

# Peak Area Leadership in Science (PALS)

## ----- 2023-2024 PALS Hub Meetings Info -----

### \*\*\*\*\* Semester TWO

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#### Title: **Chemistry of Cooking**

Day, Date, Time: Saturday, Jan 20, 2024 Workshop from 9:00 am - 2:00 pm NOTE: Participants arrive USAFA no later than 8:15 am, meeting on the south steps of the Cadet Field House. Group is then escorted to Chemistry Conference Room (2N189)

Contact Hours: 5

Food: Bring a sack lunch. Snacks and drinks provided.

Location: USAFA Chemistry Department - Meet at Cadet Field House 2169 Field House Dr, Air Force Academy, CO 80840

Presenters: Dr. Abby Jennings, Associate Professor of Chemistry, USAFA Chemistry Department  
Dr. Ron Furstenau, Retired Professor of Chemistry, USAFA Chemistry Department  
Dr. Andrea Kelley, Assistant Professor of Chemistry, USAFA  
Stacey Lazzelle, Chemistry STEM Outreach Educator, USAFA Chemistry Department  
Sandy Lamb, STEM Outreach Coordinator, USAFA

Description: Join us to take a closer look at the chemistry of food. Participants will learn about the chemical reactions behind cooking as well as the taste of a variety of foods. You will learn how things such as acidity, cooking temperature, and even the manner in which you cut food affect the chemistry and thus the flavor and texture of foods. You'll even get the chance to put your cooking (and tasting) skills into action. Like most of the Science HUB activities at the USAF Academy, we'll make sure that we have something for everyone, with emphasis on middle and high school teachers. We will provide activities that (1) expand participants' knowledge base; (2) provide the opportunity to do experiments that can be used in their classrooms, either as a demonstration or student lab; and (3) provide the opportunity to do experiments in a research-style environment using advanced equipment.

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#### Title: **Hydro - Terra - Vida: Exploring CSU SPUR**

Day, Date, Time: Saturday, March 9, 2024 9:00 am - 2:30 pm  
[Bus leaves Colorado Springs at 7:15 am and returns ~ 4:15 pm]

Contact Hours: 5

Food: Bring your own lunch. PALS will provide some snacks and water.

Location: CSU SPUR 4777 National Western Drive, Denver, CO 80216

Presenters: CSU SPUR Educators

Description: Join PALS as we travel up to Denver to experience CSU SPUR ! CSU SPUR is focused on engaging PreK-12 students, families, and visitors around the topics of food, water, and health through real-world experiences. CSU SPUR connects and inspires visitors through the ability to watch ongoing research, to see behind-the-scenes of services, and to watch professionals at work. We will be attending on a 2nd Saturday where SPUR offers free and open to the public interactive programs that you will have an opportunity to experience. CSU SPUR comprises three

buildings - Hydro, Terra and Vita, all three open on this day. You may view cooking activities in the CSU SPUR kitchen, have opportunities to watch veterinarians perform surgery on dogs and cats, see horses assisting with human therapies and engage with scientists at work. Also participate in several activities related to food, water and/or health. Learn more about CSU SPUR at <https://csuspur.org>.

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**Title: Investigating Aquaponics**

Day, Date, Time: Wednesday, April 3, 2024 4:00 - 7:00 pm Arrive 4:00 for food and networking, Program 4:30 - 7:00 pm

Contact Hours: 2.5

Food: Light dinner (pizza), drinks, and snacks provided.

Location: Emerge Aquaponics (<https://www.emergeaquaponics.com/>)  
4135 Shoup Road; Black Forest 80908

Presenters: Emerge Aquaponics Staff

Description: Join us as we delve into the details involved in starting and maintaining an aquaponics company. We will tour the facility and explore each step in the process, including the role of the tilapia. Topics covered will include determining the plants most suitable for the facility, the chemistry involved in maintaining a balanced ecosystem and the environmental benefits of this method of food production.

