

# Camp Tontozona STEM Module Packages

Package A	Package B	Package C
Ice Cream Matters	Mini Greenhouse, Seed Bursts & Food Web	Solar Amusement Park
Ecology Hike	Ecology Hike	Astronomy
Crayfish Engineering (Late April - Early September only)	Lego Engineering & Racers	Amazing Race
Lego Engineering & Racers	Low Ropes	Low Ropes
Archery	Archery	Stream & Pond Ecology
STEAM Machine	Solar Amusement Park	STEAM Machine

- ONE module can be substituted from a different package to your chosen package

<b>Inclement Weather Contingency Plan</b>
Aerodynamics With Paper Airplanes
Lego Engineering & Racers
Indoor Team Building
STEAM Machine
Solar Amusement Park
Ice Cream Matters
Mini Greenhouse, Seed Bursts & Food Web
Solar System Science Fair

- Will be used in the event that rain, snow, or other weather conditions prohibit the use of our outdoor facilities

## Module Descriptions

### **Aerodynamics With Paper Airplanes**

This lesson introduces students to the art of designing an airplane (aerodynamics) through paper airplane constructions. The goal is that students will learn important aircraft design considerations and how engineers must iterate their designs to achieve success. Students first follow several basic paper airplane models, after which they will then design their own paper airplane. They will also learn how engineers make models to test ideas and designs.

### **Amazing Race**

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 checkpoint, 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!

### **Astronomy Daytime Session**

Students learn how to navigate the night sky through 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 Nighttime 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.

### **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.

### **Crayfish Engineering**

The genetic engineering pathway focuses on understanding and developing possible solutions for a real Arizona problem - crayfish invasion! The Northern, Redclaw and Rusty species of crayfish are non-native species with no natural predators. Students investigate traits and behaviors of crayfish and how these traits and behaviors affect native Tonto Creek species. Students will design their own crayfish adaptations that would alter the damaging effects of the crayfish on the Arizona stream ecosystems.

### **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.

### **Ice Cream Matters**

In this lesson, the students will change matter from liquid to solid by changing the temperature. They will discover that energy causes the matter to change. They will also practice following directions and measuring with accuracy.

### **Indoor Team Building**

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 they will need and use the rest of their lives.

### **LEGO® Engineering & Racers**

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.

### **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.

### **Mini Greenhouse, Seed Bursts & Food Web**

Students become botanists with a deeper understanding of what resources are necessary for plants to thrive, what pollination is, how a pollinator fits into an ecosystem, and how easily an ecosystem is affected by a population change. Students will create their own mini-green house, seed bomb to take home and plant at home or school, and an ecosystem simulator with their classmates.

### **Solar Amusement Park**

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.

### **Solar System Science Fair**

Students will learn the basic fundamentals of astronomy by creating a project about our solar system. They will implement the facts about relative distance to create an accurately placed solar system. Students will then create their own star system and present that to the class.

### **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 teamwork 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.

### **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 from a tributary of Tonto Creek and from a spring fed pond on camp. Students will compare and contrast the information they learned about each section of water.