

**AP<sup>®</sup> EUROPEAN HISTORY**  
**2011 SCORING GUIDELINES (Form B)**

**Question 7**

**Analyze the impact of science and technology on European society in the period from 1800 to 1900.**

**9–8 points**

- Thesis is sophisticated and clearly stated and addresses both science and technology.
- Organization is clear and effective.
- Discussion is well balanced and contains both scientific and technological developments, mostly from the specified time period.
- All major assertions are supported by multiple pieces of relevant evidence.
- Essay contains insightful analysis of the impact of scientific discoveries and technological advances on society.
- Essay may contain some minor factual or chronological errors that do not severely detract from the argument.

**7–6 points**

- Thesis is clearly stated and addresses both science and technology.
- Organization is clear and effective.
- Essay is mostly balanced between science and technology; most of the discussion is chronologically on task.
- Assertions are supported by at least two pieces of evidence.
- Essay contains some analysis, though it tends to read more as historical narrative.
- Essay may contain some minor factual or chronological errors that do not severely detract from the argument.

**5–4 points**

- Attempted thesis may address only one component (science or technology) or may be a restatement of the prompt.
- Organization may be unbalanced and ineffective.
- Discussion tends to focus on either just science or just technology.
- Major assertions are supported by at least one piece of evidence.
- Essay tends to read as factual narrative with little analysis of social impact.
- Essay may contain factual or chronological errors that detract from the argument (e.g., discussions of the scientific or agricultural revolutions).

**3–2 points**

- Thesis is missing or just restates the prompt.
- Organization is unclear and ineffective.
- Discussions shows serious imbalance or may be largely or mostly off task chronologically.
- Essay contains at least one piece of specific historical evidence.
- Essay may contain several errors that detract from the argument.

**1–0 points**

- Thesis is missing.
- Essay is poorly organized.
- Essay is off task or not responsive to the prompt.
- There is little or no supporting evidence.
- Essay contains major errors.

The rapid development of both science and technology from ~~during~~ 1800 to 1900 led to increased urbanization through transportation, an ~~increased~~ <sup>improved</sup> standard of living through sanitation, and an explosive and extremely successful economy which led to <sup>increased</sup> prosperity. ~~The~~ The Industrial Revolution gave rise to dramatic changes in society by causing rapid urbanization and a revolutionarily new basis for European economies' industrialization. These changes were caused by countless developments in <sup>the</sup> fields of science and technology.

During this period, the revolutionary new transportation led to increased urbanization. With the introduction of electricity, ~~these~~ electric street cars appeared in <sup>and around</sup> many urban centers. People no longer relied on canals, ~~trains~~ and horses for transportation. The introduction of major and modern railroad lines throughout Europe further provided increased access to transportation. As a result, it was easier for people to move from the countryside to the cities which promised employment in the countless factories. In addition to promoting urbanization, better transportation increased the standard of living. Previously cities were extremely dense because workers needed to be within walking distance of their work. The electric street car changed this. This cheap and efficient <sup>urban</sup> transportation allowed cities to be built with lower densities. Lower population densities in turn

meant cleaner living conditions

Moreover, large advances in sanitation during this time period led to dramatic improvements in the standard of living. People became more aware of diseases with new discoveries by Robert Koch, who studied bacteria. An understanding that bacteria and viruses rather than ~~obrs~~ <sup>obrs</sup> cause disease became widespread. In addition, Louis Pasteur (pasteurization - killing bacteria) and Lister (a German who ~~discovered~~ <sup>pioneered</sup> sterilization of medical tools) further improved awareness of the importance of sanitation. Governments became aware of this and began to change the horrible sanitary conditions in cities, such as sewage in the streets, that had been caused by uncontrolled rapid urbanization. For example, the British government made several improvements that promoted sanitary standards such as clean water in cities. In France under Napoleon III, countless internal improvements were made such as the construction of parks to improve urban living conditions. Discoveries in the fields of biology were applied and put to use through methods such as sterilization, dramatically increasing the European standard of living.

