Was the Development of Agriculture Good for Humans?

The ard was a tool used to break up soil to get it ready for planting crops.

Supporting Questions

1. How did environmental changes and new technologies affect the development of agriculture?
2. How did the development of agriculture in Mesopotamia lead to the development of writing?
3. What were the consequences of agriculture for humans?

6th Grade Agriculture and Human Civilization Inquiry

Was the Development of Agriculture Good for Humans?

New York State Social Studies Framework Key Idea & Practices	**6.3 EARLY RIVER VALLEY CIVILIZATIONS IN THE EASTERN HEMISPHERE (ca. 3500 BCE – ca. 500 BCE):** Complex societies and civilizations developed in the Eastern Hemisphere. Although these complex societies and civilizations have certain defining characteristics in common, each is also known for unique cultural achievements and contributions. Early human communities in the Eastern Hemisphere adapted to and modified the physical environment.

Supporting Question 1	Supporting Question 2	Supporting Question 3
How did environmental changes and new technologies affect the development of agriculture?	How did the development of agriculture in Mesopotamia lead to the development of writing?	What were the consequences of agriculture for humans?
Formative Performance Task	**Formative Performance Task**	**Formative Performance Task**
Create a chart with information about how climate change and improved tools contributed to the development of agriculture.	Write a paragraph about how writing emerged in Mesopotamia and describe the implications of that development.	Develop a claim supported by evidence that agriculture had a range of consequences for human culture.
Featured Sources	**Featured Sources**	**Featured Sources**
Source A: Timeline of the Neolithic Revolution **Source B:** Historical temperature data **Source C:** Image bank: Neolithic farming tools	**Source A:** Sumerian counting tokens **Source B:** Sumerian numeric system **Source C:** Clay tablet with cuneiform symbols	**Source A:** Graph of population changes in the Neolithic period **Source B:** Image bank: Life in Paleolithic and Neolithic communities **Source C:** Graph of changes in rates of disease

Content Background

More than 15,000 years ago, hunters and gatherers began to settle in permanent villages along the Tigris and Euphrates rivers as the overall climate became warmer and led to more favorable conditions for farming.

These rivers provided the lifeline for civilizations such as Mesopotamia to develop and flourish as they offered access to transportation, cleanliness and health, irrigation of crops, food, and protection. As early humans learned to modify and adapt to their environments, notably by harnessing water to serve a community, they made social and technological advancements that, together, are known as the Neolithic Revolution.

Much debate, however, is centered on the impact of agriculture on early humans. Advances in agriculture and the domestication of animals in such places as Mesopotamia allowed people to form semi-sedentary and sedentary settlements, which led to the development of complex societies and civilizations. The case of Mesopotamia provides an interesting example of how the development of agriculture affected social structures and everyday life for humans living in the area. As humans began to establish permanent settlements along the Tigris and Euphrates flood plain, they built up new systems for organizing and managing the new complexities of everyday life. In Mesopotamia, writing emerged in response to these new complexities. At the same time, social hierarchies developed to maintain order and protect agricultural production. Some social scientists argue that the development of agriculture included negative outcomes, such as increased malnutrition and starvation, the rise of epidemic diseases, and the origin of a hierarchical class system marked by great differences between rich and poor. What is beyond dispute though is that the development of agriculture was a turning point in human history.

Compelling Question	
Compelling Question	Was the development of agriculture good for humans?
Featured Source	**Featured Source A:** James Fallows, article ranking human inventions, "50 Greatest Breakthroughs Since the Wheel," *Atlantic Monthly*, November 2013

Most people assume that the development of agriculture was an amazing and universally positive accomplishment. The compelling question is designed to get students to think about this accomplishment in terms of the consequences for humans. For example, when humans figured out how to irrigate crops, harvests increased and the population grew, but irrigation also contributed to an increase in waterborne diseases.

