

Third-grade differentiation

■ Reading and discussion tips:

- Read the article “Thinking green, building green” in class rather than having students read it for homework. On the board, draw a two-column chart. Label one column “Thinking green” and the other “Building green.” As you read, pause periodically and have students offer examples of both concepts. Record their examples in the appropriate columns in the chart.
- Before students read the answers in the interview, read the questions aloud and have students share their predictions about what the answers might be. After reading each answer, evaluate students’ comprehension by discussing the ways Julie Denver’s answers did and did not match their predictions.
- Rather than sharing the images of green building practices after students have read the article and the interview, share them while students are reading.

■ Activity tips:

- Have students work in pairs to write the descriptions of their dream green homes. Require that each pair’s description contain just one energy-saving technique and one way of keeping the environment cleaner.
- Create your own dream green home drawing and show it to students as a model.
- Scale back the activity by having students create a dream green room, such as a kitchen, rather than an entire home.

■ Assessment tips:

- Clarify expectations for students. Paraphrase the rubric, and share it with students before they begin their work.
- If students score lower than a 4 on “Content,” allow them to revise their work and resubmit it. Before doing so, they must meet with you to discuss ways of improving their diagram.

Fifth-grade differentiation

■ Reading and discussion tips:

- Have students add to the list of energy savers in the last paragraph of the article “Thinking green, building green.” On a bulletin board, start a list called “Living green,” and add the tips mentioned in the paragraph. For homework, assign students to come up with another tip.
- Rather than reading the interview aloud in class, have students read it for homework. In class the next day, have students discuss the current advantages and disadvantages of building green, according to Julie Denver.
- Challenge students to find images of green building practices. As a class, brainstorm a list of green materials and features. Then have students look online or in the library for images of the items on the list. Have students label their images and post them in the classroom, and allow them time to browse the “green gallery” and see each other’s pictures.

■ Activity tips:

- Require that students’ dream green home descriptions include at least three energy-saving techniques and at least three ways of keeping the environment cleaner.
- Teach students about the concept of drawing to scale, which means making a picture that is proportionately the same as the object it represents. Challenge students to draw part or all of their designs to scale.

■ Assessment tips:

- In addition to filling out the “peer review” forms for their classmates, have students fill out a copy of the form to evaluate their own presentation. On the back, have them write one sentence that describes a strength of their presentation and one that describes a goal for improvement.

■ Optional extension tips:

- Have students find out about other common materials that can be used for insulation, such as cotton clothing. Choose one or more of these items to add to their jean drive.

Grade four

Objectives

Students will:

- Learn about alternative sources of energy and the pros and cons of using them.
- Learn what features in buildings make them more energy efficient and better for the environment.
- Learn how builders for Habitat for Humanity help homeowners save money and energy when they build homes.
- List the features of their dream green homes.
- Draw diagrams and illustrations showing the features of their dream green homes.
- Present and display their diagrams.

National content standards

Science

- Students develop abilities necessary to do scientific inquiry.
- Students develop abilities of technical design.
- Students develop understanding about science and technology.

Social Studies

- Students describe how people create places that reflect ideas, personality, culture, and wants and needs as they design homes, playgrounds, classrooms, etc.
- Students examine the interaction of human beings and their physical environment, the use of land, building of cities and ecosystem changes in selected locales and regions.

Language Arts

- Students adjust their use of spoken, written and visual language (e.g., conventions, style, vocabulary) to communicate effectively with a variety of audiences and for different purposes.
- Students apply knowledge of language structure, language conventions (e.g., spelling and punctuation), media techniques, figurative language and genre to create, critique and discuss print and nonprint texts.

Scope

- 3 class periods (30 to 45 minutes each)

Materials

- **Article:** "Thinking green, building green."
- **Interview:** "Interview with Julie Denver."
- **Worksheet:** "Peer review."
- Print out images and descriptions of green building practices from the Environmental Protection Agency Web site at <http://www.epa.gov/region8/building/kids/>. You may also share this information with students by projecting the Web site in your classroom.
- Paper and pencils.
- Large sheets of drawing paper.
- Simple art supplies for drawing, coloring and labeling diagrams.
- Assessment rubric.

