

TMSC Summer of STEM Adventures 2024

Week 1: June 24 - June 28

(K-2) Weather Wizards Make snow in the summer, create a model tornado, and experience mini lightning storms that will make you hair stand on end, literally! Create weather instruments to take home for your own personal weather lab!

(K-2) Robotics: Mindstorms NXT Build and program robots with LEGO® Mindstorms NXT! Use your robot to compete in challenges and solve science problems. This is a week full of teamwork, creativity, and fun!

(K-2) Girls Rock! Have you dreamed of being a scientist? Fun and engaging activities focus on discovery skills and hands on experiences - from rock IDs to biology labs to chemistry experiments. Highlights from all areas of STEAM are designed to build confidence and show that girls rock!

(3-5) The Science of Magic Discover the science behind some great tricks that can fool your friends! Use high tech and everyday objects to learn some amazing illusions. Have a great time perfecting your magic tricks and science experiments. Conjure up wondrous illusions, feats of prestidigitation, and legerdemain.

(3-5) Game Design for Gamers Explore the world of computer games by building your own! Work on several platforms and game tools to create original characters, stories, and worlds. You'll end up with your own game to play and share with your friends!

(3-5) Geocaching - Treasure Hunt! Geocaching is high-tech hide-and-seek, a modern scavenger hunt. There are hidden treasures waiting to be found in mountains, forests, waterways, cities, and parks near you! Around the world, teams have hidden "caches" of items, and it is your job to find them. Learn GPS, create your own caches, and find caches on our campus. Includes a field trip to a nearby park to test your searching skills!

(6-8) Anatomy and Physiology If you want to know how our bodies work, this course is for you! Learn about bones, muscles, and cells - of humans and other creatures. You'll get to test your strength, listen to your heart, and explore skeletons. It doesn't get more hands-on than building models and doing dissections!

(6-8) Arduino Engineering Want to get under the hood of today's electronics? Build circuits that can be used to power gadgets, games, and robots? You'll create cool stuff using an Arduino project board, LEDs, sensors, and motors. *Additional purchase of a SparkFun Arduino tinkerkit (\$55) at registration if you want to bring yours home. If not purchased, you will use ours and it will stay at TMSC.

Week 2: July 8 - July 12

(K-2) Budding Biologists Creepy crawly creatures are everywhere - and it's your job to find them! Discover life around us as you explore our mountaintop forest. You'll feel like a biologist as you examine plants and animals in the lab. Catching bugs, petting snakes, scooping pond water - what could be better?

(K-2) Robotics: Mindstorms NXT Build and program robots with LEGO® Mindstorms NXT! Use your robot to compete in challenges and solve science problems. This is a week full of teamwork, creativity, and fun!

(K-2) Physics is Fun! The way things look, move, and sound - are all due to physics! Experiment with motion, rockets, roller coasters, light, rainbows, and sound waves. Every action has a reaction, and every week of physics is fun!

(3-5) Wild Weather Put yourself (safely!) in a hair-raising lightning storm! Broadcast "live" from the crater of a volcano! Learn about some of Earth's wildest natural disasters and place yourself right in the action with our green screen - and use weather tools so you can forecast like the pros.

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(3-5) 3D Printing 3D printers have opened up a world of do-it-yourself design and manufacturing, from game pieces to prosthetics. Using CAD programs and our suite of Prusa printers, you'll be able to design and print your very own gadgets and 3D models to take home!

(3-5) Green Engineering How can the wind power your house? How can we harness the energy of water? Can you cook with sunshine? Switch on to wind, water, and solar energy! Discover how electrons energize lights and motors as you build circuits and learn how to tap into nature for power!

(6-8) The Universe Knows Math Is mathematics discovered or invented? You'll get to see how even simple mathematics is used to describe our world and everything in it. Starting with variables, you'll explore the notion of how to prove something using mathematics, and apply mathematics to everything from the spread of perfume's fragrance to the expansion of the universe.

(6-8) DNA Detectives Learn about what makes you, YOU! Featuring DNA themed crafts and games, DNA extraction, transcription/translation, Punnett squares, and even use our very own PCR and Gel Electrophoresis equipment to solve a "who-done-it" genetic mystery.

Week 3: July 16 - July 19

(K-2) Earth Explorers You live on Earth, but how much do you really know about it? Here's your chance to explore the world from our mountaintop. Learn about water cycles, rocks and minerals, fossils, the sky, and natural disasters.

