

peacock ORIGINAL



THE END IS



DEAR EDUCATOR,

We are living in a critical moment as we face the harsh realities of climate change in real-time and try to figure out actionable steps to take to move toward a more sustainable future. To help achieve this goal, NBCUniversal's Peacock is streaming the new original series, ***The End Is Nye***, hosted by beloved science expert Bill Nye. Each episode takes viewers on a heart-stopping thrill ride depicting the worst-case scenario brought on by a different type of natural or unnatural disaster. Then, Nye demystifies the disaster and explains how we can harness the power of science to save ourselves.

With this free educational program from Peacock and Young Minds Inspired, you can integrate ***The End Is Nye*** into your science and social studies curriculum, while deepening students' understanding of science as a tool to solve complex, real-world problems on a global scale. The program features engaging activities that introduce students to different natural catastrophic scenarios and empowers them to take action with science-based solutions.

Please share this program with other teachers in grades 5 to 8. Although these materials are protected by copyright, you may make as many copies as you need for educational purposes. Please visit [yomiclassroom.com/feedback-theendisnye](https://www.yomiclassroom.com/feedback-theendisnye) to let us know your thoughts on this program. We look forward to receiving your comments.

Sincerely,

Dr. Dominic Kinsley
Editor in Chief
Young Minds Inspired

ABOUT THE END IS NYE

This brand-new, eye-popping science adventure Peacock Original series takes a deep dive into the most epic global disasters imaginable – both natural and manmade. Each stand-alone one-hour episode takes viewers on an up-close thrill ride as they dive into the mystery and terror behind one specific threat and how the worst-case scenario could unfold. Then, host Bill Nye demystifies each disaster, using science to show how we can survive, mitigate, and prevent the worst from happening. Every catastrophe is abundant with thrills, but also hope and a way forward — a scientific blueprint for surviving anything that comes our way. ***The End Is Nye*** is streaming now, only on Peacock. Visit [peacocktv.com](https://www.peacocktv.com) to learn more.

TARGET AUDIENCE

Students in grades 5 to 8 as a supplement to science and social studies classes

PROGRAM COMPONENTS

Available at [yomiclassroom.com/theendisnye](https://www.yomiclassroom.com/theendisnye):

- This teacher's guide
- Three reproducible activity sheets
- A reproducible family letter
- A standards chart
- An online feedback form



Questions? Contact YMI toll-free at 1-800-859-8005 or by email at feedback@yomiclassroom.com.

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PROGRAM OBJECTIVES

- Educate students about the impact natural disasters may have on our daily lives and the role science can play in mitigating them
- Build critical thinking focused on how decision-making on the local, national, and global level collectively can help address climate change and its related environmental impact
- Inspire students to explore science-related activities

HOW TO USE THIS PROGRAM

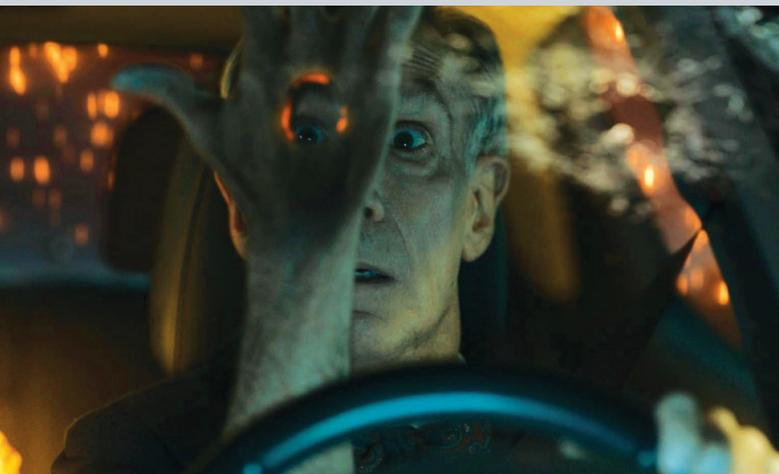
Visit [ymiclassroom.com/theendisnye](https://www.ymiclassroom.com/theendisnye) to download, copy, and distribute the activity sheets to students, and to view the trailer of this Peacock Original *The End Is Nye* as well as additional resources. Also copy and share the letter with families to extend the learning to the home. Please note that viewing the episodes is not necessary to complete the activities in this guide. However, viewing the episodes will help students discuss and explore each topic in more detail.

