# AP® UNITED STATES HISTORY
# 2013 SCORING GUIDELINES

## Question 4

Analyze the impact of technological innovations on the lives of TWO of the following groups. Confine your answer to the period 1865–1920.

Factory workers
Middle-class urban residents
Midwestern farmers

**The 8–9 Essay**

- Contains a clear, well-developed thesis that addresses all parts of the question.
- Develops the thesis with substantial and relevant historical information.
- Provides effective analysis of the impact of technological innovations on the lives of two groups; treatment of two groups may be somewhat uneven.
- May contain minor errors that do not detract from the quality of the answer.
- Is well organized and well written.

**The 5–7 Essay**

- Contains a partially developed thesis that addresses the question.
- Supports the thesis with some relevant historical information.
- Provides some analysis of the impact of technological innovations on the lives of two groups, but treatment of the two groups may be uneven.
- May contain errors that do not seriously detract from the quality of the essay.
- Has acceptable organization and writing.

**The 2–4 Essay**

- Contains an undeveloped or limited thesis or simply paraphrases the question.
- Provides minimal relevant information or lists facts with little or no application to the question.
- May address the question only partially, with limited or no analysis.
- May have major errors.
- May be poorly organized, or poorly written, or both.

**The 0–1 Essay**

- Lacks a thesis or simply restates the question.
- Demonstrates an irrelevant or inappropriate response.
- Has numerous errors.
- Is organized or written so poorly that it inhibits understanding.

**The — Essay**

- Is blank.

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## Question 4 (continued)

**Potential Outside Information**

**Factory Workers**

- Technology changed the nature of work itself: mass production.
- Skills and craftsmanship faded; workers changed from being producers paid for the quality of their products to wage workers paid by the hour; unskilled labor predominated; increased use of unskilled workers caused an increase in child labor and female employment; low wages meant women needed to work (and they were paid less than men).
- Factories became more impersonal; assembly line work (as at automobile plants) was monotonous.
- Hours became longer; electric lights allowed night shifts.
- Technology such as in the steel industry (transition to Bessemer process, open-hearth steelmaking, and by early 1900s, electric arc furnaces) increased capacity of production and made production a 24-hour process; cigarette-making machine (patented 1881) replaced hand-rolling workers.
- Mass-production factories led to oppressive work conditions and lower wages, which led to labor unrest, efforts by workers to unionize, and sympathy with radical politics.
- Factory work was hazardous under mass production (*The Jungle*, Triangle Shirtwaist Factory Fire). Business titans such as Andrew Carnegie and John D. Rockefeller cared little for workers. Work became more dangerous as technology increased speed, complexity, and rate of production.
- New chemical developments, especially dyes, bleaches, and cleaning agents, helped spur the textile industry but also made work hazardous.
- "Scientific Management," Frederick W. Taylor, Taylorism.
- Mass production also brought benefits: lowered price of goods within reach of average consumers, such as the Model T Ford. Henry Ford offered workers a $5 per day wage. Ford Motor Co. used full moving assembly line production, 1913–1914 ("Fordism" is an extension of Taylorism). The moving assembly line was made possible by advances in grinding and cutting materials that were accurate to 1/1000 of an inch.
- Technological innovations in transportation allowed better distribution and made products less expensive, but reduced workers' control.
- Rise of mass entertainment and urban transportation changed social lives of workers.
- Creation of amusement parks (Coney Island in New York City, Riverview in Chicago), dance halls, baseball stadiums, and nickelodeons; movies catered to working-class; electric lights and improvements in urban transportation allowed the working class to attend vaudeville theaters at night.
- Electric sewing machines allowed for mass production of clothing and encouraged sweatshop labor in garment industry, particularly for immigrants and women.
- Industrial waste polluted streams and rivers around many plants; smoke, soot, and ashes polluted the air; middle class responds with city beautiful movements.
- Advances in food production (canned meats, refrigeration for fruits and vegetables, pasteurized milk, vitamin fortified cereals from the Kellogg brothers, etc.) meant less malnutrition, even for poor factory workers.

