UNIVERSITY OF WYOMING

SCIENCE POSSE

HANDBOOK
ACADEMIC YEAR
2013-2014

The Science Posse is supported by NSF GK-12 Project # 084129, and the University of Wyoming School of Energy Resources
I. About the Handbook
II. General Information
III. Overview of the Science Posse?
   III.1 What Is the Science Posse?
   III.2 What Are the Science Posse’s Goals?
   III.3 How Are Those Goals Met?
   III.4 What Is the Science Posse’s History?
IV. Who is in the Science Posse?
   IV.1 Principal Investigator
   IV.2 Coordinators
   IV.3 Fellows
   IV.4 Partner Teachers
   IV.5 External Evaluators (WYSAC)
V. What Does the Science Posse Do?
   V.1 Partner Teacher/Year Long Projects
   V.2 On Campus Events
   V.2.1 Lab Tours
   V.2.2 Women (And Men) in Science
   V.2.3 State Science Fair
   V.3 Classroom Visits
   V.3.1 Research/Career Talks
   V.3.2 Science Mini-lessons
   V.3.3 Specialized Lesson Plans
   V.3.4 Science Fair Consultations
   V.3.5 Virtual Visits
   V.4 Summer Camps for Students
   V.5 Summer Workshops for Teachers
VI. How Does the Science Posse Work?
   VI.1 Email
   VI.2 Time Commitment
   VI.3 Meetings
   VI.4 Training and Evaluation
   VI.4.1 Training and Conferences
   VI.4.2 Evaluation
   VI.4.3 Megan’s Mean Face Section
   VI.5 Travel Teams
   VI.6 Logistics for School Visits
   VI.6.1 Request/Lead Protocol
   VI.6.2 Vehicles
   VI.6.3 Lodging
   VI.6.3 Meals
   VI.7 Cancellations and Weather
   VI.8 Event Follow-Up
   VI.9 Emergency Situations
   VI.9.1 Vehicle Accident Procedures
   VI.9.2 Accident During On-Campus Event
   VI.9.3 Accident During School Visit
   VI.9.4 Accident During Field Activity
   VI.9.5 Accident During Summer Camp
   VI.10 Website
   VI.10.1 Meet the Posse
   VI.10.2 Requests
   VI.10.3 Calendar
   VI.10.4 Blogs
   VI.11 Dropbox
   VI.12 iPads
   VI.12.1 Purpose
   VI.12.2 Agreement
   VI.12.3 UW Email
   VI.12.4 Apps
   VI.13 Money Stuff
   VI.13.1 The Science Posse’s P-Cards
   VI.12.2 University Bookstore
   VI.13.3 Copy Center
   VI.13.4 Chemical Stockroom
   VI.13.5 Reimbursements for Out-of-Pocket Expenses
   VI.14 Science Posse Spaces
VII. Resources
   VII.1 Standards
   VII.2 Basic Inquiry Information Resources
   VII.3 Books in the Science Posse Library
   VII.4 Other Helpful Websites
   VII.5 FAQ
   VII.6 Helpful Hints (Collected Wisdom)
   VII.7 Bridging the Gap: Understanding the Teachers and Students
   VII.7.1 Teachers
   VII.7.2 Students
   VII.7.3 Classroom Management Tips
APPENDIX
   A NSF GK-12 Overview
   B University Vehicle Policy
   C Reimbursement Forms
   D Science Posse Evaluation Rubric
   E Terms and Conditions for Requests
   F Partner Teacher Handbook
   G Information about the UW Plane
   H Activity Tracking
   I Elluminate Guide
   J Lead Examples
   K iPad Policy

The Science Posse is supported by NSF GK-12 Project # 084129,
and the School of Energy Resources at the University of Wyoming
I. About this Handbook
This handbook provides helpful information about the purposes, structure and operation of the Science Posse. The nature of the Science Posse requires flexibility, so there may be situations that are not covered. Talk to the Coordinators (or other Fellows) to get the information you seek. Because of the flexibility and fluid nature of the Science Posse, the handbook is regularly updated to reflect the most current situation. Also remember to regularly check the Grad's Science Posse folder in Dropbox and www.scienceposse.org, for the most current information. (We are grateful to Project Fulcrum at the University of Nebraska, Lincoln, NE for the inspiration for this handbook.)

II. General Information
The Science Posse has two Coordinators: one full time Program Coordinator with experience in public education and a Graduate Fellow Coordinator with experience as a traveling Fellow for the Science Posse. All general questions and/or concerns should be directed to them.

Program Coordinators
Jan Truchot
Phone: 307-290-1159
Email: jtrucho1@uwyo.edu

Megan S. Candelaria
Phone: 307-290-0058
Email: megdiane@uwyo.edu

Office location: AG-C 5006
Office Phone: (307) 766-6398
Office Fax: (307) 766-3875

Mailing address
University of Wyoming Science Posse Dept. 3544
1000 E. University Ave.
Laramie WY 82071

Website: http://www.scienceposse.org/
Email: scienceposse@uwyo.edu

III. Overview
III.1 What is the Science Posse?
The Science Posse is an outreach program composed of graduate students in STEM fields who want to share their passion for research and education with the students and teachers of the state of Wyoming. The Science Posse is supported by a National Science Foundation (NSF) Graduate STEM Fellows in K-12 Education (GK-12) program grant. The essence of these grants is to have Fellows bring their STEM research practice and findings to K-12 learning settings so that teachers and K-12 students are more directly exposed to what science and engineering is all about, how it is done, how discoveries happen and what STEM professionals do. (Please see the appendix for more detailed information about the GK-12 goals.)
III.2 What are the Science Posse’s goals?

The Science Posse’s goals are directed at the graduate Fellows, K-12 education and the University of Wyoming.

1. The Posse’s goal for GK-12 graduate Fellows is to develop transferable skills and to improve their graduate program outcomes. *This is in line with NSF’s expectation that graduate Fellows will have an enhanced understanding of their own research subject area, and its societal and global contexts; improved communication skills in STEM subjects with technical and non-technical audiences, leadership, team building, and teaching capabilities.*

2. The Posse goal for K-12 education is
   a. To increase STEM literacy and interest in STEM careers in the students we work with.
   b. To increase teachers’ content knowledge in our target areas of water quality and energy.

   *These goals are in line with NSF’s expectations for K-12 education: Professional development opportunities for teachers in both STEM content and pedagogy; and enhanced learning and STEM career interest for students.*

3. The Posse’s goals for graduate education at the University of Wyoming include:
   a. Integration of successful components of the GK-12 program into all graduate programs at the University.
   b. Developing, strengthening and sustaining partnerships & collaborations among K-12 schools, UW and private industry.

   *These goals are in line with NSF’s expectations about the transformation of graduate programs; strengthened and sustained partnerships with local school districts, industry, and non-profit sector, etc.; enhanced institutional impact of graduate education to society.*

4. The Posse also has a goal to find efficient and effective ways for UW and WY schools to use cyber infrastructure and other relevant technologies to support collaborative GK-12 efforts. *This goal reflects NSF’s support of including cyber infrastructure in GK-12 grants.*

III.3 How are these goals met?

The Science Posse achieves these goals through a variety of projects for students and teachers around Wyoming. Teachers from any Wyoming school may request the Science Posse to work with their students. These teachers are an essential link between the Science Posse Fellows and K-12 students. Requests are made through the Science Posse’s website and may be for any of the activities the Posse routinely provides. In response to these requests, graduate Fellows work with students on campus or travel Wyoming, physically and virtually, presenting career talks, research talks, science mini-lessons and providing fair consultations. In the summer, the Science Posse collaborates with the Teton
Science School to present a middle school science camp and with the School of Energy Resources to present the Energy Summer Institute for high school freshman and sophomores. In addition, the Posse collaborates with the NASA Space Grant Consortium to present a week-long teacher workshop that emphasizes the importance of inquiry-based learning in the science classroom.

III.4 What is the Science Posse’s history?
The Science Posse was established in 2006 with funding from an NIH SEPA grant, an NSF GK-12 grant, and the Graduate School of the University of Wyoming. Currently the Science Posse is in year five of another NSF GK-12 Grant (#0841298). Under the NIH SEPA grant the Science Posse emphasized biomedical science. The initial NSF GK-12 grant emphasized science more generally. The current NSF GK-12 grant is aimed at middle school students and focuses on energy and water quality issues. In coming years, as the Science Posse explores other funding opportunities and moves toward sustainable funding, the emphasized areas may change yet again.

IV. Who is in the Science Posse?
The main players of the Science Posse are in bold in the chart on the next page. In addition to Coordinators, Fellows and their advisors, and Partner Teachers, the Science Posse includes evaluators and partner organizations with similar goals.

IV.1 Principal Investigator (PI)
Responsibilities
• Secure permanent funding beyond the current NSF GK-12 grant (4/30/2014).
• Establish partnerships throughout the state.

