

# Value of a Tree

## Correlated Standards by Grade

NGSS=Next Generation Science Standards, ACOS=Alabama Course of Study, GPS=Georgia Performance Standards, GSE=Georgia Standards of Excellence, MSF=Mississippi Science Framework, TASS=Tennessee Academic Standards for Science



### Grade 2

#### **NGSS**

2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats..

#### **ACOS**

SC.2.7. Obtain information from literature and other media to illustrate that there are many different kinds of living things and that they exist in different places on land and in water.

#### **MSF**

#### **TASS**

2.ETS1,1, Define a simple problem that can be solved through the development of a new or improved object or tool by asking questions, making observations, and gather accurate information about a situation people want to change.

#### **GPS.**

S2CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

S2CS4. Students will use the ideas of system, model, change, and scale in exploring scientific and technological matters.

S2CS5. Students will communicate scientific ideas and activities clearly.

S2CS7. Students will understand the important features of the process of scientific inquiry.

### Grade 3

#### **NGSS**

#### **ACOS**

#### **MSF**

3.I.1. Apply concepts involved in a scientific investigation.

#### **TASS**

#### **GSE**

S3L2. Obtain, evaluate, and communicate information about the effects of pollution and humans on the environment.

#### **GPS**

S3L2. Students will recognize the effects of pollution and humans on the environment.

S3CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

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S3CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

S3CS6. Students will question scientific claims and arguments effectively.

S3CS8. Students will understand the important features of the process of scientific inquiry.

S3CS7. Students will be familiar with the character of scientific knowledge and how it is achieved.

### Grade 4

#### **NGSS**

4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.

#### **ACOS**

SC.4.15. Analyze and interpret data to determine effects of weathering and rate of erosion by water, ice, wind, and vegetation using one single form of weathering or erosion at a time.

#### **MSF**

4.ES.4.G. Summarize the process that results in deposits of fossil fuels and conclude why fossil fuels are classified as nonrenewable resources.

#### **TASS**

4.LS2.1. Support an argument with evidence that plants get the materials they need for growth and reproduction chiefly through a process in which they use carbon dioxide from the air, water, and energy from the sun to produce sugars, plant materials, and waste (oxygen); and that this process is called photosynthesis.

4.ETS2.2. Determine the effectiveness of multiple solutions to a design problem given the criteria and the constraints.

4.ESS3.1. Obtain and combine information to describe that energy and fuels are derived from natural resources and that some energy and fuel sources are renewable and some are not.

#### **GSE**

#### **GPS**

S4CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

S4CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

S4CS6. Students will question scientific claims and arguments effectively.

S4CS7. Students will be familiar with the character of scientific knowledge and how it is achieved.

S4CS8. Students will understand the important features of the process of scientific inquiry.

### Grade 5

#### **NGSS**

5-ESS3-1. Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.

#### **ACOS**

SC.5.16. Collect and organize scientific ideas that individuals and communities can use to protect Earth's natural resources and its environment.

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## **MFS**

5.ES.4.G. Conclude that the supply of many Earth resources is limited and critique a plan to extend the use of Earth's resources.

## **TASS**

4.ESS3.1. Obtain and combine information to describe that energy and fuels are derived from natural resources and that some energy and fuel sources are renewable and some are not.

## **GSE**

## **GPS**

S5CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

S5CS4. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

S5CS6. Students will question scientific claims and arguments effectively.

S5CS7. Students will be familiar with the character of scientific knowledge and how it is achieved.

S5CS8. Students will understand the important features of the process of scientific inquiry.

S6E6. Students will describe various sources of energy and with their uses and conservation.

## Middle School

## **NGSS**

MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

MS-LS2-1. Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.

MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

MS-ESS3-4. Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

## **ACOS**

SC.7.6. Analyze and interpret data to provide evidence regarding how resource availability impacts individual organisms as well as populations of organisms within an ecosystem.

SC.6.16. Implement scientific principles to design processes for monitoring and minimizing human impact on the environment.

## **MFS**

6.ESS.4.G. Research and cite evidence of current resources in Earth's systems.