Top 10 from a list of "50 Greatest Breakthroughs Since the Wheel" found in the *Atlantic Monthly*:

1. The printing press, 1430s
2. Electricity, late 19th century
3. Penicillin, 1928
4. Semiconductor electronics, mid-20th century
5. Optical lenses, 13th century
6. Paper, second century
7. The internal combustion engine, late 19th century
8. Vaccination, 1796
9. The Internet, 1960s
10. The steam engine, 1712

Adapted from the *Atlantic Monthly*, http://www.theatlantic.com/magazine/archive/2013/11/innovations-list/309536/.

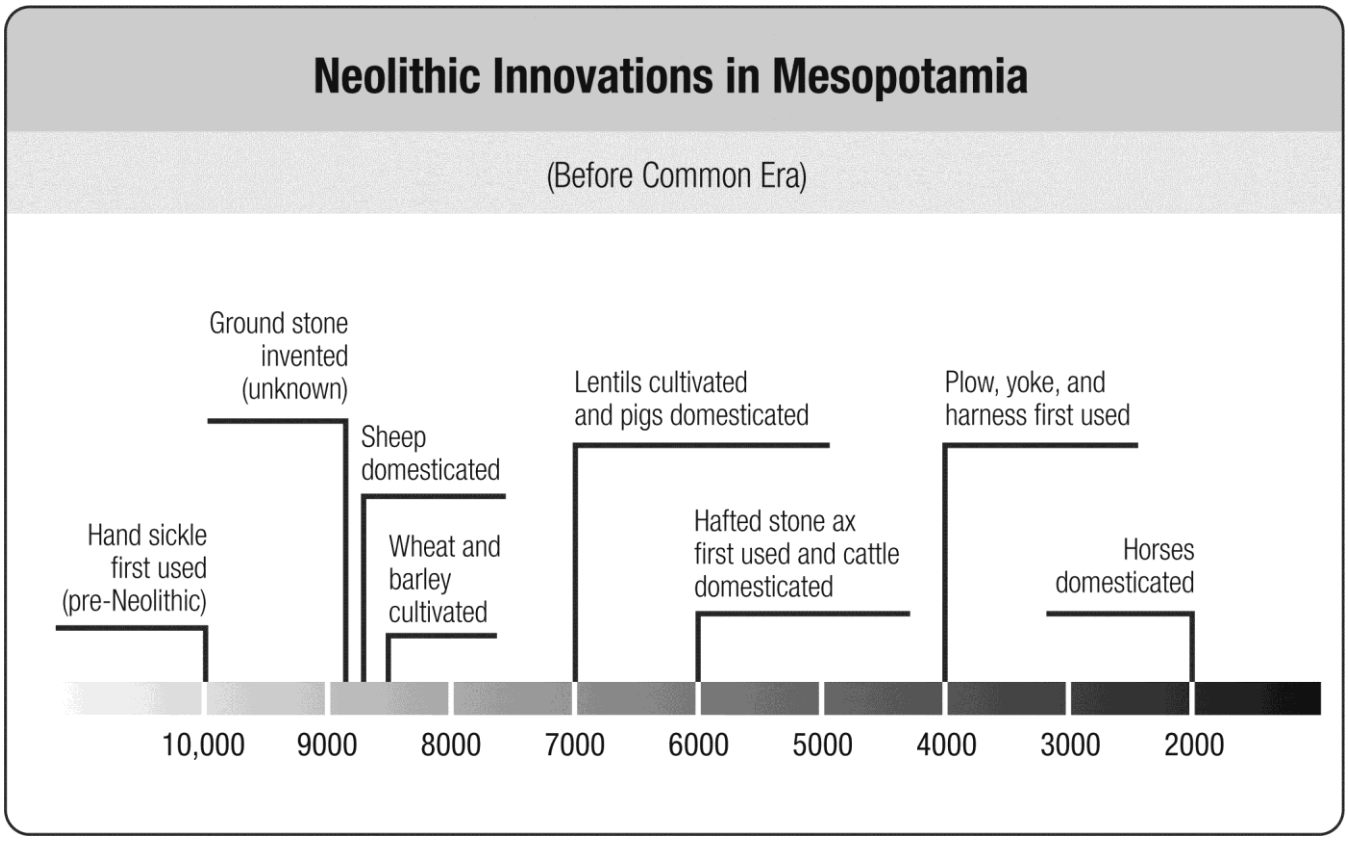
Supporting Question 1	
Supporting Question	How did environmental changes and new technologies affect the development of agriculture?
Formative Performance Task	Create a chart with information about how climate change and improved tools contributed to the development of agriculture.
Featured Sources	**Source A:** Timeline of the Neolithic Revolution **Source B:** Historical temperature data **Source C:** Image bank: Neolithic farming tools