(K-2) Claymation Create animated stop-motion stories with your own clay creations. You'll work independently or in a team to write a story, set up a stage, move your characters, and create an original video of their adventures!

(K-2) LEGO® Science From cars to catapults, from motors to Mars rovers, you can explore science and technology with LEGO®. Bring your creativity as you compete in challenges to create bridges, towers, and other contraptions. There is a world of possibilities when using LEGO® bricks!

(3-5) Robotics: Mindstorms EV3 Create and code custom robots with LEGO® Mindstorms EV3. You'll work in teams to tackle challenges designed to test your design and programming skills. Our bots, your brains!

(3-5) MicroSafari Want to learn more about the little critters that run the world? Join us for a "microsafari" to get hands-on experience with insects, crustaceans, reptiles, plants, and more! You will do plenty of fun crafty projects, explore the miniature world of pond water, and learn to safely handle our unusual class pets. You'll get to search the outdoors to find creatures, and examine them back in the lab.

(3-5) Lights, Camera, Action! (week 1) Ever dream of being a producer, director, or star of your own production? Now's your chance! In the first week you will work collaboratively to write scripts, create wardrobes, scout locations, and determine casting. In the second week you will film, edit, and add effects. In the end you'll have movie files to take home and share!

(6-8) 3D Printing 3D printers have opened up a world of do-it-yourself design and manufacturing, from game pieces to prosthetics. Using CAD programs and our suite of Prusa printers, you'll be able to design and print your very own gadgets and 3D models to take home!

(6-8) Darkroom Photography Photography used to be more than just point and click - here's your chance to learn to take and develop film photos, using our own dark room! You will learn the principles of photography, use chemicals in the dark room, and bring home your printed photos. You'll also learn to scan and edit your photos digitally, so you can easily share your work! You can bring your own film camera, or use the ones we provide. *Additional charge of \$25 for film at checkout

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Week 4: July 22 - July 26

(K-2) Physics is Fun! The way things look, move, and sound - are all due to physics! Experiment with motion, rockets, roller coasters, light, rainbows, and sound waves. Every action has a reaction, and every week of physics is fun!

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(3-5) Robotics: Mindstorms EV3 Create and code custom robots with LEGO® Mindstorms EV3. You'll work in teams to tackle challenges designed to test your design and programming skills. Our bots, your brains!

(3-5) Lights, Camera, Action! (week 2) Ever dream of being a producer, director, or star of your own production? Now's your chance! In the first week you will work collaboratively to write scripts, create wardrobes, scout locations, and determine casting. In the second week you will film, edit, and add effects. In the end you'll have movie files to take home and share!

(6-8) Raspberry Pi It's not dessert - learn how to assemble and program your very own RaspberryPi computer! It runs RaspberryPi OS and can connect to a keyboard, mouse, monitor, or TV. Experiment with Java, Wolfram Mathematica, GIMP graphics, and Minecraft! Please bring your own microSD card. *Optional purchase of a RaspberryPi 4 single-board computer (\$45) at registration if you want to bring yours home. If not purchased, you will use ours and it will stay at TMSC.

(6-8) Game Theory Want to figure out what it takes to win? From chess to checkers to the latest mobile games, there's strategy and psychology at play. Game theory is a mixture of math, logic, and human behavior. Even rock-paper-scissors is more complex than you may think!

Week 5: July 29 - August 2

(K-2) Astro Adventures Discover our solar system! Craft a constellation, eat a comet, and learn about space in our very own planetarium. The sun, moon, and planets wait to be explored!

(K-2) LEGO® Science From cars to catapults, from motors to Mars rovers, you can explore science and technology with LEGO®. Bring your creativity as you compete in challenges to create bridges, towers, and other contraptions. There is a world of possibilities when using LEGO® bricks!

(K-2) Pirate Science Set sail on a science-filled adventure! All aspiring buccaneers are welcome during this week of ocean-themed fun. Build boats, make maps, design your own pirate hat, and hunt for buried "treasure". Arrrrrr you ready for an exciting week?

(3-5) Girls Rock! Have you dreamed of being a scientist? Fun and engaging activities focus on discovery skills and hands on experiences - from rock IDs to biology labs to chemistry experiments. Highlights from all areas of STEAM are designed to build confidence and show that girls rock!

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(3-5) Computer Animation Through hands-on paper crafts and digital lessons, learn the fundamentals of animation, and discover how to bring your imagination to life! Our animated adventure will include guided drawing lessons, classic cel animation, stop-motion, and 2D computer animation.

