

Sustainable Classrooms™



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Acknowledgments

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Message from the Director

We make choices every day—in our classrooms, households, and workplaces—that impact our Earth, our health, and the resources we need to grow and thrive. Our lifestyle habits around energy, water, food, solid waste, transportation, and air quality can strain ecosystems. To change that, we need a culture of sustainable living that begins early in life so that we don’t have to manage it later in life, a culture that safeguards not only our environment but protects social equity and the economy as well—“people, profit, planet.”

Sustainable Classrooms is designed to meet that challenge by ensuring sustainable living education is a priority. By empowering teachers to integrate sustainable living principles into their classrooms year-round and encouraging students to think creatively about how to make more resource-conscious decisions in their lives, we can ensure today’s youth are tomorrow’s stewards and leaders. Saving the world begins with this kind of inspiration, with teachers who care, and with school communities who support them.

On behalf of our partners, welcome to Sustainable Classrooms.

Todd Lawrence

Todd Lawrence
Executive Director, Urban Green Lab





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01



Putting Sustainability on the Map

→ 45 MINUTES—02 PERIODS

Standards Addressed

6.LS4.2

Design a possible solution for maintaining biodiversity of ecosystems while still providing necessary human resources without disrupting environmental equilibrium.

6.ESS3.3

Assess the impacts of human activities on the biosphere including conservation, habitat management, species endangerment, and extinction.

The Four C’s

COLLABORATION

Students will work responsibly in groups to collectively develop ideas while completing their resource maps.

COMMUNICATION

Students will justify the connections made across their resource maps.

CREATIVITY

Students will generate connections between resources to create an original resource map.

CRITICAL THINKING

Students will apply knowledge about the benefits of natural resources to understand the importance of sustainability.

STEM Careers

URBAN PLANNER

Develop plans and programs to get the best use of the land resources for residential, commercial, educational, or recreational means to meet community needs.

SUSTAINABILITY MANAGER

Helps businesses and other institutions find innovative ways to save resources that protect the planet and reduce company costs.

Objectives

ONE

Students will understand how sustainable living practices maintain ecosystem equilibrium while providing humans with the resources they need to live.

TWO

Students will create connections between how humans use natural resources and the resulting impact on the environment, economy, and society.

Background for Teachers

Sustainability is about protecting natural resources. According to the United Nations, the term is defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs. Sustainability is often framed in terms of three core pillars: the environment, the economy, and society (or “People, Profit, Planet”).

Sustainable living is a lifestyle found at the balanced intersection of all three pillars where people try to reduce their impact—or “footprint”—on the Earth by reducing unnecessary waste of Earth’s natural resources. Increased awareness of how natural resources are interconnected and used daily can result in a more

conscious effort to reduce resource waste. The sustainable management of natural resources is not only important for meeting human needs, but for protecting ecosystem biodiversity as well. **Biodiversity**, the variety of life in a particular ecosystem, boosts productivity and is critical for maintaining the basic planetary life support systems we rely on every day. Human activities that use natural resources unsustainably can threaten biodiversity and degrade ecosystems; examples include deforestation, overexploitation, and pollution. Therefore, we all have the power to take individual actions that can directly impact the availability of resources for current and future generations.

01

**MATERIALS**

1 per group

**1 POSTER BOARD**
or large sheet
of butcher paper**1 SET OF MARKERS****1 ROLL OF TAPE****3-6 RESOURCE
CARDS****Warm-Up** 15 minutes

- 1 Introduce the unit to the class. Over the next seven weeks, students will be learning about the Earth's natural resources and sustainable living practices for conserving these resources.
- 2 Write sustainability on the board.

Student Turn & Talk

What does sustainability mean? If unsure, what can you infer that it might mean by breaking the word into two words: sustain and ability?

