

Canyon Country Discovery Center

Education Programs



Four Corners School of Outdoor Education










Our education programs are standards-based and incorporate scientific and engineering practices. To make the content more meaningful to area students, programs relate to the Colorado Plateau. Most of the programs help students build understanding of concepts found in the standards. Links to the Next Generation Science Standards, Geography for Life: National Geography Standards, and the Common Core Standards are noted for each program to help integrate them into your instruction. Standard program length is generally 40-60 minutes. Programs may be modified to ensure content is level appropriate. If you have any questions about the programs please contact us.

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Quick Key

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Adaptations of Birds of the Colorado Plateau

Students observe birds on the CCDC campus and collect data to test hypotheses about how wings and flight patterns of local birds have adapted to specific habitats and foraging habits.

Grade(s): 6-12

Key words: *adaptation, habitat, collecting and analyzing data*

NGSS: MS-LS4-2; HS-LS4-4, **CCSS Connections:** MP.2

Art of Landforms



Students learn about geologic features of the Colorado Plateau by creating an artistic rendering using air-dry clay.

Grade(s): 6-12

Key words: *geology, stratigraphy, map design*

NGSS: MS-ESS1-4, MS-ESS2-1-2; **CCSS Connections:** WHST.6-8.2, SL.8.5; **Geography:** 1, 2, 3, 7

Biomes of the Colorado Plateau



Students explore biomes and vegetation zones of the Colorado Plateau and discover how they are related to climate and elevation.

Grade(s): k-12

Key words: *biome, climate, vegetation zone, modeling, interpreting data*

NGSS: K-ESS2-1; K-ESS3-1, 3-ESS2-1; 3-ESS2-2; **CCSS Connections:** MP.2; RI.5.7, SL.5.5.

Build a Model of the Grand Canyon or Shiprock



Students create a scale and color-correct model of one of these Colorado Plateau landforms using natural pigment clay and connect the model's geologic history with the geologic time scale.

Grade(s): 6-12

Key words: *geology, landform, geological formation, scale, modeling*

NGSS: MS-ESS1-4; **CCSS Connections:** WHST.6-8.1, MP.2; **Geography** 2, 4, 5, 6, 7

Caught in its Tracks

Students determine what kinds of animals have damaged a garden on the Colorado Plateau by analyzing hair samples and tracks left at the scene of the crime.

Grade(s): 6-12

Key words: *forensics, microscopy, analyzing and interpreting data*

NGSS: HS-LS2-8; **CCSS Connections:** RST.9-10.8, RST.11-12.1, RST.11-12

Clay Replicas

Using air dry clay, students make necklace pendants, replica arrowheads, and animal figurines using models from ancient local cultures.

Grade(s): k-5

Key words: *clay, archaeology, artifact, local culture*

Discovering Patterns of Inheritance

Students use random processes to generate the genetic make-up and physical traits of a “canyon clay monster,” and to discover how the environment affects these traits.

Grade(s): 6-12

Key words: *genetics, inheritance, Mendelian, modeling*

NGSS: 3-LS3-1, HS-LS3-1, 3-LS3-2; CCSS Connections: MP.2; MP.4; RP.A3; RI.5.7

Easy Weaving

Participants will be introduced to very basic cardboard loom weaving, and thus develop a greater understanding of a regional practice that created functional clothing as well as allowed for artistic expression.

Grade(s): 2-5

Key words: *social studies, weaving, local (Pueblo/Navajo) culture*

NGSS: NA; CCSS Connections: NA

Every Breath You Take

Using a homemade spirometer, students measure their lung capacity and examine environmental and health factors that affect the amount of air that is normally expelled from the lungs.

Grade(s): 3-5

Key words: *biology, lung capacity, using instruments, collecting data*

NGSS: K-2-ETS1-1, 3-5-ETS1-2; Geography: 15

Fire Force (April-October)

After observing a “controlled burn” in one of two model grassland ecosystems, students simulate heavy rainfall to determine which ecosystem best holds soil in place, reducing mudslides and other types of erosion.

Grade(s): 4-8

Key words: *ecosystem, erosion, modeling*

NGSS: 4-ESS2-1; CCSS Connections: RST.6-8.7, WHST.6-8.1, MP.2 Geography 14, 15

Fun with the Sun

Discover the hidden wonders of sunlight, use light to communicate and to power solar motors, create art using sunlight and objects of different opacity on solar print paper, and learn how the energy in light is related to its wave frequency and color.

Grade(s): k-5

Key words: *frequency, light, solar energy, sustainability, wavelength*

NGSS: K-PS3-1; 1-PS4-3; 1-PS4-4; 4-PS3-2; 4-PS3-4; CCSS **Connections:** K.MD.A2; MP.5; W.4.7

The Gist of Being a Paleontologist

Working in teams, students model a dinosaur dig, excavate layers to reveal hidden fossils, and discuss and report their findings using the same methods as field scientists.