## Question 4 (continued)

**Middle-Class Urban Residents**

- Improved urban transportation, such as cable cars, streetcars, electric trolleys, elevated trains, electrical interurban railway, trains, subways, and automobiles allowed workers to live farther from their jobs, giving rise to suburbs; San Francisco cable cars 1873, Richmond first electric trolley line 1888, Boston subway 1897, New York City Subway 1904, and the Hudson Tubes.
- Bridges, trolleys, and railroads led to the end of the "walking city" and the rise of the modern suburbs; allowed middle class to move and live away from industry and immigrant ethnic neighborhoods.
- Urban areas expanded; consolidation of New York City (1898); by the 1920s the urban population rivaled the rural population in size.
- Technology, such as indoor plumbing, water, and sewer systems ameliorated public health and sanitation maladies.
- Private bathrooms with toilets and bathtubs became standard in middle class homes. Chain-pull washdown water closets came to the United States from Great Britain in the 1880s. By 1900 flush toilets were made possible by the mass production of enamel coated fixtures. Paper mills began to produce toilet paper. Plumbing advances led to bathtubs and sinks with running water. Before 1880 only luxury hotels and private estates had private indoor bathrooms, but now bathrooms became increasingly common for the middle class. This phenomenon intersects with the rise of germ theory.
- Technology led to better medicine and reduction of deadly diseases such as tuberculosis, which proliferated in overcrowded conditions; medical advances like antiseptic techniques, X-rays, and new drugs, made possible by chemical breakthroughs, improved the health of urban residents.
- Mechanized transportation reduced the use of horses, which in turn reduced the presence of horse manure and dead horses in city streets, but led to congestion and safety hazards for pedestrians.
- Architectural technology led to tenements, such as dumbbell tenements that could house greater numbers of residents within a small area, although they sometimes contributed to urban squalor.
- Mass production and mass consumption created a new middle-class urban culture and increasing expectations for middle class women to consume and display items. Feminists like Charlotte Perkins Gilman criticized this new role, calling such women "parasites."
- Technological changes in consumer goods resulted in lower prices for consumer goods, a greater variety and more goods available to middle class.
    - Canned processed foods and tobacco were less expensive and more available.
    - Refrigerated railroad cars made fresh fruits and vegetables more available and less expensive.
    - New machines could peel fruits and vegetables and process salmon.
    - Stamping and soldering machines could mass-produce cans from tin plates
    - Gail Borden invented a means of condensing and preserving milk.
    - Home iceboxes (1870s innovations in producing ice commercially) allowed for storage of perishable food.
    - Electrical signs (1890s) made goods more attractive.
    - The middle class could enjoy products formerly exclusive to the wealthy such as fresh oranges, strawberries, grapes, tomatoes, silk stockings, candy, and cigars.
    - New convenience goods included Del Monte canned fruits and vegetables, National Biscuit Company (NABISCO) crackers, Van Kamp's pork and beans, Wesson oil, Lipton tea, Wrigley's Juicy Fruit chewing gum, Hershey's chocolate bars, Aunt Jemima pancake mix, Coca-Cola, Pepsi-Cola, Michelob beer.
    - Economic abundance and consumer goods became associated with the "American way of life."

