

STEM Learning Kits are available through Colorado State University Extension services of the Tri River Area (Mesa, Delta, Montrose, & Ouray Counties). The below kits are currently available for check out in TRA Counties. Anyone (Teachers, Parents, Non-Profits, Etc.) may check out kits.

Make all kit requests through our online Google Doc form. You can find the form on our website or by clicking the link [HERE!](#) Additional questions about kits or STEM programming can be sent to TRA STEM Agent Stephanie Lamm at [Stephanie.Lamm@colostate.edu](mailto:Stephanie.Lamm@colostate.edu).

### Important Information before checking out STEM Kits.

- There is no cost to borrow a kit unless it is not returned. We request that you restock the inexpensive consumable supplies. Please inventory all items when you repack the kit for return to your County Agent. Let the STEM Agent know what has not been restocked.
- We will do our best to provide the kit or equipment on your preferred dates, however **kits are loaned out on a first come, first booked basis.**
- Kits may loan out for a maximum of 4 weeks, but please return it as soon as you are done using the kit. We may be able to accommodate you if you would like to borrow a kit longer.
- If anything is missing or broken, please inform us immediately so we may replace it before use.

**Kits contain most activity supplies. We ask that before returning kits, users complete the provided kit inventory, replace consumable supplies (if you have the funds to do so), and make note of any missing, broken, or un-replaced supplies. Kit feedback is always welcome!**

Be sure to view our other STEM resources including:

- Local Facebook Page: [STEM/k12 Programs - TRA Extension](#)
- Local YouTube Page: [STEMin with Steph](#)
- TRA Extension Website: [STEM Pages!](#)
- STEM Agent's Blog: [\(STEM\)in with Steph](#)
- STEM Activities: [Listing of STEM Activities](#)

Please contact us if you have any questions! Keep on STEMin!

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## STEM Kit Clickable Listing

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- [Catapult Fling!](#)
- [Cellular Respiration](#) - **NEW!**
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## STEM Kit Descriptions

**Biofuels ~ Seed Press - (All Ages):** This demonstration kit teaches viewers of all ages about the exciting process of biofuel production. Supplement your lessons on renewable energy and resources by using this kit to demonstrate how to take ordinary seeds and press them into oil or fuel for a multitude of purposes! *Please contact our extension agent directly to reserve this kit.*

**Brain Teasers - (All Ages):** Brain Teasers contains over 30 fun, hands-on activities that tickle the brain and challenge the mind. Challenges can be enjoyed by all ages (adults too!) and range from mathematics to physics. Kit includes most supplies and all puzzle solving instructions for the kit coordinator. Its interactive nature makes it a great demonstration kit for large events such as Open Houses or Expos.

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**Bubbles Galore! - (All Ages):** This demonstration kit explores the fun science behind bubbles! Play with bubbles while learning about the properties that hold them together! Kit includes multiple hands on activities for exploring bubble science and creating super large, as well as frozen bubbles! This kit is also good for demonstration events!

**Catapult Fling! - (1<sup>st</sup>-5<sup>th</sup> Grades):** This kit explores the basics of a catapult. Construct your own basic spoons models and experiment with different forms of leverage to discover what design will throw furthest and most accurately.

**Cellular Respiration - (All Grades):** This kit gives learners a quick glance into the background behind how cells release energy to help them survive and thrive. Learn about Aerobic Vrs. Anaerobic respiration and experiment with yeast to see how temperature and fuel source variances can change energy production. Sum up your learning by mixing up a batch of homemade ROOTBEER!

**Dissection Discoveries - (All Grades):** Looking to conduct a dissection class or course with your students? This kit provides educators with the basics of instruction and all the dissection tools they will need to conduct the course in a professional fashion. Kit includes basic instruction, tips for dissecting with different age groups, and a professional classroom lab grade dissection tool kit. Specimens are not included. Ask our STEM Agent about conducting in person dissection classes!

**Embryology (Hatching) - (1<sup>st</sup>-5<sup>th</sup> Grades):** This kit enables teachers to bring the science of embryo hatching into the classroom. Kit includes five lessons in chicken embryology and provides materials for in the classroom chicken hatching. Students are introduced to an incubator, learn the parts of an egg and how to candle, what to do once chicks hatch, how to create their own chicken farms, and explore careers in the poultry industry.

**Entomology Display Box - (All Ages):** The entomology box is for display only (Not to be opened or handled by students). The bug display can be checked out for classroom use, open house exhibition, or expos. It contains a variety of beautiful and uniquely preserved insects.

**Forensic Science - (All Ages):** A fan of crime dramas? Ever wonder how they take something as simple as a blood stain, fiber, or fingerprint and use it to solve a crime? This kit helps kids of all ages (adults have fun too!) to learn about and practice the art of forensic science investigation - just like the pros! 5 standalone activities are included and cover: DNA Exploration, Fingerprinting, Anthropology, Blood Stain Analysis, and Fiber Comparison! Good for the classroom or just for some investigative fun!