Grade(s): 3-8

Key words: *paleontology, fossils*

NGSS: 3-LS4-1, 4-ESS1-1, 5-ESS1-4, MS LS4/LS4-1; CCSS **Connections:** RI.3.3, W.3.W, MP.5, MD.B.4, W.4.7, RST.6-8.7, WHST.6-8.2; **Geography:** 2

Intro to Topographic Maps

The mapping of the US in topographic quadrangles was initiated by John Wesley Powell, the first person to voyage down the canyons of the Green and Colorado Rivers in 1869. Students map the topography of their hands and a landscape they make from clay.

Grade(s): 3-12

Key words: *geography, topography maps, orienteering, modeling*

NGSS: 3-5-ETS1-1, MS-ETS1-1, HS-ESS3-6; **Geography:** 1, 2, 3

Lift Off

Blast off with an activity that emphasizes design and engineering. Participants design, build and launch model rockets powered by compressed air and water using plastic bottles and cardboard.

Grade(s): 3-8

Key words: *design, engineering*

NGSS: 3-5-ETS1-1; 3-5-ETS1-3; MS-ETS1-2; CCSS **Connections:** MP2; MP5

Light and Dark in Space

Students investigate how the color of a star affects its temperature and relate it to the range in which life might be able to exist.

Grade(s): 5-6

Key words: *energy, light, taking measurements, using instruments*

NGSS: 5-ESS1-1; CCSS **Connections:** W.5.1, MP.2, MP.4

Mountain Building



Students model erupting volcanoes and expanding laccoliths to learn how many of the mountain ranges on the Colorado Plateau, including the Abajo Mountains, were formed.

Grade(s): 2-8

Key words: *geology, geological formations, modeling*

NGSS: 2-ESS1-1, MS-ESS2-2; **Geography:** 7, 8, 17

The Mystery of Leaves



Students discover what leaves can reveal about their environment by taking detailed measurements of the size and shape of leaves from the Four Corners region. They apply their results to help solve a mystery dealing with a missing person and buried Spanish gold.

Grade(s): 6-12

Key words: *adaptation, environment, collecting, analyzing and interpreting data*

NGSS: MS-LS1-5; MS-PS4-2; **CCSS Connections:** MP.2; 6.RP.A.1; RST.6-8.3.

Natural Selection



Participants track the numbers of pony beads of each color from one generation to the next to understand how natural selection can cause changes in a population over time.

Grade(s): 3-12

Key words: *natural selection, modeling*

NGSS: 3-LS4-2; 5-LS4-3; MS-LS4-4; **CCSS Connections:** MP.2; W.3.7; 3.MD.B.3; 6.SP.B.5

Picking it Apart



Students analyze a model of Colorado Plateau wildlife “scat” to characterize seasonal diet shifts. We discuss how scat analysis can provide information on the health of organisms, ecosystems, and past and present climates.

Grade(s): 6-8

Key words: *ecosystem, forensics, modeling*

NGSS: MS-LS2, MS-LS2-1; **CCSS Connections:** RST.6-8.7, WHST.6-8.9, SL.8.1, SL.8.4, MP.4

Plant Illustration on the Colorado Plateau



Students learn basic plant illustration techniques, while investigating the internal and external structures of plants that support survival, growth, and reproduction within the plant kingdom.

Grade(s): 4-12

Key words: *botany, plant structure, making observations*

NGSS: 4-LS1-1, MS-LS1, LS1.A & B; **CCSS Connections:** W.4.1, WHST.6-8.7

Plunging into Pond Water



Students observe and identify the microscopic creatures living in a drop of pond water. They learn what protozoans indicate about water quality, and then design, construct, test, and evaluate a water filter.

Grade(s): 3-9

Key words: *biology, geography, microscopic, water quality, design*

NGSS: 3-5-ETS1-1; 3-LS4-3; **CCSS connections:** MP.5; W.3.7; W.4.7; W.5.7

Pollinators at Play



Students create and perform puppet theater using a Colorado Plateau butterfly, bat, bee, hummingbird, and flower puppets to illustrate “a day in the life of a pollinator” to show how important pollinators are to ecosystems.

Grade(s): k-2

Key words: *biology, ecosystem, pollination*

NGSS: 2-LS2, 2-LS2-2; **CCSS Connections:** W.2.8

Population Genetics of Puffs



Follow patterns of survival and inheritance in a population of simulated prey species (puffs) in which each individual has one of three distinct phenotypes, which may or may not be advantageous for escaping predation.

Grade(s): 9-12

Key words: *genetics, Hardy-Weinberg, natural selection, population, modeling*

NGSS: HS-LS4-2; HS-LS4-3, HS-LS4-4; **CCSS Connections:** MP.2; MP.4, RST.11-12, HSS-1C.A1.

