

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 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 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, often all, 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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- [Bubbles Galore! - NEW!](#)
- [Catapult Fling!](#)
- [Electricity Basics](#)
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## Clickable MINI-Kit Listing!

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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 which can be used 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 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 included multiple hands on activities for exploring bubble science and creating super large, as well as frozen bubbles! This kit is awesome 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.

**Electricity Basics - (3<sup>rd</sup>-5<sup>th</sup> Grades):** This kit includes a basic introduction to Electricity. The kit contains four 1-hour lessons that cover basic activities such as: Circuits - When Electricity Flows and when it Will Not, Insulators and Conductors, Magnetic Fields, Electrical Symbols, Electrical Schematics, and How to Follow a Schematic to Connect Circuits.

**\*\*Additional energy themed mini kits** are available to continue exploring the properties of electricity. These include: *Home Energy Audit kit, Get Energized kit, Mini Wind Turbine kit, and Solar Power Kit.* See *Mini Kits* below for more info on these kits.

**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. Embryology kits are available only to Tri River Area counties at this time. Lesson plans are available to anyone upon request.

**Entomology Display Box - (All Ages):** The entomology box is for display only (Not to be opened or handled by students). Check out display for classroom use, open house exhibition, or expos. It contains a variety of beautiful and unique 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 methods - 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 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 bacterial! 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.

**Here Comes the Sun - (K-2<sup>nd</sup> Grades):** This kit contains seven lessons. 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 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, how different objects move, and science related careers.

**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. Many plants "leak" or exude sugars (and other compounds) into the soil to feed soil organisms in exchange for plant available nutrients. The students will play 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).

*Kit description continued on next page!*

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**Soil, It's Alive! Cont.** ~ The organisms will play different roles in exchanging nutrient candy for solar candy. During the game, the soil organisms will have to adapt to changing soil conditions when the Queen/King rolls the soil condition dice!

The lessons explore the evidence outcomes and one career connection lesson that includes:

- 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 soils collected from and journal what soil combinations serve as the 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 state of matter and phase changes, difference 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.

**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! These rockets can travel up to 50 feet!

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**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 rockets 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.

## 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. The activities demonstrate how drones and remote sensing can be used to solve real-world problems. *(All Activities Approximately 2-hours)*

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**Get Energized - (All Ages):** Can I make a rechargeable battery? What is a Solar Cell? How does it all work? This kit shows youth step by step how to make and charge a battery via sunlight! (*Approximately 1½-hour lesson, Small Group Recommended!*)

**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!*

**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 devices. You will also challenge youth to brainstorm and test blades that they build themselves. Watch the power output change as you change numbers, pitch, and blade shape!

**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 can be 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 model 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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