MINI LESSON

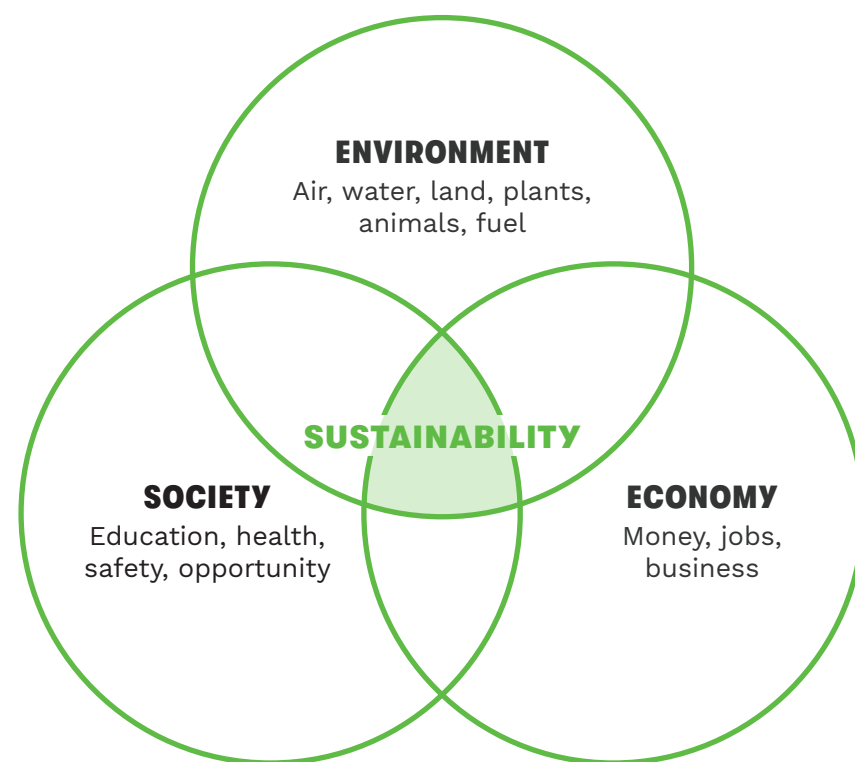
- **Natural resources** are things that are found in nature and are valuable to humans. Natural resources include energy, water, food, air, land, raw materials, etc. Natural resources are also important for maintaining the **biodiversity** of animals and plants in an ecosystem.
- Humans use natural resources every day for activities as simple as breathing and as complex as building cities. Not all humans have equal access to every natural resource for a variety of factors, such as resource availability and affordability.
- Some natural resources are **renewable** and some are **nonrenewable**. Renewable resources are often considered infinite, while nonrenewable resources are considered finite, meaning there is a limited amount available.
- **Sustainable living** means choosing to use natural resources in a way that meets our current needs, while making sure those same resources will be available for future generations. Our choices regarding how we use these resources impact the **environment**, the **economy**, and **society**. These three areas are known as the **pillars of sustainability**.

OPTIONAL 4 minutes

Supplement the Mini Lesson with the video **Resources: Welcome to the Neighborhood** by Crash Course Kids

Activity 25 minutes

- 1 Draw the three pillars of sustainability (environment, economy, society) in a large triple Venn diagram on the white board, or use hula hoops on the ground.



Teacher Instruction

Today, you will work in groups to categorize resources. Each group will receive a set of resource cards. After reading the cards, decide where each card belongs in the Venn diagram on the board. Some cards may seem to fit in more than one area of the Venn diagram, so be ready to explain your group's decisions.

- 2 Divide students into small groups. Give each group a set of at least three (3) resource cards.
- 3 Allow groups up to five minutes to discuss their cards and tape them on the Venn diagram.

Student Turn & Talk

Why are resources divided across the environment, economy, and society, and not all in one category? Which placements do you agree or disagree with, and why?

Teacher Instruction

Next, we are going to make a resource map. As a group, you will choose six resources from the diagram which you use the most of in your own lives. Write those six resources spread out across a large sheet of paper.

- 4 Give each group a large sheet of butcher paper or poster board and a marker.
- 5 Allow groups up to two minutes to select and write six resources on their maps.

Teacher Instruction

Next, think about connections between the resources you wrote on your map. For example, “water” and “food” are connected because plants and animals need water before they can produce—or turn into—food. Draw lines between resources and write a sentence along each line explaining how they connect.

- 6 Monitor groups for 10 minutes as they complete their maps. If time allows, encourage students to illustrate them.

Teacher Instruction

On your map, choose one resource as a group. Think about how your map would change if that resource no longer existed. One person in each group will become the spokesperson and present to the class what would happen if that one resource disappeared. Would the disappearance affect other resources?

- 7 Allow groups two minutes to prepare their presentations. Allow each group one minute to present.