Lesson plan

In this lesson, students will learn about building practices that save energy and lessen the impact on the environment. They will write about their "dream green" home and draw diagrams and illustrations showing the home's features.

■ Preparation:

Before beginning the lesson:

- Have students read the article "Thinking green, building green" as homework.

■ Procedure:

Day 1 Introduce the topic of building green.

1. Discuss the article "Thinking green, building green."

Answer the questions that follow the article. In a discussion, be sure to bring up the following points:

- "Thinking green" means considering your impact on the environment.
- One reason for keeping the environment cleaner is that we will be healthier.
- Using green building practices has a major effect on energy consumption and pollution.
- Homeowners can do many things to help the environment.

2. Read an interview about one Habitat for Humanity affiliate's green practices in building homes.

Read each interview question aloud. Have student volunteers read the interview responses. Remind students that this is one affiliate's experiences with green building practices. Different affiliates may or may not be able to take the same measures. Be sure to highlight the following points in a discussion of the reading:

- This Habitat for Humanity affiliate is practicing green building in many ways, small and large.

- Green building practices can be more expensive than the old ways of building in the short term, but they are often worth the money in the long run.

3. Display images of alternative building materials and features of green buildings.

Share and discuss the images you obtained previously of green building practices (materials and features) with students.

4. Students write descriptions of their dream green home.

Tell students to think about the kind of green home they would like to live in. Ask them to imagine what it would look like, what things about the green home would save energy, and what things about the green home would keep the environment cleaner. Have students write down their descriptions. You might wish to help students brainstorm some ideas for a dream green home and list them on the board beforehand. Have students complete their descriptions as homework.

Day 2 Students complete labeled diagrams of dream green homes.

1. Students draw their dream green homes.

- Distribute large drawing paper and simple supplies to students. Direct students to use the descriptions they made the previous day to help them decide what green features their homes will have.
- Instruct students to create diagrams based on original, creative ideas.
- Remind students to label and describe the features on their diagrams. Tell them they will be presenting their diagrams in small groups. Allow students the class period to work on their diagrams. Have them finish them as homework if necessary.

Day 3 Students present their diagrams in small groups.

1. Introduce the worksheet “Peer review.”

- Divide the class into groups of three or four. Explain that students will take turns presenting their diagrams

to their small groups. Have students take a few minutes to think of and write down the message they will try to communicate during their presentations.

- Explain that as a presenter, a student’s goal is to inform and entertain the audience. Advise students to speak clearly and to share with their audience the excitement of their dream green homes. Students should speak for at least a minute but no more than three minutes.
- Explain that as a member of the audience, a student’s goal is to listen carefully. Advise students to keep their eyes on the presenter and to sit still and quietly during other students’ presentations.
- Distribute the worksheet “Peer review.” Read the directions and the peer review questions aloud, and answer any questions students might have.

2. Students present their diagrams to their groups.

- Students take turns presenting their green homes and highlighting their features. Students listening fill out peer review sheets for each member of their group.
- Collect diagrams and deliver them to your local Habitat for Humanity affiliate for display.

■ Assessment:

Evaluate student diagrams and presentations according to the rubric on Page 7. Use the worksheet “Peer review” to help score presentation and work habits.

■ Optional extension:

Hold a jean drive to collect “green” sources of insulation.

Tell students about an alternative to fiberglass insulation—jeans! Scraps of denim can be used as cotton insulation in homes. Once the jeans are sent to a recycling plant and processor, the end product is easy to work with and is not hazardous to your health. Have students hold a jean drive to collect worn denim of any kind. Contact a local Habitat for Humanity affiliate (<http://www.habitat.org/local>) to see if it might be available to partner with you for the drive.

Thinking green, building green

Green resources

Today, people are discovering ways to live that do not harm the environment. They are learning to plant trees to replace the trees they use. They are learning to use less coal, gas and oil. They are learning to “think green.”

