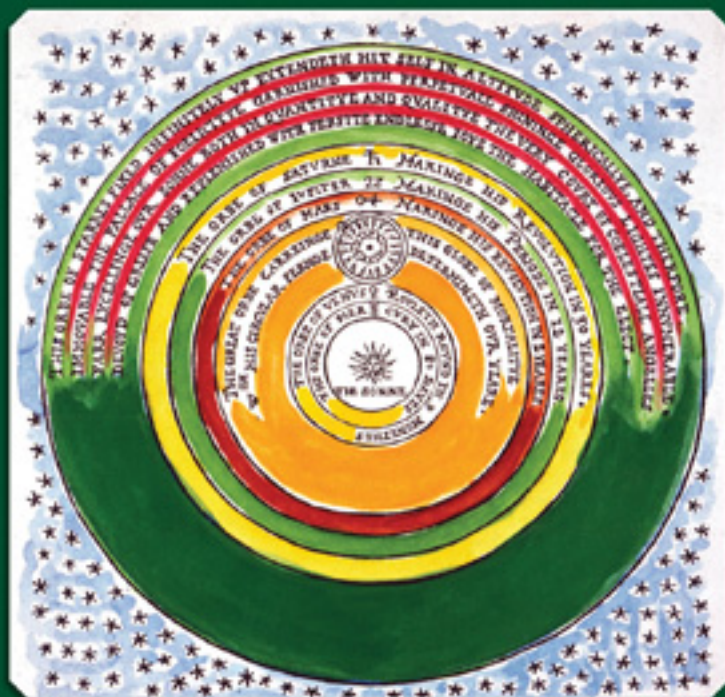


What Was Revolutionary About the Scientific Revolution?

The breakthrough to modern science occurred after the 1400s. What made this science so revolutionary?



Debating the DOCUMENTS

Interpreting Alternative Viewpoints
in Primary Source Documents

What Was Revolutionary About the Scientific Revolution?

The 2017 World History Course and Exam Description of the College Board Advanced Placement Program* lists five themes that it urges teachers to use in organizing their teaching. Each World History *Debating the Documents* booklet focuses on one or two of these five themes.

The Five Themes

- 1. Interaction between humans and the environment.** (demography and disease; migration; patterns of settlement; technology)
- 2. Development and interaction of cultures.** (religions; belief systems, philosophies, and ideologies; science and technology; the arts and architecture)
- 3. State-building, expansion, and conflict.** (political structures and forms of governance; empires; nations and nationalism; revolts and revolutions; regional, transregional, and global structures and organizations)
- 4. Creation, expansion, and interaction of economic systems.** (agricultural and pastoral production; trade and commerce; labor systems; industrialization; capitalism and socialism)
- 5. Development and transformation of social structures.** (gender roles and relations; family and kinship; racial and ethnic constructions; social and economic classes)

This Booklet's Main Theme:

2 Development and interaction of cultures.

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Teacher Introduction

★ Using Primary Sources

Primary sources are called “primary” because they are first-hand records of a past era or historical event. They are the raw materials, or the evidence, on which historians base their “secondary” accounts of the past.

A rapidly growing number of history teachers today are using primary sources. Why? Perhaps it’s because primary sources give students a better sense of what history is and what historians do. Such sources also help students see the past from a variety of viewpoints. Moreover, primary sources make history vivid and bring it to life.

However, primary sources are not easy to use. They can be confusing. They can be biased. They rarely all agree. Primary sources must be interpreted and set in context. To do this, students need historical background knowledge. *Debating the Documents* helps students handle such challenges by giving them a useful framework for analyzing sources that conflict with one another.



*“Multiple,
conflicting
perspectives are
among the truths
of history.
No single
objective or
universal account
could ever put an
end to this endless
creative dialogue
within and
between the past
and the present.”*

From the 2011 Statement on Standards
of Professional Conduct of the Council of
the American Historical Association.

★ *The Debating the Documents Series*

Each *Debating the Documents* booklet includes the same sequence of reproducible worksheets. If students use several booklets over time, they will get regular practice at interpreting and comparing conflicting sources. In this way, they can learn the skills and habits needed to get the most out of primary sources.

Each *Debating the Documents* Booklet Includes

- **Suggestions for the Student and an Introductory Essay.** The student gets instructions and a one-page essay providing background on the booklet's topic. A time line on the topic is also included.
- **Two Groups of Contrasting Primary Source Documents.** In most of the booklets, students get one pair of visual sources and one pair of written sources. In some cases, more than two are provided for each. Background is provided on each source. *Within each group, the sources clash in a very clear way.* (The sources are not always exact opposites, but they do always differ in some obvious way.)
- **Three Worksheets for Each Document Group.** Students use the first two worksheets to take notes on the sources. The third worksheet asks which source the student thinks would be most useful to a historian.
- **One DBQ.** On page 20, a document-based question (DBQ) asks students to write an effective essay using all of the booklet's primary sources.

★ *How to Use This Booklet*

1. Have students read “Suggestions for the Student” and the Introductory Essay.

Give them copies of pages 5–7. Ask them to read the instructions and then read the introductory essay on the topic. The time line gives them additional information on that topic. This reading could be done in class or as a homework assignment.

2. Have students do the worksheets.

Make copies of the worksheets and the pages with the sources. Ask students to study the background information on each source and the source itself. Then have them take notes on the sources using the worksheets. If students have access to a computer, have them review the primary sources digitally.

NOTE: If you are using these materials with an AP world history class, an honors class, or some other group of advanced and/or more knowledgeable students, you may want to make more written sources available to them on this topic. Do a basic Internet search for sources that provide additional perspectives and then add to the sources provided here.

3. “Debate the documents” as a class.

Have students use their worksheet notes to debate the primary source documents as a class. Urge students to follow these ground rules:

- Use your worksheets as a guide for the discussion or debate.
- Try to reach agreement about the main ideas and the significance of each primary source document.
- Look for points of agreement as well as disagreement between the primary sources.
- Listen closely to all points of view about each primary source.
- Focus on the usefulness of each source to the historian, not merely on whether you agree or disagree with that source’s point of view.

4. Have students do the final DBQ.

A DBQ is an essay question about a set of primary source documents. To answer the DBQ, students write essays using evidence from the sources and their own background knowledge of the historical era. (See the next page for a DBQ scoring guide to use in evaluating these essays.)

The DBQ assignment on page 20 includes guidelines for writing a DBQ essay. Here are some additional points to make with students about preparing to write this kind of essay.

The DBQ for this Booklet (see page 20):

The scientific revolution centered above all on new ideas about the solar system or the universe. Why do you think this subject was so important to the scientific revolution?

- Analyze the question carefully.
- Use your background knowledge to set sources in their historical context.
- Question and interpret sources actively. Do not accept them at face value.
- Use sources meaningfully to support your essay’s thesis.
- Pay attention to the overall organization of your essay.