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**Glo Germ (Handwashing) - (K-5<sup>th</sup> Grades):** Learn about Germs! This kit allows educators to teach youth all about bacteria! Kids will learn how good handwashing techniques can help reduce exposure to potentially harmful germs! Kit includes Glow Germ Paste, Dark Light, and Dark Box.

**Grab and Go Electricity - (3<sup>rd</sup>-5<sup>th</sup> Grades):** This kit is made to learn about electricity from the bottom up! Explore generators, switches, conductors, and more with part 1. Advance to larger circuits boards in part 2, and add in some regenerative energy learning in your bonus activities! We've also included the materials to create your own Bottle Fan!

**Here Comes the Sun - (K-2<sup>nd</sup> Grades):** This kit contains seven lessons. In them, students explore shadows changing over the course of one day, practice reading a thermometer and collect temperature data to build a classroom graph, explore the sun's impact on plants through scientific experiments, and envision being a scientist!

**Insulation Investigation - (K-4<sup>th</sup> Grades):** Animals have several options when it comes to wintertime. Some migrate (travel), some hibernate (sleep), and others insulate! This kit explores mammals from all three categories and dives into insulation experiments to discover what the best form of insulation is!

**Invertebrates (Entomology) - (K-12<sup>th</sup> Grades):** In this kit, youth begin the fascinating journey into invertebrate (bug) zoology with specific equipment and supplies. They will explore not only the anatomy and classification of arthropods, but also beneficial/detrimental invertebrates, capturing/preserving invertebrates, and exploring arthropod behavior.

**Motion Commotion - (K-2<sup>nd</sup> Grades):** This kit contains six lessons to explore how balls follow the first Law of Motion: Inertia, the second Law of Motion:  $F=ma$ , the 3rd Law of Motion: Action/Reaction, how energy transfers from one object to another, and examines careers in physical science.

**Moving Makers - (K-2<sup>nd</sup> Grades):** This kit contains four lessons that explore force and friction, and includes a career connection lesson. Explore how objects move by speed, how friction changes movement, and how different objects move.

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**Pigments in Soil - (All Ages):** This kit introduces the colors of art in the world! Youth will learn to collect substratum and rock samples, identify the pigments found in collected samples, prepare paints using pigments and different medias, create art and learn about art from the past, and identify the three different aspects of the theory of color! This kit is all hands on as kids get their hands dirty to discover the history of color!

**Soil, It's Alive! - (MS/HS):** Most nutrients in the soil are not in a plant available form. Soil organisms convert soil nutrients into a form that is available to the plants. This game style kit allows students to play out the roles of sun, plant leaves, plant roots, bacteria, fungi, protozoa, and nematodes. The soil organisms will try to obtain "solar energy" in the form of candy (starbursts) in exchange for nutrient candies (tootsie rolls).

The organisms will exchange nutrient candy for solar candy, all while adapting to the changing soil conditions. The lessons explored include:

- Classify characteristic traits and players in the soil food web
- Examine the behavior of soil organisms in different soil conditions
- Explore the needs of plants through soil food web
- Discover a few careers in soil science

**Soil Science - (2<sup>nd</sup>-12<sup>th</sup> Grades):** Soil is the foundation to plant growth, but not all soils are alike. There are different particle sizes in different types of soils. In this kit, students will collect different samples of soils from around the area and separate the layers and particles. They also perform a survey of the areas soil's are collected from and journal what soil combinations serve best for plant growth.

**Solids, Liquids, and Gases, Oh My! - (1<sup>st</sup>-2<sup>nd</sup> Grades):** This kit includes five lessons that explore states of matter and phase changes, differences between mixtures and reactions, and the different states of chemicals. The career connection allows youth to envision being a chemist.

**Staying Alive - (1<sup>st</sup>-2<sup>nd</sup> Grades):** All life is classified into a hierarchy system! This helps scientist's sort life into smaller and more manageable groups of organisms. In this kit, youth will learn to list characteristics of an organism and use those different characteristics to separate organisms into simpler and smaller groups. Students will learn that vertebrate life is very small when compared to invertebrate life and will complete multiple activities to strengthen this knowledge.

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**Straw Rockets - (1<sup>st</sup>-6<sup>th</sup> Grades):** Building straw rockets is a fun, inexpensive activity and a great way to introduce students to rocketry. Students build and launch straw rockets of their own designs while being encouraged to conduct scientific experiments by varying the trajectory angle, design, and launch energy. Science based teaching standards are included! Outdoor space recommended as some rocket designs can travel over 50ft!

**Water Bottle Rockets - (1<sup>st</sup>-6<sup>th</sup> Grades):** This kit explores the engineering behind rockets, while incorporating the use of hydropower (water) and air pressure. Kit has both 1 hour and full day lesson plans. Learn to design and build your rocket, test the aerodynamics of the design, and make modifications as needed! In addition, test variables with your rocket's fuel systems that can affect your rocket's height abilities.