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**Title: Exploring Human Physiology**

Day, Date, Time: Monday, April 15, 2024 4:300 pm - 7:00 pm

Contact Hours: 2.5

Food: Light dinner, snacks and drinks provided.

Location: UCCS Hybl Center, 4925 N. Nevada Ave., Colorado Springs, CO 80918

Presenters: Sabine Allenspach, Senior Instructor, UCCS Dept of Human Physiology & Nutrition

Description: Explore the human body - at the cellular, organ, and system levels during our visit to the cadaver labs. We'll do a dissection and do a personal histology study of our own cells! We will also tour the Hybl center to learn about the variety of opportunities available for students in the study of human physiology. Graduate and undergraduate students will share their current research and we'll also learn about the various programs available to high school students who are interested in health sciences.

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**Title: Vacuum Science - It's No Matter**

Day, Date, Time: Tuesday, April 23, 2024 4:00 pm - 7:00 pm Arrive 4:00 for food and networking, Program 4:30 - 7:00 pm

Contact Hours: 2.5 hrs

Food: Light dinner (pizza), drinks, and snacks provided by PALS

Location: The Campus @ 6113 Constitution Ave, Colorado Springs 80916

Presenters: Marc Straub, Executive Director, Cool Science

Description: Join us as we explore the fascinating world of vacuum science ! Marc Straub will present the vacuum science demo show from COOL SCIENCE. Then he will lead you through the experience of building your own vacuum chamber with easy to obtain materials and you will do some fun low pressure experiments. You'll also get a chance to learn about all that COOL SCIENCE does throughout the year including ways that Cool Science can come to your classroom.

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**Title:** Dermestid Beetles at Work  
**Day, Date, Time:** Wednesday, May 1, 2024 4:30 pm - 7:00 pm Arrive 4:00 for food and networking, Program 4:30 - 7:00 pm  
**Contact Hours:** 2.5 hrs  
**Food:** Light dinner (pizza), drinks, and snacks provided by PALS  
**Location:** Vista Ridge High School, 6888 Black Forest Rd, Colorado Springs, CO 80923  
**Presenters:** Scott Fortney  
**Description:** Did you know that beetles can clean the flesh from bones without causing bone damage? Come learn about the Dermestid beetle and how they are used at the Cheyenne Mountain Zoo and the El Paso County Coroner's Office.

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## \*\*\*\*\* Semester ONE

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**Title:** **Solar Eclipses, Astrophotography, Space Science, and the Night Sky**  
**Day, Date, Time:** Friday, August 18, 2023 4:30 - 11:30 PM (Includes travel time) Bus leaves Cheyenne Mountain JHS at 4:30  
**Contact Hours:** 5.0 hours  
**Food:** Box dinner will be provided on the bus. Snacks and drinks provided.  
**Location:** Florissant Fossil Beds National Monument, 15807 Co Rd 1, Florissant, CO 80816  
**Presenters:** David Warren, Colorado Springs Astronomical Society  
**Description:** Join us at the Florissant Fossil Beds as we explore the summer sky. Our view of the universe changes as we orbit the sun, allowing us to observe different stars and constellations. Study about solar eclipses and learn how to observe them safely. Florissant Fossil Beds is a great place to see these astonishing wonders through the telescopes of the Colorado Springs Astronomical Society members. Solar viewing, Solar Eclipses, Introduction to Astronomy, Bringing Space Science to the Classroom  
**Agenda:** 4:30 depart Colorado Springs from Cheyenne Mountain JHS. Lunch on bus. Exploring solar eclipse materials.  
6:00 Observing with solar telescopes. How to safely view the sun, Learn about Solar Eclipses,  
7:00 Introduction to Astronomy. Bringing Space Science to students. Astrophotography  
8:00 Q & A, Evaluations, Door Prizes  
8:30 Colorado Springs Astronomical Society presents the summer night sky  
10:30 Depart Florissant Fossil Beds National Monument

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**Title:** **The Science of Healthy Forests**