★ *Complete DBQ Scoring Guide*

Use this guide in evaluating the DBQ for this booklet. Use this scoring guide with students who are already familiar with using primary sources and writing DBQ essays.

Excellent Essay

- Offers a clear answer or thesis explicitly addressing all aspects of the essay question.
- Does a careful job of interpreting many or most of the documents and relating them clearly to the thesis and the DBQ. Deals with conflicting documents effectively.
- Uses details and examples effectively to support the thesis and other main ideas. Explains the significance of those details and examples well.
- Uses background knowledge and the documents in a balanced way.
- Is well written; clear transitions make the essay easy to follow from point to point. Only a few minor writing errors or errors of fact.

Good Essay

- Offers a reasonable thesis addressing the essential points of the essay question.
- Adequately interprets at least some of the documents and relates them to the thesis and the DBQ.
- Usually relates details and examples meaningfully to the thesis or other main ideas.
- Includes some relevant background knowledge.
- May have some writing errors or errors of fact, as long as these do not invalidate the essay's overall argument or point of view.

Fair Essay

- Offers at least a partly developed thesis addressing the essay question.
- Adequately interprets at least a few of the documents.
- Relates only a few of the details and examples to the thesis or other main ideas.
- Includes some background knowledge.
- Has several writing errors or errors of fact that make it harder to understand the essay's overall argument or point of view.

Poor Essay

- Offers no clear thesis or answer addressing the DBQ.
- Uses few documents effectively other than referring to them in “laundry list” style, with no meaningful relationship to a thesis or any main point.
- Uses details and examples unrelated to the thesis or other main ideas. Does not explain the significance of these details and examples.
- Is not clearly written, with some major writing errors or errors of fact.

Suggestions to the Student

★ *Using Primary Sources*

A primary source is any record of evidence from the past. Many things are primary sources: letters, diary entries, official documents, photos, cartoons, wills, maps, charts, etc. They are called “primary” because they are first-hand records of a past event or time period. This *Debating the Documents* lesson is based on two groups of primary source documents. Within each group, the sources conflict with one another. That is, they express different or even opposed points of view. You need to decide which source is more reliable, more useful, or more typical of the time period. This is what historians do all the time. Usually, you will be able to learn something about the past from each source, even when the sources clash with one another in dramatic ways.

★ *How to Use This Booklet*

1. **Read the one-page introductory essay.**

This gives you background information that will help you analyze the primary source documents and do the exercises for this *Debating the Documents* lesson. The time line gives you additional information you will find helpful.



2. **Study the primary source documents for this lesson.**

For this lesson, you get two groups of sources. The sources within each group conflict with one another. Some of these sources are visuals, others are written sources. With visual sources, pay attention not only to the image’s “content” (its subject matter) but also to its artistic style, shading, composition, camera angle, symbols, and other features that add to the image’s meaning. With written sources, notice the writing style, bias, even what the source leaves out or does not talk about. Think about each source’s author, that author’s reasons for writing, and the likely audience for the source. These considerations give you clues as to the source’s historical value.

3. **Use the worksheets to analyze each group of primary source documents.**

For each group of sources, you get three worksheets. Use the “Study the Document” worksheets to take notes on each source. Use the “Comparing the Documents” worksheet to decide which of the sources would be most useful to a historian.

4. **As a class, debate the documents.**

Use your worksheet notes to help you take part in this debate.

5. **Do the final DBQ.**

“DBQ” means “document-based question.” A DBQ is a question along with several primary source documents. To answer the DBQ, write an essay using evidence from the documents and your own background history knowledge.

The Scientific Revolution

Up through the fourteenth century, Europe did not stand out in its mastery of astronomy, mathematics, geography, biology, human anatomy, or other fields of knowledge that we now call “science.” India and China and the Islamic societies had their own scientific traditions at that time. In many cases, they were ahead of Europe’s. European thinkers were often aware of that fact, and as they began to look outward from the twelfth century on, they turned to Muslim philosophers, medical writers, and mathematicians. Islamic scholars had preserved and commented on the works of ancient Greek thinkers, in particular Aristotle. When Europeans reacquired these works from Islam, they made Aristotle (and his Muslim commentators) the basis of all learning for university scholars.

Muslims had also preserved the work of Ptolemy (second century CE). Ptolemy’s earth-centered view of the universe was the most advanced thinking on the subject for centuries. But later Muslim astronomers even began to raise questions about Ptolemy’s complex planetary system of circular orbits and epicycles (orbits going around other orbits). This complicated system explained planetary movements in such a way as to keep the earth at the center of the universe. It also depicted all heavenly movements as exact circles, a “perfect” form of motion for the heavens, which were seen as a pure spiritual realm.

The problems with Ptolemy noted by Muslim astronomers were also ones that Nicolaus Copernicus tried to overcome with his book in 1543, *On the Revolutions of the Celestial Spheres*. It is this book more than any other that produced the scientific revolution. What made it so revolutionary?

Copernicus described a solar system with the sun at the center and the Earth and planets revolving around it. To claim this as actual fact

would be to reject Ptolemy, Aristotle, and the teachings of the Catholic Church. Copernicus merely suggested it as a mathematically simpler way to think about the heavens. Yet others soon did take his “heliocentric” theory as reality itself. When Galileo Galilei did this, he was put on trial by the Church and forced to recant his views. The Church was not the only force standing in the way of scientific advance. The heliocentric view itself raised many questions. For example, how could the Earth move without throwing everything on it into space? Why can’t we feel it moving? What force could possibly make it move?

Also, the Earth alone was thought to be made of heavy, ordinary matter. The heavens were not seen as empty space containing other ordinary objects. They were a pure, spiritual realm with points of light set in crystal spheres all moving with a perfect circular motion. Earth was the unmoved center of an orderly universe —logical, given that God created it as a home for man. In answering the questions raised by the Copernican system, this entire view of the universe had to be given up.

A line of development went from Copernicus, to Tycho Brahe and Johannes Kepler, to Galileo, and finally to Isaac Newton and his theory of universal gravitation. The result was an entirely new sense of the lawfulness and unity of nature. Galileo’s laws of motion for objects on Earth were adapted by Newton to explain the motions of planets as these had been described by Kepler. A limitless universe opened up, not centered on the Earth and not bound by spheres or the biblical Heaven above them. All this was both frightening and inviting.

In describing this universe, these men also passed on a new spirit and a far more disciplined method of scientific thinking to carry the quest for new knowledge forward. It was this that made the scientific revolution so revolutionary. In fact, it created a revolution that is still underway.