IV.2 Coordinators
The Science Posse has two Coordinators: one full time Program Coordinator with a background in education and a Graduate Fellow Coordinator who was previously a traveling Fellow for the Science Posse.
Responsibilities
• Coordinate and oversee Fellow activities.
• Communicate with Wyoming educators, University faculty and staff, external evaluators, and project partners.
• Manage grant funds and all reporting required by the grant.
• Oversee the planning of all Posse events (e.g., training sessions, summer camps, teacher workshops, new Fellow training, etc.)
• Observe and evaluate graduate Fellow participation and progress.
The Science Posse is supported by NSF GK-12 Project # 084129

Principal Investigator
Don Roth
School of Energy Resources

Program Coordinators:
Jan Truchot  Megan S. Candelaria

Fellows:
Alex Karanevich
Michael Huntington
  Mathematics
Mikey Tabak
Reilly Dibner
Beth Fitzpatrick
  Ecology
Jacob Greenlee
  Microbiology
Jodi Schilz
  Biomedical Sciences
Daniel Allen
  Geology and Geophysics
Phil Bermaier
  Atmospheric Science
Corin Chepko
Scott Maloney
  Physics
Margie MacGregor
  Zoology & Physiology

Partner Teachers:
Erin Klauk
  Laramie HS
Sonja Brown,
  Spring Creek Elementary.
Pat Urasky,
  Cheyenne East HS

Accounting:
Kara Enyeart
  Marissa Gannon

Co-PIs:
Fred Ogden  K.J. Reddy

Partners:
School of Energy Resources
Science Math
Teaching Center
NASA Space
Grant Consortium
Teton Science
School
Big Brothers/Big
Sisters of Albany
County
Wyoming State
Science Fair

WYSAC Evaluator
Tim Pearson

Fellow Faculty
Advisers
IV.3 Fellows

Science Posse Fellows are full-time graduate students pursuing degrees in math, science or engineering who are taking 9-12 credits of graduate courses, doing research, or both. Science Posse Fellows are selected in part because of their potential to be future leaders in their fields: they are not planning to become K-12 teachers nor is it the Science Posse’s intent to encourage them to do so. In ten years, they will be university faculty, managers in industry, entrepreneurs, and government employees. These scientists will be able to make their research accessible and understandable to non-technical audiences. They will know how to work effectively with teachers, will be interested in doing so, and will encourage others to do the same. They will work to encourage students to care about and pursue careers in science.

Responsibilities

• Meet with K-12 students through partner teacher classroom visits and visits around the state to classrooms and schools that request the Science Posse.
• Serve as "leads" to coordinate details of classroom visits with requesting teachers, Coordinators and other Fellows on the team.
• Develop science mini-lessons, specialized lessons, and research/career talks that bring their research into the classroom.
• Develop and conduct lab tours on campus.
• Develop innovative cyber lessons that can be used with students and teachers at a distance.
• Present information on and mentor students in the creation of science fair projects
• Attend weekly meetings and other meetings as necessary.
• Read and respond promptly to emails from Coordinators, teachers and other Posse members.
• Complete in a timely manner all required readings, journal entries, activity tracking forms, lesson plans, and surveys from WYSAC and NSF.
• Turn in all receipts and paperwork for reimbursements in a timely manner.
• Participate in professional development as a learner or a teacher, including inquiry sessions, conferences, and other training-related meetings (The August Teacher Workshop and GK-12 Seminar are mandatory training for incoming Fellows).
• Lead sessions for the teacher professional development workshop.
• Develop innovated inquiry-based summer camp lessons.
• Participate in summer camps.

Expectations

• Model excitement for material when with students.
• Demonstrate a positive attitude toward students, teachers, coordinators and other fellows. Accept constructive criticism graciously and work to resolve problems as soon as they arise.
• Take initiative when communicating with teachers. (Remember that texting and email may not be the natural way for many teachers to communicate. If the teacher does not respond to these means, please call the teacher.)
• Work constructively with PIs, Coordinators, other Fellows, Partner Teachers and other teachers.
• Communicate ANY concerns to the Coordinators as soon as possible.
• Plan his or her time so that assignments from the Coordinators are completed by the due dates given.
• Science Posse Fellows represent the University and the Science Posse to the public. When representing the Science Posse, Fellows are expected to
  • Be punctual to all Science Posse activities and to provide as much advance notice as possible when unexpected circumstances require a change of plans.
  • Dress and act in a professional manner at all times when interacting with students and teachers or otherwise representing the Science Posse.
  • This is especially important to consider when you are traveling in a University vehicle and/or wearing official Science Posse gear (i.e. anything with a Science Posse logo on it). Even when you are not physically in a school or with a group of students, if you are on a Science Posse trip you are representing both the University of Wyoming and the Science Posse. Where you park, how you act, and what you post to social media on a trip all reflect back on our program.

Stipend, Fees, & Health Insurance
• These are paid for the graduate Fellow by the NSF grant and the University of Wyoming’s Academic Affairs Office:
  • Monthly stipend (September through August)
  • Tuition and fee waiver
  • Student health insurance

IV.4 Partner teachers
  Responsibilities
  • Develop a plan for integrating the expertise of the Fellows in their team into their classroom.
  • Make time for Fellows in the classroom as necessary throughout the semester.
  • Coach the Fellows as they develop their classroom skills. (Remember, they have limited experience in classrooms and limited pedagogical training.)
  • Assist Fellows with lesson development and implementation.
  • Work with Fellows to produce a ‘product’ - the form/nature of this product is flexible and should be cleared with the coordinators.
  • Meet with Coordinators as needed, in person or virtually.
  • Complete surveys required by WYSAC and NSF.

Expectations
• Maintain discipline among students.
• Work constructively with PI, Coordinators, Fellows, and other Partner Teachers.
• Communicate ANY concerns to the Coordinators as soon as possible.
• Prepare students with sufficient pre-teaching knowledge and skills.
• Evaluate learning by students at appropriate stages of the project.

Stipend & Financial Support
• Partner teachers sign a contract with the Science Posse and receive a stipend at the end of each semester of involvement.

IV.5 External evaluators: WYSAC

The Wyoming Survey and Analysis Center (WYSAC) acts as the Science Posse’s external evaluator, assessing progress toward achieving the goals specified in the grant. WYSAC’s evaluation tools include open-ended questionnaires distributed following each semester to the Fellows, their partner teachers, and their faculty advisors; a focus group with the Fellows at the end of the academic year; and anonymous one-time surveys of K-12 students and teachers participating in Science Posse events. The student surveys examine attitudes toward and interest in STEM areas and careers. In addition to using these tools, evaluators meet informally with teachers during the summer workshops and accompany Fellows to observe the Science Posse in action. Project Coordinators also meet and communicate regularly with the WYSAC evaluators.

V. What does the Science Posse do?
NOTE: Although the Science Posse’s target audience is middle school students (grades 5-8), the Posse may be invited to do Career Talks, Research Talks and Science Fair Consultations (but not Science ALIVE!) in high school classrooms as well. There are also occasions when the Science Posse works with elementary students, but working with these groups is the exception rather than the rule.

V.1 Partner teacher projects / Year-long projects
V.1.1 Partner Teacher Projects
Science Posse Fellows assigned to a partner teacher project will collaborate with one or more of the Science Posse’s partner teachers in Laramie/Cheyenne during the school year.
• Goal: The goal of partner teacher projects is for an interdisciplinary team of Fellows to develop their abilities to design and present inquiry-based lessons (or series of lessons) in a partner teacher’s classroom(s). This should benefit the teacher (by increasing their content knowledge and providing with lessons to do with future classes), the students (by providing them hands-on innovative classroom activities to enhance their learning), and the graduate Fellow (be helping them to develop new and better ways to communicate key ideas from their research and their field.)
• Description: Partner teacher projects take place during the fall semester. Graduate Fellows regularly go into the partner teachers’ classroom and teach. The exact nature of these projects varies depending on grant requirements, graduate Fellows’ interests,
and the semester’s curriculum. During the spring semester, there will be some form of follow-up on these projects. During 2009-2010, the teams collaboratively wrote articles for publication in the National Science Teacher’s Association journals.

• Examples of “products”:

• 2009-2010:
  o Laramie Junior High School: The main goal of the composting project was to teach students about scientific methodology, ecological responsibility, and composting through the implementation of a school-wide composting initiative. Activities included organizing and implementing the composting initiative, lessons on scientific methodology, data analysis, ecology, and composting, and a field trip to the UW student farm.

• 2010-2011:
  o Snowy Range Academy: The teachers and Fellows identified areas where each could contribute expertise to the curriculum and planned visits accordingly. In addition, Fellows worked with students preparing for the Science Fair and in collaboration with the teacher, produced a guide to completing a science fair project.
  o Laramie High School: The Fellows worked with the teacher to enhance the energy and environment unit in her earth science class. This later grew into a proposal for a new, semester-long course to be implemented at the high school
  o Big Piney Middle School: The Fellow worked with students in small groups to design science fair projects and later created two virtual learning experiences involving a presentation on glaciers and a lab about the nitrogen cycle.

• 2011-2012
  o Big Piney Middle School: The Fellows and Partner teacher created a guide to using Elluminate for virtual visits.
  o Laramie High School and Snowy Range Academy: Fellows and Partner teachers created unit plans for water and energy.
  o Spring Creek Elementary: Fellows worked with the Partner Teacher on a watershed unit and created a poetry book.

• 2012-2013
  o Laramie High School: The Fellows and Partner Teacher developed a soil science unit and created an iBook with the materials.
  o Snowy Range Academy: The Fellows and Partner Teacher developed a manual and video about developing science fair projects.

V.1.2 Year Long Projects
Science Posse Fellows not assigned to a partner teacher project will instead work (with guidance from the coordinators) to create sustainable products for educational use.

• Goal: The goal of yearlong projects is for Fellows to translate key innovative activities into sustainable educational resources that will outlast their tenure within the Posse.
• Description: Yearlong projects are a serious undertaking in which motivated Fellows find (often technology-based) methods of translating their expertise and creativity into sustainable resources for teachers.

• Example of “products”:
  o Virtual lessons which can be recorded and posted online.
  o Activities and lessons translated into iBook format.
  o Write-ups of innovative lessons that can be used by teachers (lesson plans).