ACTIVITY 1: HURRICANES AND CLIMATE CHANGE



Start this activity by asking students to name a major hurricane that has happened in their lifetime and/or to describe extreme weather patterns they've noticed (both in their town or on the news). Explain the distinction between **global warming** (the long-term trend of higher average temperatures worldwide) and **climate change** (a shift in normal climate patterns usually due to increasing levels of carbon dioxide in the air). Distribute the activity sheet and review it with your class. After students read the passage and infographic, discuss the connection between extreme weather and climate change. Review the chart as a class, clarifying key terms as necessary. Have students share their completed "clean" designs in small groups.

Extension: Have students research direct carbon capture technology and present their findings to the class.



ACTIVITY 2: VOLCANOES AND GEOTHERMAL ENERGY



To begin, ask students to brainstorm how we use heat in our daily lives (i.e., to cook, keep our homes warm, etc.). Then ask if they know the difference between thermal and geothermal energy. Explain that **thermal energy** is energy that comes from the temperature of a

heated substance and **geothermal energy** is heat that comes from within the earth. Distribute the activity sheet and have students complete Part 1. Review the labeled diagram and clarify key terms as necessary. Before starting Part 2, explain that geothermal energy is a renewable resource and that heated water and/or steam carry geothermal energy to the earth's surface. Use their completed research project to launch further discussion of renewable energy.

Extension: Ask students to identify three ways that geothermal energy finds its way to the earth's surface and discuss their findings.

ACTIVITY 3: SOLAR FLARES AND OUR POWER GRID



Give students 60 seconds and challenge them to list all the ways they use electricity. Emphasize that electrical energy is the most common form of energy we use. Explain that our power grid is a complex system that delivers electricity from power plants to us for

daily use. Distribute the activity sheet and have students complete Part 1. Before students begin the writing assignment for Part 2, lead a brief class discussion. Ask students to use the infographic to think through the consequences of a solar event that causes total power grid failure.

Extension: Have students research Earth's magnetosphere or the Faraday Cage and create an infographic to illustrate their findings.

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ACTIVITY
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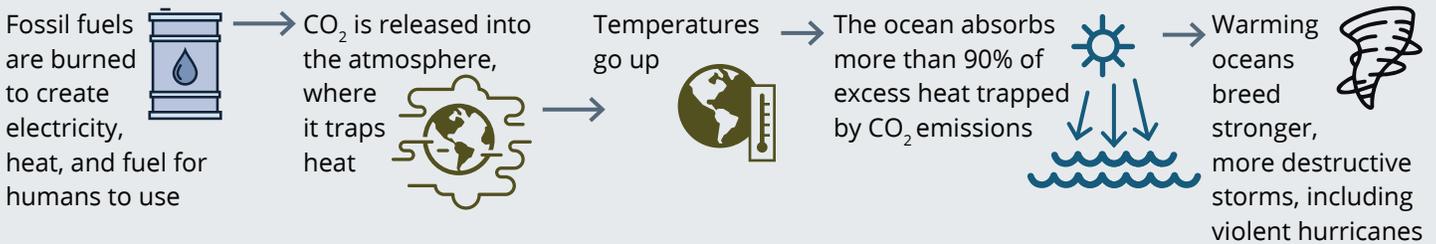
HURRICANES AND CLIMATE CHANGE

Scientists agree we need to combat global warming and mitigate the damage that climate change is causing. But is it too late? Review the information below and then put your engineering skills to the test to help build a sustainable future.

PART 1: HURRICANES: A CLEAR SIGN OF CLIMATE CHANGE

Our planet is warming because **greenhouse gases** like carbon dioxide trap heat when released into the atmosphere, creating a greenhouse effect. Unfortunately for the environment, humans rely on burning **fossil fuels** to create electricity, which releases huge amounts of **carbon dioxide (CO₂)** into the air. This buildup of greenhouse gases in the atmosphere speeds warming, including a dramatic increase in the surface temperature of the oceans. Hurricanes, the fiercest type of storm, gather heat and energy through contact with warm ocean waters. As the oceans absorb more and more heat over time, it sets the stage for stronger, more frequent superstorms. The high-speed winds, heavy rains, and violent waves that hurricanes bring when they make landfall often cause massive destruction to a wide area.

Global Warming at a Glance: Warming Oceans → Superstorms!



