Renewable Resource

Earth & Space Science | Lesson Guide

1st Grade

Photo Description

This image shows the inside of a wooden building or shed under construction. The wooden frame is made of trees that have been cut into boards and beams. The walls are filled with fluffy, tan-colored insulation material that helps keep the building warm. A large window lets sunlight shine inside, and we can see the wooden roof beams above that support the whole structure.

Scientific Phenomena

Anchoring Phenomenon: How do we use trees and natural materials to build and protect our homes?

This image demonstrates renewable resource use and material properties. Trees grow naturally and can be replanted, making wood a renewable resource. When trees are harvested and processed into lumber, their strong structure allows them to support heavy buildings. The insulation material (likely made from plant fibers or recycled materials) uses air pockets to trap heat, demonstrating how natural materials have different properties that serve human needs. The window allows light energy to enter, showing how we work with natural forces in building design.

Core Science Concepts

* Renewable Resources: Trees are living things that grow again after being harvested, making wood a renewable material we can use sustainably.

* Material Properties: Different materials (wood, insulation, glass) have different properties—wood is strong and sturdy, insulation is fluffy and traps air to keep warmth in, and glass is clear so light passes through.

* Energy Transfer: Sunlight enters through the window, and the insulation helps trap heat energy inside the building to keep it warm.

* Human Needs and Nature: People use materials from nature (trees, plants, minerals) to meet our needs for shelter and safety.

Pedagogical Tip:

For First Grade, focus on concrete, observable properties rather than abstract concepts. Let students touch real wood scraps, insulation samples, and glass to experience HOW different materials feel and what they can do. This sensory-rich approach builds foundational understanding before introducing vocabulary.

UDL Suggestions:

Representation: Provide labeled photos showing each material separately (wood, insulation, glass) alongside the full image so students can identify components. Use picture cards during discussion.

Action & Expression: Allow students to sort material samples into categories (soft/hard, see-through/not see-through) rather than only talking about concepts. Create a tactile display board where students can feel actual samples.

Engagement: Connect to students' experiences: "Do you have a wooden desk? A warm blanket like this insulation?" Personal connections increase relevance and motivation.

Zoom In / Zoom Out

Zoom In (Microscopic):
At the cellular level, wood is made of tiny plant cells arranged in long fibers. These cells once carried water and nutrients through the living tree. The insulation material also has a cellular structure with many air pockets between fibers—these air pockets are what make it fluffy and able to trap heat. Even glass, though it looks solid, is made of tightly packed atoms arranged in a special pattern that lets light pass through.

Zoom Out (Ecosystem/Larger System):
This building is part of a larger cycle: trees grow in forests !' people harvest trees sustainably !' wood is processed into materials !' buildings are built !' buildings shelter people and animals !' eventually materials break down and return to soil !' trees grow again. The insulation might come from plant waste or recycled materials, showing how we can reduce waste. The whole system connects to weather patterns (the insulation protects from hot and cold), human communities (people live and work in buildings), and forest ecosystems (where trees regrow).

Discussion Questions

1. "What parts of this building come from trees, and what job does each part do?" (Bloom's: Analyze | DOK: 2)
   - Students must identify wood components and explain function.

2. "Why do you think the builders put that fluffy insulation inside the walls instead of leaving them empty?" (Bloom's: Evaluate | DOK: 3)
   - Students must think about cause and effect, and consider human needs for comfort.

3. "Where do you think the trees came from before they became the wood for this building?" (Bloom's: Remember/Understand | DOK: 1)
   - Students make the connection that materials come from nature.

4. "If we keep cutting down trees to build, what might happen to our forests?" (Bloom's: Analyze | DOK: 2)
   - Students begin thinking about sustainability and resource management in age-appropriate ways.

Potential Student Misconceptions

Misconception 1: "Trees are killed when we cut them down, so we can never use them again."
- Clarification: Some trees are cut down completely, but people can plant new trees to grow in their place. We can also harvest wood from trees in ways that let them keep growing. Using renewable resources means we can keep using them if we're careful and replant.

Misconception 2: "Insulation is just stuffing that feels soft, but it doesn't do anything special."
- Clarification: Insulation has a job! The tiny air pockets inside trap warm air and keep it from escaping. This is why animals grow thick fur and why we wear blankets—they work like insulation to keep us warm.

Misconception 3: "We take materials from nature, and then they're gone forever."
- Clarification: Many materials from nature can be used again and again. Wood comes from trees that can grow back. Some insulation is made from recycled materials that used to be something else. Nature and people can work together to keep resources available.

Extension Activities

Activity 1: Material Sort & Touch Board
Create a tactile display with real samples: wood blocks, insulation scraps, glass pieces (safely secured), and other building materials. Let students handle and sort them by properties: soft/hard, see-through/not see-through, warm/cold. Ask, "Which one do you think is good for holding up a building?" and "Which one keeps heat inside?" This builds sensory awareness of how material properties match their functions.