V.2 On-campus events

V.2.1 Lab tours

• Goal: The goal of the lab tour is to introduce students to a working laboratory in your discipline and, more generally, to excite students about possibly working in your discipline.

• Description: These generally involve a 45-minute to 1 hour-long tour through your laboratory or department. The number of students for lab tours is capped at 15 students per tour, unless the lab is such that an even smaller group is necessary. Graduate Fellows are encouraged to make these tours as interactive (i.e. hands-on) and interesting as possible.

• Example: Psychology lab tour: Students visit several labs within the psychology department, including the psychophysiology, developmental, and anxiety disorders lab. They then are involved as "participants" in a classic group motivation study.

• Tips: Some labs are inherently interesting to students (e.g., mammology, molecular biology). Others are more difficult to make interesting (e.g., mathematics, psychology). Try to make your lab tour as interactive as possible, and students will be interested. Also, point out the professional research posters in your department.

• Connection to Inquiry: While lab tours may not be inherently inquiry-based, the nature of inquiry should be introduced to students through the demonstrated lab work, and/or the lab tour activities should involve some level of relevant process skills and ownership depending on the available time.

• Connection to Research: Depending on your lab, this may be one of the most direct representations of your research.

V.2.2 Women (And Men) In Science (WIS/MIS)

• Goal: The goal of the Science Posse’s involvement in WIS is in line with the goal of WIS, to increase the number of women in science. (Note: WIS at the University of Wyoming is in the spring. Central Wyoming College alternates Women in Science with Men in Science each fall, and the Science Posse is also involved in these.)

• Description: Fellows present hands-on interactive experiences for mixed groups of 6-12th grade students. (Sessions usually last 45 minutes.)

• Examples: These sessions often incorporate lab tours or mini-lessons.

• Tips: see lab tours (V.2.1) and mini-lessons (V.3.3)

• Connection to Inquiry: see lab tours (V.2.1) and mini-lessons (V.3.3)
• **Connection to Research**: see lab tours (V.2.1) and mini-lessons (V.3.3)

### V.2.3 State Science Fair

**Goal**: The goal of the Science Posse's involvement in science fair is in line with the goal of science fair: it is an opportunity for the students to show their understanding of scientific and logical thought and to gain confidence communicating their research.

**Description**: Fellows may be expected to perform several functions during the state science fair, including providing information about the Science Posse to students and teachers, judging science fair projects, and conducting lab tours for science fair participants. The Science Fair takes place on UW's campus in the spring (typically mid-March).

- **Examples**: n/a
- **Tips**: n/a
- **Connection to Inquiry**: n/a
- **Connection to Research**: n/a

### V.3 Classroom visits

Each Science Posse Fellow needs to develop the following to take into classrooms around the state. The presentations need to be flexible in terms of audience (from 5th graders to possibly 12th graders) but each has a specified length and maximum number of students. This provides the best teaching environment for the Fellows and the best learning experience for the students.

#### V.3.1 Research/Career talks

**Goal**: The goal of the research part of the talk is to bring the Fellow's research to the classroom in an accessible and interesting way. The goal of the career part talk is to inform the students about careers in the Fellow's field and answer the question “What do people do with a degree in that field?” More generally, Fellows also want students to get excited about possibly pursuing a career in the sciences and mathematics, and encourage students to enroll in science and math courses offered at their school.

**Description**: The format of the research/career talk varies, but it typically involves Fellows giving a 15 to 35 minute presentation about their particular area of expertise as well as an overview of types of careers with in the Fellow's particular field. Group sizes for this presentation can range from 15 to 30 students. Although the Fellow can take a lecture-type approach, it is strongly encouraged to involve the audience in these talks. Teachers report students get more out of the talks if there is hands-on student involvement.

- **Example**: A Fellow presents his research on otter populations in Yellowstone National Park (with sample traps and/or tracks, etc. to pass around) and then talks about other kinds of things ecologists do, including having the students use radio telemetry.
- **Tips**:
  o You will have to learn to present your research to individuals from a broad range of educational backgrounds and alter your presentation such that it is appropriate for individuals in certain grades. In short, you should be able to make your research
understandable and interesting to 5th graders, 12th graders and everything in between.

- You will want students to get excited about possibly engaging in a career in your field, so include details that they will find interesting. For example, students are often quite interested in details on salary, how many years of education are required, what kind of classes and activities they should be participating in during high school to prepare for certain fields of work, etc.
- The more interactive you can make your research talk, the better the students will receive it. Include multiple hands-on activities.
- This should not be a lecture. If you use PowerPoint, do fill the screen with interesting pictures and graphics. Do not fill the screen with words, and expect the students to read them. Even worse, do not fill the screen with words and then proceed to read them directly to the students.
- Passing samples around is a good idea. If you can come up with a brief activity (or several) that is an even better idea.

- **Connection to Inquiry:** Research/Career talks don’t lend themselves well to inquiry-based learning, but they are a good way to show how inquiry and scientific methods are involved in developing research questions and conducting research.
- **Connection to Research:** Here is an opportunity for Fellows not only to briefly discuss their research, but also other areas of research in their fields.

V.3.3 Science Mini-Lessons

- **Goal:** The goal of a Science Mini-lesson is to get the students excited about the Fellow’s field by engaging them in short, interactive, and fun activities related to his or her area of expertise that also illustrate the processes of science or the scientific method. (Because of the difficulty of turning some research into activities for students, Fellows can branch out into other closely related areas when creating their mini-lesson.)

- **Description:** A mini-lesson is an interactive science activity where the students are either performing the activity themselves or are heavily involved with the person performing the activity. Mini-lessons are supposed to be fun and also teach (or at least introduce) important science content and/or research skills. Using a template supplied by the Coordinators, Fellows will create a lesson guide that includes a brief description of the activity, important vocabulary, the content and concept focus, and components of the scientific method that are highlighted. These will be posted on the website. Mini-lessons will be 20-25 minutes in length with a maximum of 15 students per group.

- **Examples:** For chemistry, an appropriate mini-lesson may involve the properties of dry ice. For ecology, students can view and handle a variety of animal skulls.

- **Tips:** It is nice to have a mini-lesson that showcases your specialty in your field but this is not always possible. Remember: a key is to make the mini-lesson interactive (and if possible, “flashy”) so students will enjoy the presentation.
• **Connection to Inquiry:** A mini-lesson is a good place to use some inquiry. Encourage the students to have as much control during the mini-lesson as possible (e.g., have students make predictions, guide the activities, etc.).

• **Connection to Research:** Sometimes Fellows’ research or field of study may not lend itself to short exciting mini-lessons, however they may be able to illustrate the kinds of things scientists do while conducting research and then explain how that relates to their own research. While mini-lessons may not directly involve Fellows’ research, they provide models for students about how scientists in general do research.

### V.3.4 Specialized Lessons

• **Goal:** The goal of these lessons is to supplement a teachers’ curriculum by applying Fellows’ research expertise, passion, and the novelty of their presence in the classroom.

• **Description:** Fellows may be requested by a teacher to lead a class on a topic related to their area of expertise that does not fall in one of the above *types of lessons*. This is their opportunity to create an individualized lesson. These lessons may be a one-time visit in a classroom or may lead to repeated visits to a given teacher’s class(es). Topics each Fellow feels comfortable teaching will be listed on the Science Posse webpage.

• **Examples:** Past examples include sheep brain dissections for local biology classes, geometry lessons, an inquiry-based electrical engineering unit for an advanced physics class, practical applications of quadratic equations, vectors and navigation with the GPS, cryptography, the botany of Lewis and Clark, a three lesson series on the geology of Wyoming, and a year-long collaboration focused on problem solving in an inclusion Algebra 1 class.

• **Tips:** The key here is to not overextend yourself, but to be available to cover topics that you are inherently comfortable with, while a teacher may not be.

• **Connection to Inquiry:** These lessons are not necessarily inquiry-based, but, if time and resources allow, should strive to incorporate some qualities of inquiry-based learning.

• **Connection to Research:** Depending on the lesson developed, there may or not be a direct connection to a Fellow’s research, however it is always appropriate to mention your graduate research and field as part of your introduction to the class.

### V.3.5 Science Fair Consultations and Judging of School Science Fairs

• **Goal:** The goal of science fair consultations is to educate students and teachers about the important steps to be followed in developing a science fair project and provide students one-on-one time with a Science Posse Fellow to talk about their individual project. (NOTE: The Science Posse will not judge any science fairs (but the State Science Fair) unless the teacher and students have used the Science Posse’s materials, either virtually or in person.)

• **Description:** The Science Posse has a standard science fair lesson that all Fellows will use during Science Fair Consultations. This lesson includes sample project boards and sample paperwork.

• **Examples:** n/a
• **Tips:** n/a
• **Connection to Inquiry:** A science fair project, done right, is the ultimate inquiry.
• **Connection to Research:** n/a

### V.3.5 Virtual Visits

A virtual visit involves the Science Posse Fellow in Laramie connecting with students in a remote location.

• **Elluminate** is a real-time training, demonstration and collaboration environment that enables the delivery of live, online learning, training, coaching, mentoring and meeting. Elluminate is particularly useful for the Science Posse’s cyber efforts with schools across the state (and beyond) because the schools need nothing but basic Internet access, a computer, webcam, speakers and a microphone. The University has a license for Elluminate and the Science Posse has access to the program because we are part of the University. Fellows set up Elluminate sessions and teachers are emailed a link to join the session. With Elluminate, you can engage students through real-time “talking” (video and voice) as well as display live video, use the built-in white board, access multimedia files, share applications and desktops and access sites on the Internet. Elluminate is easy to set up and easy to use. A complete guide to using Elluminate can be found in Appendix I.

