TRA STEM Kits Listing

CSU Extension STEM Learning kits are an excellent way to introduce learners to a variety of STEM topics through Expertly Built Lesson Plans and Hands on Learning Activities! We have over 20 kits available for check out ranging in topics from Rockets to Sea Exploration – and everything in between!

Kits need to be requested through our online Google Doc form, 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.

What you need to know before checking out STEM Kits.

- There is usually 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 CSU Office.
- Kits with a fee (Embryology and Skeleton) are to cover replacement costs of the equipment over long term use.
- We will do our best to provide the kit or equipment on your preferred dates, however **kits are loaned out on a first booked basis.**
- Kits may be checked out for a maximum of 4 weeks. 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 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

Please contact us if you have any questions! Happy STEMin!

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TRA STEM Kits Listing

STEM Kit Clickable Listing

- Brain Teasers
- Bubbles Galore!
- Catapult Fling!
- Cellular Respiration
- Dissection Discoveries
- Embryology (Hatching) - $20 Rental Fee
- Entomology Display Box
- Forensic Science
- Germs are Everywhere!
- Here Comes the Sun
- Insulation Investigation
- Invertebrates (Entomology)
- Measuring Up
- Motion Commotion
- Moving Makers
- Pigments in Soil
- Soil Science
- Solids, Liquids, and Gases Oh My!
- Staying Alive
- Straw Rockets
- Water Bottle Rockets
- Water Pollution
- Water Windmill Challenge

Clickable MINI-Kit Listing!

- Bell Jar/Vacuum Pump
- Drone Discovery (Gliders)
- Explorers of the Deep!
- Gems/Rock Samples
- Hot Air Rises
- MARs Mission
- Mini Wind Turbine 2.0
- Rockets to the Rescue
- Skeleton Kevin! - $5 Rental Fee

STEM Kit Descriptions:

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, STEM Nights, or Expos.

Bubbles Galore! – (All Ages): This kit explores the fun science behind bubbles! Play with bubbles while learning about the membranes 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 excellent for demonstration events!

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

Cellular Respiration – (1st-5th Grades): Use this kit to teach students about cell basics, different types of cells, and how they use energy to support cellular functions! Experiment with yeast to watch active cells at work and make homemade root beer!

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) – (K-5th Grades): This kit enables teachers to bring the science of Chicken embryo hatching into the classroom. Kit includes five lessons in chicken embryology and provides materials for in the classroom 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 manage their own chicken farms, and explore careers in the poultry industry. **$20 Rental Fee, Eggs provided in Spring.**

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, etc. It contains a variety of beautiful and uniquely preserved insects collected from the Western Slope.

Forensic Science – (All Ages): A fan of crime dramas? Ever wondered 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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Germs Are Everywhere! – (K-HS Grades): This kit covers topics like doubling, swabbing germs in your environment, and even talking about barriers that protect us from germs. Kit also covers Handwashing and Glo-Germ activities for all ages! This kit can be used at every age level and is one of our most popular requests! Pair it up with our ***online ViralCycles Lessons*** and students will cover everything about bacteria and viruses from shapes to transmission!

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

Insulation Investigation – (K-4th 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-HS 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. A great introduction to Entomology Studies OR the 4-H Bug Project!

Measuring Up - (1st-3rd Grades): Measuring up introduces students to measuring with numerous tools for Lengths, Weights, and Volumes. Students are introduced to the Imperial vs. Metric systems and learn how to measure with both. Harder lessons are available to encourage learning for older users.

Motion Commotion – (K-2nd 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-2nd 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 at different rates.

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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 while learning 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 fingers dirty to discover the history of color!

Soil Science – (2nd-HS 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 area's soils they collect from and journal what soil combinations serve best for plant growth.

Solids, Liquids, and Gases, Oh My! – (1st-6th 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. Dive deeper by discussing energy usage within experiments. The career connection allows youth to envision being a Chemist.

Staying Alive – (1st-2nd 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 learn to list characteristics of an organism and use those different characteristics to separate organisms into simpler and smaller groups. Students learn that vertebrate life forms are a very small category when compared to invertebrate life forms, and complete multiple activities to strengthen this knowledge.

Straw Rockets – (1st-6th Grades): Building straw rockets is a fun, inexpensive activity and a great way to introduce students to rocketry/angles/engineering and more! 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 – (1st-6th 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 capabilities.

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Water Pollution – (1st-5th Grades): Help students learn the importance of keeping our water clean. Students learn about the need for 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 – (3rd-HS 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 10 students with activities lasting about 2-hours+, plan accordingly!)*

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MINI-STEM Kit Descriptions:

Mini-Kits are usually for small groups (6<). Some kits (specified) need longer interaction times to implement the full learning objectives.

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 (Glider) – (4th-HS Grades): For Beginners - Explore engineering design and flight principles of a drone (Styrofoam Glider). The activities demonstrate how drones and remote sensing can be used to solve real-world problems. (*Full Activity requires approximately 2 hours to complete - only 1 Styrofoam glider in kit*)

Explorers of the Deep! – (3rd-8th Grades): Kit 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 are affecting the environment, such as melting glaciers, increasing ocean temperatures, declining fisheries and an increase in frequency and severity of storms. The three included activities develop observational and critical thinking skills while exploring the interconnected nature between the ocean and humans, regardless of where they live. *(Kit built for 6 users per interaction)*

Gem/Rock Samples – (All Ages): Studying geology, minerals, or etc. and need some hands-on examples? We have 9, 15, or 40 count geology rock sets to check out which help students see and feel what the different rock samples are.

Hot Air Rises – (Elementary Ages): Take a flight into the history and basics behind hot air balloons. Youth get to craft and experiment with a homemade balloon while learning a little about Lift and Density.

MARs Mission – (3rd-8th 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. *(Kit built for 6 users per interaction)*

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Mini Wind Turbine 2.0 – (3rd-6th Grades): This kit helps youth explore the power of the wind. It includes an easy-to-build turbine that produces enough electricity to power a LED bulb, a buzzer, a light panel, and other load baring 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!

Rockets to the Rescue – (4th-HS 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. It emphasizes aerospace engineering, as it incorporates lessons related to math, science, and physics. (*Approximately $1\frac{1}{2}$-hour lesson*)

Skeleton Kevin – (All Ages): Kevin is a full scale, plaster skeleton on wheels. He features moving parts/joints and nervous system information and comes with 2 color posters (bones and muscular system) to display while studying. Break down lesson book with skeletal references also available upon request. Handle with care, but enjoy the experience! **$5 Rental Fee.**

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