The Scientific Revolution Time Line

83–161 CE

• • •

Lifetime of Claudius Ptolemy of Roman Egypt. His *Almagest* describes a “geocentric” universe—that is, one with the Earth at the center. He describes the universe as a series of nested spheres containing the planets and other heavenly bodies, all revolving around the Earth. In the Middle Ages, the *Almagest* was unknown in Europe but preserved in Arabic by Muslim scholars.

1100s

• • •

Gerard of Cremona translates the *Almagest* from Arabic. Europeans also translate the Greek philosopher Aristotle’s major works, preserved by Muslim scholars for centuries. Ptolemy and especially Aristotle become key intellectual authorities for Europe. Other ancient Greek and Islamic writers are translated in the twelfth and thirteenth centuries, including the works of Euclid on geometry, al-Khwarizmi on algebra, the physics of Archimedes, the medical works of al-Razi and Ibn Sina (Avicenna), etc.

1514–1554

• • •

Lifetime of Andreas Vesalius. As a lecturer in anatomy, he uses dissection as a teaching tool. He challenges some of the ideas of the ancient Greek physician Galen and the Muslim writers who based their views on Galen’s work.

1543

• • •

On the Revolutions of the Celestial Spheres by Nicolaus Copernicus is published. Its “heliocentric” theory places the sun—not the Earth—at the center of the universe. At first, the Catholic Church does not condemn the book.

1546–1601

• • •

Lifetime of Tycho Brahe. The king of Denmark gives him support as he devotes his life to compiling records of planetary movements that are far more accurate than any previously recorded.

1571–1630

• • •

Lifetime of Johannes Kepler. Kepler uses Brahe’s figures to discover that planetary motion is not perfectly circular but elliptical. He reluctantly gives up his geocentric beliefs and formulates laws of planetary motion that Newton will later explain.

1561–1626

• • •

Lifetime of Francis Bacon, who forcefully defended an early version of the scientific method, stressing the need to base reasoning and conclusions on careful observation and experiment.

1564–1642

• • •

Lifetime of Galileo Galilei. Galileo refines a telescope and uses it to see mountains on our moon and other moons revolving around Jupiter. This challenges the idea of the heavens as perfect and immaterial. In 1632, Galileo is put on trial by the Church and ordered to abandon his heliocentric views. His later work on the motion of objects lays the basis for modern physics.

1578–1657

• • •

Lifetime of William Harvey, whose discoveries about the role of the heart in the circulation of blood laid the foundation for modern medicine.

1596–1650

• • •

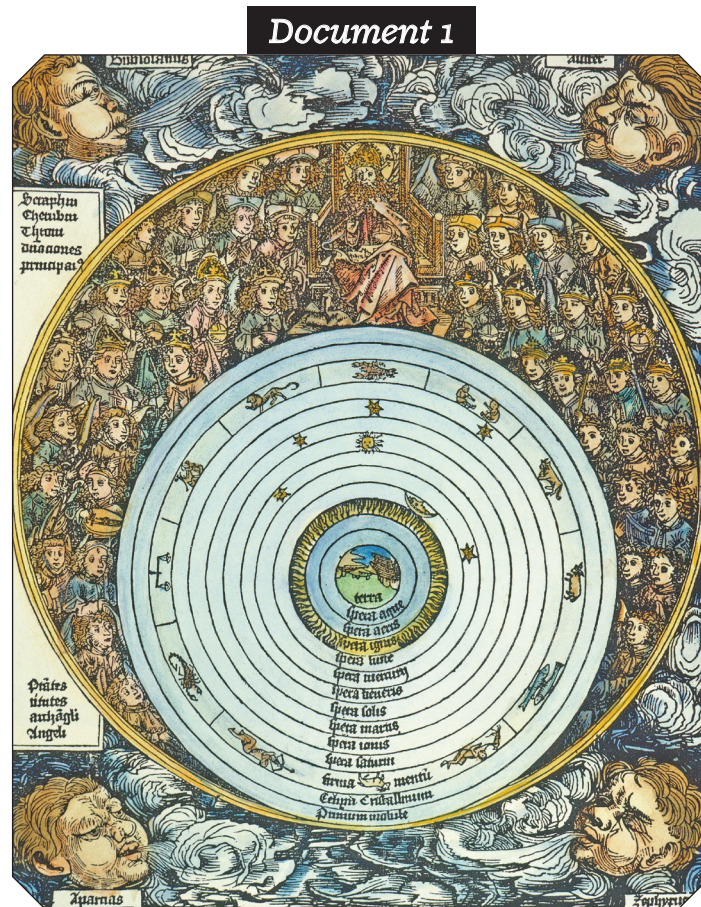
Lifetime of philosopher Rene Descartes. His strict mind-body dualism suggests that all matter, including the human body, is determined by impersonal natural laws. Whereas Bacon stresses observation and experiment as a way to knowledge, Descartes doubts what the senses alone tell us and sees deductive reasoning as the way to truth.

1643–1727

• • •

Lifetime of Isaac Newton, whose *Principia Mathematica* (1687) offered the theory of universal gravitation and the three laws of motion that tied together the work of Copernicus, Kepler, and Galileo and provided the foundation for modern physics and engineering.

Primary Source Document 1



The Granger Collection, New York

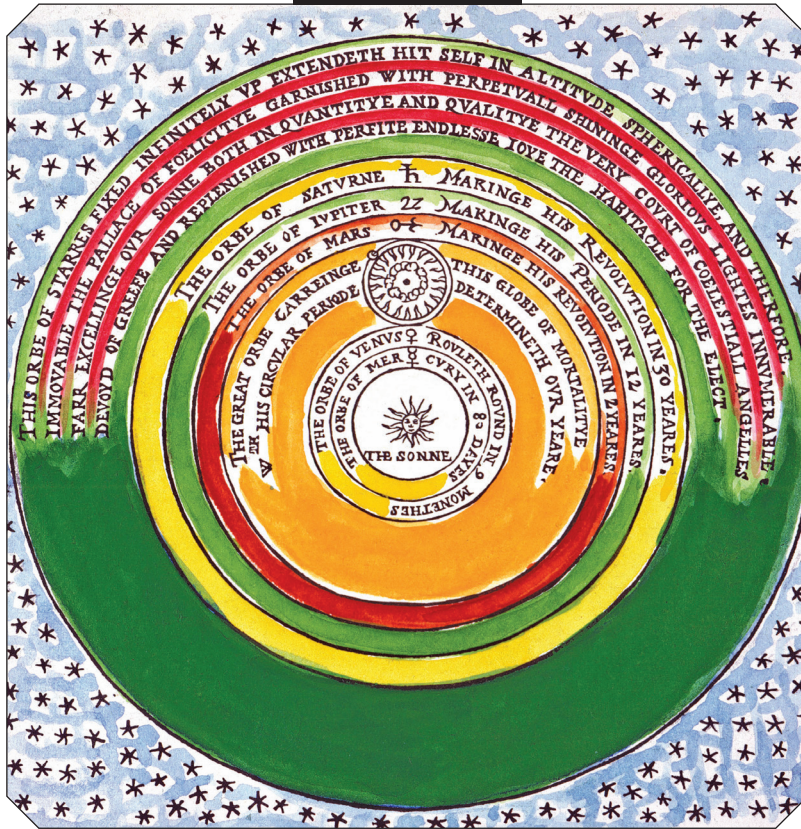
Information on Document 1

Document 1. This 1493 woodcut diagram depicts the Christian-Ptolemaic view of the universe. The Earth, made of ordinary matter, is at the center. The sun, moon, planets, and stars all revolve around the

Earth within several perfect crystalline spheres of a pure, spiritual substance. Above these perfect spheres is the realm of God and his angelic court.