• **Skype** is more intuitive to set up and work with. However, there are some disadvantages to Skype:
  • Skype only allows you to have one camera on each end of the conversation. (You have to pay for video conferencing between more than that on Skype). So if you wanted to video conference with more than two folks at different locations, Elluminate is better.
  • If you want to share pictures, PowerPoint slides, or have the option of writing/drawing so that it is visible to the kids, Elluminate is your best bet as it has the built-in whiteboard feature.
  • Skype may be blocked at the school. This is happening less and less, however it is still an issue. Also, the teacher will need to have a Skype account you can connect to (which is free to set-up) whereas with Elluminate no account is needed.
  • Whichever platform is used, it is suggested that you set up a test session with the teacher before you are scheduled to talk to the kids to work out any technological kinks that may happen.
  • The Annex is set up with a Dell laptop, webcam, headset and microphone for use in cyber visits.

### V.4 Summer Camps for Students

The Science Posse collaborates on two camps each June. In conjunction with the Teton Science School, the Science Posse provides programming for middle school students at TSS’s Kelly Campus in Grand Teton National Park, The Posse also provides programming for the ninth and tenth grade students attending the School of Energy Resources Energy
Summer Institute on campus. Fellows will be asked to work on one of the two camps. (In addition, new Fellows will be paid a stipend to attend one of the camps as part of their training.)

The Science Posse’s *Exploring Science* middle school camp is very popular! The camp typically reaches capacity many months prior to the start date of the camp, and there are waiting lists of students wishing to attend. In other words, Fellows can plan on having a full camp each summer. The camps are also the incubator for activities to be used the next school year. Each year a different theme is chosen for the camps, and each Fellow creates a lesson from his or her area of expertise that fits with the general theme. Camp planning and lesson development begins right after winter break and continues throughout the spring.

### V.5 Summer Workshop for Teachers

The Science Posse and the NASA Space Grant Consortium collaborate on the Exploring Science Workshop for Teachers, scheduled for the first full week of August. This is a weeklong professional development opportunity for teachers of all grade levels. This is the Science Posse’s primary venue for expanding teachers’ working knowledge of current STEM advancements and best practices in teaching science. Teachers from around the state of Wyoming come to the University of Wyoming and learn to integrate inquiry into their teaching.

- All new Science Posse Fellows are required to attend as learners.
- All returning Science Posse Fellows are involved in facilitating this workshop through the following activities:
  - Conducting lab tours
  - Familiarizing teachers with the activities of the Science Posse by conducting research talks, career talks, science demonstrations, and describing science fair consultations.
  - Facilitating the five lessons of the Fundamentals of Inquiry developed by the Institute for Inquiry® located at the Exploratorium® in San Francisco, CA.
- The main goals of this workshop are to ensure that teachers
  - Experience inquiry through hands-on investigation, reflection, and group discussion.
  - Understand the essential features and structure of inquiry and how to incorporate it into their teaching.
  - Transform a lesson from their curriculum to include inquiry.
  - Learn about the activities of the Science Posse and the NASA Space Grant Consortium.
  - Be exposed to current research and technology at the University of Wyoming and become familiar with resources besides the Science Posse available through the University.
VI. How does the Science Posse work?

VI.1 Email:
Posse members and Coordinators do most of their communication through email. Fellows are expected to read their emails every day and to promptly respond with acknowledgements or requested information. (See tips for managing/organizing email using Outlook in VII.6 Helpful Hints.)

VI.2 Commitment to the Posse:
The Science Posse Fellowship is a full GA commitment that pays Fellows a rate significantly higher than a standard graduate assistantship. This requires us to monitor both the time the Fellows devote to the Posse as well as the number of events they participate in.

- A full-time NSF GK-12 Science Posse Fellowship appointment is for 12 months. The Science Posse sets aside UW's winter and spring breaks as well as the month of July and requires no Science Posse work during those times. This leaves 38 weeks of Science Posse activity with an expected time commitment of an average of 20 hours per week. Because of the nature of the Posse's activities, especially with travel every other week, some weeks may require a greater time commitment and others will require less.
- Activities Posse members track include (but are not limited to):
  - **Science Posse Events:** This is face-to-face time with students, in person or virtually through Elluminate.
  - **Event Travel:** This includes travel time in the vehicle, and time for meals while on the road.
  - **Lesson Development and Event Preparation:** This includes time preparing lessons and material and time conferring with teachers about the logistics of the event.
  - **Professional Development**
  - **Administrivia:** This includes meetings, journal entries, activity tracking, and emailing.
  - (See Appendix H for activity tracking forms.)
- The number of events each Fellow completes is also tracked. The expectation is that Fellows participate in one event per week. Since the teams travel every other week, half the events will be out-of-town and half will be in town. In actuality, the distribution of events may not be exactly half in-town and half out-of-town nor may the events fall one per week. However this provides a gauge of Fellow involvement and ensures an equal distribution of events among the Fellows.
- Graduate Fellows will also be required to:
  - Attend a 5-day teacher workshop, and a 3-day GK-12 Symposium near the end of summer as either a facilitator or a learner. (See VI.4 and V.5)
  - Create and conduct lessons for the Science Posse Summer Camps. (See V.4)
VI.3 Meetings:
Group meetings are held every week and all Science Posse members are required to attend. During the meetings the Coordinators will discuss upcoming events and requirements to prepare for them. Teams will be assigned for teacher requests. Journal entries will be assigned, and all other necessary business will be done. 1 credit (through a topics course) is available to Science Posse members for attending these meetings and completing their other Science Posse responsibilities. Each week, the agenda for the Science Posse meeting will be posted in the Meeting Agendas folder in the Grad's Science Posse folder. It is the Fellow's responsibility to access the agenda before the meeting and come prepared with either a hard copy or with it on their iPad.

VI.4 Graduate Fellow training and evaluation:
To facilitate the development of graduate Fellows' transferable skills (improved communication skills in STEM subjects with technical and non-technical audiences, leadership, team building, and teaching capabilities), and to meet NSF and University requirements, the Science Posse has an extensive program of training and professional development which is required of all Fellows.

VI.4.1 Training and Conferences
• UW GK-12 Summer Institute will be held in August. During this training Fellows will be taught the rules associated with the GK-12 grant and shown how Science Posse is run. They will present their own science demonstrations and career talks. They will also get to know the other Fellows and see examples of work from previous Fellows.
• Responsible Conduct of Research training through the University is now required for all participants in NSF-funded research/projects. (This can be done online.)
• The Institute for Inquiry in San Francisco, CA holds a “Fundamentals of Inquiry” workshop each March and October. A limited number of first year Fellows who will be continuing with the Posse for a second year will attend this training.
• Educational Conferences such as the Fall and Spring School Improvement Conferences (September in Cheyenne and March in Casper), and the Wyoming Math and Science Teacher’s Conference (October in Casper) are examples of “Science Posse Events” that Fellows may be required to attend. Not all Fellows will attend each conference.

VI.4.2 Evaluation
• The Coordinators will observe graduate Fellows as they work with students early in the fall semester. Fellows will receive feedback based on these observations. (See appendix L for the observation rubric)
• The Coordinators will ask Partner Teachers for assessments of the Fellows they work through an online survey. These results will be posted to the Fellow’s folder in Dropbox.
• Fellows will also receive teacher and student feedback as soon as it becomes available after Science Posse events. (There are spaces for feedback on surveys and teachers will be emailed after an event and asked for specific feedback.)

• The Coordinators and Fellows will meet for formative and summative evaluations at least once per semester, and at other times as deemed necessary. The purpose of the meetings is to create the best experience possible for both the Fellow and the Posse. The focus of these meetings will be on how the Fellow is meeting his or her responsibilities and expectations, the quality of journal entries, activity tracking and teaching evaluations. (See appendix D for evaluation criteria)

VI.4.3 Megan’s Mean Face Section

The Science Posse wishes to make it very clear that while the Science Posse is important, families and school come first. However, Science Posse graduates are aware of the time commitments etc. when they accept their fellowship and so are expected to fulfill all the requirements of the job in a timely manner with a respectful attitude. This includes (but is not limited to):

• responding to emails (from coordinators, other Fellows, and teachers) in a timely manner,
• filling out all financial and travel paperwork in a timely manner,
• attending all meetings and training sessions,
• being prepared for all presentations to students and teachers,
• signing up for a reasonable number of events (but knowing their own limits!),
• taking on a fair number of lead duties,
• and creating all required written lesson plans by their assigned deadlines.

In general, Science Posse graduate fellows are very responsible and good at managing their time. However, if during the course of the semester there are regular and continued breaches of these duties, disciplinary action will be taken.

• An initial individual meeting with the coordinators to discuss the problem will be scheduled as soon as it becomes evident there is a problem. The coordinators will keep the lines of communication open with the graduate Fellow in question; ideally problems should be solved well before probation is necessary.

• Probation will become necessary if during the course of a semester, Any TWO of the following occur:
  • A graduate Fellow is more than 10 minutes late to two consecutive meetings or three meetings in a semester.
  • A graduate Fellow consistently does not turn in paperwork (reimbursement forms, travel requests, etc.) in a timely manner.
  • A graduate Fellow consistently does not follow procedure when turning in paperwork.
  • A graduate Fellow consistently does not respond to Science Posse related emails.
• A graduate Fellow does not take on an equitable share of work in a partner teacher classroom.
• A graduate Fellow does not take on an equitable share of lead duties.
• A graduate Fellow does not participate in an equitable number of events.
• A graduate Fellow is consistently unprepared for events.
• A graduate Fellow turns two consecutive or three total assignments (journal entries, lesson plans, activity tracking, anything with a due date) late during the course of a semester.
• Additional items at the discretion of the coordinators.