**Question 4 (continued)**

- Cast-iron and steel frame construction techniques developed in 1880s, which allowed for high-rise buildings. The development of skyscrapers and the widespread use of elevators (Otis Elevator Co. installed first electric elevator in 1889) led to multiple-story factories, office buildings, hotels, and apartments.
- Technological advancements resulted in the unintended consequence of the rise of leisure time for the middle class and changes in how it was spent; popularity of low-framed safety bicycles (1880s), roller-skating, mass produced pianos, movies; new activities from fairs, carnivals, Coney Island, team sports, especially baseball.
- Thomas Edison and his lab at Menlo Park invented electric light bulbs, phonographs, motion pictures, and electric power generators. Nikola Tesla invented the alternating current generator, making electricity more widely available to middle-class consumers.
- Household appliances, such as carpet sweepers and suction vacuum cleaners (1869), changed middle-class domestic life.
- Development of steel bridges opened up new areas where people could live.
- Linotype (1885) created more newspapers, a mass consumption product for urban residents; national press service — telegraphs supplied papers with standardized stories.
- 1866, working telegraph cable laid across the Atlantic Ocean. Middle-class urban residents could read about recent international affairs in their newspapers.
- New technology of house construction (balloon frame houses, machine produced nails, water pipes connected to outside water sources, central heat, artificial light) opened new suburban neighborhoods for middle class and were used in urban middle-class residences.
- Typewriter (1867), cash register, adding machine, telephone used more in 1890s and prompted more women into office work.
- Paved streets with asphalt made vehicular traffic more comfortable and streets safer for pedestrians.
- Increase in technology-driven industry resulted in middle-class professions that required more specialized education (engineering, chemistry, metallurgy, architecture).
- Margaret Sanger brings diaphragms (developed 1880) to America and develops birth control clinics. Controversial, but makes family planning available to more women. Average family size for middle class continues downward trend.

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## Question 4 (continued)

**Midwestern Farmers**

- Technology reduced some of the drudgery of farm life.
- Plows made with chilled iron (sod-buster plow 1868) made it easier to plow prairies.
- Mechanized tractors, reapers, threshers, harvesters (cord binder 1878), automatic knitters (1880s), spring tooth harrows (1869), seeders, cord binders, corn planters, mowers, listers (1880), grain drills (1874), baling presses (1866), combines, rakers, rotary plows, and manure spreaders increased production while saving back-breaking labor and reducing dependence on work animals. Centrifugal cream separator (1879) made skimming milk easier. Mechanized incubator (1885) increased profits from chicken production. Co-ops allowed farmers to purchase machinery more cheaply and in quantity.
- Grain elevators to store and load grain into railroads; these were often controlled by Eastern bankers, which led to financial exploitation.
- Steel windmills, dry farming, drought-resistant crops addressed need for water.
- The expense of new farm technology, including irrigation systems, meant bank loans. Farmers became dependent on banks and the national market. These conditions favored larger operations that squeezed out small family farms. Such conditions led to Grange and Populist sympathies, bimetalism.
- Farm families tended to invest in labor-saving devices for men's work, like plowing and harvesting, but not for women's work like laundry or vacuuming, meaning that technology improved men's lives more than women's lives on midwestern farms.
- Telephones allowed rural farmers to maintain contact with distant friends and relatives, while the automobile allowed them to connect more with each other and travel to cities.
- Telegraph systems also expanded, improving communication for farmers.
- New railroad lines gave birth to new towns, allowing farmers to settle along new areas.
- Technology professionalized farming and allowed growth of agricultural science; the Morrill Act (1862) gave rise to new colleges that offered agricultural science, such as Cornell University and agricultural and technical colleges; Hatch Act 1887 created state experimental stations for agricultural research.
- Technological advancements led to economies of scale; these favored wealthier farmers and average farm size grew; bonanza wheat farms in Minnesota and North Dakota; commercial farms specialized in cash crops; farms dependent on bankers, railroads, and international trade.
- Scientific research on agriculture: perfection of hard wheat; Luther Burbank developed new food and seed plants; George Washington Carver created new products at Tuskegee Institute.
- Improved rifle and weapons technology allowed the Army to defeat Plains Indians in the Plains Wars, opening up more land for settlement by farmers.
- Standardized gauge railroads fostered more integrated rail systems, allowing farmers to more easily transport goods to market.
- Refrigerated railroad cars also helped farmers transport goods to market.
- Barbed wire (1873-1874, Joseph H. Glidden, I. L. Ellwood) helped the expansion of livestock and farming on Great Plains.
- Flour milling process contributed to expansion of wheat farming.
- Use of commercial fertilizer expanded in early 20th century.
- Pesticide use was more widespread by late 19th century (1910 Insecticide Act regulated sale and use of insecticides); helped to increase production of crops.
- Technology changed time: rise of Railroad Standard Time divided the country into four areas: Eastern, Central, Mountain, and Pacific; zones created 1883, federal government made them standard 1918.