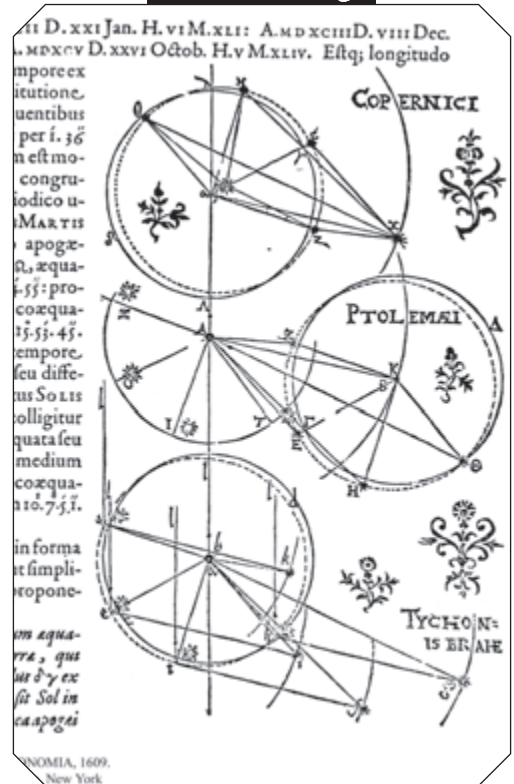
Primary Source Documents 2 & 3

Document 2



The Granger Collection, New York

Document 3



The Granger Collection, New York

Information on Documents 2 & 3

Document 2. This illustration depicts the “heliocentric” (or sun-centered) universe that Copernicus wrote about. The sun is at the center of the universe, with the planets, including Earth, orbiting it; the moon orbits the Earth. All of this is set in an infinite sea of stars. This is a woodcut from Thomas Digges’ supplement to the 1576 edition of *Prognostication Everlasting* by his father Leonardo Digges, a scientist and populariser of science.

Document 3. Copernicus did not give up the idea that the planets revolve in perfect circles, but Johannes Kepler did. This illustration is from Kepler’s *Astronomia Nova* (1609). It shows his system of triangulation by which he concluded that the true path of the planets was an ellipse, not the perfect circles as claimed by Ptolemy and even by Copernicus and Tycho Brahe.

Study the Document: Source 1

Instructions: Take notes on these questions. Use your notes to discuss the documents and answer the DBQ.

1 Main Idea or Topic _____

Taken as a whole, what overall feeling about the universe do you get from this image? Sum up the sort of universe it shows in a single caption line.

2 Visual Features _____

Notice the size of the Earth in relation to the rest of the universe. Why do you think it is shown this way? How does the drawing suggest major differences between the Earth and the air around it, and the rest of the universe?

3 What Else Can You Infer? _____

For example, in what way is this not at all like a modern-day scientific illustration? What might this suggest about the differences in the way people thought about scientific matters then, compared with now?

Study the Documents: Sources 2 & 3

Instructions: Take notes on these questions. Use your notes to discuss the documents and answer the DBQ.

1 Main Idea—Doc. 2

Create an imaginative headline for a news story about this illustration, as if it had just been presented as a brand-new idea about the universe.

2 Background Knowledge

Why did the real Copernican “revolution” not occur until Johannes Kepler’s calculations (Primary Source Document 3) were taken into account?

3 Visual Details

List all of the ways the illustrations here differ from the previous one showing the universe (Primary Source Document 1).

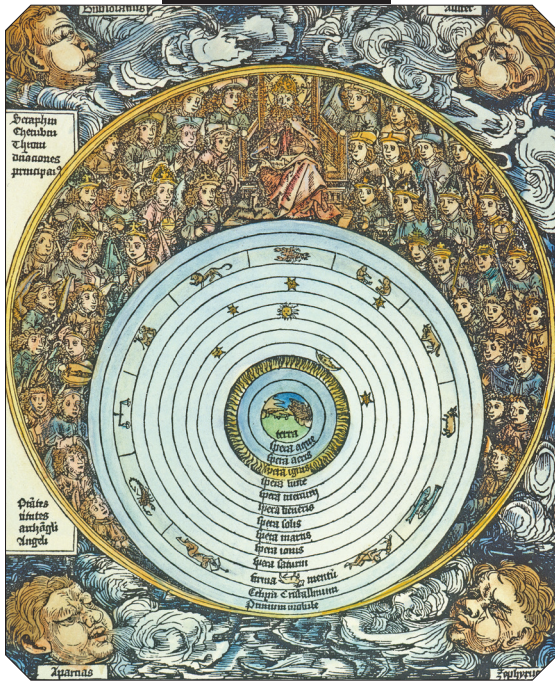
Comparing the Documents

★ The Sources

Answer the question by checking one box below. Then complete the statements on the Comparison Essay worksheet. Use all your notes to help you take part in an all-class debate about these documents—and to answer the final DBQ for the lesson.

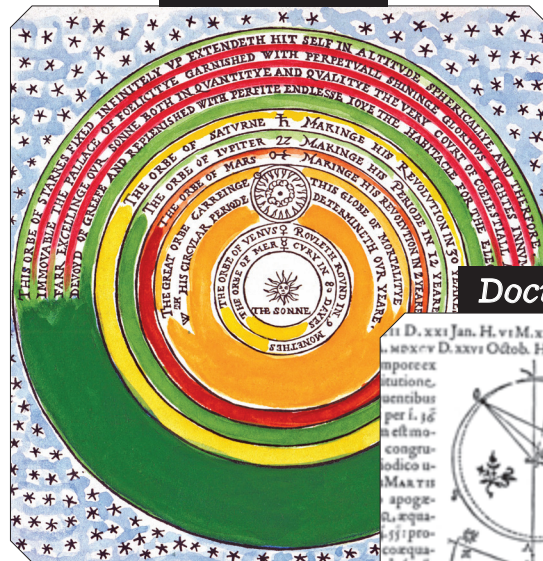
Which of these primary source documents would be most useful to a historian trying to understand the scientific revolution of the sixteenth and seventeenth centuries?