Supporting Question

As early humans fine-tuned their hunting and gathering skills, a series of environmental changes and the gradual adaptation of tools that had been used to harvest wild plants contributed to the development of agriculture. The emergence of agriculture allowed humans to create permanent settlements with the hope of a stable food supply. This supporting question asks how changes and innovations unfolded, keeping a specific focus on warming temperatures and creation of hand tools for working with crops. These changes and technical innovations occurred over a long period of time, but together they represented a remarkable leap forward. Increasing temperatures opened the door for humans to learn how to cultivate wild plants, while new tools allowed humans to better manage crops and increase crop yields.

	Summarize this information or data.	How does this information or data help you to better understand how agriculture developed?
Historical Temperature Data		
Agricultural Tools		

Supporting Question 1	
Featured Source	**Source A:** Timeline showing "Neolithic Innovations in Mesopotamia," 10,000–2000 BCE



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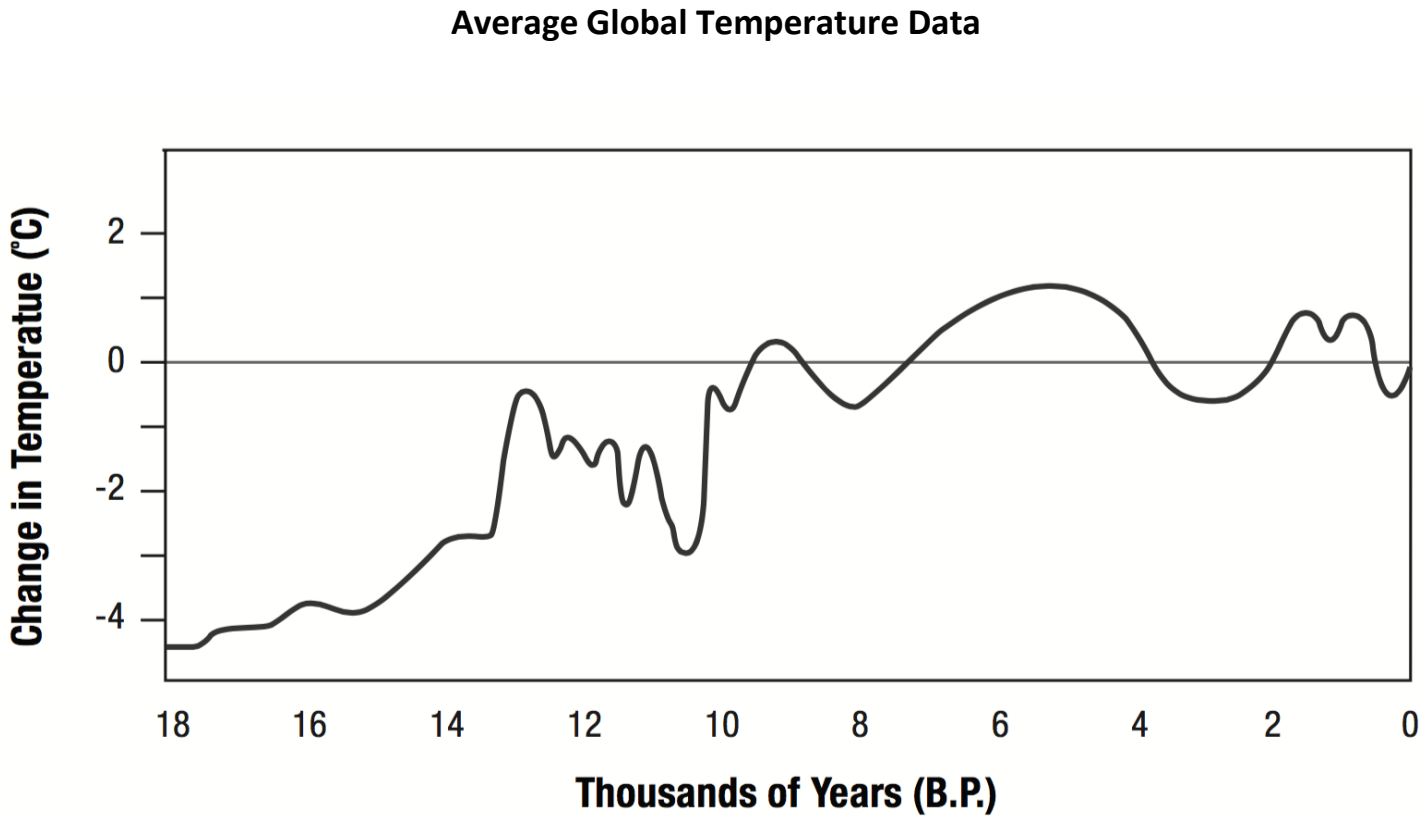
Supporting Question 1	
Featured Source	**Source B:** Graph showing historical temperature data since 18,000 BCE