(3-5) Kid Coding Learn to code on iPads with fun programming apps that let you create graphics, solve problems, and use your imagination! All apps used are open-source or freeware that you can use after the course.

(6-8) Marine Science From coral reefs to the deep sea to nearby Long Island Sound - there is so much of the ocean to explore! You will learn about geology, watersheds, tides, sea monsters, shells, and even dissect some squid. Includes a day trip to Hammonasset Beach State Park for a visit to Meig's Point Nature Center, ocean observations, and catch-and-release of some cool creatures!

(6-8) Robotics: Spike Prime New this year - LEGO® Spike Prime robots! Assemble and program Spike to tackle a variety of contests and challenges. Teamwork, perseverance, and programming skills will all be put to the test.

Week 6: August 5 - August 9

(K-2) The Science of Magic Discover the science behind some great tricks that can fool your friends! Use high tech and everyday objects to learn some amazing illusions. Have a great time perfecting your magic tricks and science experiments. Conjure up wondrous illusions, feats of prestidigitation, and legerdemain.

(K-2) Future Engineers Are you an inventor at heart? Like to tinker and take things apart? You will get to build cool stuff, compete in design contests, and create your own new inventions. You're on your way to becoming an engineer!

(3-5) Wild and Crafty Discover your creative talents using materials found in nature. Experiment with natural dyes and stencils. Create art with nature's colors and textures. What you make is yours to keep!

(3-5) Marine Science From coral reefs to the deep sea to nearby Long Island Sound - there is so much of the ocean to explore! You will learn about geology, watersheds, tides, sea monsters, shells, and even dissect some squid. Includes a day trip to Hammonasset Beach State Park for a visit to Meig's Point Nature Center, ocean observations, and catch-and-release of some cool creatures!

(3-5) Science Takes Flight What goes up must come down - eventually! Learn about how things stay aloft, both natural and manmade. See how nature has inspired modern designs of airplanes, rockets, and other flight vehicles. You will get to design, build, and launch your own rockets!

(6-8) Code Hackers Learn the skills needed to create a piece of software - design, algorithms, analysis, debugging, and more! Code in Python & Programming and more. Along the way you'll integrate science, math, and logic to make your own games, graphics, and programs.

(6-8) Robotics: Spike Prime New this year - LEGO® Spike Prime robots! Assemble and program Spike to tackle a variety of contests and challenges. Teamwork, perseverance, and programming skills will all be put to the test.

(6-8) Nature and Printmaking Are you inspired by the plants and animals all around us? Here on our mountaintop campus you'll enjoy morning nature walks, use your five senses to make observations, and put your creativity to work designing nature themed art. Our focus will be on printmaking, which is a fantastic way to make multiple copies of your favorite artwork! Carve a linocut, get messy with monotype, design a set of greeting cards, and even put your designs on fabric!



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Week 7: August 12 - August 16

(K-2) Earth Explorers You live on Earth, but how much do you really know about it? Here's your chance to explore the world from our mountaintop. Learn about water cycles, rocks and minerals, fossils, the sky, and natural disasters.

(K-2) Kitchen Chemistry There's plenty of cool chemistry you can do with everyday materials from home - and we'll show you how! You'll experiment with acids and bases, make chemical reactions, and create colorful works of art - all with things right off the kitchen shelf!

(3-5) Kid Coding Learn to code on iPads with fun programming apps that let you create graphics, solve problems, and use your imagination! All apps used are open-source or freeware that you can use after the course.

(3-5) Cool Contraptions Engineering, problem solving, and creativity - all in one! Build chain-reaction contraptions to perform tasks, using a wide variety of supplies. You will get to tinker, create, and collaborate - and learn some physics and engineering along the way.

(6-8) Reach for the Stars Explore the wonders of the solar system and beyond! Journey through the cosmos in our planetarium, see the sun like never before, and fit the moon in your pocket. From crafting constellations to lunar landings, anything is possible when you reach for the stars! *Includes a night-time observing event using our telescopes, weather permitting

(6-8) Adventures with Arthropods Insects, arachnids, crustaceans... there are arthropods everywhere! Find out how they move, what they do, and where to find them. You will learn collecting techniques, identification, how to use microscopes, and how to keep arthropods alive as pets. A major focus will be on collecting and pinning insects to make your own insect collection to take home.

(K-6) Camp Invention - Illuminate! This year's brand-new program will illuminate imaginations, inspire curiosity and help kids build essential STEM skills through collaboration and problem solving. Students explore hands-on challenges and open-ended adventures designed to unlock creativity and help them shine their brightest!