Document 1



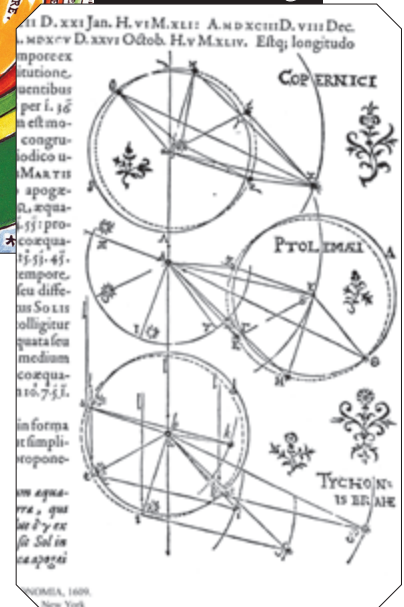
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Document 2



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Document 3



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Document 1

☐

Documents 2 & 3

☐

Comparison Essay

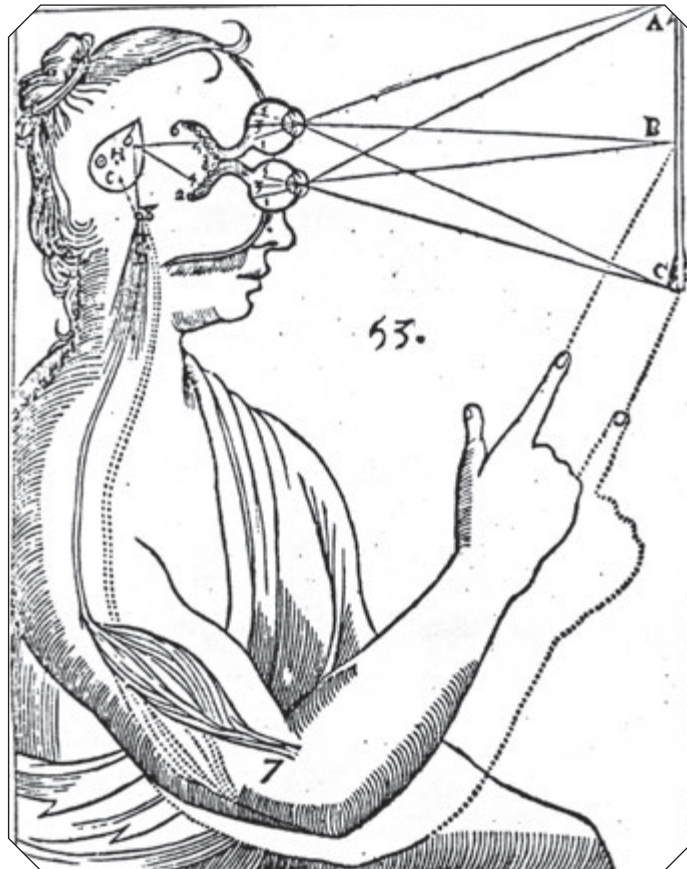
I chose Documents _____ because:

*I did **not** choose Documents _____.*

However, a historian still might use the documents in the following way:

Keep this in mind: Some sources are very biased. A biased source is one that shows you only one side of an issue. That is, it takes a clear stand or expresses a very strong opinion about something. A biased source may be one-sided, but it can still help you to understand its time period. For example, a biased editorial cartoon may show how people felt about an issue at the time. The usefulness of a source depends most of all on what questions you ask about that time in the past.

Primary Source Document 4



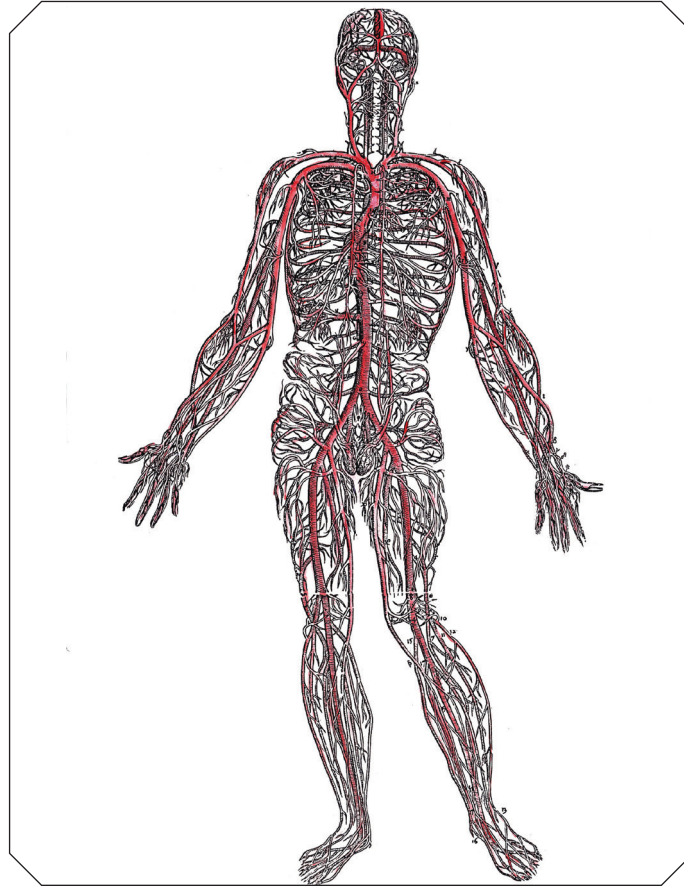
The Granger Collection, New York

Information on Document 4

This is a woodcut from *Treatise of Man* (1664) by René Descartes. It illustrates his theory that perceptions travel from the eyes to the pineal gland, which then allows “humors” to pass to the muscles to produce responses. Descartes’s philosophy sharply distinguished matter from spirit. Everything in nature was just matter in

motion, whereas the soul was a spiritual entity entirely separate from the body. All bodily functions—even those of the brain or eye shown here—were governed by purely mechanical laws. Descartes, however, arrived at his ideas by a process of abstract reasoning, not by experiment or observation.

Primary Source Document 5



The Granger Collection, New York

Information on Document 5

Experiment and observation were key parts of the scientific revolution. One example of this was the work done by Andreas Vesalius (1514–1564). Through careful dissection of bodies, Vesalius corrected many mistaken notions about the organs and structure

of the human body. His work went well beyond that of Galen, the greatest ancient Greek medical authority. This woodcut of the human venous system is from the third book of his *De Humani Corporis Fabrica* (1543).

Study the Document: Source 4

Instructions: Take notes on these questions. Use your notes to discuss the documents and answer the DBQ.

1 Main Idea or Topic _____

Descartes felt that human beings could be understood scientifically.
How does this diagram illustrate what he meant?