**Day, Date, Time:** Saturday, September 16, 2023 8:15 - 3:15 Bus leave Cheyenne Mountain JHS at 8:15 AM

**Contact Hours:** 5.0 hours

**Food:** Bring your own sack lunch. Snacks and drinks will be provided.

**Location:** Manitou Experimental Forest, 232 County Road 79, Woodland Park, Colorado 80863

**Presenters:** Steven Alton, Forester and Site Manager, Rocky Mountain Research Station, Manitou Experimental Forest. History of the Manitou Experimental Forest. Ongoing Research.  
Andy Schlosberg, Forestry: Challenges for a Healthy Forest, Colorado State Forest Service,  
Sandy Smith, Science Teacher, Data Puzzles

**Description:** The Manitou Experimental Forest (MEF) is part of the **USDA Forest Service** Rocky Mountain Research Station. Currently, the site is home to several meteorological, ecological and biological research initiatives, including the BEACHON project, an NADP monitoring site, and a long-term Flammulated Owl study to name a few. Research at Manitou has been broadened to gain a better understanding of ponderosa pine ecosystems, the disturbance regimes active within them, and ways to best manage these urban-interface forests. Current studies include assessment of silviculture techniques to restore fire-dependent forests to a healthy condition, studies of fire history, fuels assessment, quantifying soil heat fluxes during prescribed burning under a spectrum of fuel loadings, studies of insect and bird biology, an intensive study of dwarf mistletoe ecology, and a major effort to assess human values and preferences in urban-wildland interface forests. Participants will explore the forest with a guide from the Colorado State Forest Service to look at signs of a healthy forest. The workshop ends with a look at a Data Puzzle - Megafires: Rare Occurrences or the New Normal? Data Puzzles combine classroom-friendly datasets with the research-based instructional practices of Ambitious Science Teaching to help students make sense of the natural world. Examining the data and discussing the causes of these megafires provides students an opportunity to explore the interaction of humans and their environment.

**Agenda:** 9:00 Announcements and introductions.  
9:10 - 10:10 Steve Alton will give an overview of the Manitou Experimental Forest, History, Past and Ongoing Research  
10:10 - 10:15 break  
10:15 - 11:30 Andy Schlosberg will lead an outdoor walk in the woods and speak on Challenges of a Healthy Forest  
11:30 lunch  
12:00 - 2:15 Data Puzzles. Megafires: Rare Occurrences or the New Normal? Sandy Smith  
2:15 - 2:30 Evaluations and Door Prizes

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**Title:** **Garden of the Gods Geology**

**Day, Date, Time:** Saturday, September 23, 2023 9:30 am - 12:00 pm

**Contact Hours:** 2.5 hours

**Food:** Food is not allowed in the visitor center, would be able to get snacks/drinks in the parking lot

**Location:** 1805 N 30th St, Colorado Springs, CO 80904

**Presenters:** Bret Tennis, Garden of the Gods Program Manager  
Jennifer Heiny, Garden of the Gods Park Guide

**Description:** So much geological history of the region can be found in the Garden of the Gods. Join us for a moderate hike throughout the park to learn more about the geological history and programs that can be included in your classroom.

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**Title:** **Explore before Explain**

Day, Date, Time: Tuesday, Sept 26, 2023 Arrive 4:00 for food and networking, Program 4:30 - 7:00 pm  
Contact Hours: 2.5  
Food: Light dinner (usually pizza), snacks and drinks provided.  
Location: Coronado High School, 1590 W Fillmore St, Colorado Springs, CO 80904  
Presenters: Christina Collazo, Science Teacher - Carson Middle School  
Kathy Jeppson, Science Teacher - Colorado Early Colleges  
Dana Malfeld, Science Teacher - Discovery Canyon High School  
Traci Morey, Science Teacher - Coronado High School

Description: Are you looking for a way to maximize the impact of your science lessons on your science students' learning? Perhaps you are working on ways to implement phenomena-based, 3-D lessons aligned with the current Colorado Science Standards while utilizing proven, research-based learning strategies. There is so much "out there" in terms of instructional models - 3-D learning using phenomena, the 5Es, Ambitious Science Teaching, Anchored Inquiry Learning, Argument Driven Inquiry, OpenSciEd - and the list goes on. Are you overwhelmed with the possibilities?