OR

Any ONE of the following occur

• A graduate Fellow misses a scheduled trip without proper notification and a reasonable excuse.
• A graduate Fellow misses a scheduled meeting without proper notification and a reasonable excuse.
• A graduate Fellow violates policies of a school at which they are presenting.
• A graduate Fellow uses inappropriate language, wears inappropriate clothing, or has inappropriate interactions with students.
• Additional items at the discretion of the coordinators.

• First Level Probation: The Science Posse graduate Fellow shall be required to have weekly one-on-one meetings with the coordinators in order to ensure that the situation is resolved.
• Second Level Probation: Should the situation not be resolved during these one-on-one meetings, the Graduate Fellow shall be required to schedule weekly meetings with the Science Posse’s PI.
• Should the problems not be resolved during a probationary period (to be set by the coordinators and graduate Fellow) the graduate Fellow may be dismissed from the Science Posse.

VI.5 Travel Teams
The Science Posse’s virtual visit program to provide lessons, science fair consultations, and career or research talks to schools throughout the state via distance learning. These will allow the Posse to maximize its presence in the state in spite of the long distances between schools and the University. Even with the virtual visit component in place, Science Posse Fellows will still travel to schools throughout the state. Given the distances between outlying schools and Laramie and the travel time that necessitates, the Science Posse has implemented travel teams. This year there will be two travel teams of 6 Fellows each. The teams may be further “subdivided” based on the requests the Science Posse receives.

(NOTE: Fellows will be expected to conduct lab tours and cyber visits as well as work with
teachers and classrooms in Laramie and the nearby area (Laramie, Cheyenne and Rock River) during their non-travel weeks.)

The following section details the makeup and function of travel teams:

- Science Posse visits occur during the University’s fall semester and in the spring through the end of May.
- The two travel teams will travel on alternating weeks.
- Fellows will be expected to travel out of town only during their travel weeks.
- The days of the week each team travels will determined based on the team members’ schedules.
- Before each semester, Science Posse Fellows should assure that their class and research schedules allow them to travel during the week. Fellows should be prepared to stay overnight on some visits.
- Members of a travel team should have each other’s phone numbers (especially helpful to have all Fellows’ and Coordinators’ cell phone numbers stored in contacts).

Travel Teams are designed to be a help rather than a hindrance to scheduling Science Posse Events in addition to other grad school and family obligations. Some Fellows choose to adhere very closely to their travel weeks. Others prefer a little bit more flexibility, traveling at times other than their set travel schedule. The important thing to remember is to find what works for you in meeting your obligations as a Science Posse Fellow while still finding the proper time management and balance.

VI.6 Logistics for school visits

School visits are the heart of what the Science Posse does, and are the basis for our reputation throughout the state. (One teacher told a faculty member in the SMTC, “The Science Posse is the best thing to come out of the University in years!”) It goes without saying that Science Posse Fellows are expected to enhance that feeling at every visit.

- Science Posse Fellows should wear the red polo, blue dress shirt, or baseball shirt, to all Science Posse events. (Science Posse name tags are also encouraged.)
- Science Posse Fellows should check in at the school’s front office and obtain a visitor pass.
- If a Science Posse Fellow is unable to fulfill a scheduled request due to an emergency, the teacher and coordinators should be notified as soon as possible, and every attempt should be made to reschedule the event.

VI.6.1 Request/Lead Protocol

In order to make things run smoothly from the time we get a request through the time the requested event takes place, the following protocol has been established:

Note that this should be followed even when you are the only one going - relevant information still needs to go to Jan and/or Meg.

- When a request comes in, the following happens:
• Terms and conditions are automatically sent to the teacher and a reply is requested.
• Jan acknowledges teachers request and lets him/her know when they should hear back (i.e. after the next SP meeting); also makes sure terms and conditions are agreed to.
• Megan puts request on agenda.
• The request is discussed at the next meeting and one of the following happens:
  o We agree to do it and a lead is assigned.
  o We decide we can’t do it. (Jan emails the teacher.)
  o We need more information. (Meg emails the teacher.)

• Once a lead has been chosen for an event, the following should happen:
  • Meg emails the original request form to the lead, along with any relevant information. (All team members copied on this email.)
  • Jan emails the teacher and tells him/her who the lead is and that he/she should be contacted soon (lead is copied on that email.)
  • The lead should make initial contact with the teacher within a week. (See Appendix J for Sample Lead Emails.)
  • In the initial correspondence with the teacher, the lead needs to get the following in formation:
    o Number of students and timeframe for each activity
    o Background of students – particularly if you know which mini-lessons are being presented or if SP has been to the school before. (We don’t want to show up and present the exact same thing the students saw with their teacher last week or with the Science Posse last year.)
    o Directions and parking information
  • From each member of the team, the lead should gather the following information
    o What he/she needs supplied by the school (computer, projector, etc.)
    o Room/Space requirements (sinks, access to water, etc.)
    o Any potential hazards the teacher needs to know about (recall that smoke etc. may be an issue for asthmatics, things like flashing lights may be an issue for students with epilepsy.)
  • If the event is on campus, the lead needs to find out from his/her team who will need rooms. The lead needs to give Megan the room requests, being sure to include the following information:
    o The number of rooms needed and the capacity of each room
    o Any special requests (sinks, computer/projector, etc.)
    o Megan will do her best to fulfill all room requirements, but because we often schedule events during prime class time we often have to do the best we can with what we get.
  • The lead should coordinate the schedule of events with the teacher. This should include:
• Sufficient time for set-up and introduction in the beginning and clean-up/tear-down at the end.
• Sufficient transition time – not just for students to get from one station to another, but also for grads to replenish supplies, set things up for the next group etc.
• A lunch break
• Possibly rotating grads for events such as mini-lessons (i.e. each rotation three grads present, one takes a break) This needs to be determined ahead of time and explained to the teacher.
• If the event is out-of-town, the lead needs to let Jan know about travel arrangements, specifically:
  o When the group will be leaving
  o When the car(s) should be picked up
  o If overnight accommodations will be needed.
• Jan will also need the total number of students for each event in order to print off appropriate surveys. Jan will give the surveys to the lead at the meeting prior to the event.
• Once the lead has set the schedule of events, including number of students per group, number of groups, length of rotations, etc. all of this information should be passed on to the entire travel team and the coordinators.
• Team members should agree on the departure time and location.
• It is the responsibility of each member of the team to:
  o Respond promptly to the lead with their room/equipment needs.
  o Make sure he/she has all the supplies needed, or make arrangements with the teacher/team/lead to get supplies when you arrive at the school. (This includes bringing along floor/table protection if you have a messy lesson!)
  o Show up on time at the departure spot.
• If the event is off campus, the lead should communicate the following to the teacher:
  • The final schedule, including the number of groups the teacher should create (i.e. if there are 5 Fellows going, but only 4 will be presenting at a time, the teacher will need 4 groups, not 5)
  • The Fellows’ room/space requirements and the items that need to be supplied by the school
  • What time the Science Posse will show up at the school – be sure to give your team adequate time to set up.
• If the event is on campus, the lead should communicate the following to the teacher:
  • The schedule
  • Location of and directions to each session
  • How switching between various sessions/labs will work
• A day or two before the event, the lead should confirm the event one more time with the teacher (See Appendix J for Sample Lead Emails.)
  o This is also the time to remind the teacher of weather issues - particularly if the weather looks like it might be bad.)
  o This is also a good time to ask the teacher about nametags - will the school be providing nametags? Is it all right if the Science Posse brings nametags for the students?
  o This might also be the time to ask if there are any special circumstances in the classroom the team should be aware of - students' with disabilities etc.
  o The lead needs to be sure he/she knows the directions to the school.
  o The lead may want to ask the teacher about places to eat lunch.
  o The lead should also send a confirmation to the team at this time as well to insure everyone is still on the same page.
• At the event, the lead needs to be sure to give the student surveys to the teacher. The lead also should ask the teacher to be the timekeeper, stating the ending time of each session and coming around to give the Fellows a “two-minute warning”.
• The lead also needs to make sure to get receipts for the rental car (if there was one, it would be in the lead’s name) as well as hotel receipts. These need to be turned in to Jan no later than the next Posse meeting, as do receipts for any dining from the trip.

  • After the event has taken place, the following happens:
    • Jan emails Teacher Survey to teacher and follows-up until it is returned.
    • When teacher survey is returned, Meg pulls out relevant comments and puts them on grad feedback form in Dropbox.
    • When teacher/student surveys come back, Jan emails relevant comments to Meg to add to Grad feedback.