The chart shows temperature change over the past 18,000 years. The horizontal axis indicates the years before the present (B.P.). The vertical axis shows changes in temperature from the current average global temperature.

Created for the New York K-12 Social Studies Toolkit by Agate Publishing, Inc., 2015.
Adapted from J. A. Eddy, OIES, and R. S. Bradley, University of Massachusetts, Earthquest, Spring 1991.

Supporting Question 1	
Featured Source	**Source C:** Image bank: Neolithic farming tools

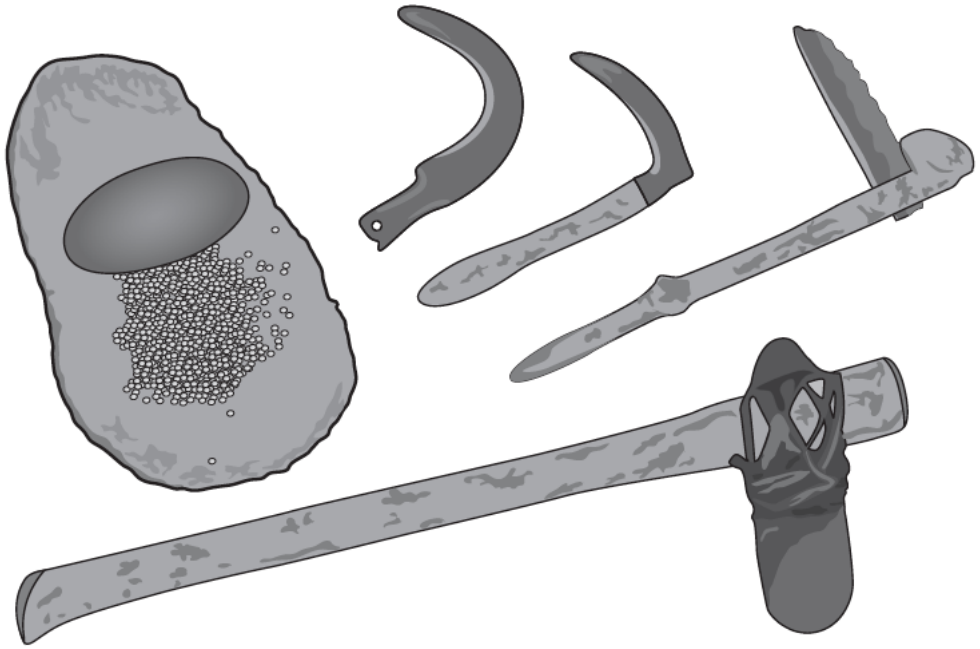


Image 1: An ax (bottom) used for clearing, flint sickles (top right) used for harvesting cereal crops, and a flat rock and stone (top left) used for grinding flour.

