Curriculum Guide

Sustainability Foundations: Plants, Animals, and Our World™

- **Recommended Grade Level:** 5th–8th Grade
- **Total Time:** 4 lessons, 15 minutes each
- **Subject Fit:** Science, Economics, CTE, Social Studies
- **Standards Alignment:** Next Generation Science Standards (NGSS), Collaborative for Academic, Social, and Emotional Learning (CASEL), Common Core - ELA

COURSE DESCRIPTION

This course will introduce learners to the concept that our world is made up of interconnected systems, governed by natural principles. Students will learn the relevant science behind this interconnectedness, and the impact that their choices have on these systems. This course will give students many opportunities to practice making sustainable choices, reinforcing the concept that they have agency to create sustainable change.

This course will be grounded in both National and State standards as appropriate. The content will cut across disciplines and subjects to support the widest teacher adoption and implementation possible.

COURSE OVERVIEW

TOPIC AREAS
Global Systems
Personal Responsibility
Social Responsibility
Biodiversity
Interconnected and Interdependent Systems

COURSE STRUCTURE

Pre-survey	Sustaining Global Resources	Protecting Healthy Biodiversity	Positively Impacting Climate Change	Innovating for a Healthy Life	Post-survey

Each lesson is approximately 15 minutes.

DETAILED COURSE OUTLINE

Lesson: Sustaining Global Resources

Students will understand the importance of natural laws in complex systems and how they relate to global resources. Students will understand that all systems have limits, and that healthy systems live within their limits.

Learning Objectives

Students will be able to...

- Describe the natural limits of resources, and how those limits contribute to healthy systems.
- Identify renewable and non-renewable resources.
- Describe a product's life cycle.
- Make creative choices that respect the physical law of limits to address the impact and cycle of resource usage.

ACTIVITY TOPIC	ACTIVITY DESCRIPTION
Introduction	Students see symbolic representation of how systems, such as land, air, water and animals are connected. Students see themselves as part of those systems and in a reciprocal relationship with all the other parts. The topic of global resources is introduced by exploring renewable and nonrenewable resources. The purpose is to introduce resources, define renewable/nonrenewable, and put students in the frame of mind to think about resources as they begin to envision the world they want to live in.
Model	Students are presented with the information they need to know to create the world they want to live in as it relates to resources. Specifically, the concept of limits is defined and put into the context of resources and how the choices that students make have an impact on the living systems upon which we depend. Students understand that our choices about resource consumption have an impact on all living things because we are interdependent with them.
Application	Students understand that resources have limits by exploring their life cycle. The following concepts are explained: renewable and nonrenewable resources, carrying capacity, overloaded and underloaded systems, how systems affect each other, how choices are related to life cycles, how overloaded and underloaded systems degrade.
Reflection	Students understand that there is only so much of any resource at a given time for us to share and how we use that resource matters in terms of its limits, renewal rates, and the influence of time in relation to limits.

ACTIVITY TOPIC	ACTIVITY DESCRIPTION
	Students carry out an action plan in the real world that connects their choices to the world they want to create through their use of resources. Students craft a social contract about use of common resources.

Lesson: Protecting Healthy Biodiversity

Students will understand the importance of diversity in complex systems. Biological and other diversity makes systems stronger and healthier.

Learning Objectives

Students will be able to...

- Explore the importance of biodiversity and the balance of all living organisms.
- Understand the specific role that humans play in maintaining healthy biodiversity.
- Define biomimicry and explore how we can leverage it to solve our sustainability challenges.
- Develop a pledge around conscious consumption to rebalance and maintain our biodiversity.

ACTIVITY TOPIC	ACTIVITY DESCRIPTION
Introduction	Students will understand that all living things are interconnected, interdependent on each other, and that everything we do and don't do makes a difference. Relationships are reciprocal, and all living things, including students taking this course, have a unique role to play.
Model	Students explore the kind of world they want to live in, in the context of animal welfare. Students will understand that every species has a specific role to play in nature and contributes to biodiversity. Students will understand the conditions that support biodiversity as well as the conditions that inhibit biodiversity. Students are exposed to a vision of the favorable conditions necessary for biodiversity in an attainable way.
Application	Students explore the choices they can make that have an impact on biodiversity.
Reflection	Students create a pledge using the vision of biodiversity and favorable conditions.

Lesson: Positively Impacting Climate Change

Students will understand the importance of materials on complex systems, and specifically how CO2 relates to climate change. Students will understand that climate change can be reversed.

Learning Objectives

Students will be able to...

- Hypothesize about what it will take to contribute to the restoration and regeneration of a virtual place they created.
- Explain Earth's natural balance (dynamic equilibrium) of greenhouse gases and gas absorption or capture.
- Develop a pledge that will reduce our over-production of CO2 equivalents in the atmosphere using information learned from the course.

ACTIVITY TOPIC	ACTIVITY DESCRIPTION
Introduction	Students are introduced to the importance of place in the context of climate, as well as key terms such as greenhouse gases, global warming and climate change.
Model	Students explore the kind of world they want to live in, in the context of climate change. Students understand the impact of CO2, illustrating where it comes from, the impact it has on the air, and the impact it has on other living systems.
	Students categorize and rank action items on the micro-level, such as personal choices at home, and the macro-level, such as social choices within their community and global choices within government and businesses.
Application	Students are able to see their choices against several other courses of action, or lack thereof, that impact CO2 levels and climate change overall.
Reflection	Students create a pledge to take action as it relates to global warming and climate change.

Lesson: Innovating for a Healthy Life

Students will understand the importance of adaptability in complex systems and how adaptability relates to human health.

Learning Objectives

Students will be able to...

- Describe the complexity of needs required to keep human life healthy.
- Explain the importance of caring for a shared resource set to make a healthy life possible for everyone.
- Define adaptability and delineate between adapting to decline and adapting for sustainability.
- Reconcile individual rights with collective responsibilities through a pledge.

ACTIVITY TOPIC	ACTIVITY DESCRIPTION
Introduction	Students think about all the things it takes to live a healthy life and how we have to work for equitable access.

ACTIVITY TOPIC	ACTIVITY DESCRIPTION
	Students explore how adaptability helps all living things, including humans, survive and even thrive over time, including adapting what we consume. Students are introduced to the concept of “survival of the fittest” as a means to adaptability. Students visualize that humans are dependent on our shared natural resource base (the natural commons) for life—things like food.
Model	Students understand that Innovation is key to adaptation. We get creative to thrive, not just cope with decline. Students identify that our physical, mental, and emotional health depend on the health of our physical and social environment, on the health of the foods we eat, and on our opportunity to move. Students understand that our physical and mental health are interdependent on one another, and our ability to unleash our potential is dependent on our physical and mental health.
Application	Students identify the components of a healthy community.
Reflection	Students make a pledge to themselves to adapt to thrive, not cope with decline.