

Teacher Guide: Geothermal Energy

Incorporating the Sustainable Development Goals (SDGs) into elementary education is an important way to introduce young learners to real-world issues and to help them understand the interconnectedness of the world. AGI has put together resources (e.g., student guides, lesson plans, media) to assist in introducing the SDGs and to encourage exploration of specific case studies that tell about projects that use Earth science knowledge to support one or more of the SDGs. Explore these resources [*here*](#).



Connections SDGs

7: Affordable and clean energy

- 7.1 Ensure universal access to affordable, reliable and modern energy services.
- 7.2 Increase substantially the share of renewable energy in the global energy mix.

9: Industry, innovation, and infrastructure

13: Climate action

NGSS

Energy

- MS-PS3-3

Earth's Systems

- MS-ESS2-2

Earth and Human Activity

- MS-ESS3-1

Lesson Summary

Students will be introduced to SDG 7: Affordable and clean energy by engaging with a video or another visual resource that will help them consider why the SDG is important to address. Students will then learn about a case study that describes work being done related to SDG 7. Suggested discussion questions are provided to help guide students in understanding and considering the importance of SDG 7. Then, lessons with hands-on components and data sets can be used to engage students with the case study and related earth science concepts.

It is recommended that the SDGs be introduced to students prior to this lesson. Explore AGI resources, UN Student Resources, UNESCO Resources for Educators, and The World's Largest Lesson resources for ideas.

Facilitator Background

- ◆ Learn more about case study 4.3.2 on page 40-42 in the [Geoscience in Action Report](#). The student reading "Geothermal Energy" is adapted from this case study.
- ◆ Case study 4.3.2 focuses on SDG 7, and also ties to SDGs 9 and 13.
- ◆ Explore the summary pages from the UN about the SDGs included in the student handout: [What is Goal 7 - Affordable and clean energy](#).
- ◆ Read about all [17 SDGs](#).
- ◆ Familiarize yourself with geothermal energy by watching this 15-minute video, [Geothermal: The energy resource of our past, present, and future](#), browse through [Geothermal Basics](#), and explore additional [Geothermal Materials](#).

Student Activity

Show students one of these two-minute videos ([Understand Goal 7: Affordable and Clean Energy; Take Action on Goal 7](#)), read a book from the [UN Zero Hunger booklist](#) or page 7 in [this comic](#), or interact with another visual summary of SDG 7 and discuss why work being done is important. Then, guide students in conducting a close reading of “Geothermal Energy”, which is a middle school level summary of a case study. Depending on the level of the students, you may want to have them mark and discuss one or more terms, such as those that they think are important, confusing, or new to them.

Suggested Discussion Questions

1. What natural features in your community could be important for producing energy?
2. How does Kenya’s location along the Great Rift Valley make it easier to use geothermal energy compared to other places? Where else in the world might it be relatively easy to access geothermal energy sources and why?
3. Why is it important for communities to find energy sources that are clean and reliable (SDG 7)?
4. What other SDGs might also be supported by using geothermal energy?
5. What challenges might a community face when trying to build and use geothermal energy plants, and how could they be solved?
6. How might scientists, engineers, and local communities work together to make a geothermal project successful?
7. If your community wanted to use a renewable energy source like geothermal, what actions would you take to help support that goal?
8. What challenges do you think communities might face in transitioning energy sources?
9. In what ways can students help support affordable and clean energy solutions?

10. What trade-offs might communities need to think about when deciding where to build geothermal energy plants?

Hands-on Activities

- ◆ [Ground Temperature Investigation](#)
- ◆ [Modeling Geothermal Exchange](#)

Related Activities

- ◆ [Geothermal: The Energy Resource of Our Past, Present, and Future! Student Video](#)
[Geothermal Rising](#)
- ◆ [Geothermal Materials Teaching Resources](#)
[National Energy Education Development Project](#)
- ◆ [Geothermal Basics](#)
[U.S. Department of Energy](#)
- ◆ [Energy in Our Lives and Communities Curriculum Kit](#)
[American Geosciences Institute](#)

Related Data

- ◆ [Geothermal Resource Data, Tools, and Maps](#)
[National Renewable Energy Laboratory](#)
- ◆ [Geothermal Processes & Features](#)
[National Park Service](#)
- ◆ [Energy Data Explorer](#)
[Our World in Data](#)