2 Interpreting Meanings _____

Descartes believed the human body could be explained just as we would explain a machine. Read the information accompanying this diagram. Use it to explain how the “human machine” could respond meaningfully to light from objects in the world.

3 Bias, or Point of View _____

Does this diagram present a scientific theory of human perception and action, or does it merely express Descartes’s point of view about human nature?

Study the Document: Source 5

Instructions: Take notes on these questions. Use your notes to discuss the documents and answer the DBQ.

1 Background Knowledge

Some historians say Renaissance art played a big role in furthering scientific research and understanding about the human body? Why might they believe that?

2 Compare & Contrast I

Compare this diagram with the one Descartes did (Primary Source Document 4). One is a result of deductive reasoning, the other of inductive reasoning. Can you explain why?

3 Compare & Contrast II

Of the five visual primary sources for this lesson, choose two that best sum up what was revolutionary about the scientific revolution of the sixteenth and seventeenth centuries?

Comparing the Documents

★ *The Sources*

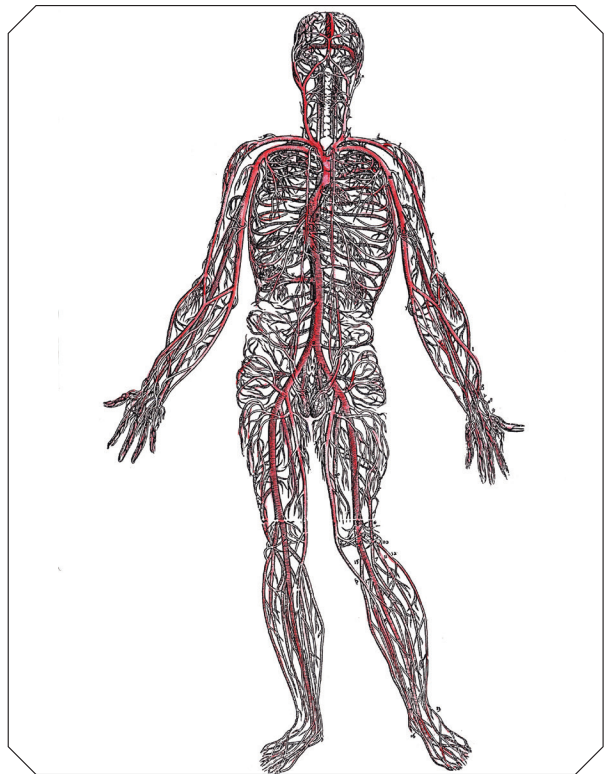
Answer the question by checking one box below. Then complete the statements on the Comparison Essay worksheet. Use all your notes to help you take part in an all-class debate about these documents—and to answer the final DBQ for the lesson.

Which of these primary source documents would be most useful to a historian trying to understand the scientific revolution of the sixteenth and seventeenth centuries?



The Granger Collection, New York

Document 4 ☐



The Granger Collection, New York

Document 5 ☐

Comparison Essay

I chose Documents _____ because:

*I did **not** choose Documents _____.*

However, a historian still might use the documents in the following way:

Keep this in mind: Some sources are very biased. A biased source is one that shows you only one side of an issue. That is, it takes a clear stand or expresses a very strong opinion about something. A biased source may be one-sided, but it can still help you to understand its time period. For example, a biased editorial cartoon may show how people felt about an issue at the time. The usefulness of a source depends most of all on what questions you ask about that time in the past.

Document-Based Question

Your task is to answer a document-based question (DBQ) on the scientific revolution in Europe in the sixteenth and seventeenth centuries. In a DBQ, you use your analysis of primary source documents and your knowledge of history to write a brief essay answering the question. Using all four sets of documents, answer this question. Below are two DBQs. The first is somewhat less demanding than the second. Use whichever DBQ your teacher assigns.

Document-Based Question

1

The scientific revolution centered above all on new ideas about the solar system or the universe. Why do you think this topic was so important to the scientific revolution?

OR

2

Describe the impact the scientific revolution of the sixteenth and seventeenth centuries had on culture and society as a whole. Do you think historians are justified in calling this impact “revolutionary”? Why or why not?

Below is a checklist of key suggestions for writing a DBQ essay. Next to each item, jot down a few notes to guide you in writing the DBQ. Use extra sheets to write a four- or five-paragraph essay.

- ***Introductory Paragraph***
Does the paragraph clarify the DBQ itself? Does it present a clear thesis, or overall answer, to that DBQ?
- ***The Internal Paragraphs—1***
Are these paragraphs organized around main points with details supporting those main ideas? Do all these main ideas support the thesis in the introductory paragraph?
- ***The Internal Paragraphs—2***
Are all of your main ideas and key points linked in a logical way? That is, does each idea follow clearly from those that went before? Does it add something new and helpful in clarifying your thesis?
- ***Use of Primary Source Documents***
Are they simply mentioned in a “laundry list” fashion? Or are they used thoughtfully to support main ideas and the thesis?
- ***Concluding Paragraph***
Does it restate the DBQ and thesis in a way that sums up the main ideas without repeating old information or going into new details?

Worksheet Answers and Guidelines

Some worksheet questions call for specific answers to factual questions. In these cases, correct answers are provided here. Most worksheet questions are open-ended and call on students to offer their own interpretations and personal reactions. In those cases, we offer suggestions based on the purpose of the question and the sort of interpretive activity it calls for.

Worksheet 1

Source 1

1. Answers may vary. Discuss them in class.
2. The Earth is large, reflecting the medieval view of the universe as a fairly self-contained space centered on the Earth.
3. The drawing is much more than a diagram. It illustrates things that were in fact not observable or even expected to be observable, such as the heavens, etc.

Worksheet 2

Sources 2 & 3

1. The headline should focus above all on the sun at the center of the universe, the Earth as one of several planets, and possibly also the stars “fixed infinitely” far away, as some of the words indicate.
2. Copernicus tried to hold on to the notion that planets moved in perfect circles. Kepler proved they did not, and this undermined the idea of the heavens as uniquely different from the Earth.
3. These diagrams have few imaginative features. They are mainly diagrams, rather than schematic pictures of the universe, etc.

Worksheet 3

Source 4

1. It attempts to diagram carefully the way light enters the eyes and triggers human responses, which it does with mathematically precise lines, anatomical mechanisms, etc.
2. The key to this is the task given to the pineal gland, which takes in light as information and then guides the muscles in responding to that information.
3. Answers may vary, but the diagram could be inventing a mechanical process without any real evidence to back it up—that is, it could be Descartes imposing his mechanical view on the diagram rather than the other way around.