Thinking green means considering ways to keep the environment healthy. Thinking green means thinking about the bad effects on the environment before doing something. When we talk about the environment, we talk about the air we breathe. We talk about the water we drink. We talk about the earth we use to grow food. When we take care of the environment, we take care of ourselves. When our environment is clean, we can be healthier. Future generations have a better chance to be healthy.

Green building

Building homes and other buildings is a major industry. Today, more people are thinking green about building. They are making green construction choices so homeowners save money on energy. They are making green choices to create less pollution.

The people who design buildings are called architects. More and more architects are thinking green. Green architects design houses that sit a certain way on the land. They place houses on the land so that the windows let in a lot of sunlight. Sunlight can help heat and light a home. They also may advise homeowners to use solar panels on their roofs to collect and store the sun’s energy so it can be used for electricity. For cold climates, green architects



design homes with radiant heat instead of a furnace. Homes with radiant heat have pipes inside the floors. They might also have pipes in the walls and ceilings. Hot water runs through the pipes and warms the home.

This Habitat house in Wilmington, California, will be heated with hot water.

Building a brand new house with green technology can be expensive. Many Habitat for Humanity affiliates try to make green choices while keeping costs low when building new homes. For instance, they might ensure that the house is airtight by constructing walls properly and insulating with recycled materials.

Habitat for Humanity has also created stores where builders can take reuseable building materials. At a Habitat ReStore, builders and homeowners can find used doors, windows, light fixtures and many other building supplies. These supplies are in good condition and are sold at low prices. They can use these supplies when building new houses.

Thinking green now

What about homes that are already built? Can they be greener? Habitat for Humanity encourages its new homeowners to make green choices. Homeowners can turn off the lights, computer, television or stereo when they are not in use. Homeowners can install compact fluorescent light bulbs (CFLs), which use 75 percent less energy than regular light bulbs. They can seal any cracks in their homes to reduce heat loss. Homeowners in hot climates can also plant more trees in their yard to create shade from the sun. When they need new appliances, homeowners can purchase those with an Energy Star label. These appliances use less energy than the old appliances. In these ways, all homeowners can use less energy and keep the environment cleaner.

What does it mean to “think green”?

Describe two ways people are thinking green when it comes to building and designing houses.

What are some ways homeowners can make their homes greener? Give three examples.

Interview with Julie Denver

Julie Denver* works as the executive director of a Habitat for Humanity affiliate. In this interview, she describes how her affiliate uses green building practices in the homes they build.

What does it mean for your affiliate to “build green”?

Building green can mean several things for us. It can mean designing and building a house so it uses less energy. It can mean using materials that come from areas close to the site so we use less energy to get the materials to us. It can mean building the house so that natural elements like sun, wind, trees and bushes help heat and cool it.

Why do you build houses that are more energy efficient?

Our affiliate builds green houses for many reasons. First, the monthly bills are less if the house is energy efficient. The family can save money. Second, we think building green is the right thing to do for the earth. Third, we received funding to test new materials and techniques.

How does your affiliate use green building practices when you build houses?

We first make sure the “envelope” around the house is sealed very tight. We do not want air to pass in or out of cracks in the house. We do three things to keep air from passing through. First, we put two-inch foam around the outside of the house. We seal every crack between pieces of foam with special tape. Second, we put special caulk in every crack around every piece of wood and every pipe. Third, we spray insulation inside the walls of the house to keep air from coming in or going out.

We also control the water flow in the house. The toilets are special toilets. People can choose to use a lot of water or a little water when flushing. We put in special faucets in the kitchen. We put in special faucets in the bathroom and laundry room. These faucets are called “low-flow faucets.” They use less water than other faucets.

We save electricity by putting in Energy Star appliances. Stoves, refrigerators, and washers and driers with the Energy Star label use less electricity than other appliances. We also save electricity by placing the house in a good spot. We place it where it can get a lot of sunlight when it’s cold outside. This helps keep the house warm. We put the house in a spot where it gets good shade when it’s warm outside. This helps keep the house cool.