Created for the New York K-12 Social Studies Toolkit by Agate Publishing, Inc., 2015.

Image 2: The ard was a tool used to break up soil to get it ready for planting crops.

Supporting Question 2	
Supporting Question	How did the development of agriculture in Mesopotamia lead to the development of writing?
Formative Performance Task	Write a paragraph about how writing emerged in Mesopotamia and describe the implications of that development.
Featured Sources	**Source A:** Sumerian counting tokens **Source B:** Sumerian numeric system **Source C:** Clay tablet with cuneiform symbols

Supporting Question

As agriculture became more complex, humans began to create some of the habits, customs, structures, and techniques that we associate with civilizations. For example, people in Mesopotamia, in particular the region of Sumer, developed ways to record information about crops and animals that they later transformed into writing. The first writing systems date as far back as 8000 BCE when Neolithic humans started using counting tokens with simple markings on small stones to represent and communicate ideas. The tokens were used to represent the quantity of a commodity. For example, a cone-shaped token might represent a small amount of grain. Sumerian priests and royalty used tokens to record whether people had paid what they owed the temple or had received goods from the temple stores (like seed grain) in return for their labor.

Archaeologist Denise Schmandt-Besserat describes this initial system of writing in her 1996 book *How Writing Came About*. She argues that humans developed this simple system of recording ideas as a precursor to more complex symbolic writing. Sometime around 3000 BCE Sumerians and Egyptians developed more complex systems of writing. These systems made use of cuneiform and symbolic representations.

Featured Sources

FEATURED SOURCE A depicts Sumerian counting tokens. The earliest tokens were designed in particular shapes, such as a cone or a sphere. Each shape represented a specific crop or commodity. The more complex tokens developed later had markings on the stone shapes. These complex tokens represented a certain quantity of a specific commodity.

FEATURED SOURCE B is an image of symbols used in the unique Sumerian numeric system. The source illustrates how humans in Sumer developed symbols to represent the physical counting tokens.

FEATURED SOURCE C is an image of a clay cuneiform tablet. Around 3200 BCE, Sumerians started etching symbols on clay tablets in order to represent ideas. This form of writing was an innovation in that the system included a collection of symbols on a single surface.

	Describe what you see in the image. How might these items have been used in Sumerian society?	Summarize the text with the image. What is the key idea? What are two supporting details?	How is this source evidence of the development of writing?
Source A: Image bank: Sumerian counting tokens			
Source B: Sumerian numeric system			
Source C: Clay tablet with cuneiform symbols			

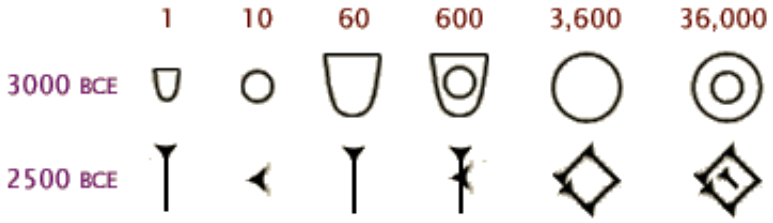
Supporting Question 2	
Featured Source	**Source A:** Sumerian counting tokens

The first counting stones, like these, were made in the Neolithic period. This period was a time of great change for humans. People, who had been hunters and gatherers before, were starting to become farmers. Farming allowed people to produce more food than they could actually eat. The extra food provided by agriculture meant that some people did not have to spend their time gathering food. They could spend their time making other things, such as clothes, jewelry, and pottery, as long as they could convince the people who did produce food to give some of their surplus to them.

Some of the surplus food that was produced needed to be stored as seed for the next year, and the rest could be distributed to people who did not produce food themselves. Communities needed to decide how this would be done and how the land that produced the food would be owned. In Sumer, these decisions were first made by the priests who ran the temples and then by kings and their officials. They decided that much of the land belonged to the temple and the king and that everyone owed some labor, crops, or other goods as taxes or rents. They also decided they needed a way to keep track of these payments, which led to the development of these tokens.