PART 2: IMAGINING A MORE SUSTAINABLE FUTURE

Scientists are working to find alternatives to burning fossil fuels since there is a limited supply and burning them is harming the environment. Review the chart below to see how renewable energy sources compare to fossil fuels and how they are used to produce clean energy.

Fossil Fuels	Renewable Energy	Clean Energy Technology
<ul style="list-style-type: none"> • Coal, oil, natural gas • Nonrenewable: will eventually run out • Accessed via drilling (oil, gas) and mining (coal) • Dirty = releases CO₂ into atmosphere 	<ul style="list-style-type: none"> • Solar, wind, geothermal, hydro • Renewable: continually replenished • Accessed mostly via clean technology • Clean = zero carbon emissions 	<ul style="list-style-type: none"> • Solar panels: capture sunlight → convert it to electricity • Wind turbines: wind turns blades → powers generator → creates electricity • Geothermal power plant: underground heat → electricity

THINK LIKE AN ENGINEER! Use what you know about clean energy alternatives to design a vehicle, machine, or building powered by one or more sources of renewable energy. Consider all benefits and any potential downsides to using a renewable energy source as you think through your design.

- **Step 1:** Identify how your vehicle, machine, or building will be used.
- **Step 2:** Sketch your design and label the different features powered by clean energy.
- **Step 3:** Write a report describing how your design will contribute to a greener future.

ACTIVITY 2

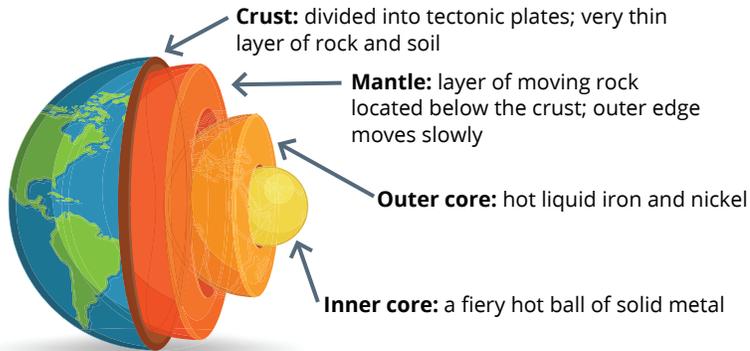


VOLCANOES AND GEOTHERMAL ENERGY

Volcanic eruptions can wreak havoc on the earth's landscape and climate. But can the power they generate work to our advantage? Read the information below and complete the activities.

PART 1: VOLCANOES: A SPECTACULAR DISPLAY OF GEOTHERMAL ENERGY

If someone asked you to picture a volcanic eruption, you would probably visualize a massive explosion of liquid fire and a huge cloud of steam and ash shooting up toward the sky. But what causes volcanoes to erupt? Can we harness their awe-inspiring power – which has the ability to nurture life *and* destroy it – to power our daily lives?



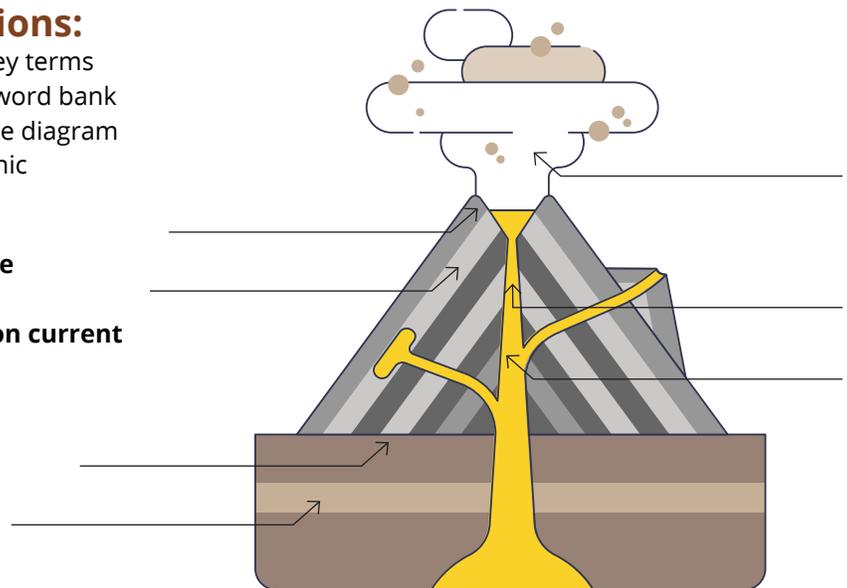
Earth is made up of four layers. The **inner core**, as hot as the surface of the Sun, is a solid ball of metal. The **outer core** consists of fiery liquid metal. The next layer, the **mantle**, is extremely hot, not-quite solid rock that shifts and flows very slowly. The **crust**, the solid outer layer, is broken up into seven huge pieces called tectonic plates. **Convection currents** beneath the crust transfer heat by moving large masses of hot, liquified rock (magma). This causes the tectonic plates to move slowly atop the magma and can cause intense pressure to build.