Worksheet 4

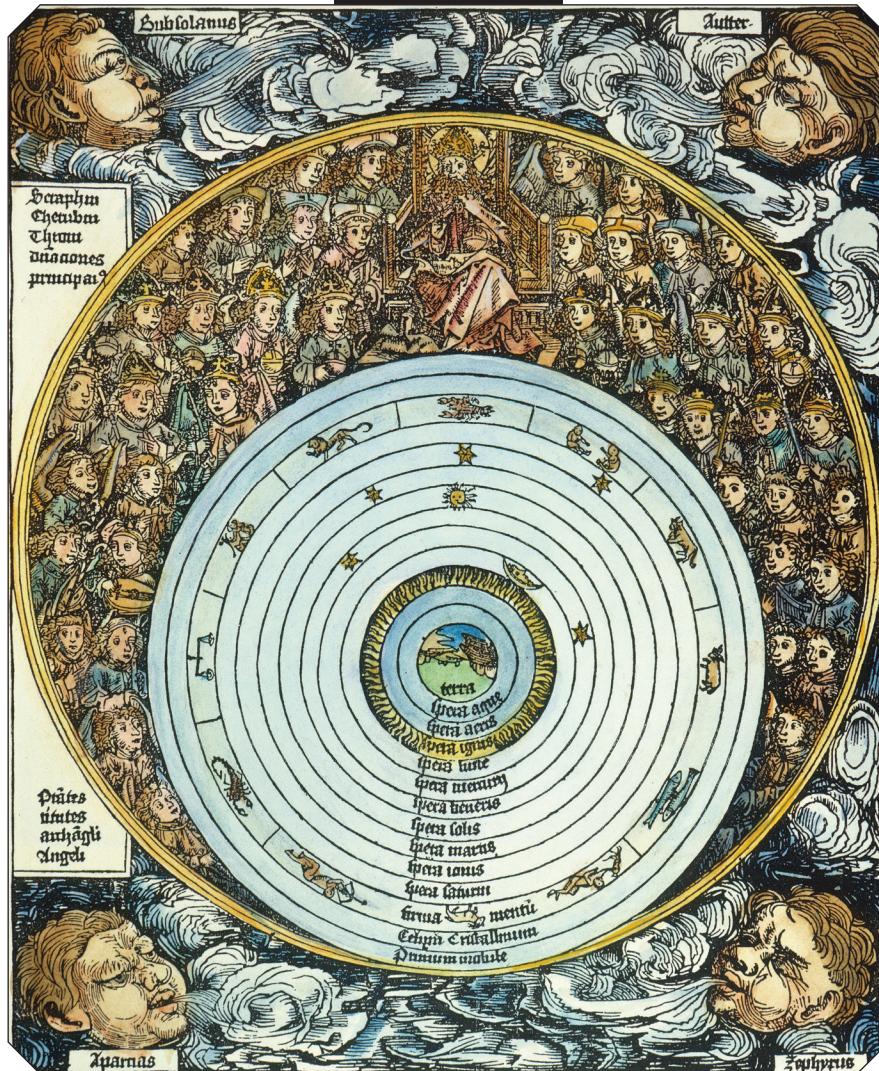
Source 5

1. Renaissance art promoted the use of geometric perspective to produce a realistic three-dimensional space, as well as very careful observation of anatomy to depict the human form.
2. Deductive reasoning uses logic to draw conclusions from accepted premises or assumptions. Inductive reasoning bases conclusions on careful observations. Deductive reasoning: Descartes’ diagram; inductive reasoning: Versalius’ diagram.
3. Answers may vary. Use them in a class discussion.