Volunteers put up insulation in a Habitat house in Plains, Georgia.

We design the outside of the house to best use natural elements. This practice saves energy. The driveways and the sidewalks are made out of special blocks. These blocks are made from a material that lets water seep through it. That way, when it rains or snows, the water can soak back into the ground. These special blocks help prevent flooding.

We also put plants and grasses in the yards of the homes we build. We choose plants and grasses that don’t need a lot of water. We plant less grass so that less mowing is needed. Mowing pollutes the air.

When we build a house, we order materials from companies that are near the building site. That way, the trucks use less gas when they bring concrete, lumber, drywall and paint to the site.

**Names have been changed.*

What are the disadvantages right now about building green?

Right now, most green buildings cost more to build than regular buildings. Many green materials cost more. Many green construction practices cost more than building the old ways. Some parts of the mechanical system are more costly. The furnace and water heater that save energy cost more. The toilet and faucets that save water are more expensive than regular toilets and faucets. The extra foam and insulation and tape add cost to the house.

Often a donor supplies extra money to buy the more costly materials for a green house. Sometimes a donor supplies the green materials directly. When this happens, the price of the green home remains affordable for Habitat families.

Some of the techniques take extra time. Putting up extra foam and insulation and tape can increase the time it takes to build a house. We often use volunteers to complete these tasks. Using volunteers helps keep the house affordable for our Habitat families.

To receive certification for green building also costs more money because it requires special permits and inspections. We have to pay people to do special tests on the house. We have to meet certain standards to be considered green by an outside rating organization.



Plants and trees in a Habitat neighborhood in LaGrange, Georgia.

What would the perfect energy-efficient home look like?

The perfect energy-efficient home could look like almost any other home. At our affiliate, our goal is to use green materials and techniques in every house we build. If more people use green materials and building methods, then we believe the cost of the green materials will go down. If more people use these materials and methods, soon all houses can be green and also be affordable. Eventually, throughout the country, green won't be a special way to build. Green will be the way everyone builds homes.

Worksheet: Peer review

Directions: Meet with your group. Take turns describing your green homes. Show your group members the diagram you have drawn. Listen to your group members describe their green homes. Rate each person in your group by answering the questions below.

Presenter's name _____

The presenter's green home diagram was (circle one) amazing / very good / good in some ways / okay.

The presenter's message was (circle one) very clear / clear / sometimes clear / not very clear.

The presenter made this presentation (circle one) a lot of fun / fun / sometimes fun / not much fun.

When I did my presentation,
this person listened (circle one) all of the time / most of the time / some of the time / not much of the time.

.....

Presenter's name _____

The presenter's green home diagram was (circle one) amazing / very good / good in some ways / okay.

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this person listened (circle one) all of the time / most of the time / some of the time / not much of the time.

Rubric: Building green

	5	4	3	2	1
Content	Diagram and labels show understanding, analysis and synthesis of reading materials.	Diagram and labels show understanding of reading materials.	Diagram and labels show some understanding of reading materials.	Diagram and labels show little understanding of reading materials.	Diagram shows no understanding of reading materials, or student does not complete assignment.
Creativity	Student approaches project eagerly and with original thought.	Project displays original thought.	Project shows some original thought.	Project shows little original thought.	Student shows little interest in creating an original project or copies another student's idea.
Presentation	Delivery is confident, clear and engaging. Student shows high awareness of audience.	Delivery is clear and engaging.	Delivery is clear, but student does not always seem able to keep audience's attention.	Delivery is unclear, and student shows little awareness of the audience.	Student shows little interest in presentation or does not take part in presentation.
Work habits	Student is highly focused, listens attentively and provides insightful feedback.	Student is focused, listens attentively and provides accurate feedback.	Student is somewhat focused, listens fairly attentively and provides somewhat accurate feedback.	Student must be asked repeatedly to focus, listen and provide feedback.	Student shows little interest in completing the assignment, listening or providing feedback, or does not complete assignment.