A volcano forms when the intense heat and gas pressure in the magma builds up and bursts through an opening in the earth's surface. When a volcano erupts, it generates an incredible amount of energy. The most violent explosions cause a catastrophic amount of damage. Lava, rock particles, ash, dust, and toxic gas are launched into the atmosphere. This debris can poison the air, contaminate water, and impact weather worldwide, blocking out sunlight and turning summer days cold. Eruptions may also cause earthquakes, mudslides, wildfires, and avalanches.

Directions:

Use the key terms from the word bank to label the diagram of a volcanic eruption.

ash plume
lava
convection current
magma
summit
crust
mantle



PART 2: HOW CAN WE HARNESS GEOTHERMAL ENERGY TO WORK FOR US?

Geothermal energy is the natural heat stored in rocks and fluids deep beneath the earth's surface. It can be used to heat homes directly or to generate electricity. To produce power from geothermal energy, wells are dug deep into underground reservoirs, often located near active volcanoes or hot spots. This provides access to a plentiful – and renewable – supply of steam and hot water, which are used to drive turbines connected to electricity generators. Research the difference between **geothermal plants** and **hydraulic fracturing** (fracking) and create a poster or multimedia presentation weighing the pros and cons of each option.

- What are some ways that geothermal plants operate to produce energy?
- Why do you think hydraulic fracturing (fracking) is considered controversial?

ACTIVITY 3



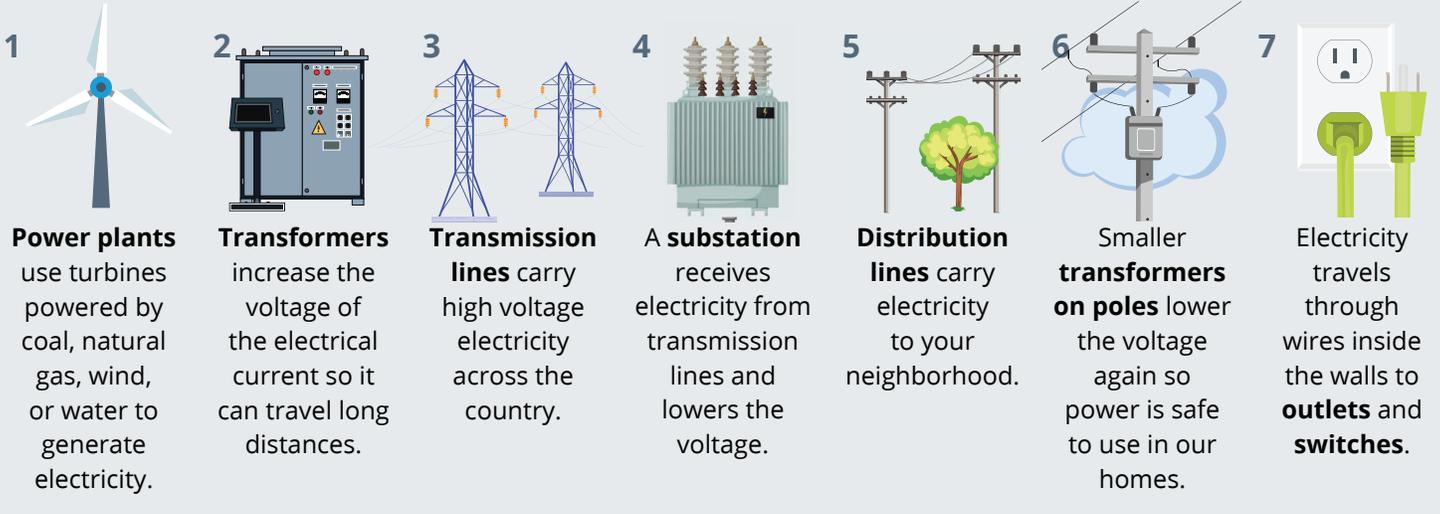
SOLAR FLARES AND OUR POWER GRID

Our vast communication networks – and the electrical power grid that supports them – are essential to ensuring that human civilization runs smoothly. However, a massive solar event could destroy our technological existence in one fell swoop!