**Question 4 (continued)**

- Technological changes broke down the boundaries of local communities and tied them to regional, national, and international markets, cultures, and societies.
- Extension of railroads: isolated rural farm families became tied into the national consumer culture with mail order catalogs like Montgomery Ward and Sears, Roebuck & Co.
- Irony: technology helped farmers and the agricultural lifestyle, but technology bound them more closely to national, and even international, markets that the individual farmers neither recognized nor controlled; overproduction led to drop in prices and economic distress; the proportion of the number of agricultural workers compared to the larger work force declined.

4A

1 of 4

Circle the Section II question number you are answering on this page.

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
|---|---|---|
| 1 | 2 or 3 | (4) or 5 |

4A

1 of 4

After the end of the civil war, America expirenced a second industrial revolution. The war had built up Northern industry and caused for quick technological innovation inorder to fight the war. For example, the Rail Road built during the civil war to allow for quick transportation of materials had massive impact on the lives of americans in the following years -- it allowed for western farmers to settle the western territory with ease and also allowed for the connection of the entire country and therefore ease of shippment. Many innovations such as the railroad helped to build industry and change the face of America after the civil war. However while many of these innovations raised the quality of life for middle class urban residents, it meant horrible conditions for the factory workers.

The technological innovations from 1865 to 1920 increased the quality of middle class american lives dramatically. For one, the innovations in transportation lead to the development of cars and electric shuttles. These transportation changes allowed for the middle class americans who could afford the daily commute to move outside of the cities. This suburbanizations meant an immediate improvement in the quality of life

Circle the Section II question number you are answering on this page.

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
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| 1 | 2 or 3 | 4 or 5 |

4A 2of4

of middle-class urban americans, because they now were relieved of the dismal ~~of~~ conditions of the city -- They had an escape while maintaining their businesses. Revolutions in the production industry allowed for the mass production of goods. The development of the assembly line meant that consumer products could be produced quickly and efficiently for little expense. Due to ~~the~~ The development of the assembly line and interchangeable parts (earlier) Middle class americans experienced another boost in their quality of life -- they could now afford extravagances previously allotted to the rich. The technological innovations from 1865 to 1920 raised the middle-class urban's status and acted as a precursor to the frivolosity of the 1920s.

While the middle classes lives was only improved, the factory, blue collar workers only saw an increasingly dismal lifestyle. The creation of the bessemer process and development of the steel industry meant revolutions in the construction and landscapes of cities. While it produced some marvelous feats of engineering like the brooklyn bridge, it also meant the ability to raise skyscrapers and cramp more and more urban poor into ~~into~~ inner residences. One housing innovation was the dumbell tenements. They were designed with an air shaft so that it would ~~be~~ follow the building regulation that every apartment have a window. Instead of facilitating airflow, the

4A

3of4

Circle the Section II question number you are answering on this page.

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
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| 1 | 2 or 3 | 4 or 5 |

4A

3of4

design of the tenements facilitated the spread of cholera and virus. Additionally, the creation of the assembly line negatively impacted the lives of the urban factory workers. Because production could now be done by the hands of unskilled workers, namely the help of large machines and in charge of a single step of production, many factory workers were laid off and many white factory workers saw their positions go to new immigrants who did not have particular skills and could perform the easy jobs. In addition, the changes in factory production meant that workers would work longer hours under dismal conditions. They were forced to work in areas where air quality was horrible, and long hours with heavy machines that could easily injure a person. The lack of skilled labor necessary also caused wages to decrease and made factory workers even more dependent on political machines like Boss Tweed. The technological developments from 1865 to 1920 worsened quality of life for factory workers. They were too poor to even enjoy the fruits of their labor — a consumer society.

