

Topic 9.1: Advances in Technology and Exchange After 1900

Standards Table

Theme	Learning Objective	Key Concept(s)	Education Standards Met
Technology and Innovation (TEC)	Explain how the development of new technologies changed the world from 1900 to present.	KC-6.1.I.A, KC-6.1.I.B, KC-6.1.I.C, KC-6.1.I.D, KC-6.1.III.B	AP World History: causation, comparison, and evidence-based reasoning (SAQ focus)

Learning Objectives

- Explain how new technologies transformed communication and transportation
- Analyze the effects of energy innovations on production and daily life
- Describe how medical and agricultural advances changed population patterns
- Evaluate how technological change affected gender roles and family structures
- Use specific historical evidence in short-answer responses

Lesson Overview

After 1900, technological innovation accelerated at an unprecedented pace, transforming how humans communicated, traveled, produced goods, and lived their daily lives. These developments reduced geographic barriers, increased productivity, and improved life expectancy, but they also created new social, economic, and environmental challenges. From the spread of the internet and air travel to advances in medicine and agriculture, technology reshaped global interactions and human experiences. This lesson examines these changes and prepares students to explain their causes and effects using evidence.

Essential Vocabulary

- **containerization** — the use of standardized shipping containers to transport goods efficiently
- **Green Revolution** — agricultural innovations that increased crop yields using new seeds and chemicals
- **antibiotics** — medicines that treat bacterial infections
- **nuclear energy** — energy released from atomic reactions used for power
- **birth control** — methods used to prevent pregnancy

Background Reading

Technological advances after 1900 significantly reduced the impact of distance on human interaction. Innovations such as radio, television, and eventually the internet allowed people to communicate instantly across vast distances. At the same time, improvements in transportation, including commercial air travel and container shipping, made it easier and faster to move people and goods around the world. These developments contributed to the growth of globalization by increasing connections between regions.

Energy technologies also played a major role in transforming economies and societies. The widespread use of petroleum fueled industrial growth and transportation, while nuclear power provided a new source of energy capable of producing large amounts of electricity. These energy advances increased productivity and enabled the expansion of industries, though they also raised concerns about environmental damage and long-term sustainability.

Agricultural and medical innovations helped support rapid population growth. The Green Revolution introduced high-yield crops, chemical fertilizers, and irrigation systems that increased food production, particularly in developing countries. Meanwhile, medical advances such as vaccines and antibiotics reduced mortality rates and increased life expectancy. These changes allowed populations to grow rapidly, especially in regions that had previously experienced food shortages and high disease rates.

Technological change also affected social structures, particularly in relation to gender roles and family life. More effective forms of birth control gave women greater control over reproduction, which contributed to declining fertility rates in many regions. This shift allowed more women to pursue education and employment, changing traditional social roles and contributing to broader social transformations.

Primary Sources

Primary Source 1: United Nations Report on Global Communications (1999)

<https://www.un.org/en/development/desa/population/publications/pdf/trends/internet1999.pdf>

The rapid development of communication technologies has significantly reduced the constraints of distance and time. The expansion of the internet and telecommunications networks has allowed individuals, businesses, and governments to exchange information at unprecedented speed.

These changes have contributed to the growth of global economic integration, allowing markets to operate more efficiently and enabling new forms of social and cultural interaction across borders. However, disparities in access to technology continue to create inequalities between regions and populations.

Questions

1. Identify ONE claim the document makes about communication technology.
2. Explain ONE way communication technology affected global interactions.
3. Analyze the purpose of this report.
4. Explain ONE limitation of technological development mentioned.
5. Connect this document to a broader trend in globalization.

Primary Source 2: International Atomic Energy Agency Report on Nuclear Power (1970)

<https://www.iaea.org/publications>

Nuclear energy has emerged as a powerful source of electricity capable of supporting industrial growth and economic development. Its efficiency allows for the production of large quantities of energy with relatively limited fuel resources.

At the same time, the use of nuclear technology presents challenges, including concerns about safety, waste disposal, and the potential for catastrophic accidents. These risks require careful regulation and international cooperation.

Questions

1. Identify ONE benefit of nuclear energy described in the document.
2. Explain ONE challenge associated with nuclear energy.
3. Analyze the purpose of this report.
4. Explain how nuclear energy changed production or industry.
5. Compare nuclear energy to another energy source after 1900.

Primary Source 3: Norman Borlaug, Nobel Prize Lecture on the Green Revolution (1970)

<https://www.nobelprize.org/prizes/peace/1970/borlaug/lecture/>

The Green Revolution has demonstrated that agricultural science can significantly increase food production. New high-yield crop varieties have allowed farmers to produce more food on the same amount of land.

However, these advances must be combined with proper distribution systems and continued investment. Without these, hunger and inequality will persist despite increased production.

Questions

1. Identify ONE claim Borlaug makes about agricultural technology.
2. Explain ONE effect of the Green Revolution.
3. Explain ONE limitation mentioned in the document.
4. Analyze Borlaug's point of view.
5. Explain how this contributed to population growth.

Key Tables / Charts

Table 1: Major Technological Developments After 1900

Category	Example	Impact
Communication	Internet, radio	Faster global communication
Transportation	Airplanes, container shipping	Increased global trade
Energy	Oil, nuclear power	Increased production
Agriculture	Green Revolution	Increased food supply
Medicine	Vaccines, antibiotics	Longer life expectancy

Change / Continuity / Comparison

Change over time:

After 1900, technological innovation dramatically increased the speed and scale of global interaction. Communication became nearly instantaneous, transportation became faster and more efficient, and advances in medicine and agriculture allowed populations to grow at unprecedented rates.

Continuity over time:

Despite these advances, inequalities persisted. Not all regions benefited equally from new technologies, and disparities in access to medical care, food, and energy remained significant.

Comparison:

Developed regions often experienced earlier and greater benefits from technological innovation, while developing regions saw delayed but significant impacts, particularly through the Green Revolution and medical aid programs.

Key Takeaways

- Technology reduced geographic barriers and increased global interaction
- Energy innovations fueled industrial and economic growth
- Medical and agricultural advances increased population growth
- Birth control transformed family structures and gender roles

- Technological benefits were unevenly distributed

SAQ Practice Section

SAQ Set 1 (Stimulus-Based — Communication Technology)

Stimulus:

“In the late 20th century, digital communication technologies allowed individuals to exchange information instantly across continents, transforming economic and social interactions.”

- Identify ONE technological development that supports this statement.
- Explain ONE way this development changed global interactions.
- Explain ONE limitation or negative consequence of this development.

SAQ Set 2 (Stimulus-Based — Agriculture & Population)

Stimulus:

“The introduction of high-yield crops and chemical fertilizers significantly increased food production in developing countries.”

- Identify ONE example of this development.
- Explain ONE effect on population growth.
- Explain ONE environmental or social consequence.

SAQ Set 3 (Non-Stimulus — Social Change)

Skill Focus: Causation

- Identify ONE technological development that affected gender roles after 1900.
- Explain ONE way this development changed women’s roles in society.
- Explain ONE broader social effect of this change.