Enduring Issues Essay Practice (Scientific Revolution)

An **enduring issue** is a challenge or problem that has been debated or discussed across time. An enduring issue is one that many societies have attempted to address with varying degrees of success. Some examples of Enduring Issues include the Impact of Technology, Impact of Cultural Diffusion, Impact of Trade, Impact of Environment on Humans, Impact of Humans on Environment, Population Growth, Power, Conflict, Scarcity, and Human Rights Violations.

You are not limited to these suggestions.

Assignment

You will be working through enduring essay practice this week. Do not worry if you were absent when we worked on writing an enduring essay in class. This assignment is designed to walk you through it step by step, in a very easy way. The topic of the essay practice is the **Scientific Revolution**. I have included last week’s notes at the bottom of this assignment for your reference.

Open a Google Doc. Be sure to title it **Enduring Issues Essay Practice**. Complete all steps in ONE Doc. Your work should be divided into steps, NOT written as one essay. Share it with me upon completion (kwelgoss@wscschools.org).

**Step 1:** Read each document closely, and in your Google Doc., create the following chart.

a. **Column 1:** Next to each Document #, identify the topic of the document.

b. **Column 2:** Identify the Enduring Issue that you believe is present in each document. (A list of enduring issues is under the writing task below).

c. **Column 3:** Write 2 pieces of evidence from the document that supports the enduring issue.

<table>
<thead>
<tr>
<th>Document</th>
<th>Enduring Issue</th>
<th>Evidence (from the document that supports the enduring issue chosen)</th>
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Gradually scientists came to challenge more and more what the ancients [past civilizations] taught. They came to develop new, better methods of finding out how things worked. Mathematical knowledge increased and helped them to reason. They began to think up experiments to check on their ideas in a methodical way. The scientific revolution had begun. Many men were needed to bring this about. These men came from every part of Europe. They wrote books to explain their ideas. The printing press made it possible to produce thousands of copies which found their way all over Europe. Scientists were able to learn from one another and give one another new ideas. So the Scientific Revolution was not the work of Englishmen, or Frenchmen, or Italians alone. It was the work of Europeans. And, as we have seen, even they did not do it all by themselves. The Chinese, the Indians, the Persians, and the Arabs all gave something before it came about. Today this is not hard to understand, because men and women from all over the world add to scientific knowledge and so help one another.

Source: Peter Amey, Scientific Revolution, Greenhaven Press

As in Mathematics, so in natural philosophy, the investigation of difficult things by the method of analysis [scientific method], ought ever to precede the method of composition. This analysis consists in making experiments and observations, and in drawing general conclusions from them by induction [reason], and admitting of no objections against the conclusions, but such as are taken from experiments, or other certain truths. For hypotheses [theories] are not to be regarded in experimental philosophy. And although the arguing from experiments and observations by induction be no demonstration of general conclusions; yet it is the best way of arguing which the nature of things admits of, and may be looked upon as so much the stronger, by how much the induction is more general. And if no exception occur from phenomena [facts], the conclusion may be pronounced generally. But if at any time afterwards any exception shall occur from experiments, it may then begin to be pronounced with such exceptions as occur. By this way of analysis we may proceed from compounds to ingredients, and from motions to the forces producing them; and in general, from effects to their causes, and from particular causes to more general ones, till the argument end in the most general. This is the method of analysis [scientific method]: and the synthesis [combination of parts] consists in assuming the causes discovered, and established as principles, and by them explaining the phenomena proceeding from them, and proving the explanations.

Source: Sir Isaac Newton, Opticks, 1718
This is an excerpt from a letter written by Galileo Galilei in 1615 to the Grand Duchess Christina defending his approach to science. Some years ago, as Your Serene Highness well knows, I discovered in the heavens many things that had not been seen before our own age. The novelty of these things, as well as some consequences which followed from them in contradiction to the physical notions commonly held among academic philosophers, stirred up against me no small number of professors — as if I had placed these things in the sky with my own hands in order to upset nature and overturn the sciences. They seemed to forget that the increase of known truths stimulates the investigation, establishment, and growth of the arts; not their diminution [lessening] or destruction. Showing a greater fondness for their own opinions than for truth, they sought to deny and disprove the new things which, if they had cared to look for themselves, their own senses would have demonstrated to them. To this end they hurled various charges and published numerous writings filled with vain arguments, and they made the grave mistake of sprinkling these with passages taken from places in the Bible which they had failed to understand properly, and which were ill suited to their purposes. . . .

Source: Galileo Galilei, “Letter to the Grand Duchess Christina” (1615)

The Copernican Model: A Sun-Centered Solar System The Earth-centered Universe of Aristotle and Ptolemy held sway on [governed] Western thinking for almost 2000 years. Then, in the 16th century a new idea was proposed by the Polish astronomer Nicolai Copernicus (1473–1543). The Heliocentric System In a book called On the Revolutions of the Heavenly Bodies (that was published as Copernicus lay on his deathbed), Copernicus proposed that the Sun, not the Earth, was the center of the Solar System. Such a model is called a heliocentric system. The ordering of the planets known to Copernicus in this new system is illustrated in the following figure, which we recognize as the modern ordering of those planets. . .

