ART & LITERATURE THEME

STEM Photography

This module focuses on expanding the digital photography skills of students through the creation of immersive photo experience. Students will learn a brief history of cameras and the progression of technology from film to digital. Students will learn and use consumer quality digital cameras (students may opt to use personal cell phone cameras) to capture digital photos which they use to create a panoramic landscape collage on the subject of ecology and human impacts on the environment.

EARTH SCIENCE THEME

Soils

We will be getting our hands dirty and playing in the mud for this module. Through a series of experiments on several soil types found within the camp, the students will learn about the different components and types of soil. Students will also learn about how soil affects and changes the entire micro-environment around it.

ENGINEERING & PHYSICS THEME

LEGO® Engineering Sponsored by Brix4U!

Students will learn engineering concepts through building with LEGO's. How to create a bridge design that can span the longest possible distance and determine the weight bearing load it can take. This module uses creativity with classic building design to show first-hand how the engineering feat of bridges work.

LEGO® Racers Sponsored by Brix4U!

First, it is a contest to come up with your own design to be the fastest LEGO car in the class. Then a twist and turn takes the students on a re-modification route as their guidelines change. They have to continue to be the fastest LEGO car with some serious design challenges. Fun and creative competition and team work to focus on ingenuity and design.

LEADERSHIP & TEAM BUILDING THEME

Low Ropes Course

Students will be taken on a journey of personal perils and group challenges through the course. All of the activities require no harnessing as they are no more than 3 feet off the ground. The goal of the course is to develop team building and leadership skills that will be useful throughout their lives.

Team Building Leadership Games

This succession of games and challenges are given to student teams for them to strategize and complete. The key is communication! We will work on all the necessary skills to be an effective team. The students are also given a few rules but then are left to figure out the rest to encourage out of the box and critical thinking skills. These are fun and challenging games with the end result of discovering skills that will they will need and use the rest of their lives.

Amazing Race Adventure

The groups will be given clues which they have to figure out how to get to their check point somewhere within the camp. Once at the check point, the team must successfully complete a challenge. The team must go back to home base to get another clue. At the designated stop time, the team with the most completed clues is deemed the winner!

Photo Bomb Scavenger Hunt

Scavenger hunt with a trendy twist! Groups must find the items on the list (or their interpretation of the item) and create a photo bomb picture. All groups meet back at the ending time to be scored and judged. Bonus points for creative and unique photos.

Fire & Forest Ecology

Students will learn what happens when there is a fire in the forest before, during and after the fire. We will discuss the good and bad after effects of fire to the natural community. Students will take a short hike to do data analysis of vegetation densities and observations to look for signs of previous fire.

Animal Tracks & Birding Coming Soon

Students will learn how to use their observation skills in nature specifically to find and identify animal tracks and birds. We will learn about the techniques to master and practice using binoculars on a nature hike in which we will scout out tracks and birds.

Habitat Gardens a 3-Module selection

Within an interactive outdoor classroom, students will learn about our Arizona ecology, plants and wildlife. Through hands-on activities they will explore and learn about the connections between man, nature and the world around them.

OUTDOOR DISCOVER THEME

Crayfish Engineering

Students explore the natural fluctuations that take place within a healthy ecosystem and to recognize how introducing a non-native species into a habitat can compromise the quality and diversity of the ecosystem.

Orienteering

Students will learn how to use a compass to find their way through an orienteering course. While on the course, students become part of a scientific team taking measurements and data.

Wilderness Survival

Students will learn the basic human needs for survival focusing on survival priorities; such as Shelter, fire building, water and food acquisition, signaling and first aid.

GRADE-LEVEL CONTENT PATHWAYS GRADE-LEVEL CONTENT PATHWAYS

THE GRADE-LEVEL PATHWAYS BUNDLE THE MODULES TO ADDRESS SPECIFIC GRADE-LEVEL CONTENT ACCORDING TO ARIZONA SCIENCE STANDARDS.

ADAPTATIONS *(suggested grade level: 4th)*

The adaptations pathway focuses on building students understanding of how organisms are best suited for their environment and the relationships between organisms that increase chances for survival.

Ecology Hike

Students participate in a nature walk; using their senses to make observations of the organisms that survive in the forest ecosystem and how their structures and behaviors increase the chances for survival.

Stream & Pond Ecology

Students become stream ecologists in this module and learn about the many attributes that play into the working ecosystem of a stream. We will take measurements as teams in the Tonto Creek and from a spring fed stream on camp. Students will compare and contrast the information they learned about each section of water.

Nocturnal Hike

Students explore the animals of the night through sounds and discover what it takes to have night vision. A variety of interactive activities will start in the dining hall and end at our upper field with a star viewing. Along the way, students will learn about nocturnal animals, communicate with nocturnal animals and maybe even observe nocturnal animals.

Landforms *(suggested grade level: 4th)*

The landforms pathway focuses on building student understanding of how weathering, erosion and deposition affect landforms and how the properties and composition of rocks can tell the story of how landforms have changed.

Canyons

This module was developed by and is taught by PhD students from ASU through a NASA grant. Students learn what a canyon is, how it is formed and how our Tonto Creek is a mini version of the Grand Canyon. Students take a short hike to see examples of weathering, erosion and canyons.

Forces (suggested grade level: 5th)

The forces pathway focuses on building students' understanding of forces that cause and change motion. Students will experience different learning experiences where understanding forces will increase their success.

