



## Program Components and Standards

Students complete short, digital interactives tools focused on one learning objective. Each tool is grounded in both Next Generation Science Standards (NGSS) and Common Core State Standards (CCSS).

### Plant Structure

**Learning Objective:** Students will be able to label a plant's external features and know their functions.

**Tool Description:** Students will see an image of a plant with a flower. Plant and flower parts highlighted are the roots, stem, leaf, and flower. When students click on each part, information pops up for them to learn more about how the selected part is vital to the plant.

**Standards:**

NGSS 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

### Photosynthesis

**Learning Objective:** Students will be able to observe how sunlight, water, and carbon dioxide allow plants to grow and will select ideal conditions for plant growth.

**Tool Description:** Students see an image of a plant. There are three sliders – sunlight, water, and carbon dioxide. The plant will grow as you increase each of the sliders, and students will see sunlight going into the chloroplast, water going into the roots, and carbon dioxide going into the stomata of the leaves. Students will be given choices of different environments and will select the best environment for plant growth.

**Standards:**

NGSS 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

### Plant Reproduction

**Learning Objective:** Students will be able to identify the reproductive parts of a plant based on a description of their function.

**Tool Description:** Students will see a virtual “dissection” tool of a lily. As students move a slider, layers will be removed, and individual pieces will be highlighted with a statement about what the piece does. Once dissected, students will label the plant. The labeled parts are petal, stamen, pistil, stigma, style, ovary, ovule, fruit, and seed.

**Standards:**

NGSS 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

## Seed Dispersal

**Learning Objective:** Students will be able to predict the method of dispersal for different types of seeds.

**Tool Description:** Given a picture of a seed, students must decide whether the specific seed is most likely dispersed through water, wind, or by animal. They drag the seed to the correct location (all three are represented in the background/landscape).

**Standards:**

NGSS 3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment.

CCSS.ELA-LITERACY.RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

## Ecosystems

**Learning Objective:** Students will be able to identify species as consumers, producers, or decomposers; learn about invasive species; and determine which parts of an ecosystem would be altered by an invasive species.

**Tool Description:** There are two parts. First, given images of different organisms and a short description, students will sort organisms into producers, decomposers, or consumers. Next, there is an image of the Smoky Mountains ecosystem with several parts (e.g., sun, animals, lake, etc.) highlighted. Students will click on each part of the ecosystem to determine how an invasive species will impact the rest of the ecosystem.

**Standards:**

NGSS 3-LS2-1 Construct an argument that some animals form groups that help members survive.

CCSS.ELA-LITERACY.RI.3.3 Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.

## Classify the Mystery Plant

**Learning Objective:** Students will be able to use the facts gathered by all teams to classify the invasive plant species.

**Tool Description:** Students will use the facts gathered by all teams to decide which choice to make on a dichotomous key. Their decisions lead to correctly identifying the invasive plant species.

**Standards:**

NGSS 3-LS3-1 Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

CCSS.ELA-LITERACY.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

## Team Research Contributions

**Learning Objective:** Each team will work together to make observations about the mystery plant.

**Tool Description:** Students will use the facts gathered by all teams to decide which choice to make on a dichotomous key. Their decisions lead to the correctly identifying the invasive plant species.

**Standards:**

NGSS 3-LS3-2 Use evidence to support the explanation that traits can be influenced by the environment.

NGSS 3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

CCSS.ELA-LITERACY.RI.3.1 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers.

## Code Breaking

**Learning Objective:** Students will communicate with others to reach a consensus on how to break the encrypted code.

**Tool Description:** Students will break an encrypted code to find one digit of the combination locks needed to access the rescue supplies.

**Standards:** none listed

## River Crossing

**Learning Objective:** Students will be able to work with their classmates to determine which option will solve the emergency – get the park ranger safely across the river.

**Tool Description:** Students will compare four options and determine the best option to get the park ranger across the river.

**Standards:**

NGSS 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

CCSS.ELA-LITERACY.RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

## Engineering Activity

**Learning Objective:** Students will be able to use the engineering design cycle to build a tool related to the story line of the Adventure.

**Tool Description:** Students will learn about the components of the engineering design cycle. They will then use recycled materials and materials found in classrooms to rebuild a bridge that was destroyed during the Adventure.

**Standards:**

NGSS 3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

NGSS 3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

CCSS.ELA-LITERACY.RI.5.1 Quote accurately from a text when explaining what the text says explicitly and when drawing inferences from the text.

## Nonfiction Science Writing Activity

**Learning Objective:** Students will be able to communicate the information they learned in the Adventure through nonfiction writing.

**Tool Description:** Students will be able to choose between several nonfiction writing styles with suggested prompts and use a provided graphic organizer to write a reflection of what they learned.

**Standards:**

CCSS.ELA-LITERACY.W.5.3 Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

CCSS.ELA-LITERACY.W.5.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.