Reaping the Wind



Participants design and build a model wind turbine that maximizes efficiency by optimizing the shape, number, and angle of blades.

Grade(s): 3-8

Key words: *energy, sustainable energy, design*

NGSS: 3-5-ETS1-1; 3-5-ETS1-3; MS-ETS1-2; **CCSS Connections:** MP2; MP5

Should I Stay or Should I Go?



Students engage in a game to learn about the hazards, natural and manmade, that migrating winged animals face and find out what characteristics and behaviors help the migrators survive.

Grade(s): 3-8

Key words: *migrate, predator, prey, hazard, structure*

NGSS: 3-LS2-1, 4-LS1-1; **CCSS Connections:** RI.3.1, W.3.1, W.4.1 ; Geography: 1

Tracks and Scat Scavenger Hunt



Many wild animals, especially mammals, are rarely seen. Students use indirect evidence (tracks and scat) to conclude which animals have visited the CCDC.

Grade(s): k-2

Key words: *using evidence to support conclusions*

NGSS: K-LS1-1, 2-LS4-1

Tangled up in Food Webs



Students gather data on the sizes and abundance of different types of plants, animals, and fungi around the CCDC, learn about how they obtain their food, and build a food web connecting them to each other. The flow of energy through food webs and the effects of feeding interactions on populations of organisms at different trophic (feeding) levels will be emphasized.

Grade(s): 6-12

Key words: *food web, collecting and interpreting data, modeling*

NGSS: MS-LS2-1; CCSS Connections: MP.2; MP.4, 6.RPA.3, HSN-Q.A.1.

Treebook



Explore the language of trees and take a journey to the past. Students learn how to read tree rings, determine climate history, and understand the effects of fire and insects on Colorado Plateau woodlands. By interpreting tree “cookies” students discover how trees help predict human water supplies and influence land management practices.

Grade(s): 5-8

Key words: *dendrochronology, climate, weather, ecosystem, tree core*

NGSS: 5-ESS2, 5-ESS2-1, MS-LS1, MS-LS1-1, MS-LS1-5; CCSS Connections: WHST.6-

8.1 Geography: 8

What the Heck is Oobleck?



Students characterize a mysterious substance that has properties of both a solid and a liquid, then make predictions about the substance and test them.

Grade(s): k-2

Key words: *states of matter, making observations, using evidence to support conclusions*

NGSS: 2-PS1-1, 2-PS-1; CCSS Connections: W.2.7, 2.MD.D.10

What's the Weather?

Explore the seasons by listening to a story and then make and record observations about the weather.

Grade(s): 2-5

Key words: *seasons, weather, making observations*

NGSS: K-ESS2-1; **Geography:** 7

Whither Cometh the Weather



Students measure temperature, relative humidity, wind speed, barometric pressure, and precipitation and compare their measurements to long-term averages from the nearest weather station, and learn how to use information like barometric pressure, the speed and direction of prevailing winds, and satellite imagery to make a short-term weather forecast.

Grade(s): 6-12

Key words: *weather, climate, weather patterns, geography, collecting and interpreting data*

NGSS: 3-ESS2-1, 3-ESS2-2, 5-ESS2-1, MS-ESS2-6; **CCSS Connections:** MP2; RI.3.7;

Geography: 1, 7, 8, 17

Wind Power

Use wind to light a light bulb. Students experiment with the number, type and angle of the blades on a model wind turbine to optimize the energy conversion in generating electricity from wind to electrical energy.