Sumerians developed a system of tokens consisting of plain tokens that were designed in specific shapes, like a cylinder or a cone, and were meant to represent quantities and concepts, such as sweet or wood. Complex stones had carvings or marks to represent more complex ideas and specific things like wheat, sheep, and wool.

Supporting Question 2	
Featured Source	**Source B:** Chart showing symbols in the Sumerian numeric system



Another challenge people overcame was how to represent large numbers. Instead of making numerous inscriptions for large numbers, Sumerians developed a numbering system. Doing so allowed them to represent multiple instances of the same symbol. Like many people today, Sumerians used a base-10 system. Unlike people today, Sumerians also used a counting system in which the number 60 was a base.

Supporting Question 2	
Featured Source	**Source C:** Clay tablet produced between 3100–2900 BCE, with cuneiform symbols

Administrative account of barley distribution, Jamba Nasr, Uruk III style. 3100–2900 BCE.

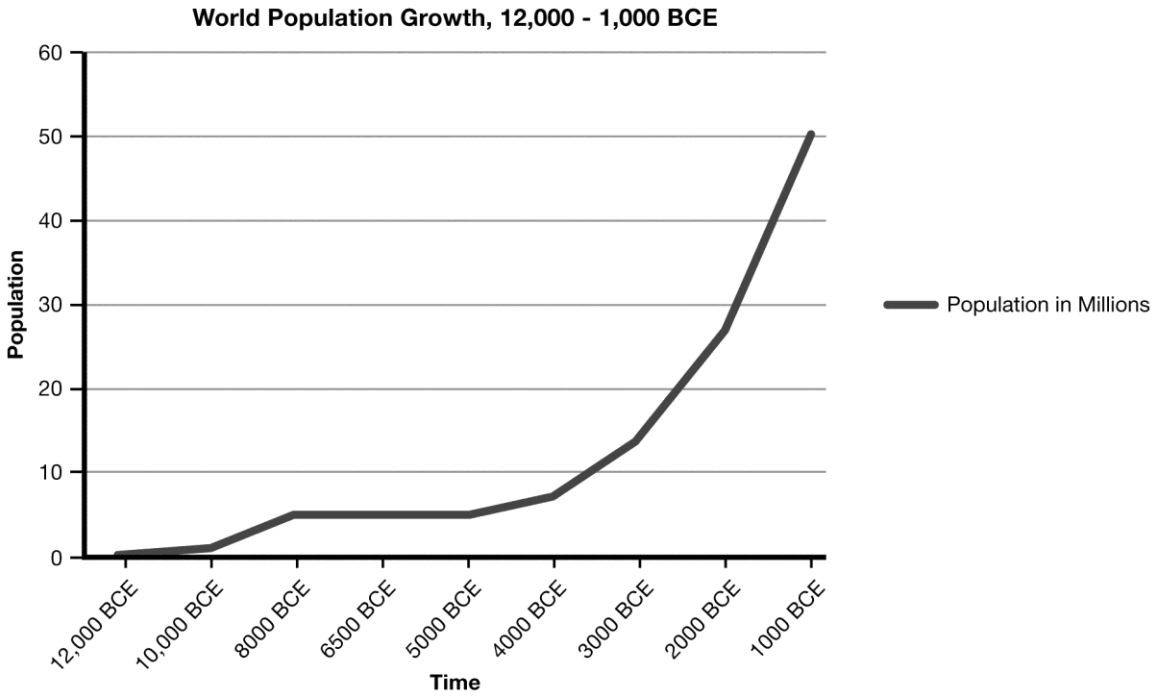
http://www.ancientscripts.com/sumerian.html.

The development of writing was a slow and gradual process. Sumerians began using tokens as counting stones to keep track of payments, taxes, and trade around 8000 BCE. Soon, however, this process became too difficult to manage. After about 4,000 years, people realized that the tokens were not really needed. Instead, they could make symbols that represented the tokens in clay.