Finally, Europe experienced outstanding economic

prosperity during the first and second industrial revolutions at the beginning and end of the nineteenth century, respectively. Technological developments such as the use of coke for steel production instead of ~~iron~~<sup>coal</sup> because higher temperatures could be reached and the Bessemer process improved the heavy industries. The most dramatic development was the invention and use of the steam engine to run factories. Previously, factories had been located near rivers due to the requirement of water power. Since steam engines could operate long distances from rivers, factories became extremely widespread. Although Britain led the Industrial Revolution throughout Europe in the earlier part of the nineteenth century, it was quickly overtaken by Germany, which had new factories and technologies (it had industrialized later) near the end, becoming the strongest European power. This increase in the economic production of Europe led to <sup>prosperous</sup> ~~an~~ middle class. ~~With~~ high industrialists became wealthy and experts in the fields of engineering were needed and well-paid.

The explosion of scientific and technological discoveries between 1800 and 1900 dramatically influence European society by promoting urbanization, improving living conditions, and producing a new wealthy middle class. These changes came about through improvements in transportation, sanitation,

7A-4

Write in the box the number of the question you are answering on this page as it is designated in the exam.

and the growing prosperity of wealthy businessmen.  
Although these changes initially caused worse living conditions and hardships in cities (exploitation in factories), further <sup>technical</sup> developments played an important role in improving the situation, partly through government intervention.

The Scientific Revolution that began in the early seventeenth century spanned across two centuries and introduced Europe to many new inventions and ways of life. The period from 1800 to 1900 specifically improved the lives of Europeans. The many scientific <sup>+ technological</sup> discoveries of the era greatly changed every sector of <sup>European</sup> life including religion, the economy, and the everyday lives of Europeans.

As ~~scientists~~ scientific discoveries grew in popularity and credibility, religion slowly faded away. Throughout the Middle Ages, the majority of Europeans maintained a strong faith in God and a fierce loyalty to the Church. They viewed the world through religious "glasses" and blindly believed everything the Church told them. Though the Renaissance, a period focused on humanity instead of God, and the Enlightenment, an era of adoration of reason, shook the religious zeal of Europeans, Christianity remained a strong force in Europe. However, as scientific and technological discoveries

7B-2

Write in the box the number of the question you are answering on this page as it is designated in the exam.

who speculated on the theory of evolution, discrediting the role of God in creation

advanced, that force was sapped of its energy. Europeans read books on scientific theories like that of Charles Darwin and began to doubt their ~~one~~ blind faith. Suddenly, they no longer had to have blind faith in ~~an~~ Biblical concepts. They now had science, which could seemingly explain ~~any and~~ everything.

European ~~economy~~ economies also changed due to the influx of scientific and technological discoveries. New inventions produced goods at a faster and cheaper rate, allowing the middle class to have extra money to spend on "treats." This was the first time most of European population had the ability to partake in trips abroad and spend money on forms of entertainment such as books, magazines, plays, <sup>and</sup> shops.

The numerous factories that housed the <sup>newly invented</sup> machines were prime locations for peasant looking for jobs. This stimulated the economy as hundreds rushed to the cities. The period of scientific discovery

can then be seen as beneficial to the economy.

The part of society that was most affected by technical and scientific advances was the everyday life of Europeans. Though it took time for the fruit of ~~the~~ discovery to trickle down into the lives of commoners, when it did, it radically changed their lives forever. They had more money as more jobs were available due to factories and products were cheaper due to mass production. Europeans had better food due to the Agricultural Revolution which was spurred by the Scientific Revolution which in turn inspired the Industrial Revolution. Europeans were also more mobile. As railroads were constructed, people were able to pick and choose where they ~~could~~ <sup>wanted</sup> work <sup>and live</sup> and with new communication devices like the telegraph, they could still keep in touch with friends and family. Their children received better education. Technical advances led to



better schools and equipment. This age consisted of hundreds of firsts for Europeans and greatly improved their standards of living. However, the flip side of so many new machines meant more worker-related injuries, air pollution, and crowded, dangerous cities. The good effects, however, <sup>generally</sup> outweigh the negative effects.