PART 1: ELECTROMAGNETISM AND HOW IT CAN AFFECT OUR POWER GRID

Electromagnetism is the invisible force that makes electricity flow and magnets stick. The movement of a magnet can generate electricity and the flow of electricity can generate a **magnetic field**. The Sun and Earth have magnetic fields that interact with each other. Earth's magnetic field protects our atmosphere from being stripped away by the **solar wind** (a powerful stream of charged particles ejected from the Sun) by deflecting most of the particles into space. The interaction between the Sun and Earth's magnetic fields sometimes causes geomagnetic storms that can affect Earth. When energy stored in the Sun's magnetic fields is suddenly released, it can cause an eruption on the Sun, called a **solar flare**. Minor solar eruptions happen regularly and usually don't affect Earth. However, large-scale solar events like a **coronal mass ejection** (CME), a super powerful explosion on the Sun, can send a massive shockwave of radiation toward Earth. If a solar shockwave were to hit Earth directly, the resulting magnetic storm could overwhelm our power grid and shut down life as we know it.

How does electricity get to our homes?



PART 2: IMAGINING THE WORST-CASE SCENARIO

Think about it! Small storms can bring down local distribution lines or blow out smaller transformers, leading to a temporary loss of power in your home or neighborhood. A major solar event can create electrical surges that could deactivate power plants around the world simultaneously. Choose one of the following writing prompts to think through the direct aftermath and long-term consequences of a total power grid shutdown.

Option 1: Write two journal entries imagining the fallout of an electrical grid shutdown. One should describe the immediate aftermath and one should describe the long-term consequences (no internet, no heat, no electricity, no factories, etc.).

Option 2: Write a persuasive speech from the perspective of a concerned citizen to political leaders and/or the public about the importance of investing in electrical infrastructure (independent power grids, automated safeguards, more efficient distribution, etc.).

DEAR PARENTS AND CAREGIVERS,

We all face unprecedented challenges as we work to build a more sustainable future. In school, your child is learning about the science behind some of these challenges. They have also explored different types of natural energy and how it can be harnessed in ways that protect the environment and benefit humankind. These themes and much more are explored in the new Peacock Original ***The End Is Nye***, streaming now, only on Peacock. Beloved science expert Bill Nye shows how natural and unnatural disasters could potentially devastate humankind. Then he explains how science is the key to avoiding catastrophe.



Viewing the show with your child (recommended for grades 5 and up) provides a perfect opportunity to learn more about our changing world, and to explore science-related topics together in a fun way. With Bill Nye's help, you and your child can become citizen scientists as they investigate how to solve problems they observe around them. Watch the show as a family and then try some of these at-home science-based ideas and plans.



THEME: RENEWABLE ENERGY

Brainstorm as a family how you can start using renewable energy sources in your home.



THEME: ELECTRICAL POWER GRID

Work together to make sure your family is prepared in the event of a power outage. Make a checklist and gather supplies to have on hand.



THEME: GEOTHERMAL ENERGY

What is the closest active volcano to where you live? Find the answer together. What type of volcano is it? When did it last erupt?



EXPERIMENT:

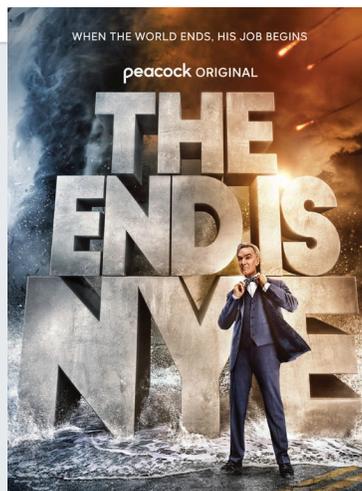
Check out some of Bill Nye's experiments and try them together at home:

<https://billnye.com/home-demos>

ABOUT THE END IS NYE

Take an unforgettable trip to the Disaster Institute for an up-close look at some worst-case scenarios! ***The End Is Nye*** is streaming now, only on Peacock.

Join beloved science expert Bill Nye as he demystifies some of Earth's most powerful natural disasters and explains how science is the key to mitigating them.



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