By about 3000 BCE, Sumerian images of tokens on clay tablets began to change. This new style of writing came to be known as "cuneiform," which means wedge-shaped. The strokes were made by pressing a reed stylus into clay. The direction of writing also changed: Instead of writing top to bottom, people began to write from left to right in horizontal rows.

Supporting Question 3	
Supporting Question	What were the consequences of agriculture for humans?
Formative Performance Task	Develop a claim supported by evidence that agriculture had consequences for human culture.
Featured Sources	**Source A:** Graph of population changes in the Neolithic period **Source B:** Image bank: Life in Paleolithic and Neolithic communities **Source C:** Graph of changes in rates of disease

Supporting Question 3	
Featured Source	**Source A:** Graph of population changes during the Neolithic period, "World Population Growth," 12,000 to 1000 BCE



Created for the New York K-12 Social Studies Toolkit by Agate Publishing, Inc., 2015.
Adapted from Colin McEvedy and Richard Jones, *Atlas of World Population History*. New York: Facts on File, 1978: pp. 342–351.

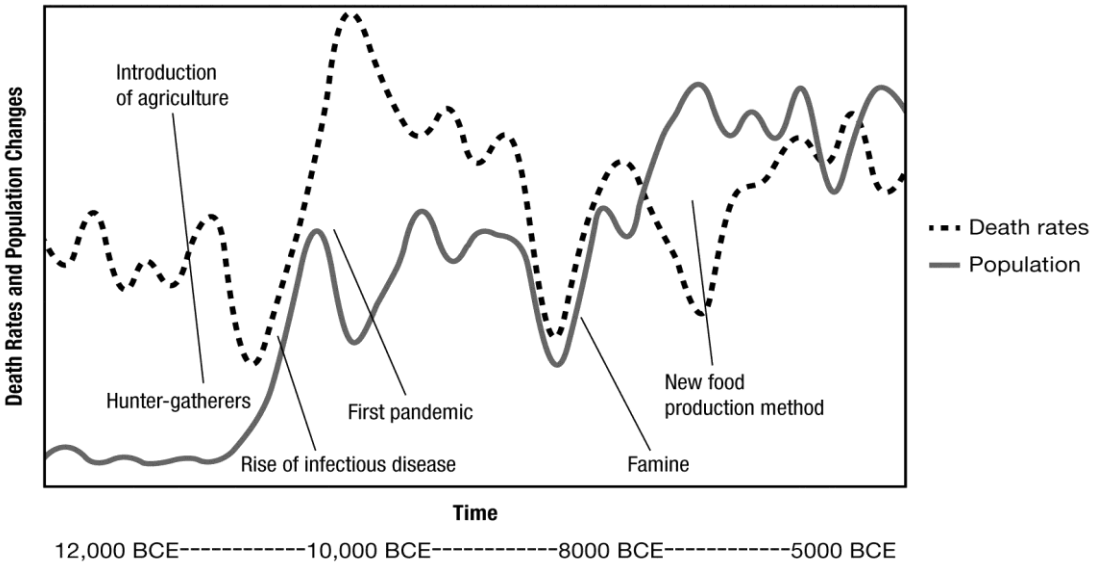
Supporting Question 3

Featured Source	**Source B:** Image bank: Life in Paleolithic and Neolithic communities

Paleolithic	Neolithic
 Image 1 © David Hawgood; licensed for reuse under the Creative Commons Attribution-ShareAlike 2.0 license.	 Image 2 © AWK/Masterfile.
Question: Think about how humans spent much of their time outside their homes or dwellings. What does this picture tell you about Paleolithic life? Evidence/rationale:	Question: Think about how humans lived inside these buildings. What does this picture tell you about Neolithic life? Evidence/rationale:
Taken together, what do we learn from these two images about the transition from the Paleolithic to the Neolithic eras?	

Supporting Question 3	
Featured Source	**Source C:** Graph showing changes in rates of death and population growth, 12,000 to 5000 BCE

Changes in Population and Death Rates, 12,000 to 5000 BCE



Created for the New York K-12 Social Studies Toolkit by Agate Publishing, Inc., 2015.
Adapted from Razib Khan, "Grain, Disease, and Innovation," *Discover* magazine website, June 18, 2011.
http://blogs.discovermagazine.com/gnxp/2011/06/germs-disease-and-innovation.

