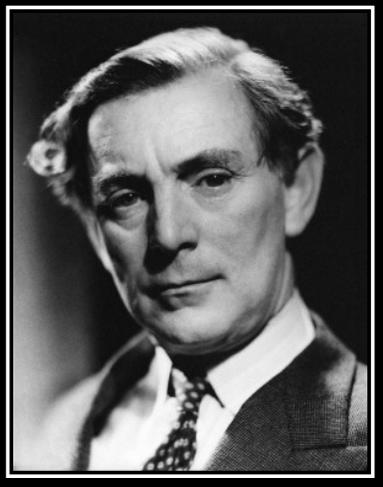
SOURCE: 1646, Blaise Pascal, "Pascal's Wager." Pascal was a French mathematician, physicist, inventor, writer and Christian philosopher who refuted the Aristotle's theory of "Horror Vacu," or, in other words that "nothing cannot exist."

DOCUMENT D: THE BIBLE, BOOKS OF PSALMS

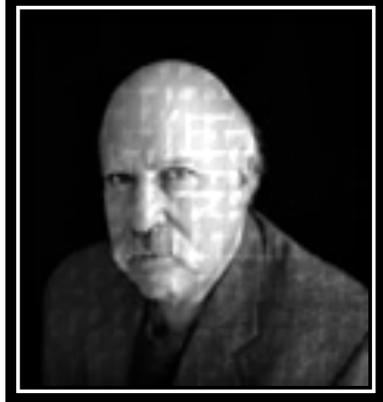
	<p>“The Lord set the earth on its foundation...and is firmly established...it can never be moved.” SOURCE: <i>The Book of Psalms, 104:5.</i></p>	<p>The Lord is King; he is clothed with glory; the Lord is clothed with strength; power is the cord of his robe; the world is fixed, so that it may not be moved. SOURCE: <i>The Book of Psalms, 93:1.</i></p>	
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MODERN DAY HISTORIANS ON THE SCIENTIFIC REVOLUTION

DOCUMENT E: HERBERT BUTTERFIELD ON THE REVOLUTIONARY COMPONENT OF THE SCIENTIFIC REVOLUTION (MODIFIED)

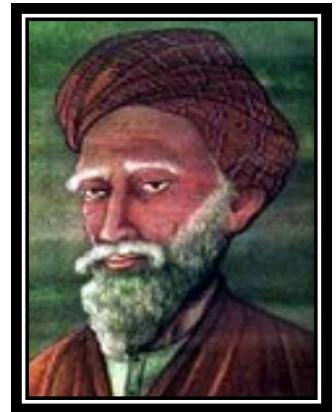
<p>The Revolution in science overturned the authority in not only of the middle ages but of the ancient world ~ it ended not only in the eclipse of scholastic philosophy but in the destruction of Aristotelian physics....The Scientific Revolution outshines everything since the rise of Christianity and reduces the Renaissance and Reformation to the rank of mere episodes, mere internal displacements within the system of medieval Christianity.</p> <p>SOURCE: 1948, Herbert Butterfield. “Origins of Modern Science.” Butterfield was a British historian and philosopher of history who was a devout Christian and reflected at length on Christian influences in historical perspectives. Butterfield thought individual personalities were more important than great systems of government or economics in historical study. His Christian beliefs in personal sin, salvation, and providence heavily influenced his writings, a fact he freely admitted.</p>	
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DOCUMENT F: PROFESSOR STEVEN SHAPIN QUESTIONING THE SCIENTIFIC REVOLUTION

<p>“It ought to be understood that ‘most people’—even most educated people—in the seventeenth century did not believe what expert scientific practitioners believed, and the sense in which ‘people’s’ thought about the world was revolutionized at that time is very limited.”</p> <p>SOURCE: 1996. Steven Shapin, “The Scientific Revolution.” Shapin is a professor of the History of Science at Harvard University. He has written broadly on the history and sociology of science, and is known as a key contributor to the sociology of scientific knowledge. His 1996 book, <i>The Scientific Revolution</i>, has been translated into 14 languages.</p>	
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PHILOSOPHERS OF THE MIDDLE AGESDOCUMENT G: "THE SHAPE OF THE SEAS," from ALMASUDI (MODIFIED)

"The ancient philosophers, such as the mathematicians of the Hindus and the Greeks, believe that the seas are round and not flat. They provide many arguments as *proofs* of their statement. For instance, if you sail away on the sea, land and mountains disappear gradually, until you lose sight of even the highest mountain peaks. On the other hand, as you near the coast, you first see the mountains. Only when you come nearer do you see the trees and plains. But those who strictly follow the revelation the Qur'an, reject this hypothesis."



SOURCE: 928 AD, Al-Masudi (المسعودي), "The Shape of the Seas" was an Arab historian and geographer, and one of the first to combine history and scientific geography in a large-scale work. He lived at a time when books were readily available and relatively cheap. After the Chinese introduced paper mills to the Arab world, there was a great access to books in most large cities. There is no doubt that the availability of cheap writing material contributed to the growth of lively intellectual life of the Arab world.