STEM Archery

In this module, students will learn the fundamentals of beginning archery with an emphasis on safety and self-discipline for proper technique. This introduction to the sport of archery will not only allow students the opportunity to learn an Olympic sport but to also learn the science behind it. We will integrate STEM by teaching students how and why the design of the bow and arrow work for precision through design and physics concepts.

STEAM Machine

Students will learn and put into practice engineering design concepts to create a Rube Goldberg machine using 3 chain reaction steps to pop a balloon. The students will work in small groups and have to incorporate team work to be successful. In the end, we learn that failures are a chance to learn and improve your design. We will also learn about the importance of a machine having a good design for consistent performance.

THE NIGHT SKY *(suggested grade level: 5th)*

The Night Sky pathway focuses on building students understanding of the position of the Earth in the solar system and how this position impacts what we see on earth.

Astronomy Daytime Session

Students learn how to navigate the night sky though hands-on astronomy lessons about galaxies, planets and more. Students will also make star wheels and learn how to use them to find constellations and identify stars.

Astronomy Night time Session w/Telescopes

Students participate in an introductory astronomy presentation, and then through hands-on experiences they participate in solar system exploration using high powered reflecting telescopes.

ENERGY (suggested grade level: 6th)

The Energy pathway focuses on building students' understanding of the transfer and transformation of energy. They will experience alternative energy.

Energy & Solar Ovens

Students learn about using renewable energy from the sun for heating and cooking as they design and build a solar oven from cardboard. They will take measurements and compare its performance to others' designs. They explore the concepts of insulation, reflection, absorption, conduction and convection.

Energy & Solar Ovens II

Students learn about using renewable energy from the sun for heating and cooking as they design and build a solar oven from metal and compare its performance to others' designs. They explore the concepts of insulation, reflection, absorption, conduction and convection.

Solar Amusement Park Ride

Students are introduced to the world of creative engineering product design. In this activity, teams work through the steps of the engineering design process by completing an actual design challenge presented in six steps. As members of an engineering design team, students choose a theme park ride that they want to build that is run ONLY by a solar panel and simple motor.

WATER IN THE ENVIRONMENT *(suggested grade level: 6th)*

The Water in the Environment Pathway focuses on exploring sources of fresh water in and on the Earth. Students will observe the watershed in the Rim Country to understand groundwater and relate weather to the cycling of water in our environment.

Hydrology Coming Soon

This module will teach the students about ground water and the local watershed in Rim Country and how that affects them in the valley. The students will take a hike up a spring fed stream to find the source where it comes out of the ground. Measurements and data will be collected throughout the hike to make conclusions about the ground water and the water shed.

Weather & Environment Coming Soon

Students will explore the science of weather and how weather is an important factor of ecosystems. Students will learn and test a variety of weather conditions such as temperature, wind speed, humidity, etc. These elements of weather will be discussed as well as weather systems such as storms, fronts, drought and more.

Changing Earth *(suggested grade level: 7th)*

The Changing Earth Pathway focuses on building student understanding of how weathering, erosion and deposition affect landforms and how the properties and composition of rocks can tell the story of how landforms have changed.

Canyons

Students will experience canyons through a mini hike that teaches what a canyon is, how it is formed, and how the Tonto Creek is a mini version of the Grand Canyon.

Earth's Position in the Solar System *(suggested grade level: 7th)*

The Earth's Position in the Solar System Pathway focuses on building students understanding of the position of the Earth in the solar system and how this position impacts what we see on earth. Students will make observations of the night sky to make connections between the patterns we see from Earth.

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Astronomy Daytime Session

Students learn how to navigate the night sky though hands-on astronomy lessons about galaxies, planets and more. Students will also make star wheels and learn how to use them to find constellations and identify stars.

Astronomy Night-time Session w/Telescopes

Students participate in an introductory astronomy presentation, and then through hands-on experiences they participate in solar system exploration using high powered reflecting telescopes.

<u>Ecosystems</u> (suggested grade level: 7th)

The Ecosystem Pathway will focus on students making observations of the biotic and abiotic factors in the Tonto National Forest and Tonto Creek ecosystem. They will gather evidence to explain the interactions between these factors.

Ecology Hike
Students participate in a nature walk; using their senses to make observations of the organisms that survive in the forest ecosystem and how their structures and behaviors increase the chances for survival.

Stream & Pond Ecology
Students participate in hands-on activities at one of TCC's outdoor water features (pond or creek) and collect water, plants, animal life, et cetera to perform simple experiments to see how water, temperature, light and minerals affect the biotic community that exists within the pond/creek. Students participate in discussion regarding where all water comes from and make connections between natural water sources and "their" water sources (i.e. drinking fountains, bottled water, etc.)

Survival of Living Organisms *(suggested grade level: 8th)*

The Survival of Living Organisms Pathway focuses on making observations of behaviors and structures of living things. Students will analyze the data to explain how the adaptations increase the chances of survival of the organisms in the Tonto Creek ecosystem

Ecology Hike
Students participate in a nature walk; using their senses to make observations of the organisms that survive in the forest ecosystem and how their structures and behaviors increase the chances for survival.

Phenology ***Coming Soon***
Students will explore the changes in plants and animals in relation to the timing of flowering and migration and interactions with other plants and animals in the ecosystem. They will gather data to analyze the changes that increase the chances for survival.