The nineteenth century brought many technical and scientific innovations to Europe. Religion was slowly replaced with the cult of science. Economies flourished and prices dropped. The everyday lives of Europeans improved and allowed for a more prosperous future for the continent. This era of science and technology drastically altered European life and shaped our modern Western world.

7C-1

Write in the box the number of the question you are answering on this page as it is designated in the exam.

Science and technology had a great impact of enlightenment on Europe society in the period from 1800 to 1900.

One of the technology that enlightened Europe was the rail road. This was made during 1800s. By the invention of rail roads, people saved time traveling. In addition, steam engines were also invented. They are trains that works with coals. This two things improved time of heavy works and workers traveled with these to work. Middle and high social class people used these to travel to other countries. It saved more time than traveling by ships, horses, or cars.

Another technology was the spinning machine called the "spinning jenny". This was made around the same time as the rail roads. This was when housewives had to work to improve economic problems. This machine saved time for women to sew or make something in the factory. Before this invention, all women had to work by their hand which took them all day. Although young teenagers were killed accidentally from this machine, it improve the economic problems and saved time for women workers.

A big impact of science in Europe was astronomy. Many scientists found new scientific ideas. Isaac Newton is a scientist of physics. He discovered many new useful equations that helped the European governments. He also discovered laws. Another scientist found about heliocentric and geocentric. Heliocentric is when the earth is spinning around the sun. and

Write in the box the number of the question you are answering on this page as it is designated in the exam.

7C-2

geocentric is the opposite. From this discovery, scientists found more and deeper studies about the world.:

From many investments and discoveries for science and technology, Europe had a great impact of enlightenment.

**AP<sup>®</sup> EUROPEAN HISTORY**  
**2011 SCORING COMMENTARY (Form B)**

**Question 7**

**Sample: 7A**

**Score: 9**

The essay presents a clear thesis in the final two sentences of the introductory paragraph. The discussion addresses developments in the correct time period. The essay is well organized, addressing both science and technology. Multiple specific examples are provided in support of the argument regarding advances in transportation, medicine and sanitation, and industrialization. The social impact of scientific discoveries and technological innovations is insightfully analyzed (for example, the impact of advances in transportation on urban life, of advances in medicine and sanitation on standards of living, and of advances in steam power and steel-making technologies on economic development and the rise of the middle class), and the essay stays focused on the question throughout. There are no major errors. The essay features analysis at a level of sophistication that merited the maximum score of 9.

**Sample: 7B**

**Score: 5**

The essay has a clear thesis, articulated in the final sentence of the introductory paragraph. The first body paragraph contains a largely off-topic discussion (with the exception of reference to Darwin's evolutionary theory) of the diminishing role of religion in European society since the medieval period. The discussion is more focused in the second and third body paragraphs, presenting a coherent, if not particularly sophisticated, narrative of the social impact of advances in mass production, transportation and communications. Both science and technology are addressed, although the emphasis is on technology. The essay is more narrative than analytical, but it does make a few original analytical points (for example, the discussion of the "flip side" of technological progress, including a higher incidence of work-related injuries, environmental problems and urban overcrowding). The essay did not earn a score of 6 because it is not strongly focused on the question of science and technology's impact on society, and it contains little analysis. It merited higher than a score of because it does have a thesis and supports the argument with a sufficient amount of evidence.

**Sample: 7C**

**Score: 1**

The attempted thesis appears to be merely a restatement the question, with the addition of confusing terminology (the reference to "enlightenment"). The essay is poorly organized. Most of the discoveries and technological advances mentioned either are out of period or have been misunderstood or misinterpreted. The essay earned a score of 1 because there is some correct information (albeit presented in a basic and general manner) in the first body paragraph regarding transportation advances (the reference to railroads, and an attempt to explain their social impact).