7.ESS.4.A. Justify the importance of Earth materials to humans.

8.ESS.4.D. Research the importance of the conservation of renewable and nonrenewable resources, including Mississippi, and justify methods that might be useful in decreasing the human impact on global warming.

7.ESS.4.D. Conclude why factors, such as lack of resources and climate can limit the growth of populations in specific niches in the ecosystem.

## **TASS**

6.ESS3.2. Investigate and compare existing and developing technologies that utilize renewable and alternative energy resources.

6.LS2.3. Draw conclusions about the transfer of energy through a food web and energy pyramid in an ecosystem.

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6.ESS3.3. Assess the impacts of human activities on the biosphere including conservation, habitat management, species endangerment, and extinction.

7.LS1.6. Develop an argument based on empirical evidence and scientific reasoning to explain how behavioral and structural adaptations in animals and plants affect the probability of survival and reproductive success.

## **GSE**

S6E6. Obtain, evaluate, and communicate information about the uses and conservation of various natural resources and how they impact the Earth.

## **GPS**

S6-8CS1. Students will be aware of the importance of curiosity, honesty, openness, and skepticism in science and will exhibit these traits in their own efforts to understand how the world works.

S6-8CS5. Students will use ideas of system, model, change, and scale in exploring scientific and technological matters.

S6-8CS7. Students will question scientific claims and arguments effectively.

S6-8CS8. Students will be familiar with the character of scientific knowledge and how it is achieved.

S6-8CS9. Students will understand the important features of the process of scientific inquiry.

## High School

## **NGSS**

HS-ESS2-6. Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.

HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

## **ACOS**

PS.HS.8. Develop and use models to describe the cycling of matter (carbon, nitrogen, water) and flow of energy between abiotic and biotic factors in ecosystems.

BIO.HS.6. Analyze and interpret data from investigations to explain the role of products and reactants of photosynthesis and cellular respiration in the cycling of matter and the flow of energy.

ES.HS.2. Use models to illustrate and communicate the role of photosynthesis and cellular respiration as carbon cycles through the biosphere, atmosphere, hydrosphere, and geosphere.

BIO.HS.7. Develop and use models to illustrate examples of ecological hierarchy levels, including biosphere, biome, ecosystem, community, population, and organism.

ES.HS.6. Obtain, evaluate, and communicate information to describe how human activity may affect biodiversity and genetic variation of organisms, including threatened and endangered species.

ES.HS.4. Engage in argument from evidence to evaluate how biological or physical changes within ecosystems affect the number and types of organisms, and that changing conditions may result in a new or altered ecosystem.

ES.HS.1 Investigate and analyze the use of nonrenewable energy sources and propose solutions for their impact on the environment.

ES.HS.14. Analyze cost-benefit ratios of competing solutions for developing, conserving, managing, recycling, and reusing energy and mineral resources to minimize impacts in natural systems.

## **MSF**

HS.ESS.5. Apply an understanding of ecological factors to explain relationships between Earth systems.

HS.B.3. Investigate and explain how organisms interact with their environment.

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HS.Bot.4.D. Research factors that might influence or alter plant stability and propose actions that may reduce the negative impacts of human activity.

HS.ESS.3. Discuss the impact of human activities on the environment, conservation activities, and efforts to maintain and restore ecosystems.

### **TASS**

BIO1.LS2.5. Analyze examples of ecological succession, identifying and explaining the order of events responsible for the formation of a new ecosystem in response to extreme fluctuations in environmental conditions or catastrophic events.

L.LS1.9. Construct a scientific explanation based on compiled evidence for the processes of photosynthesis, cellular respiration, and anaerobic respiration in the cycling of matter and flow of energy into and out of organisms.

### **GSE**

SB5. Obtain, evaluate, and communicate information to assess the interdependence of all organisms on one another and their environment.

### **GPS**

SBO4. Students will explore the defense systems of plants and recognize the impact of plant diseases on the biosphere.

SG5. Students will apply geologic knowledge to the use of resources in the Earth and the control of human impacts on Earth's systems.