Renewable Resource

Earth & Space Science | Lesson Guide

2nd Grade

Photo Description

This image shows the inside of a wooden building or shed that is still being built. You can see wooden beams holding up the roof, insulation material between the wooden frames, and a window letting light inside. The structure shows how people use natural materials like wood to create spaces where we live and work.

Scientific Phenomena

Anchoring Phenomenon: Why do we build houses and buildings with wood and other natural materials?

Scientific Explanation: Wood is a renewable resource—meaning trees can grow back after we cut them down. When we harvest wood responsibly, new trees can be planted to replace the ones we use. This building demonstrates how humans use natural materials from Earth to meet their needs for shelter. The insulation material visible in the walls helps keep the building warm or cool by trapping air, which shows how we apply science to improve our living spaces.

Core Science Concepts

* Renewable Resources: Materials from nature that can be replaced or regrown over time (like wood from trees, bamboo, and cork).

* Properties of Materials: Wood is strong, durable, and can be shaped into different forms—making it useful for building structures.

* Human Use of Natural Resources: People carefully select and use materials from Earth to build homes, shelters, and other structures to meet basic needs.

* Insulation and Energy: Some materials (like the gray insulation shown) trap air to help keep buildings warmer in winter and cooler in summer, reducing energy waste.

Pedagogical Tip:

Help students connect this lesson to their own experiences by asking them to notice wooden items in their classroom or homes (desks, shelves, doors). This makes the abstract concept of "renewable resources" concrete and observable. Consider taking students on a "resource hunt" around the school to identify where wood and other materials are used.

UDL Suggestions:

To support diverse learners:
- Representation: Provide labeled photos or diagrams showing the different parts of the building (roof beams, insulation, window frame).
- Action & Expression: Allow students to sort real wood samples, straw, and other building materials by texture and appearance.
- Engagement: Connect to students' personal experiences by discussing their own homes or buildings they visit (libraries, fire stations, etc.).

Zoom In / Zoom Out

Ø=Ý, Zoom In—Microscopic Level:
If we could look very closely at wood fibers under a microscope, we would see tiny tubes and cells that carried water and nutrients when the tree was alive. These hollow structures make wood lightweight yet strong. The insulation material is made of tiny air pockets trapped inside—these air pockets are what keep heat from escaping.

Ø<ß Zoom Out—Ecosystem & Global Level:
This building is part of a larger human system that depends on forests. Forests provide wood for building, clean air for us to breathe, and habitats for animals. When we use renewable resources like wood responsibly and plant new trees, we help keep our forests healthy and support the entire ecosystem that depends on them.

Discussion Questions

1. "What do you think would happen if we cut down all the trees and didn't plant new ones?" (Bloom's: Analyze | DOK: 2)

2. "Why do you think the builders put this gray insulation material inside the walls?" (Bloom's: Understand | DOK: 2)

3. "Can you find something made of wood in our classroom? What would be different if it were made of a different material?" (Bloom's: Apply | DOK: 2)

4. "How is a tree like a factory that makes wood for buildings?" (Bloom's: Create | DOK: 3)

Potential Student Misconceptions

Misconception	Scientific Clarification
"If we cut down trees, they're gone forever."	Trees are renewable resources! When we cut down one tree responsibly, people can plant new seeds or saplings that will grow into trees. It takes many years, but forests can regrow and provide wood for future generations.
"All the material in buildings comes from the ground like rocks."	While some materials (like stone and metals) come from the ground, many building materials come from living things. Wood comes from trees, and some insulation comes from plant fibers or recycled materials.
"The insulation in walls doesn't do anything important."	The insulation is very important! It traps tiny air pockets that stop heat from escaping in winter and stops heat from coming in during summer, which keeps buildings comfortable and saves energy.

Extension Activities

Activity 1: "Renewable vs. Non-Renewable Resource Sort"
Gather pictures or real samples of different materials (wood, plastic, metal, stone, paper). Have students sort them into two groups: "Can Grow Back" (renewable) and "Cannot Grow Back" (non-renewable). Discuss why some materials are renewable and others are not.

Activity 2: "Build with Natural Materials"
Provide students with twigs, straw, cardboard tubes, and tape. Challenge them to work in pairs to build a small model house or shelter. Have them discuss which materials were easiest or hardest to use and why—connecting to how real builders choose materials.

Activity 3: "Insulation Investigation"

Give each student group two clear cups filled with warm water, then wrap one cup in insulation material (cotton, wool, or bubble wrap) and leave one uncovered. Have students measure the temperature of each cup every 5 minutes for 20 minutes. Create a simple line graph to show which stays warm longer—demonstrating how insulation works.

Cross-Curricular Ideas

Math Connection: Have students measure the width and height of the window in the photo, then calculate its perimeter. Create a simple bar graph comparing the dimensions of classroom windows to the window shown in the image.

ELA Connection: Read a picture book about trees and forests (such as The Giving Tree). Have students dictate or write sentences about why trees are important and how we should care for them. Create a class poster: "Ways We Use Wood."

Social Studies Connection: Discuss different types of homes around the world and the materials people use to build them based on their environment. Create a simple map showing where forests grow and where buildings made from wood are common.

Art Connection: Have students create a collage using natural materials (twigs, leaves, bark, straw) to represent a forest or a building. Display the collages and discuss the different textures and colors of natural materials.

STEM Career Connection

Carpenter/Builder
Carpenters use wood and other materials to build houses, schools, and other buildings. They measure, cut, and fit pieces together to create strong structures where people live and work. They need to understand how different materials work and how to keep buildings safe and sturdy.
Average Annual Salary: $56,000 USD

Forest Manager/Forestry Technician
Forest managers take care of trees and forests to make sure they stay healthy. They plant new trees to replace ones that are cut down and help protect forests for animals. This job is important because it keeps renewable resources available for the future.
Average Annual Salary: $38,000 USD

Architect
Architects design buildings and plan how to use materials like wood, stone, and metal in smart ways. They think about how to make buildings beautiful, strong, and energy-efficient so they don't waste heat or cooling. Architects use science and creativity to design the buildings where we live, learn, and work.
Average Annual Salary: $82,000 USD

NGSS Connections

Performance Expectation:
K-ESS3-1: Use a model to represent the relationship between the needs of different plants and animals and the places they live.

Disciplinary Core Ideas:
- K-ESS3.A - Organisms and environments (where organisms live affects what they need)

Crosscutting Concepts:
- Cause and Effect - Humans use materials from nature (cause) to build structures and meet their needs (effect)

- Structure and Function - Different materials have different properties that make them useful for specific purposes

Science Vocabulary

* Renewable Resource: Something from nature that can grow back or be replaced after we use it, like trees that grow into new wood.

* Wood: The hard material that comes from tree trunks and branches, which people use to build homes and make furniture.

* Insulation: A material that traps air and helps keep buildings warm in winter and cool in summer.

* Shelter: A safe place where people or animals can live that protects them from bad weather.

* Building Materials: Natural or made things that people use to construct buildings and structures.

* Sustainable: Using resources in a way that doesn't use them all up, so they're available for people in the future.

External Resources

Children's Books:
- The Giving Tree by Shel Silverstein
- A Tree is Nice by Janice May Udry
- Where Do Trees Come From? by Anne-Sophie Baumann