Join us to explore (and explain) how to help guide student's sensemaking by design. In this hub meeting, participants will experience a model lesson and learn how and why this approach will make YOUR lesson planning easier and more efficient by taking learning experiences that you already do and making small shifts that will engage students, recognize the power of their prior understandings, allow them to be scientists in your classroom and encourage them to reflect on their learning experiences.

Participants may receive a book by Pat Brown that provides even more model lessons and more detail describing this method of lesson planning. The book is titled: Instructional Sequence Matters and is available for middle school and high school teachers.

- **Instructional Sequence Matters, Grades 6–8: Structuring Lessons With the NGSS in Mind – September 1, 2018**  
[\[https://www.amazon.com/Instructional-Sequence-Matters-Grades-Structuring/dp/1681405849\]](https://www.amazon.com/Instructional-Sequence-Matters-Grades-Structuring/dp/1681405849)
- **Instructional Sequence Matters, Grades 9–12: Explore-Before-Explain in Physical Science – April 30, 2021**  
[\[https://www.amazon.com/Instructional-Sequence-Matters-Grades-Explore-Before-Explain/dp/1681408449\]](https://www.amazon.com/Instructional-Sequence-Matters-Grades-Explore-Before-Explain/dp/1681408449)

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Title: **After the Asteroid - Stability and Change at the Denver Museum of Nature & Science**

Day, Date, Time: Saturday, October 21, 2023 9 am - 2:30 pm  
[Bus leaves Colorado Springs at 7:30 am, returns at 4:00 pm ]  
Contact Hours: 5 hours  
Food: BYO lunch or purchase your own lunch on site. *Some drinks and snacks will be provided on the bus to carry into the museum.*  
Location: Denver Museum of Nature and Science, 2001 Colorado Blvd, Denver, CO 80205  
[Departure point from Colorado Springs TBD]  
Presenters: James Hagadorn PhD – Tim & Kathryn Ryan Curator of Geology  
Brandon Davis, Teacher Programs Consultant, Denver Museum of Nature and Science  
Tim Blesse, Teacher Programs Consultant, Denver Museum of Nature and Science  
Description: Join us on a field trip to the Denver Museum of Nature and Science. Learn both science content and teaching strategies focused on 3D teaching and learning from museum resources (curator, geology collection, exhibit, Brandon and Tim, and other) during your 5 hour visit. It will be a day filled with wonder and awe!  
During Part 1 of your field trip to the museum you will deepen your understanding of the worldwide Extinction Event that ended the age of the dinosaurs, as well as the amazing recent discoveries at Corral Bluffs near Colorado Springs that reveal how quickly life rebounded and

diversified after this event. You will do this through a below ground, “behind-the-scenes” tour of the museum’s research geology collection and the temporary “After-the-Asteroid” exhibition on the museum’s first floor. View Physical Evidence for this Extinction Event and the changes in ecosystems before and after it.

During Part 2 of your visit you will see a large screen film in the Infinity Theatre (formerly IMAX Theatre) and participate in a short workshop about scaffolding Cross Cutting Concepts using Graphic Organizers and Mini-Lessons. Previous Museum Workshops with PALS have focused on the 8 Science and Engineering Practices: Employing Scaffolding that helps students build competence at “doing what scientists do”. But in order to effectively do what scientists do, students need to be taught to “think like scientists think”. This also requires scaffolded support as they figure out phenomena.

Agenda:

Tentative Agenda - Exact Timing to be Determined - Will be 5 hours of contact time.