KEY POINT

The resources we use every day are all connected. Our resources and how we use them have an impact on the environment, our economy and society, and sometimes two or all three of these areas. So when we use one resource, we have to think about how it will affect other resources. A goal of sustainability is to choose how we use our resources so that we do not overuse them and make sure we have enough for the future.

**The greatest threat
to our planet is the
belief that someone
else will save it.**

—ROBERT SWAN





Student Turn & Talk

Based on what you have learned, how would you define sustainability in your own words?

Exit Ticket 5 minutes

Choose one of the resources used today and answer these two questions:

- 1 Where does this resource belong in the three categories of sustainability?
- 2 Name one other resource that depends on the resource you selected.

Home Investigation

After each Sustainable Classrooms lesson over the next six weeks, students will take home a Home Investigation on each of the topics of sustainable living: energy, water, food, solid waste, transportation, and air quality. These Home Investigations are designed to help students identify how these resources are being used at home, as well as give students the tools to reduce waste and live more sustainably

After Lesson 1, encourage students to ask their families about the meaning of sustainability and investigate what is already being done at home to save resources like energy, water, and food. Send the Letter to Families about Sustainable Classrooms via email to parents and guardians. This email includes a link to Urban Green Lab’s Resources web page with information on waste-reduction services in their area.

Additional Activities



Writing Assignment

Choose one resource from your resource map created in class. Describe what would happen if this resource didn’t exist in the future. What impact would it have on the environment, economy, and society if this resource was no longer available. What solutions might humans create to replace the resource?



Career Connection

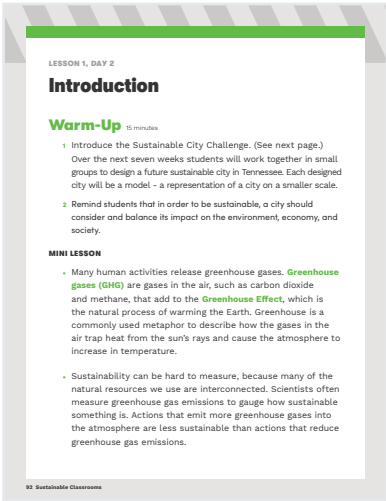
Choose a career to research and put together a presentation as if preparing for a future sustainability career fair.

- Sustainability Manager
- Urban Planner

DAY 02

Sustainable City Challenge

Refer to pages 92-95.



References

Along with original ideas from the Advisory Council, Steering Committee and Urban Green Lab staff, the Sustainable Classrooms lessons and materials were created referencing the following materials.

LESSON 1: INTRO

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LESSON 2: ENERGY

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American Forest Foundation. *Every Drop Counts*. Project Learning Tree: PreK-8 Environmental Education Activity Guide. ©2012

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EcoRise Youth Innovations. *Drip, Drip, Drop*. U.S. Green Building Council: Learning Lab. ©2018

LESSON 4: FOOD

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LESSON 5: SOLID WASTE

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Tennessee Department of Environment and Conservation. *2015-2025 Solid Waste and Materials Management Plan*. Accessed May 30, 2018 from https://www.tn.gov/content/dam/tn/environment/solid-waste/documents/sw_2025-plan-final.pdf

LESSON 6: TRANSPORT

Bradley, M. J., et al. (2007). *Comparison of Energy Use and CO2 Emissions from Different Transportation Modes*. Accessed May 30, 2018 from <https://jamesrivertrans.com/wp-content/uploads/2012/05/ComparativeEnergy.pdf>

Davis, R.L., (2016). *Tennessee Statewide Litter Study Final Report*. Accessed March 15, 2019.

Environmental Protection Agency. *Emission Factors for Greenhouse Gas Inventories*. Accessed May 30, 2018 from https://www.epa.gov/sites/production/files/2015-12/documents/emission-factors_nov_2015.pdf

LESSON 7: AIR

EcoRise Youth Innovations. *Air Quality Index*. U.S. Green Building Council: Learning Lab. ©2018

Educational and Community Resources

A list of curated educational resources in your area that complement this curriculum can be found on the Urban Green Lab website. These include nonprofits, businesses, and government departments that have materials or services to help supplement your instruction, often at no cost. Urban Green Lab is also pleased to help connect you with organizations to plan a field trip.

➔ www.urbangreenlab.org/teacherresources

Special Thanks

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