VOCABULARY: Qur'an: the Islamic sacred book, believed to be the word of God

Hypothesis: A proposed explanation made on the basis of limited evidence

DOCUMENT H: "ALHAZEN: FATHER OF THE SCIENTIFIC METHOD"

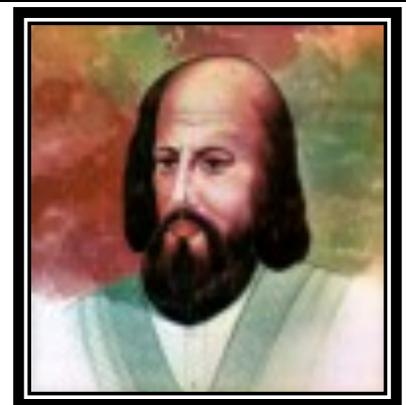
"The duty of the man who investigates the writings of scientists, if learning the truth is his goal, is to make himself an enemy of all that he reads, and attack it from every side. He should also suspect himself as he performs his critical examination of it, so that he may avoid falling into either prejudice or leniency... Truth is sought for itself. But the truths, are immersed in uncertainties and the scientific authorities, such as Ptolemy, are not immune from error..."



SOURCE: 990 AD, Alhazen, was a Muslim scientist who made significant contributions to the principles of optics, as well as to astronomy, mathematics, visual perception, and to the scientific method. He also wrote insightful commentaries on works by Aristotle, Ptolemy, and the Greek mathematician Euclid. Alhazen is widely known as the 'Father of the Scientific Method.'

DOCUMENT I: "QUAESTIONES NATURALES," from ADELARD BATH (MODIFIED)

"I have learnt one thing from my Arab masters, with reason as guide.... These days listeners do not demand arguments based on judgment. They do not understand that reason has been given to each single individual in order to decide between true and false with reason as the prime judge. Reason should be sought first, and an authority, if one is at hand, be added later. Authority alone cannot win credibility for a philosopher..."



SOURCE: 1126, Adelard Bath, "Quaestiones Naturales." The work that Adelard of Bath is known for in the Latin world is his translation of the astronomical tables of al-Khwarizmi, the first widely accessible Latin translation of the Islamic ideas about algebra. In the Middle Ages he was known for his *rediscovery* and teaching of geometry.

VARIOUS EVENTS ON THE PATHWAY TO ENLIGHTENMENT & BEYOND

Dates are approximate

350 BC – **Aristotle**'s assertion of a geocentric universe that places the earth at the center.

130 AD – Greco-Roman astronomer, **Claudius Ptolemy** reaffirms Aristotle's geocentric theory of the universe, furthering the notion that the earth did not move while at the center.

965 AD – Islamic Philosopher **Alhazen**, "Father of the Scientific Method" asserts that Greco-Roman astronomer, Claudius Ptolemy's geocentric theory of the universe is flawed.

1240 - English philosopher and Franciscan friar, **Roger Bacon**, expands upon Alhazen's Scientific Method by breaking the method down to a process of *observation, hypothesis, experiment, verification*.

1265 – European **Renaissance** begins in Florence Italy

1517- **Martin Luther** posts his "95 Thesis" in protest of various wrong-doings of the Christian Church, splitting the religion into Catholics and Protestants, beginning the Protestant **Reformation**

1539 – **Copernicus**' discovery of the sun's location in the universe is outlined and presented to Christian Church

1604 - 1607 – **Galileo** proves Copernicus' theory of the sun's location, beginning the "**Scientific Revolution**"

1686 – English Philosopher **John Locke** begins writing pamphlets, using logic & reason to question the legitimacy of the theory of the divine right of absolute kings

1687 – **Isaac Newton** presents the theory of gravity, solidifying power of mathematic & logic

1688 – **Glorious Revolution** occurs in England, overthrowing the absolute rule of King James II

1690 – **John Locke** writes the *Two Treatises on Government*, asserting man's *natural rights to life, liberty and property* and the overthrow of absolute / tyrannical governments based on the reasoning of the theory of *natural laws*, fueling the "**Age of Enlightenment**"

1776 – The Thirteen British colonies in North America declare independence from the absolute rule of King George the III, based on the belief of man's *natural rights to life, liberty and the pursuit of happiness*

1789 – The "Third Estate" (clergy, nobility and commoners) of France organize and overthrow the absolute rule of King Louis XVI based on the theory of man's right to the overthrow of absolute / tyrannical rule

NAME:

BLOCK:

THEMES OF THE TIMELINE

PART I.

DIRECTIONS: Identify *three* common themes or ideas (i.e. *Justice? Knowledge? Nature?*, anything you believe to be the main theme of the history occurring in the timeline) spread throughout the timeline on the other side of the page. Explain your reasoning.

THEME #1:

EXPLANATION:

THEME #2:

EXPLANATION:

THEME #3:

EXPLANATION:

PART II.

DIRECTIONS: What do you think is the connection between the Scientific Revolution & the Enlightenment? Explain in the space provided.

CENTRAL HISTORICAL QUESTION
TO WHAT EXTENT WAS THE SCIENTIFIC REVOLUTION A REVOLUTIONARY PHENOMENON?
 REVOLUTION OR CONTINUATION?

DIRECTIONS: With your partner(s), go through each of the documents and complete the graphic organizer. Use the timeline to help with responding to the questions.

<u>DOCUMENT(S)</u>	<u>AUTHOR(S)</u>	<u>WRITTEN BEFORE, DURING, AFTER SCI. REV?</u>	<i>*What is the main idea of the document? *Does the document seem to point to the Scientific Revolution being truly revolutionary or not? Why?</i>
A			
B			
C			
D			

<u>DOCUMENT(S)</u>	<u>AUTHOR(S) / SOURCE</u>	WRITTEN BEFORE, DURING, AFTER SCI. REV?	<i>*What is the main idea of the document? *Does the document seem to point to the Scientific Revolution being truly revolutionary or not? Why?</i>
E			
F			
G			
H			
I			