This chart illustrates changes over time as humans moved from hunter-gather societies to societies formed around agricultural production. The chart indicates when agriculture appeared in human culture, when the first diseases and pandemics (widespread diseases) emerged, when the first famine appeared, and when humans began to develop new ways to produce food. The chart shows that over this period, death rates and population increased.

Summative Performance Task	
Compelling Question	Was the development of agriculture good for humans?
Summative Performance Task	**ARGUMENT** Was the development of agriculture good for humans? Construct an argument that addresses the compelling question using specific claims and relevant evidence from historical sources while acknowledging competing views.

Additional Resources

Additional sources may be needed for students to construct their explanations about the development of agriculture. One such example is:

(Q 1)

- The Genographic Project, "The Development of Agriculture," National Geographic website. https://genographic.nationalgeographic.com/development-of-agriculture.

(Q 2)

- British Museum, "The Development of Writing," Mesopotamia website. http://www.mesopotamia.co.uk/writing/story/sto_set.html.

(Q 3)

- Jared Diamond, "The Lethal Gift of Livestock," chapter 11, in *Guns, Germs, and Steel: The Fates of Human Societies.* New York, NY: W.W. Norton, 1997.
- Jared Diamond, "The Worst Mistake in the History of the Human Race," *Discover* magazine, May 1, 1999. http://discovermagazine.com/1987/may/02-the-worst-mistake-in-the-history-of-the-human-race.
- Sanjida O'Connell, "Is Farming the Root of All Evil?" *The Telegraph,* June 23, 2009. http://www.telegraph.co.uk/science/science-news/5604296/Is-farming-the-root-of-all-evil.html.

Evidence Chart

Initial Claim	
What is your opening claim about the consequences of agriculture? This claim should appear in the opening section of your argument. Make sure to cite your sources.	

Evidence	
What evidence do you have from the sources you investigated to support your initial claim? Make sure to cite your sources.	

Additional Claims	
What are some additional claims you can make that extend your initial claim? Make sure to cite your sources.	

Additional Evidence	
What additional evidence do you have from the sources you investigated that support your additional claims? Make sure to cite your sources.	

Double Check	
What ideas from the sources contradict your claims? Have you forgotten anything? Make sure to cite your sources.	

Pulling It Together	
What is your overall understanding of the compelling question? This should be included in your conclusion. Make sure to cite your sources.	

Taking Informed Action	
Compelling Question	Was the development of agriculture good for humans?
Taking Informed Action	**UNDERSTAND** Find an example of a modern development (like agriculture) that has resulted in a variety of consequences for humans. **ASSESS** Determine intended and unintended consequences of the innovation identified. **ACT** Publish a public service announcement about intended and unintended consequences of the innovation.

Appendix A: Agriculture Inquiry Vocabulary

Term	Definition
ard	A simple tool used to break up the ground for planting crops.
ax	A simple tool used to split and shape wood.
cuneiform	A system of symbols used in ancient writing.
domesticate	The process of taming animals for use in farming.
famine	A period when food is not available and people begin to starve.
infectious disease	A type of sickness that can be spread easily to and among a population.
Mesopotamia	An area in the Middle East between the Tigris and Euphrates rivers where the ancient Sumerian civilization was located.
Neolithic	Period of human history beginning 12,500 years ago and lasting until 4,500 years ago. This was a time when humans began using advanced stone tools and developed agriculture.
Paleolithic	Period of human history beginning 2.5 million years ago and lasting until 12,500 years ago. This was a time when humans used simple stone tools and lived as hunters and gathers.
pandemic	A large outbreak of an infectious disease that affects many people over great distances.
sickle	A simple tool with a handle and curved blade used to harvest crops.
Sumerian	One of the earliest human civilizations; it dated back 6,000 years and was centered in the region of Sumer. The civilization was located in Mesopotamia between the Tigris and Euphrates rivers.
tokens	Small objects used by Neolithic humans to count and calculate.