

# Accepting the Anthropocene

## Description:

By discussing the Earth’s history and our recent shift in geological time period, teachers can provide students with a temporal lens to help convey the urgency of climate change. This context will illustrate the significance of human intervention on Earth systems throughout our relatively short time on Earth.

## Objectives:

- Recognize and discuss the primary causes of climate change
- Discuss the importance of identifying the shift in epoch
- Demonstrate how this shift has affected the Earth and natural systems

## Vocabulary:

Anthropocene, anthropogenic climate change, eon, epoch, era, Holocene

## Materials:

- Computers, laptops or tablets with internet access
- Pens and paper
- Poster paper

## Background Information:

“The ‘Anthropocene’ is the name for a proposed new geological time period defined by humanity’s role as a geological force that is capable of shaping the evolution of planet Earth.

The term may soon enter the official Geologic Time Scale.”<sup>1</sup>

Geologists use names to categorize different time periods in the Earth’s history. These time periods are determined by significant events that occurred throughout the history of the Earth, with the shortest, most specific scale being an epoch. The table below should provide some context as to how geological time scales are organized.

	Eon	Era	Period	Epoch	
Younger ↑	Phanerozoic	Cenozoic	Quaternary	Holocene	← Today
				Pleistocene	← 11.8 Ka
			Neogene	Pliocene	
				Miocene	
				Oligocene	
			Paleogene	Eocene	
				Paleocene	
					← 66 Ma
			Mesozoic	Cretaceous	~
		Jurassic		~	
		Triassic		~	
				← 252 Ma	
		Paleozoic	Permian	~	
			Carboniferous	Pennsylvanian	~
Mississippian	~				
Devonian	~				
Silurian	~				
Ordovician	~				
Cambrian	~				
			← 541 Ma		
Proterozoic	~	~	~		
	Archean	~	~	← 2.5 Ga	
	Hadean	~	~	← 4.0 Ga	
				← 4.54 Ga	
Older ↓					

Source: [The Digital Atlas of Ancient Life](#)

Key:

Ga (giga-annum) = 1 billion years

Ma (mega-annum) = 1 million years

Ka (kilo-annum) = 1 thousand years

The most recent epochs listed above include the Holocene and Pleistocene. Epochs are distinct because they all end in “cene.” Both of these epochs took place during the quaternary period,

<sup>1</sup> [NASA The Anthropocene: Humankind as a Turning Point for Earth](#)

within the Cenozoic era, which all occurred within the Phanerozoic eon.

The Holocene is characterized by human existence on Earth, and was first proposed by Charles Lyell in 1833. Lyell thought that a new epoch should be identified to note the time “the earth has been tenanted by man.”<sup>2</sup> There is overwhelming evidence that Earth’s natural systems have drastically shifted due to human intervention. The human changes that occurred during the Holocene do not represent the human domination of the Anthropocene. “Some geologists have argued that the time characterized by the rise of humanity should be separated from the time characterized by humanity’s domination over the planet’s ecological systems and biogeochemical cycles...”<sup>2</sup> beyond the impacts seen in the Holocene. It is believed that the delicate balance between humans and the Earth was imbalanced around the time of the Industrial Revolution, which took place during the 18th and 19th centuries. To remember this new term, consider the first half of the word, *anthropo*, which is derived from the Greek word for human. Therefore, Anthropocene simply means the human epoch.

The way humans generally perceive time is rarely in relation to the Earth’s history. However, relative to the life span of the Earth, our species has existed for a very short amount of time. When we think about the impact humans have had on the Earth, as compared to the short amount of time we’ve existed on Earth, climate change speaks to how quickly and vastly our species has shifted the Earth’s natural systems. It is significant that an epoch shift is necessary to characterize our current time period through the

lens of human impact. It is important to think about our species’ relationship to the Earth because it is like no other species in the planet’s history. To improve this relationship and prevent further damage, we must look carefully at this dynamic relationship and how we as individuals fit, so we can make crucial changes informed by science for the future of the planet.

### Method:

- Introduce students to the concept of the Anthropocene by watching [Welcome to the Anthropocene](#) (the first film on this site) as a class. It should help students visualize geological timescales and human impact on the environment.
- Ask students to list natural and human factors of the environment. The list should look something like this: atmosphere, biodiversity and invasive species, cities, coastal habitats, farms, forests, oceans, and water use and mining.
- Split students into eight groups. Assign one group to each of those eight categories.
- Ask students to research the impacts of their category using the [HHMI The Anthropocene: Human Impact on the Environment](#) simulator. In the simulator, students should click on their impact to change the simulation virtually.
- Ask students to write their observations of the physical changes to the landscape.
- Then, ask students to click on the graph to determine how this impact relates to the Anthropocene. Be sure students write down their findings. Discuss the results as a class.
- Now, ask students to research the impacts of their category on our local environment, including how it has shaped local history,

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<sup>2</sup> [Encyclopedia Britannica Holocene Epoch](#)

and ways we are trying to reduce these impacts today.

- Below are some helpful resources to get students started on their research:
  - [OneNYC 2050 A Livable Climate](#)
  - [NPCC 2019 Special Issue Report](#)
  - [NPCC Landing Page](#)
  - [The Welikia Project](#)
  - [New York State Department of Environmental Conservation](#)

Be sure to encourage students to look beyond these to find information specific to their assigned category.

- Based on their notes from the simulator and their research on local impacts, each group should organize their findings in the form of a tri-fold pamphlet or poster? that can be shared with classmates and displayed in the school. Students can use a Microsoft Word template to create this. For a more advanced pamphlet, consider using Adobe Indesign if accessible.

### Discussion:

- Why is the shift in epoch important?
- How has the shift affected the Earth and its natural systems?
- What caused the recent change in epoch?

- What specific connections can be made between human population and the shift in epoch?
- What are the impacts of humans on the Anthropocene?

### Extension:

- Learn more about geological time scales by evaluating past and present eons, eras, periods and epochs. Consider creating a map with the class to depict these and the defining events of each. This will help put into context the gravity of the recent shift in epochs.
- For a deeper understanding of the Anthropocene, explore the educational and interactive web portal, [Welcome to the Anthropocene](#), as a class.

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