Source: The Copernican Model: A Sun-Centered Solar System, Department of Physics & Astronomy, University of Tennessee
. . . At first, the discoveries of Copernicus and Galileo upset many Europeans. Over time, however, a new way of thinking about science emerged. Scientists began to observe the world around them and to develop ideas about why things happened. They did experiments to test these ideas. This new way of thinking was called the scientific method. . . .

Source: Guide to the Essentials of World History, Prentice Hall, 1999 (adapted)

**Step 2**: Referring to the chart created in Step 1, choose the enduring issue you will use for this essay.

**Step 3**: Write your introductory paragraph. This paragraph should be based on your Thesis Statement.

Your thesis should follow this formula: __________ is a significant enduring issue because __________ (argument why the issue is significant) as demonstrated by __________, __________, and __________ (list examples that will be discussed in the essay to show the issue has endured and is significant).

A. The *Enduring Issue*
B. Claim that argues why the enduring issue is significant
C. The examples that will be discussed in the essay to show the issue has endured and is significant

**Example**: Impact of Environment on Humans is a significant enduring issue because across time, societies have been impacted by their natural surroundings and have been forced to adapt, as is seen in the early River Valley Civilizations that had to build irrigation systems to control flood waters.
**Step 4:** Write your body paragraph. Follow the essay instructions:

**In your body paragraph, be sure to**

1. **Define the enduring issue** using relevant evidence from at least 3 documents (your chart above will help)
2. **Argue** that this is a significant issue that has endured by showing:
   - How the issue has affected people or how it has been affected by people
   - How the issue has continued to be an issue or has changed over time
3. **Include relevant outside information** from your knowledge of social studies (the notes from last week will help - included below)

In developing your answer to the essay, be sure to keep these explanations in mind:

- **Identity**—means to put a name to or to name.
- **Define**—means to explain the features of a thing or concept so that it can be understood.
- **Argue**—means to provide a series of statements that provide evidence and reasons to support a conclusion.

**Step 5:** Write your conclusion paragraph. The conclusion looks like your introductory paragraph, but now includes specific examples from your body paragraph that you used (from the documents).

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**Notes**

**(from last week)**

**Introduction:** Both the Renaissance and the Reformation looked to the past for information and models of the universe. Humanists turned to ancient classical ideas of the Greeks and Romans. Religious reformers looked to the Bible and early Christian times for inspiration. The profound change that took place in science beginning in the mid-1500’s, by contrast, pointed ahead, toward a future shaped by a new way of thinking about the physical universe. We call that historic change the **Scientific Revolution**.

**Changing Views of the World**

Until the mid-1500’s, European scholars accepted the idea of the ancient Greek astronomer Ptolemy that the Earth was the center of the universe. They accepted this view because it seemed to agree with common sense. It also followed the teachings of the Church.

**Copernicus & the Heliocentric Model**

In the 1500s and 1600s, some startling discoveries radically changed the way Europeans viewed the physical world. In 1543, Polish scholar Nicolaus Copernicus published *On the
Revolutions of the Heavenly Spheres. In it, he proposed a **heliocentric**, or sun-centered, model of the universe. The Earth, he went on, was just one of several planets that revolve around the sun.

Most experts rejected Copernicus’s revolutionary theory, which contradicted both the Church teachings, and the teachings of Ptolemy. In Europe at the time, all scientific knowledge and many religious teachings were based on the arguments developed by classical thinkers. If Ptolemy’s reasoning about the planets was wrong, they believed, then the whole system of human knowledge would also have to be questioned.

**Brahe & Kepler**

Then, in the late 1500s, the Danish astronomer, Tycho Brahe, provided evidence that supported Copernicus’s theory. Brahe set up an astronomical observatory. Every night for years, he carefully observed the sky, accumulating data about the movement of the heavenly bodies. After Brahe’s death, his assistant, the brilliant German astronomer and mathematician, Johannes Kepler, used Brahe’s data to calculate the orbits of the planets revolving around the sun. His calculations supported Copernicus’s heliocentric view. At the same time, however, they showed that the planets did not move in perfect circles, as both Ptolemy and Copernicus believed, but in another kind of orbit called an ellipse.

**Galileo**

Scientists of many lands built on the foundations laid by Copernicus and Kepler. In Italy, Galileo Galilei used technology developed by a Dutch lens grinder to assemble an astronomical telescope. With this instrument, he became the first person to see the mountains on the moon and sunspots. He also observed the four moons of Jupiter moving slowly around that planet - exactly, he realized, the way Copernicus said that the Earth moved around the sun.

Galileo’s discoveries 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 heavens were fixed, unmoving, and perfect.

In 1633, Galileo was brought to trial before the Inquisition. Threatened with death unless he withdrew his “heresies,” Galileo agreed to publicly state that the Earth stood motionless at the center of the universe. “Nevertheless,” he is said to have muttered as he left the court, “it does move.”