Visual Primary Sources

First Group—Document 1

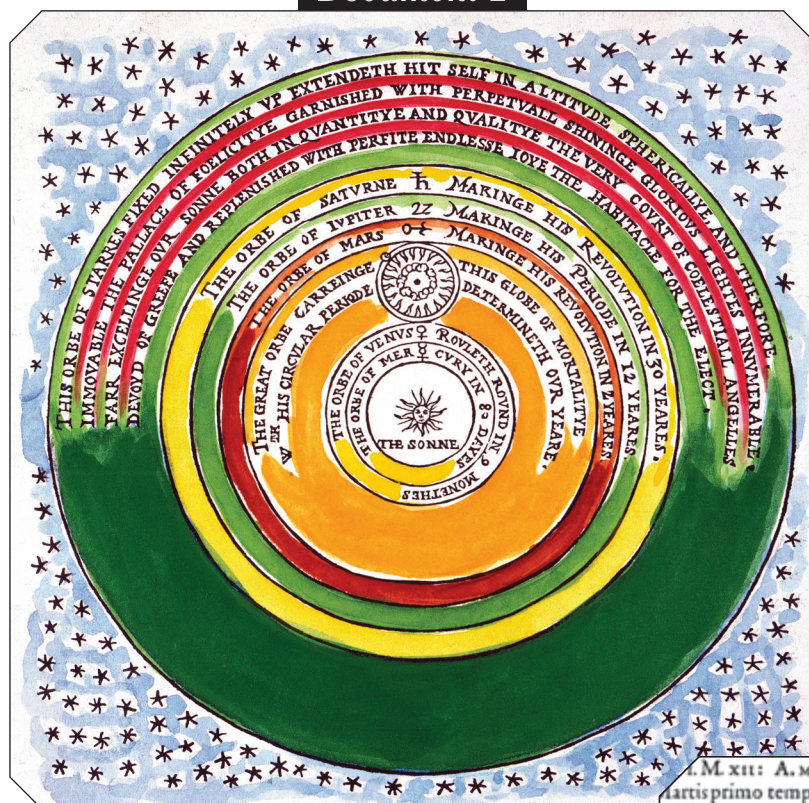
Document 1



The Granger Collection, New York

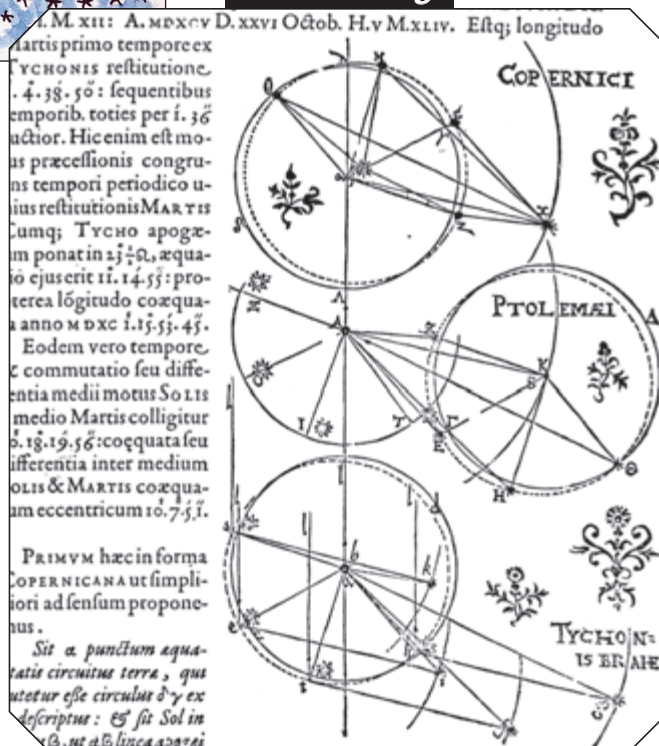
First Group—Documents 2 & 3

Document 2



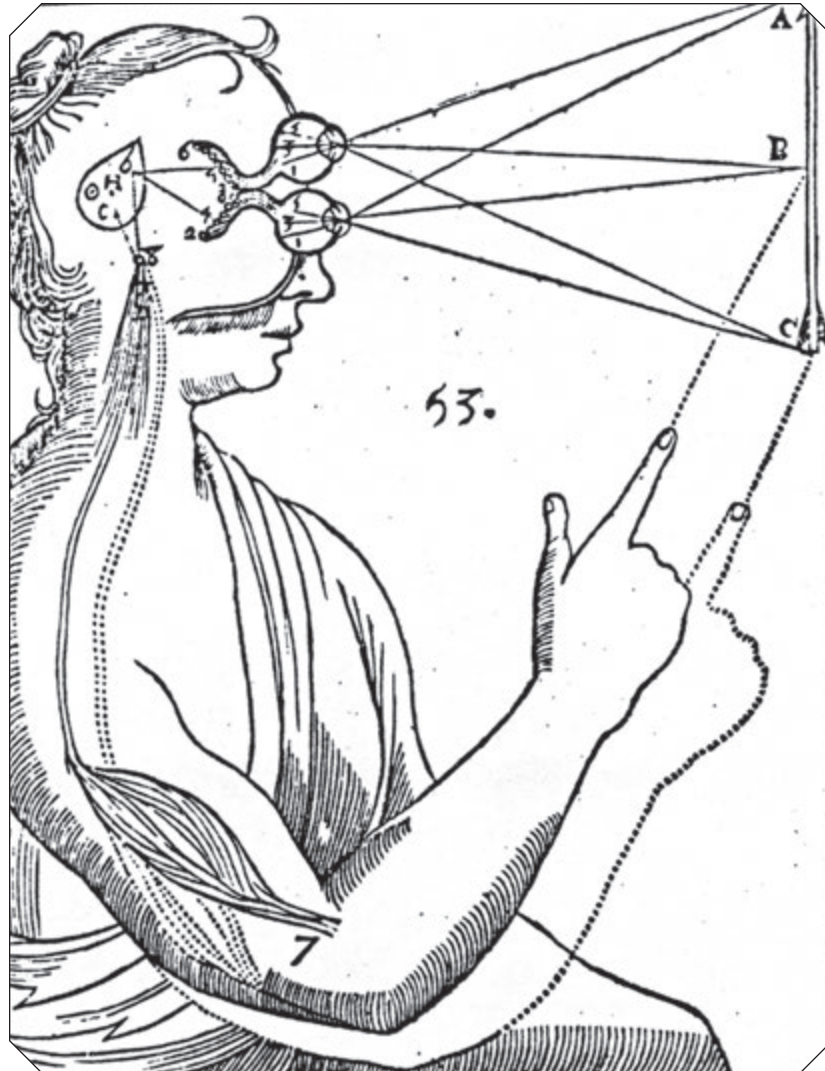
The Granger Collection, New York

Document 3



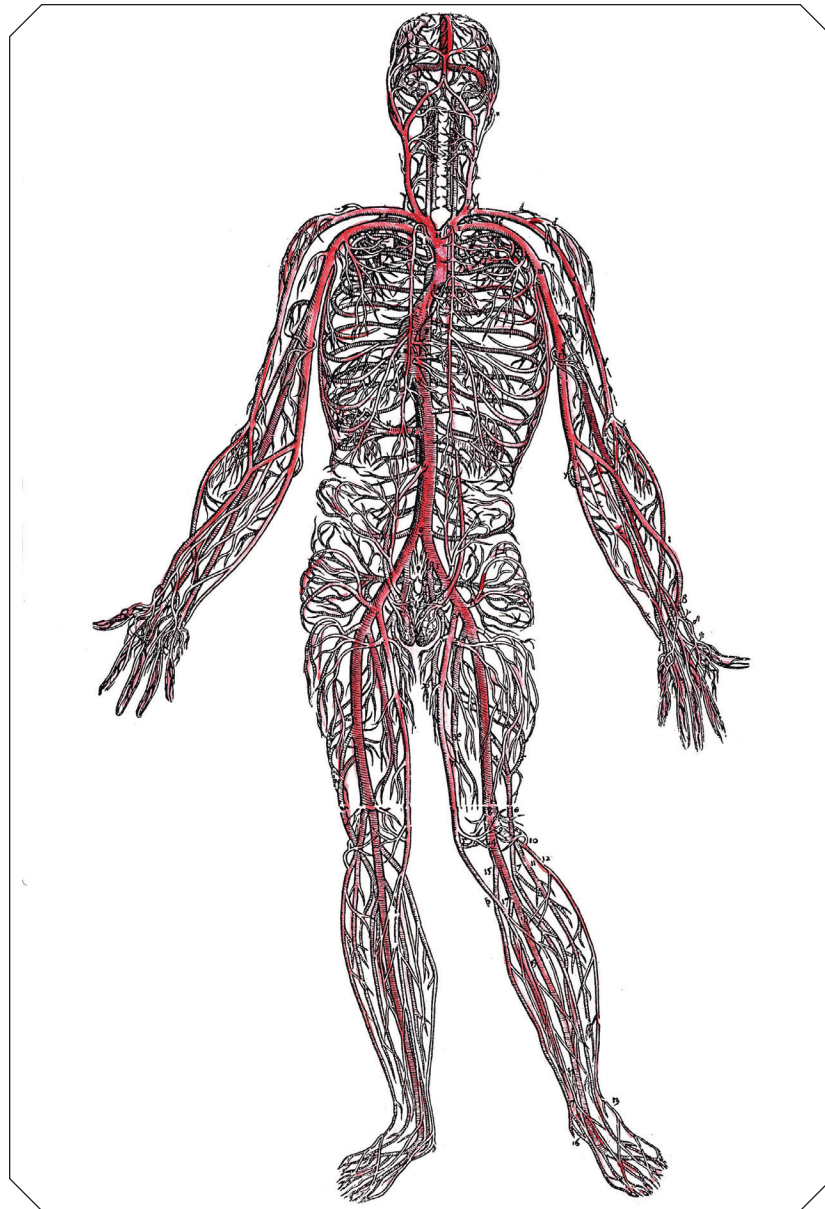
The Granger Collection, New York

Second Group—Document 4



The Granger Collection, New York

Second Group—Document 5



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