



2ND GRADE

STEAM & SOCIAL STUDIES





WE BUILT THIS SCHOOL

Driving Question:

How can we design a sustainable school?

Materials Needed:

Notebook to record plans/ observations and summarize results, writing utensils, manila or colored construction paper, large collection of recycled materials available for model building (e.g., cardboard, plastic and paper products), glue, tape and fasteners, cameras or digital devices with cameras

In this lesson, students will:

- compose three dimensional solids with given properties or attributes;
- identify and demonstrate how to use, conserve, and dispose of natural resources and materials;
- identify and explain a problem and propose a task and solution for the problem;
- combine materials that, when put together, do things they otherwise could not by themselves;
- justify the selection of those materials based on their physical properties, while building a sustainable school model; and
- identify ways people can conserve and replenish natural resources.

National Learning Standards:

Science: K-2-ETS1-1; K-2-ETS1-2

Math: 2.G.A.1

Social Studies: III,g

Art: Cr1.1.2a; Cr3.1.2a



SPINNING THE COCOON

Sustainability is about making a conscious effort to meet the needs of the present without compromising future generations. This is important to teach children at a young age. Sustainability goes beyond basic recycling to build thoughtfulness into our choices about how we treat our environment.

Use the following analogy to help students understand sustainability thinking. Break students into pairs and tell each pair to create a paper cylinder tube and a paper cone. Tell the students to study the two shapes and compare them using a Venn diagram in their journals. Then bring the group together and discuss their findings. Ask, “What do you notice about the two ends of each solid?” Record their answers on the board. They should notice that the cylinder has two openings

that are the same size, and the cone has one end that is large and open, and the other end is small and/or closed. On their cylinder have them write “present” on one open end and “future” on the other open end. On the cone have them write “present” on the large open end and “future” on the small closed end.

Next, explain that sustainability thinking is like the cylinder. We want to ensure the choices we make in the present allow for an equal amount of choices or opportunities in the future. Then ask, “How is the cone different?” Explain that if we make poor choices and use up too many of our resources, then we limit choices and resources for the future. Tell students to talk with their partner about what they understand about sustainability.

Review key vocabulary before continuing with the exploration.

- **Sustainable** means capable of being maintained at a steady level without using up natural resources or causing severe damage to the environment.
- **Replenish** means to replace what is used.
- **Natural resource** is what people can use from the natural environment including land, water, soil, plants, and animals.

KERNEL OF KNOWLEDGE

The Texas-based company Austin Footwear Labs produces stylish shoes made from 50% recycled tire rubber, which makes for great footwear and also keeps tires out of landfills.



METAMORPHOSIS

Show students the [video](#) *What is Sustainable Development?* by UNICEF. Begin a class discussion to generate ideas for how we can make more sustainable choices. Next, ask the students to think about how a school could be built to be sustainable. Allow students to call out things that they might see in a sustainable school and make a list of their ideas on the board.

Divide students into small groups and provide them materials to build a model of a sustainable school. Give students plenty of time to build and revise their designs. Remind them to create a school that will meet the needs of today's students while not limiting resources for the future generations. As the students are creating their models, talk with them about their creative choices such as color and materials. Also, discuss principles of design with the students – particularly balance. Ask, “What does it mean for a work of art to be balanced?” Discuss some examples of visually pleasing and sustainable architecture using an [article](#) from the HuffPost titled *10 Most Sustainable Architectural Projects of 2016*. You can find additional examples on Pinterest if you would like to create your own slideshow.

Remind students that if they use natural resources in their model, then they should come up with a plan to replenish those resources. Encourage students to identify ways their new school can conserve resources. Students should take a photo of their new school model and put it in their notebooks with a written description of their school and why it is sustainable. If possible, display the models in the school so that others can view them.

UPCYCLE

Students should take a digital photo of their school model and upload it to the app ChatterPix. Have them create a script of what they want to say about their sustainable school and its features. Then, they can record their own voice in the app and make the photo of their model talk. These videos can be shared with peers.



THROUGH THE LENS

Students should take digital pictures of their designs and write about it in their notebooks, including why their new school is sustainable. Digital photos and descriptions can be made into a class slideshow to share with their peers and on social media.



eARTh

A week prior to this lesson, ask students to bring in reusable materials that they might have thrown away such as food bags, lids, bottles, etc. Anything that is not perishable will work. Try to have extra materials that you have collected as well for students who might not be able to bring anything to class.

As you learned earlier in the lesson, a company called Austin Footwear Labs creates shoes that are made from 50% recycled tire rubber! Ask students to share ideas about other upcycled, or repurposed materials that could be used to make shoes.

Following the discussion, instruct students to make some sketches of ideas for shoes made from upcycled or repurposed material. Allow them to be creative as possible – there are no wrong ideas! Once they have made at least 5 different sketches, have them begin to create the shoe from the materials that they brought, or that you have available. When finished, they should share their work with the class and discuss the choices that they made and why their shoes would be successful.

Community Garden

- Take some time to do a little research with your students about your school.
- What types of efforts are being made to become more sustainable? Ask, “How can you alter your lifestyle in order to help in becoming more sustainable?”
- The Green Education Foundation offers some great examples of how students and teachers can work together to create a more sustainable school. You can access these examples [online](#).
- Together with your students, choose at least three things that you will all do to create a more sustainable school. Create posters to bring awareness to the rest of the school and work to implement your efforts school wide. Remember, the more people are educated on the need for sustainability, the more likely they will be to join in. Reiterate this to your students, and brainstorm different ways to spread this knowledge. For example, you could have an art show that focuses on the importance of sustainability and use the profits to help your school move toward more green practices. Help them think of ways to include administrators, parents and other teachers in the process. Be sure to praise their efforts in working toward building a more sustainable school environment.



CAREER CONNECTION

Architect - An architect is a person who designs buildings and, in many cases, also oversees their construction. This job requires at least a bachelor's degree in architecture.

Waste Management Professional - Waste management professionals are involved with the disposal of waste. Often they are passionate about developing green environmental technologies and innovative disposal and recycling solutions. Jobs in waste management vary, but a high school diploma is required for disposal specialists and a bachelor's degree in environmental management is required for higher level jobs.



CAREER HIGHLIGHT

Co-author of *Cradle to Cradle*, William McDonough is a leader in sustainable development and design. McDonough is working to remove the concept of “waste” from every aspect of human life. For McDonough, green building and innovation present viable solutions to current environmental crises while promoting economic growth. McDonough is the co-founder of the Make It Right Foundation and Cradle to Cradle Products Innovation Institute.