Activity 2: Build a Mini Insulation Tester
Provide two small clear cups or plastic bags. Fill one with insulation material and leave one empty. Place a warm object (a warm (not hot) washcloth) in each. Have students predict and test which one stays warmer longer. Measure temperature or simply feel both after 5 and 10 minutes. Discuss: "Why does the insulation keep the warmth in longer?" This demonstrates the function of insulation in a hands-on way.

Activity 3: Tree-to-Table Walking Tour
Take students on a walk around the classroom and school building. Point out wooden furniture, paper products, doors, and other wood-based items. Create a simple tally chart: "How many wooden things did we find?" Count together and graph results. Discuss: "All of these came from trees. Can we grow more trees to replace the ones we used?" This builds awareness that trees provide many materials we use every day.

Cross-Curricular Ideas

Math Connection:
Count and measure building materials. "How many wooden boards can you see in the photo?" Create a bar graph showing different materials used in construction (wood, glass, insulation, metal). Measure the length and width of the window or boards using non-standard units (hands, blocks).

ELA Connection:
Read picture books about trees and building (see resources below). Have students dictate or write simple sentences: "Trees give us wood." "Insulation keeps us warm." Create a class book where each student draws and labels one building material.

Social Studies Connection:
Discuss homes around the world and what materials people use to build them based on their environment. Show pictures of houses made from wood, stone, adobe, or other local materials. Talk about how people in your community get and use building materials. This connects to local resources and cultural diversity.

Art Connection:
Create a mixed-media collage where students glue real wood shavings, insulation scraps (safely handled), and cut paper to represent the building in the photo. Alternatively, have students paint or draw their own dream house and label the materials they would use, thinking about what they learned about material properties.

STEM Career Connection

1. Carpenter/Builder
A carpenter uses wood and tools to build houses, sheds, and furniture. They measure, cut, and nail pieces of wood together to create strong structures that keep people safe and comfortable. Carpenters need to know which wood is best for each job and how to make buildings that last a long time.
- Average Annual Salary: $48,000–$55,000 USD

2. Architect
An architect designs buildings and plans how they will look and work. They think about what materials to use (like wood, glass, and insulation), how to keep buildings warm or cool, and how to make spaces where people can live and work safely. Architects use drawings and computers to show their ideas.
- Average Annual Salary: $80,000–$100,000 USD

3. Environmental Scientist/Forester
A forester or environmental scientist studies trees and forests. They help make sure we have enough trees by replanting forests after some are harvested. They also study how to use wood and natural materials in ways that don't hurt the environment. This job keeps our renewable resources available for the future.
- Average Annual Salary: $63,000–$75,000 USD

NGSS Connections

Crosscutting Concepts:
- Structure and Function — The structure of wood (strong fibers) allows it to function as a building material; the structure of insulation (air pockets) allows it to function in trapping heat.
- Energy and Matter — Sunlight energy enters through the window; heat energy is trapped by insulation; matter (trees, stone, glass) is transformed into building materials.
- Cause and Effect — Because insulation has air pockets, it traps heat. Because wood is strong, it can hold up buildings.

Related Performance Expectation (Grade 2-3 level):
While there is no specific K-1 PE perfectly matched, this image connects to the progression toward 2-ESS1-1: Use information from several sources to provide evidence that Earth events can affect the environment and humans (natural resources, building materials, environmental stewardship). First Grade students build foundational understanding that humans use materials from Earth.

Science Vocabulary

* Renewable Resource: Something from nature that we can use and that can grow back or be made again (like trees for wood).

* Insulation: A special fluffy material with tiny air pockets that keeps warm air inside and cold air outside, like a blanket for buildings.

* Material: Anything we can touch and use to make things, like wood, plastic, metal, or glass.

* Harvest: To gather or collect something, like picking fruit from trees or cutting down trees for wood.

* Sturdy: Very strong and hard to break; able to hold heavy things without falling apart.

* Property: A special quality or feature of something that tells us what it's like (hard, soft, see-through, rough).

External Resources

Children's Books:
- The Tree House by Jan Lööf — A simple story about building and trees.
- House by the Lake by Ella Sarah Stewart — Explores different types of homes and building materials.
- What Lives in a Tree? by Kathleen Kudlinski (illustrated by S.D. Schindler) — Introduces trees as resources and habitats.

Final Note for the Teacher:

This image is an excellent anchor for introducing First Graders to renewable resources and material properties in a concrete, observable way. The beauty of this lesson is that students can see and touch examples of the materials being discussed, making abstract concepts tangible. Focus on sensory exploration and personal connections to deepen understanding at this developmental level.