VI.6.2 Vehicles
The Science Posse rents vehicles from Fleet Services for driving trips beginning in Laramie and through commercial rental agencies at the destination if the University plane is used. The Program Coordinators will make arrangements for vehicle rentals. Everyone who drives a University vehicle and/or receives mileage for driving a personal vehicle must abide by the updated University Vehicle Policy which began July 1, 2011. Please read the pertinent sections attached in Appendix B.
Please also be aware that when traveling on official business, University of Wyoming employees represent the University and the public is quick to report situations they consider Vehicle Misuse such as speeding. While these incidents may or may not be valid, they will be investigated by the Manager of Fleet Services and/or the Director of Auxiliary Services and the driver will be reminded of the importance of driving safely. (This investigation/reminding is authorized by UW Regulation 3-179.)
• All drivers of University vehicles and all persons requesting mileage for driving a personal vehicle on Science Posse business must complete an annual Motor Vehicle Records (MVRC) Check. If the check shows an acceptable driving record, the driver will receive “qualified” status and then be allowed to drive University vehicles. The MVRC form can be completed online at the UW Risk Management site, and is mandatory for all Posse Fellows. (An accumulation of 3 speeding tickets within 3 years will cause the driver to fail the MVRC.)

• If you are traveling with chemicals, you must carry the material data safety sheets (MSDS) with you. Also be sure to have the appropriate safety gear (e.g., goggles, gloves, and aprons) for you and students (unless teacher(s) will provide gear for their students). If you are flying in the University plane, you will also need to check to ensure your chemicals can be safely carried on the plane. (See appendix G.)

• There is a cancellation fee for UW fleet services. However, if the trip is cancelled due to weather, the cancellation fee is waived IF you tell Fleet Services why you are cancelling. (If you have taken the vehicle the evening before for an early morning departure and the trip is cancelled due to weather, return the vehicle as soon as possible and tell Fleet the reason to minimize the charge.)

• You do not need to fill the UW vehicles with gas before returning them.

• Rental cars through agencies other than UW Fleet Services must be returned with a full tank of gas. (Even if you don’t think you have used any gas, fill the car up and show the receipt to the rental folks. The Posse has been charged over $70.00 by rental agencies for not filling a car when the total mileage was only 126 miles.)

• Rental car receipts must be brought back to the Program Coordinators.

• Reimbursement for mileage on personal vehicles is limited to unique circumstances when personal mileage is less expensive than using a University vehicle. Please read the University Policy on use of personal vehicles in the appendix.
  • If a Science Posse vehicle is scheduled to travel, there will usually be no personal reimbursement. (Check with the Program Coordinators for exceptions.)
  • Mileage is figured using Mapquest.com (beginning at 1000 E. University) and currently paid at a rate of $.565 per mile.
  • Mileage reimbursement requests cannot be submitted until all receipts for the trip are turned in.

VI.6.3 Lodging
If the visit requires consecutive days in the classroom or if the school is too distant to allow leaving early in the morning on the day of the event, an overnight stay is necessary. The Program Coordinators will make arrangements for lodging using the Science Posse’s p-card.

• Within the state of Wyoming, the Science Posse is tax exempt.
  • Some motels require a tax-exempt certificate on file; you will be given one to take if needed.
• Please remind the desk clerk of your tax exempt status when you check in, and examine your receipt when you check out to make sure no tax is charged.
• If you are charged tax, that amount must be credited back to the credit card and it is easier to do it then than by phone later!
• Science Posse Fellows must obtain receipts for all hotel stays and return them to Coordinators as soon as possible. Make sure that you acquire the receipt for each room. If not, you must call to get a receipt sent directly to the Coordinator.

VI.6.4 Meals
The Science Posse reimburses Fellows for meals when they are travelling based on the guidelines below. An itemized receipt and a Science Posse Reimbursement Form must accompany all reimbursement requests. (See section I.10.5 for specifics about completing reimbursement forms.) Reimbursements will be made for a reasonable tip (<20%), but not for alcoholic beverages.
• Currently the Science Posse does not regulate nor limit the cost of meals, as we trust Fellows to be reasonable. However, should exorbitant charges be made, limits may be sent for individual Fellows or for all traveling Fellows. (For example, a lobster dinner at $54.95 is an exorbitant charge.)
• Please try to limit the number of reimbursements necessary for an event by designating one Fellow to pay for the entire group at a meal whenever possible.
• For a one-day trip, the meal usually reimbursed is lunch. (A one-day trip is defined as one where the destination is close enough that an early morning departure allows Fellows to arrive before the event starts.)
• If it is an overnight trip and Fellows leave the afternoon/evening before they will be reimbursed for dinner, breakfast (unless the motel serves one), and lunch.
• Payment for dinner on the trip home can be made if Fellows don’t get back to Laramie until after dinnertime.
• Reimbursable meals for trips to conventions or trainings (e.g. GK-12 in D.C. or IFI in San Francisco) will be determined before the trip based on travel and conference/meeting schedules.
• Accounts Payable will deny reimbursements for “road snacks” or a mid-morning coffee break, and for reimbursements that are not received within 30 days of the event.

VI.7 Cancellations and Weather
At times, poor weather conditions and bad roads makes traveling throughout Wyoming a safety risk. In such cases, a school visit will be cancelled. Teachers are made aware of the possibility of cancellation on the Science Posse website when they submit a request.
• The team lead must give teachers notice of the possibility of cancelling a visit. This should be done after consulting with a Coordinator. For example, if weather forecasts predict inclement weather on travel days, the lead on a travel team should email the teacher and make them aware of the possibility of cancellation.
• Teachers should be told of the likelihood or necessity of a cancellation at least 24 hours before the event. The lead should contact the teacher in this case. To ensure notification, a phone call to the teacher should be made during appropriate hours.

• If sections of road to a school are closed or designated “No Unnecessary Travel” by WYDOT the day before a scheduled event, the travel team should cancel that school visit by 3:00 p.m. that day. This should be done after consulting with a Coordinator. Teachers should be notified immediately of the decision (preferably through a telephone conversation), told that the decision is final, and efforts should be made to promptly reschedule. Although road conditions may improve later in the day or the next day, the uncertainty of travel during these situations creates difficulties for both the Science Posse and teachers, so decisions are final.

• On the day of travel, if conditions have deteriorated so that sections of road to a school are closed or designated “No Unnecessary Travel” by WYDOT, or if Fellows start out and determine the road is unsafe to traverse, they should immediately notify the teacher and the Coordinators.

• The Science Posse is aware that cancellations are disappointing and problematic for teachers and students at requesting schools. The Science Posse will attempt to reschedule any cancelled trips as soon as possible.

• If a team has safely travelled to a Science Posse event and then the weather deteriorates, “No Unnecessary Travel” is advised by WYDOT or roads are closed the team should contact the Coordinators to make arrangements to stay until it is safe to travel.

• If a team has safely travelled to a Science Posse event and then the weather deteriorates in Laramie, the Coordinators will contact the team and make arrangements for the team to stay where they are until road conditions improve. If this recommendation is made, the team should consider the risks they are taking by trying to get home, no matter how inconvenient extending their time away from Laramie is.

VI.8 Event follow-up

• Surveys are administered after each Science Posse visit in order to assess the impact of the Science Posse on students and teachers.
  • The team leader will be given a survey packet to take to the event. If the packet is forgotten, it is the team leader’s responsibility to notify the Coordinators and to mail/deliver the survey to the teacher at his or her own expense.
  • Surveys packets (which include a prepaid mailer) can be left with teachers to return to the Science Posse. Alternatively, if time allows, teachers can administer surveys and Science Posse Fellows can then bring the surveys back. Science Posse Fellows should not be present when students are filling out surveys.

• Receipts for items paid for with the Science Posse’s p-card (lodging and rental cars) must be turned in to the Program Coordinators as soon as the trip is over.
• Reimbursement forms need to be completed for all allowable out-of-pocket expenses.
  • Make sure to obtain *itemized* receipts for all purchases if you intend to be reimbursed. You cannot be reimbursed for the purchase of alcoholic beverages.
  • Receipts and forms should be returned to the Science Posse Coordinators as soon as possible following a trip. Accounts Payable will deny reimbursements that are not received in a timely manner. *(Forms received 30 or more days after an event will not be reimbursed.)*

VI.9 Emergency Situations

In the case of an emergency during a Science Posse event, the following procedures should be followed. In general, Fellows should always secure the situation (call emergency personnel, get appropriate medical care for participants as necessary, etc.), call the coordinators to notify them of the situation, and finally fill out a post-emergency summary as soon as possible for the Science Posse records. Fellows should *never* transport students or teachers anywhere in their personal vehicles, whether it is during an emergency or otherwise.

For the purposes of this handbook, an emergency includes:

• any student, teacher, or graduate Fellow injury (excluding things like minor cuts which simply need a band aid),
• any situation in which physical damage (to equipment or people) was done due to an accident during an event,
• any incident in which emergency personnel (ambulance, police, etc.) are called in, and
• any incident in which a student becomes exceptionally disorderly during a session

What is a Post-Emergency Summary?

A post-emergency summary is simply a written account – completed separately by each member of the Posse involved in the incident – which details what took place. This is simply to make sure the Science Posse had a coherent record of what took place in case it should become needed at a later date. These should be completed by each Fellow involved and emailed to the Coordinators as soon as possible.

VI.9.1 Vehicle Accident Procedures:

• Call UW Police: 766-5179. Call local police if accident occurs out of town.
• Call Fleet Operations: 766-3229. After hours, UW Police will assist you.
• When appropriate, call one of the coordinators (Megan: 307-290-0058 or Jan: 307-290-1159) to notify them of the accident.
• If necessitated by severity of the accident, be sure to give emergency personal all relevant MSDS.
• Prompt reporting of claims is essential. All accidents with injuries and all accidents for which the University or Employees may be at fault should be reported immediately to the police and Risk Management.
• Driver is responsible for obtaining driver and insurance information if other vehicles are involved.
• Driver is responsible for completing and returning State Accident Report Form to the State Department of Motor Vehicles, as well as an ACORD Form with Fleet Operations.
• DO NOT move injured parties. Call for medical assistance. Encourage all parties to seek medical attention.
• DO NOT make statement to anyone except police, Fleet Operations, or Risk Management.
• As soon as possible, each Science Posse Fellow involved in the accident should write up a Post-Emergency Summary and email it to both coordinators.