Grade(s): 3-8

Key words: *energy, sustainable energy, design*

NGSS: 3-5-ETS1-1; 3-5-ETS1-3; MS-ETS1-2; **CCSS Connections:** MP2; MP5

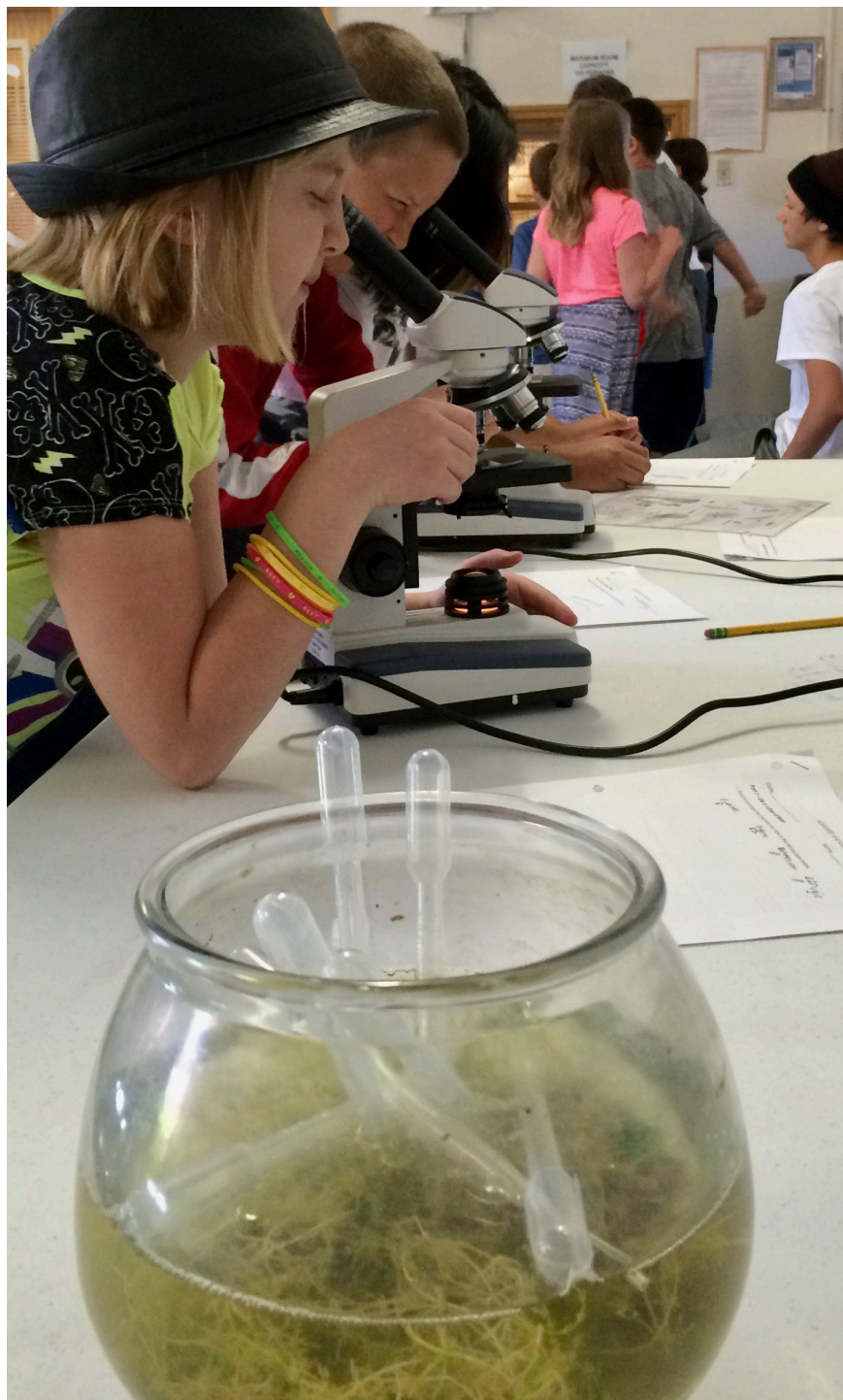
Wind Walk

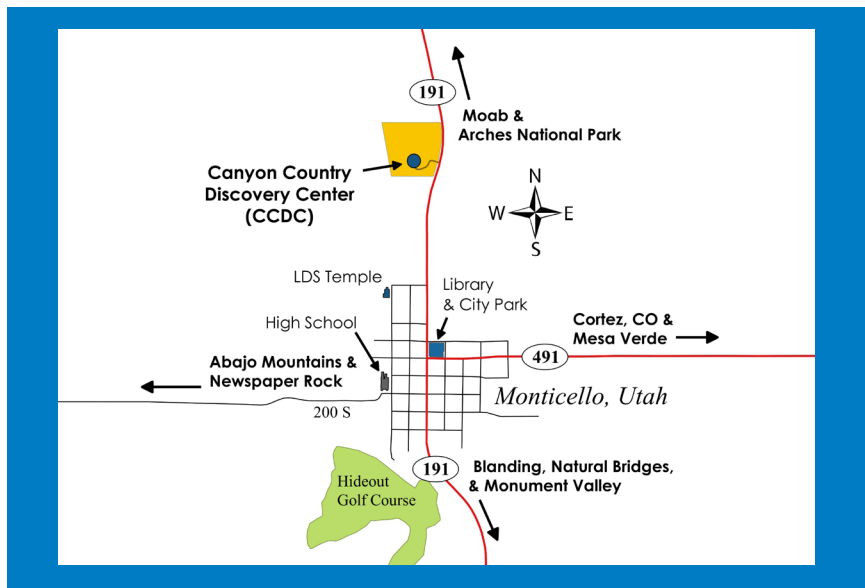
Watch wind spin giant blades, measure windspeed with a wind meter, and discover how wind energy is converted to electrical energy by observing a model turbine in action.

Grade(s): 3-8

Key words: *cardinal directions, sustainable energy, taking measurements using instruments*

NGSS: K-ESS2-1, K-ESS3-3, 5-ESS3-1, MS-ESS2-5, HS-ESS3-4; **Geography:** 7





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