The technological innovations from 1865 and 1920 held opposite effects on the urban middle-class

4A

4 of 4

**Circle the Section II question number you are answering on this page.**

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
|---|---|---|
| 1 | 2 or 3 | (4) or 5 |

4A

4 of 4

and the urban factory worker. The same technology that raised the middle class's status in turn loaned the factory workers. They only widened the gap.

4B 1 of 3

Circle the Section II question number you are answering on this page.

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
|---|---|---|
| 1 | 2 or 3 | (4) or 5 |

4B 1 of 3

Technological innovations ~~affected~~ enriched the lives of middle-class urban Americans while they drastically altered and often times hurt the lives of factory workers. Middle-class Americans beniffited from such technologies as the radio and the automobile. Meanwhile, the ~~process~~ of Taylorism forced several factory workers out of ~~jobs~~ or they had to take wage cuts. The presence of technology improved American markets for the middle-class who were purchasing the goods, while it became detremental to the factory workers who had previously been producing the goods.

Factory workers fears ~~always~~ include having to accept a lower wage or being fired. Technology did this to them. Ford's assembly line and the introduction of interchangable parts made the need for skilled workers ~~obsolete~~ non exhistent. These skilled workers were either replaced or forced to accept lower wages. City slums increased because there were more urban poor. Union membership shot up. AFL lost membership because

4B 2 of 3

Circle the Section II question number you are answering on this page.

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
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| 1 | 2 or 3 | (4) or 5 |

4B 2 of 3

it was for skilled workers. The idea of artisans who worked on a single craft, simply disappeared. As taylorism prevailed, factory workers lost any control that they ~~the~~ once had in the workplace. Workers became disposable.

As taylorism killed the urban workers, it enriched the lives of the middle-class living in urban areas. The middle class was fortunate in recieving the goods which this new market produced. They were able to enjoy radios. Automobiles allowed the middle-class to travel and increased the suburban lifestyle. This emphasice on the market allowed for a decrease in the prices of goods. Mass production and supply and demand kept prices low for the middle class to enjoy. During their leisure time Americans in the middle class were able to spend time shopping at newly created department stores. Society changed its focus to the consumers with an increase in advertising.

While the urban workers were destroyed by technology, the middle class thrived.

Circle the Section II question number you are answering on this page.

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
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| 1 | 2 or 3 | (4) or 5 |

HB 3of3

While urban workers saved every penny and experienced wage cuts, the middle class Americans were buying on credit in department stores. Middle class Americans were moving out of the cities in their cars, while urban workers sunk into their slums. The middle class was fortunate in experiencing the glory that came with technology. This massive change in industrial balance was just in time for the onset of the Roaring twenties; a time period filled with technology. During this period of innovation America as a whole gained respect in the world market, but also experienced a growing gap between the wealthy and the poor. The presence of technology in American markets brought aspects of American society to its highest points, while dragging others to rock bottom.

Circle the Section II question number you are answering on this page.

1 of 2

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
|---|---|---|
| 1 | 2 or 3 | 4 or 5 |

4C

1 of 2

4C

Middle-class urban residents and factory workers were the two main groups of people during the time period 1865 to 1920. Their live were the images of the entire American Society during that time. It also was the time of Industrial Revolution. Many ways of their lives had changed since that period.

Before the Second Industrial Revolution, 1865 to 1920, the factory workers can only work by simple machines, or even their hands. The Second Industrial Revolution gave the human sorety a new type of energy, electricity, which helped the machines can work faster than they were. It increased the speed of labors' working. More products can be produced monthly. The monopoly of the automobile business, Henry Ford, invented a new way to work in factories. Before his idea, an automobile worker needed to build a car independently. but based on Ford's idea, workers seperat in different groups, and each group only does one simple job, such as put the glass on the car.