Time	Activity	Location	Led By
9 AM	45 minute “Behind-the-Scenes Tour” with Geologist James Hagadorn PhD	Geology Collections B1 & B2	James Hagadorn PhD-Curator of Geology DMNS
TBD	1 hr Large Screen Movie Experience ( 45 min + transition time) ( Titles of October films not yet released )	Infinity Theatre	Tim Blesse Teacher Program Consultant DMNS
TBD	30-minute lunch on your own & free roaming time		
TBD	1 hour Visit to the “After the Asteroid Exhibition” Using Graphic Organizers on A Field Trip to build Cross-Cutting Concepts		Brandon Davis Teacher Program Consultant DMNS
TBD	1 hour Stability & Change- Cross Cutting Concepts - Mini Activity in A Studio		Tim Blesse Teacher Program Consultant DMNS

**Title:** **Current Teen Drug Landscape - What Teachers Need to Know.**

**Day, Date, Time:** Saturday, November 11, 2023 8:30 am - 2:00 pm

**Contact Hours:** 5

**Food:** Bring your own lunch, PALS will provide drinks/snacks

**Location:** The Campus @ 6113 Constitution Ave, Colorado Springs 80916

**Presenters:** Officer Joseph Langlais CSPD SRO, Dr Krystal.Ozanick, MD, Child and Adolescent Psychiatrist Children’s Hospital of Colorado, Megan Caraway, Science Teacher Vista Ridge High School

**Description:** Join us as we learn from local experts about the current teen drug landscape. Hear from a School Resource Officer at a local high school and from the Children’s Hospital Speaker Bureau. Participate in a virtual simulation of the effects of various drugs on the nervous system and activities simulating drug screening for the classroom.

## Workshops that were canceled or rescheduled:

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### Canceled

**Title:** ~~The Workings of the El Paso County Coroner's Office~~  
**Day, Date, Time:** ~~Wednesday, November 1, 2023 4:30 pm 7:00 pm~~  
**Contact Hours:** ~~2.5~~  
**Food:** ~~Food is not allowed in the coroner's office.~~  
**Location:** ~~El Paso County Coroner's Office 2741 E Las Vegas St, Colorado Springs, CO 80906~~  
**Presenters:** ~~Stephanie Pape, Deputy Coroner for El Paso County Coroner's Office~~  
**Description:** ~~Attend a tour of the El Paso County Coroner's office with one of the office's deputy coroners. During the tour learn about the different aspects of the autopsy process. After the tour there will be a presentation by the deputy coroner about the different manners of death.~~

Due to staffing issues this PALS hub meeting was canceled and we were unable to reschedule.

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### RESCHEDULED

**Title:** ~~Exploring Human Physiology~~  
**Day, Date, Time:** ~~Saturday, April 20, 2024 8:30 am 2:00 pm~~  
**Contact Hours:** ~~5~~  
**Food:** ~~Bring a sack lunch. Snacks and drinks provided.~~  
**Location:** ~~UCGS Hybl Center, 4925 N. Nevada Ave., Colorado Springs, CO 80918~~  
**Presenters:** ~~Sabine Allenspach, Senior Instructor, UCGS Dept of Human Physiology & Nutrition~~  
**Description:** ~~Explore the human body at the cellular, organ, and system levels during our visit to the cadaver labs. We'll do a dissection and do a personal histology study of our own cells! We will also tour the Hybl center to learn about the variety of opportunities available for students in the study of human physiology. Graduate and undergraduate students will share their current research and we'll also learn about the various programs available to high school students who are interested in health sciences.~~

### Canceled

**Title:** ~~The Physics of Everyday Things~~  
**Day, Date, Time:** ~~Saturday, February 10, 2024 9:00 am 2:00 pm~~  
~~Workshop from 9:00 am 2:00 pm NOTE: Participants arrive USAFA no later than 8:15 am, meeting on the south steps of the Cadet Field House.~~  
**Contact Hours:** ~~5~~  
**Food:** ~~Bring a sack lunch. Snacks and drinks provided.~~  
**Location:** ~~USAFA Physics Department~~  
**Presenters:** ~~USAFA Physics Department~~  
**Description:** ~~Have you ever wondered what makes the world go round? The answer is physics! Join us at the workshop to learn the specifics.~~

Due to weather conditions this PALS hub meeting was canceled and we were unable to reschedule.

