GENERATIONGENIUS
ALWAYS QUESTION. ALWAYS WONDER.

TEACHER GUIDE

DISTRIBUTION OF NATURAL RESOURCES
GRADES 6-8

COMMON MISCONCEPTIONS

- **Natural resources are equally distributed around Earth.**
  Earth was formed and continues to change through a series of processes. These processes are responsible for the distribution of some of the natural resources we find in Earth's crust. For example, we find coal deposits where prehistoric forests once stood and usable groundwater in sedimentary rocks with high porosity and permeability. Forests and arable land are found primarily in tropical and temperature climate zones.

- **Freshwater is a renewable resource.**
  Water covers most of Earth, so it could be assumed that we have an endless supply of clean drinking water, but that is not the case. Freshwater accounts for less than 3% of the water on Earth, and it is being used at a very fast rate. Humans also lose freshwater to natural contamination from mined radioactive material and chemical pollutants. As humans use the groundwater stored in aquifers around the world, they are not being recharged at a rate that can keep up with consumption.

- **If we switched to electric cars, we wouldn't need fossil fuels.**
  Although the idea of electric cars seems like a good one, these cars need a lithium-ion battery in order to work. Lithium-ion batteries last for a very long time; however, when they no longer work, we need to dispose of them. Currently there is no way to recycle these batteries, so they get put in the landfills where they can lead to ground and water pollution as they decay. And we would still need fossil fuels for other purposes until we can find renewable and environmentally-friendly solutions.

NATURAL RESOURCES

Natural Resources were created naturally as part of Earth's processes. Some of Earth's natural resources include the Sun, air (wind), and water, which humans' harness and use to create electricity. These resources are considered renewable resources as they should last for a very long time and are easy to find. Other natural resources include precious metals, minerals, and fossil fuels, which humans have to search for in the Earth and are harder to find.

PLATE TECTONICS

Plate tectonics is a widely accepted scientific theory used to explain the motion of Earth's crust. Earth's plates have been moving for billions of years and continue to move today. As the plates move, sometimes they collide, creating mountain ranges or volcanos. Other plates are moving apart, creating features such as the Marianas Trench. Scientists use plate

tectonics to explain how Earth developed its shape and surface features. Scientists also use this process to help explain the uneven distribution of Earth's natural resources.

RENEWABLE AND NON-RENEWABLE RESOURCES

Natural Resources fall into two major categories, renewable and non-renewable. Renewable resources like the Sun, wind, and water are used to produce solar energy, wind power, and hydroelectric power. These forms of energy are believed to be sustainable, as the natural resources that provide them should last a very long time. Non-renewable resources such as fossil fuels, freshwater aquifers, and giant forests like the Amazon rainforest and the Redwood forests of the Pacific Northwest are natural resources that can not be renewed in a lifetime. Once non-renewable resources are used, it takes hundreds or sometimes thousands of years to replenish them.

TEACHER TIPS

When teaching about natural resources, it is important to talk about both renewable and non-renewable resources. It is also important the students be given the opportunity to look at data about how these resources are distributed and used across the globe. Over the past century, scientist have learned more about Earth's resources and how we can use them in a way that helps both Earth and humans. Although there are many negative issues to focus on when it comes to natural resources, it is important that we address solutions to those problems and steps we are making to solve them.

ABOUT THIS LESSON

This lesson was created by the National Science Teaching Association (NSTA) to pair with the Generation Genius video and support *NGSS*.

They have requested we provide the following background with this lesson:

The Next Generation Science Standards (NGSS) are the national standards on how students learn science, and they are based on contemporary research presented in *A Framework for K–12 Science Education (the Framework).* The shift in science teaching and learning required by the Framework is summarized in this infographic: A New Vision for Science Education.

At the start of each Generation Genius lesson, students are presented with a phenomenon, then they try to explain it. Students will notice they have gaps in their knowledge and ask questions, which motivates them to build ownership of science ideas they need in order to explain how or why the phenomenon occurred. The way students build ownership of science and engineering ideas is through active engagement in the science and engineering practices (SEPs). This process of sensemaking, or doing science to figure out how the world works, is one of the major shifts the *Framework* encourages.

To engage in the SEPs, students should be part of a learning community that allows them to share their ideas, evaluate competing ideas, give and receive critiques, and reach consensus. Students can start by sharing ideas with a partner, then with a small group, and finally, with the whole class. This strategy creates opportunities for all students to be heard, build confidence, and have something to contribute to whole-class discussions. Each Generation Genius lesson provides conversational supports to facilitate such productive student discussions to contribute to sensemaking.

Excited to continue your shift toward the new vision for science education? Check out the Generation Genius Teacher Guide page on the NSTA website for resources and strategies to engage every student in your classroom in **doing** science.