During 1865 to 1920, a greart number of Americans moved into cities from countries and villages. People's life style had been changed by the development of industry, such as the invent of steel. the invent of steel gave a huge influence of the railroad industry. It is the perfect material for building railroad. People can travel easier through this development. Also, because of this, factories often settled around cities, because train station are in cities, and it was the best transportation in that time. Factories can transport

Circle the Section II question number you are answering on this page.

2 of 2

| Part A — Mandatory | Part B — Circle one | Part C — Circle one |
|---|---|---|
| 1 | 2 or 3 | 4 or 5 |

4C

2 of 2

4C

goods ~~easy~~ more easy. Factories means more employ opperlunity. So people started moved into cities, and got jobs, then settled their lives in cities.

The development of technology in the period 1865 to 1920 had changed many way of people's lives.

# AP® UNITED STATES HISTORY
# 2013 SCORING COMMENTARY

## Question 4

### Overview

The question asks students to analyze the impact of technological innovations on the lives of two of three groups — factory workers, middle-class urban residents, and Midwestern farmers — during the period from 1865 to 1920. The essay allowed students to demonstrate several historical thinking skills: cause and effect, change over time, and contextualization. The question is broad enough that students could take their arguments in different directions. Students could analyze the impact of technological innovations on any aspect of the lives of the three groups (e.g., social, economic, work, leisure, gender, political lives). The question required students to draw conclusion(s) regarding the impact of technological innovations on the lives of two different groups of people, make an argument, and support the argument with relevant historical evidence drawn from the period from 1865 to 1920.

**Sample: 4A**
**Score: 7**

This essay sets up a strong thesis in the first paragraph that addresses both middle class residents and factory workers. The essay analyzes the impact of technology on the middle class starting with transportation changes, such as cars and electric "shuttles" (actually trolleys, a minor error), and ties the technology to the changed lifestyle created by commuting. Transportation changes allowed the middle class to flee the city center. "Mass production of goods" due to assembly line production brought the price of consumer goods down, thereby improving the middle class quality of life. On the other hand, blue collar workers experienced industrialization differently. The rise of the steel industry and new techniques for steel production allowed the building of bridges and skyscrapers but crowded workers into urban spaces and tenements. In turn, tenement life came with its hazards, such as diseases. A reliance on machines led to de-skilling and unemployment for some factory workers. For workers on the job, factory conditions could be harsh. Unskilled workers turned to political machines for help and support. Thus, technology "worsened" the quality of life for workers. While the handwriting can be challenging, this essay employs some relevant information and does so in a sophisticated fashion. It analyzes two groups, and treatment is balanced. No major errors exist, and this essay is well crafted.

**Sample: 4B**
**Score: 5**

The thesis is clear, covers both parts of the question, and is developed throughout the essay. The discussion of workers shows both the short-term (lower wages) and long-term (living in slums, joining unions) impacts of technology. There is good transition to the discussion of middle class urbanites (goods available to them were made by the workers). Factual information illustrating the impact of technology on middle class lives is relevant and supports the argument. The last paragraph contrasts the status of laborers and the middle class (widening gap between rich and poor), even though it is not asked for in the question. Minor errors (decline in AFL membership, the suggestion of widespread use of the radio) do not detract from the essay.

## Question 4 (continued)

**Sample: 4C**
**Score: 3**

This essay begins with a very general thesis that people's lives changed but never develops any insight into the nature of such change. The student lists a few technological developments: electricity, cars, Ford, a description of de-skilling, the increased use of steel, growth of cities, and the expansion of the railroad, but these innovations are never applied to an analysis of their impact on people's lives. A rise in the number of jobs and movement to the cities is mentioned, but these points are not fully examined and no other avenues are explored.