VI.9.2 Accident During Lab Tours Or Other On-Campus Event:
When students are brought to campus as part of a school activity, the chaperoning teacher and sponsoring school are ultimately responsible for emergencies and should know of any and all pre-existing conditions of students. However, graduate fellows should be aware of the locations of emergency supplies (fire extinguishers, first aid kits, eye washes, MSDS etc.) as well as possible locations to get emergency care (Student Health, Ivinson Memorial Hospital, etc.) Under no circumstances should a graduate Fellow transport injured or sick students to the hospital, as there could be a liability problem if the student becomes more ill or sustains further injury while traveling to the hospital.
• For emergencies that occur on campus, graduate fellows should always call the coordinators (Megan: 307-290-0058 or Jan: 307-290-1159) and notify them of the situation.
• For emergencies occurring on campus, all graduate Fellows involved need to write up a Post-Emergency Summary and email it as soon as possible to both coordinators.

In order to head-off certain student injuries, graduate fellows should notify teachers/students if their activities involve smoke or other irritants which could aggravate students with asthma, flashing lights or other epileptic triggers, or common allergens.

V.9.3 Accident During School Visit:
During a school visit, the teacher should be responsible for any emergency that occurs on school grounds and should know of any and all pre-existing conditions of students. If for some reason an emergency occurs when there is no teacher in the room, the graduate Fellow should take control of the situation, keep everyone calm, and send a student runner to the office to notify school personnel. Under no circumstances should a graduate Fellow transport injured or sick students to the hospital, as there could be a liability problem if the student becomes more ill or sustains further injury while traveling to the hospital. If an emergency response is required, graduate fellows should be sure to give the emergency responders relevant MSDS.
• For emergencies occurring at a school, graduate fellows should use their discretion as to whether or not the situation warrants calling the coordinators (Megan: 307-290-0058 or Jan: 307-290-1159) to notify them.

• If the emergency occurred within a Science Posse session (e.g. a student injury) or as a result of a session (e.g. a fire alarm resulting from a Science Posse activity) all graduate fellows involved need to write up a Post-Emergency Summary and email it as soon as possible to both coordinators.

In order to head-off certain student injuries, graduate fellows should notify teachers/students if their activities involve smoke or other irritants which could aggravate students with asthma, flashing lights or other epileptic triggers, or common allergens.

VI.9.4 Accident During Field Activity:
When students are brought to on a field trip as part of a school activity, the chaperoning teacher and sponsoring school are ultimately responsible for emergencies and should know of any and all pre-exiting conditions of students. However, graduate fellows should be aware of the locations of emergency supplies (first aid kits – which the Science Posse has and can be taken along - MSDS etc.) as well as possible locations to get emergency care. Under no circumstances should a graduate Fellow transport injured or sick students to the hospital, as there could be a liability problem if the student becomes more ill or sustains further injury while traveling to the hospital.

• For emergencies that occur in the field, graduate fellows should always call the coordinators (Megan: 307-290-0058 or Jan: 307-290-1159) and notify them of the situation.

• For emergencies occurring in the field, all graduate Fellows involved need to write up a Post-Emergency Summary and email it as soon as possible to both coordinators.

In order to head-off certain student injuries, graduate fellows should notify teachers/students if their activities involve smoke or other irritants which could aggravate students with asthma, flashing lights or other epileptic triggers, or common allergens.

VI.9.5 Accident During Summer Camps:
Emergency procedures for camp will be determined based on the location of camp.

VI.10 The Website
The Science Posse website is located at www.scienceposse.org and is accessible to everyone, including teachers, students, and graduate Fellows. The website helps us disseminate our activities to others as well as provide information about the program and Fellows. Important announcements are posted on the website’s homepage. The website also provides resources for teachers and graduate Fellows, including a copy of this handbook. The 'Resources' link on the homepage takes you to the section of the website that provides...
Science Posse lesson plans, Internet resources, and readings about teaching science through inquiry.

VI.10. 1 Meet the Posse
Each Fellow is responsible for his or her profile. Information and a photo (preferably in the field) must be submitted to the Program Coordinators to post on the website at the beginning of the fall semester.

VI.10. 2 Requests
Science Posse events are set up through the request form on the website. Even if a teacher and a Fellow have worked out the details of a visit before hand, the teacher still must fill out a request form. (In such a case, encourage the teacher to explain this in the comments section.)

VI.10. 4 Calendar
The Science Posse monthly calendars are posted on the website and can be accessed by clicking “Calendar” on the left side of the page. The calendars show Fellow travel schedules, all scheduled and pending Science Posse events (including names of the lead and participating Fellows) and meetings. Cancelled visits are also noted on the website. Fellows and teachers are responsible for checking the online calendars regularly to stay apprised of upcoming events/deadlines and to notify the Coordinators of any changes or incorrect listings.

VI.10. 5 Blogs
If a Fellow must miss a substantial block of time during the Academic Year for research (e.g., extended conferences or field work), he or she may have the option to create a blog on the website so that students around the state are able to see what he or she is doing. Communication with students via the blog would replace any travel requirements the Fellow is unable to fulfill while absent.

VI.11 Dropbox
Dropbox is a free file-sharing service that provides up to 2GB of cloud storage. The Science Posse uses Dropbox extensively for document sharing as well as for journal entries, activity tracking, and providing feedback. The Coordinators will set up a shared Dropbox folder with each Fellow as well as a “Grad’s Science Posse” folder shared among all Fellows and the Coordinators. Graduate Fellow can use Dropbox on their personal computers, their Science Posse provided iPads, as well as any other personal electronic device.

• Folders shared between individual Fellows and the Coordinators will contain folders for activity tracking, editing, feedback, journal entries and reimbursement forms. Activity tracking and journal entries need to be placed in the folder in a timely manner, following the specified format for titling the files. (This will allow the Coordinators to search and easily find all files from all Fellows on the due date.)
• The Grads Science Posse folder contains folders for meeting agendas and for resources.
  o Each week, the agenda for the Science Posse meeting will be posted in the Meeting Agendas folder in the Grad’s Science Posse folder. It is the Fellow’s responsibility to access the agenda before the meeting and come prepared with either a hard copy or with it on the iPad.
  o The Resources folder contains necessary forms, iPad info and lessons, science fair resources, state and national standards, lesson plans from the Institute for Inquiry that are used for the teacher workshop and Science Posse lesson plan templates and examples.

VI.12 iPads

VI.12.1 Purpose
The Science Posse is proud to provide iPads for Fellows for their tenure in the Posse to develop innovative STEM curriculum and delivery methods in support of the Posse’s goals of:
• Increasing middle and high school teachers’ excitement about and content knowledge in thematic areas and increasing teachers’ knowledge and pedagogical skills in teaching STEM subjects.
• Developing cyber-infrastructure in Wyoming K-12 schools specifically for the purpose of supporting collaborative efforts.
• Developing transferrable skills and improving graduate program outcomes for the GK-Fellows.

VI.12.2 Agreement
To receive an iPad, Fellows must understand and agree to the terms and conditions listed below.
• I understand that I am responsible for any damage to the iPad and accessories that occurs while the iPad is in my care.
• I am responsible for all lost or damaged documentation (User Guide) and accessories (cables, chargers, case).
• The iPad is to be used only for Science Posse business and not for personal use.
• I may not loan the iPad to anyone else.
• I may download apps to the iPad to support my curriculum development and lesson delivery, HOWEVER apps that are not free will not be reimbursed without prior approval of the Coordinators.
• As a condition of having an iPad to use as a Posse Fellow, I will provide the Science Posse with a product (examples listed below) to be posted on the Science Posse website. I will submit a written plan for the product to the Coordinators for approval and to determine the date of delivery.
  o A lesson plan
o A list of resources for teachers
 o An app or an iBook

• The IPad will be returned to the Science Posse at the end of my tenure as a Posse Fellow on a date and in a manner agreed upon with the Coordinators.
• If I do not follow these policies and agreements, I understand that I am forfeiting my right to retain the iPad.

VI.12.3 UW Email
• Directions for setting up UW Mail on iPads can be founds at:
  http://www.uwyo.edu/askit/displaydoc.asp?askitdocid=4081&parentid=1

VI.12.4 Apps
• There are a variety of useful apps for the iPad. Some increase productivity and some are useful for lesson development and curriculum development because they bring content to the classroom in novel ways. The Science Posse has an evolving list of useful apps. (See Appendix K)
• Many apps are free. However, some necessary apps are not. The Science Posse will reimburse Fellows the cost of those apps if
  o The app is on the list of apps that are pre-approved for purchase
  o The Fellow justifies his or her use of the app to the Coordinators and receives their approval.
• All apps must be downloaded from the app store on the Fellow’s iPad, not on the Fellow’s computer.

VI.13 Money Stuff
All Science Posse accounting is housed in the University’s Molecular Biology Department in the College of Agriculture. The office is located in AS/MB 203. Any questions or concerns regarding issues such as pay checks, insurance, tuition or reimbursement for travel should be directed first to the Program Coordinators and then to Kara Enyeart or Marissa Gannon.