**Water Pollution - (1<sup>st</sup>-5<sup>th</sup> Grades):** Help students learn the importance of keeping our water clean. Students learn about clean water, how much freshwater is available on this planet, and practice explaining where water pollution comes from through hands on crafts and demonstrations.

**Water Windmill Challenge - (3<sup>rd</sup>-12<sup>th</sup> Grades):** Water is critical in food production and every product we use. In this kit, students learn about the importance of having enough water and implement STEM skills to build a Water Windmill (Derrick) capable of pumping the amount of water required by their target needs. Youth work in teams to design, build, and test their derricks and gain an appreciation for the important role water and innovation plays in agriculture! *(Kit can serve up to 12 students with activities lasting about 2-hours)*

**Weather Bear - (1<sup>st</sup>-3<sup>rd</sup> Grades):** Does the weather ever change? Have you noticed? Why is it important to watch what the weather is doing? This fun kit explores how weather changes over the seasons and gives kids a fun, visual way to view and report on the weather daily to their class. Weather bears are for daily dress-up and should be used by students to help show the daily weather prediction.

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## MINI-STEM Kit Descriptions

**Bell Jar and Vacuum Pump Set - (MS/HS):** These tools allow students to learn about Air Pressure. Experiments cover topics like; Action of a Vacuum Pump and Nature of Air Pressure, Air has Mass and Demonstrating the Density of Air, and Effects of Air Pressure on Boiling Water. ~ 2 Bell Jar Kits Available!

**Drone Discovery - (4<sup>th</sup>-12<sup>th</sup> Grades):** Explore the engineering design and flight principles of drones (Styrofoam). The activities demonstrate how drones and remote sensing can be used to solve real-world problems. (All activities approximately 2-hours)

**Explorers of the Deep! - (3<sup>rd</sup>-8<sup>th</sup> Grades):** Explorers of the Deep focuses on the mysteries and adventures of ocean exploration - with robots! Ocean exploration helps scientists prepare for and adapt to changing ocean conditions. Many of these changes in ocean conditions are affecting the environment, such as melting glaciers, increasing ocean temperatures, declining fisheries and an increase in frequency and severity of storms. The three activities develop observational and critical thinking skills while exploring the interconnected nature between the ocean and humans, regardless of where they live.

**Home Energy Audit HEAL (All Ages):** Do you ever wonder how energy efficient your home is? Curious if there is a way to cut back on your utility bill? Do you have phantom loads in your home?

The HEAL kit can help! This kit is ideal for both students learning about home energy use and Homeowners seeking to cut back on energy use! Learn to use a Thermal Leak Detector, Kill-A-Watt Monitor, Flicker Checker, Hot Water Gauge, and Refrigerator/Freezer Thermometer to help save on energy wastage!

*Kit includes lessons for students' grades 3<sup>rd</sup>-8<sup>th</sup> to explore energy savings as well!*

**MARs Mission - (3<sup>rd</sup>-8<sup>th</sup> Grades):** The race to land humans on Mars is on! The Mars Base Camp is a collection featuring four hands-on activities that can be enjoyed with or without internet access and individually or all together, the challenge teaches kids STEM skills like mechanical engineering, physics, computer science and agriculture.

**Mini Wind Turbine 2.0 - (3<sup>rd</sup>-6<sup>th</sup> Grades):** This kit helps youth explore the power of the wind. It includes an easy-to-build turbine that produces enough electricity to power LED bulbs, a sound and light panel, and other load bearing devices. Challenge youth to brainstorm and test blades that they build themselves. Watch the power output change as you change numbers, pitch, and blade shape!

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**Motion Commotion (Mini) - (4<sup>th</sup>-12<sup>th</sup> Grades):** This Mini kit explores the science of motion through the relationship to speed and stopping distance. The activity extends to real-world investigations on reaction time and safety, making connections to the dangers of distracted driving! (Approximately 1-hour lesson)

**Rockets to the Rescue - (4<sup>th</sup>-12<sup>th</sup> Grades):** This kit provides young scientists the opportunity to explore how aerospace engineering is used to solve real world challenges - such as food distribution in emergencies - to make a positive impact on our world. It emphasizes aerospace engineering, as it incorporates lessons related to math, science, and physics. (Approximately 1½-hour lesson) ~ 2 Kits Available!

**Skeleton Kevin - (All Ages):** Kevin is a full scale, paper skeleton model. He is labeled in English and Latin terminology and features moving parts. Handle with care, but enjoy the experience!

**Solar Energy - (3<sup>rd</sup>- 12<sup>th</sup> Grades):** This kit allows students to explore basic principles of solar energy! Connect multimeters to solar panels and watch your volts increase! Compare power output at different tilts/orientations. Or run a motor to spin a lightweight object.

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