VI.13.1 The Science Posse’s P-Cards
To simplify book keeping, as many purchases as possible should be made by the Coordinators using the Science Posse Procurement cards (or p-cards). The p-card is a VISA credit card issued in the Program Coordinators’ names and they are the only ones authorized to use it. P-cards can be used for most Science Posse purchases except meals when travelling. Contact the Program Coordinators to arrange the purchase of supplies with the p-card.
• Anticipated purchases should be reported to the Program Coordinators as soon as possible. In other words, DO NOT WAIT UNTIL THE LAST MINUTE to plan p-card purchases.
• For any purchases in town Fellows should make arrangements at least a week in advance to either go shopping with the Program Coordinators, or for one of them to do
the shopping from a detailed list of supplies emailed to her. This list should include the locations for purchase and specific amounts to be purchased.

- For any purchases from the Internet, Fellows should email the Program Coordinators all of the details of what needs to be orders so they can be ordered on-line. It is especially helpful if the email contains links to the products to be purchased. Please order far enough in advance to avoid the necessity of extra shipping charges.

- If the p-card is used for hotel or rental car reservations, make sure to return a receipt to the Program Coordinators for the Science Posse records.

VI.13.2 University Store
The Science Posse has a revolving account at the University Store under the Science Posse name. When Fellows make purchases at the Bookstore, the purchases can be charged to the Science Posse account (10152). The charges are paid by a Coordinator’s p-card at the end of the month. Fellows must turn in a receipt for items they purchase to the Coordinators since these must be turned in with the p-card receipt when the bill is paid.

VI.13.3 Copy Center
The Science Posse has an open charge sheet at the Copy Center, which is paid each month by a Coordinators’ p-card. Fellows just need to be sure their order is recorded on the charge sheet. If there is ever a problem, have the Copy Center call the Science Posse office (6-6398) or one of the Coordinators to get authorization to have the charge put on the Coordinator’s p-card.

VI.13.4 Chemical Stockroom
The Science Posse has an open charge sheet at the Chemical Stockroom, which is paid each month by a Coordinators’ p-card. Fellows just need to be sure their order is recorded on the charge sheet in Jan’s name. If you get a receipt, please turn it in. If not, please email us and let us know you made a purchase. DO NOT WAIT UNTIL THE LAST MINUTE to make these purchases in case the required supplies are not in stock and need to be ordered.

VI.13.5 Reimbursements for Out-of-Pocket Expenses
There are times when Science Posse Fellows will need to pay out-of-pocket. Reimbursable expenses include (but are not limited to) last minute supplies, food on trips, and fuel for University vehicles on trips. (Mileage, parking and shuttle/subway expenses are also reimbursable when pre-arranged with the coordinators.)

- Please note: if the Science Posse is already paying for a meal, i.e. breakfast at a motel, lunch at a conference, then the Posse cannot reimburse a Fellow who chooses not to eat the provided meal and pays for one out-of-pocket.

- Personalized forms will be in each Fellow’s Dropbox. He or she should complete and email the forms to the Program Coordinator. (See examples of completed forms in Appendix C.)

- Itemized, dated receipts must accompany all reimbursement requests. These can be given to the Program Coordinators at Science Posse meetings or dropped off in the Science Posse office.
Posse office. (If the office is locked, receipts can be slipped under the door. Please be sure the receipts have a name on them.)

• Receipts should be completely taped to a piece of paper on all 4 sides with “scotch-type” tape (not masking tape). This allows the Program Coordinators to make the copies needed to accompany the reimbursement forms. (Please do not tape over any of the printing on the receipt; the tape will fade the printing. If it is not readable, the reimbursement can’t be made.)

• If you are given permission to claim mileage and you have other items for reimbursement, please email your completed reimbursement form to the Coordinators along with your vehicle license number. The Coordinators will complete the mileage section. Then turn in your receipts in the regular manner. Mileage forms cannot be submitted until all other receipts for the visit have been received.

• Forms received 30 or more days after an event will not be reimbursed.

• Getting a reimbursement requires the following steps:
  • Forms and receipts are turned in to the Program Coordinator.
  • They are copied for our records.
  • The originals are delivered to Marissa Gannon in Molecular Biology.
  • Marissa emails a copy of the University voucher or payment request form for the Fellow to print, sign and return to the Program Coordinator.
  • The signed forms are returned to Molecular.
  • The forms are sent to Accounts Payable where a check is cut.
  • This check is delivered to the Science Posse office, and then to the Fellow.
  • This process is time consuming. The sooner receipts are turned in, the sooner reimbursements are paid out.

• During times that the Science Posse is not having regular meeting (i.e. winter break and summer months), the reimbursement check will be mailed to the Fellow. It is the Fellow’s responsibility to ensure that his or her address is up-to-date in the Coordinators’ records.

VI.14 Science Posse Spaces: AG 5025, the Lab and AG 5024A, the Annex
The Science Posse has storage and teaching space in AG 5025, which is shared with a class two afternoons a week in the fall and is used three mornings in the spring. This is a posted lab, and no food or drinks are allowed. Additional storage is located in Ag C 5024A.

• Common supplies (tape, gloves, etc.) are stored in the lab and can be retrieved by contacting the Coordinators.

• Other lesson supplies can also be stored in the lab as space is available.

• When a Fellow’s tenure with the Science Posse ends, he or she is responsible for returning any equipment and supplies purchased with grant money to the Science Posse storage. The following is an exception to this rule: if there is no Fellow taking over a lesson or activity that requires the supplies, and the past Fellow will continue to use the supplies for outreach purposes (e.g., Women in Science, Lab Tours, classroom
collaboration), then the Fellow may retain the supplies after reporting them and their potential use to the Program Coordinators.

VII. Resources

VII.1 Standards

Wyoming State Science Standards

Next Generation Science Standards

Common Core Standards for Math
http://www.corestandards.org/

VII.2 Basic Inquiry Information/Resources

Institute for Inquiry (at the Exploratorium)
http://www.exploratorium.edu/ifi/

Institute for Inquiry Resources Center
http://www.exploratorium.edu/ifi/resources/index.html

VII.3 Books in the Science Posse Library


The Exploratorium Science Snackbook. (cook up over 100 hands-on science exhibits from everyday materials. (2009)

Exploratopia (more than 400 kid-friendly experiments and explorations for curious minds) (2006). (3 copies)


The Truth about Science: A curriculum for developing young scientists. NSTA Press (2001)


VII.4 Helpful websites

- Science Posse Website [www.scienceposse.org](http://www.scienceposse.org)
- NSF GK-12 Website [www.nsfgk12.org](http://www.nsfgk12.org)
- NSTA Journals [www.nsta.org/publications/journals.aspx](http://www.nsta.org/publications/journals.aspx)

Common Science Misconceptions

- [www.ems.psu.edu/~fraser/BadScience.html](http://www.ems.psu.edu/~fraser/BadScience.html)

Demo Ideas

- [www.exploratorium.edu/snacks/](http://www.exploratorium.edu/snacks/)
- [http://bizarrelabs.com/control.htm](http://bizarrelabs.com/control.htm)
- [www.stevespanglerscience.com/](http://www.stevespanglerscience.com/)

VII.5 Frequently Asked Questions

When I spend my own money for supplies or food, am I reimbursed for tax?

Yes, the Science Posse will reimburse you for sales tax.

Do I need to fill University vehicles with gas before returning them?

No, there is no need to fill gas tank in University vehicles before returning them. (However, it is important to do so for commercial rental vehicles! The University does not charge extra for refueling a vehicle, but Avis, Hertz, etc. do.)

What if I need to use my department's equipment for Science Posse activities?

Most Fellows try to use Science Posse-owned equipment as much as possible, but inevitably you will need to use your research lab’s stuff every now and then (especially if the equipment is too expensive and/or infrequently used for the Science Posse to purchase). If you borrow department equipment, make sure you have an understanding with your department head and advisor. This typically involves agreeing to use department equipment if it doesn’t interfere with departmental classes or research. The Science Posse is responsible for any repairs or maintenance that might become necessary.

Do I have to be enrolled for summer credit to receive my stipend?

Yes. You must be enrolled in at least one credit during the summer to receive your stipend. The Science Posse has a 1-credit topics course for Fellows to fulfill this requirement.

Can I TA or teach a class for my department for a semester while working for the Posse?

No, the Science Posse is considered a full-time position.

Can I drive my own vehicle to out-of-town classroom visits?

It is preferable that if you are going out-of-town you take a UW vehicle. However, mileage reimbursements can be received for taking a personal vehicles if no UW vehicle is available, or if no UW vehicle is going AND paying mileage would be cheaper than...
What if my research field season/conferences/qualifiers conflict with major Science Posse activities and/or my time commitment requirements?

You are a student first and it is understood that things like qualifying exams, prelims, defenses, research trips, etc. may occasionally take priority over Science Posse activities. Every attempt should be made to notify the Coordinators and other Fellows as far in advance as possible so that alternative arrangements can be made. In some cases, for extended absences, you may be asked to do some supplemental activity (e.g., create a blog or develop a Bringing Field Ecology to the Classroom presentation to be posted online).

How do I handle controversial topics in my lessons?

Here is Fellow Jonathan Hoffman’s response to the question, “How do I teach about evolution, which can be considered controversial topic by some students?”

Some scientific topics, such as evolution, can be polarizing. When teaching these topics, it helps to present the students with actual data. If a student questions the lesson because of his/her beliefs, be sure to respect those beliefs, but be careful not to devalue the scientific data you are presenting. For example, a student may say, “My preacher tells me that evolution is a lie.” An appropriate response may be something like, “In this country we are all free to practice our own belief systems and I am certainly not here to offend those. I will give you the data as well as the accepted opinion of the scientific community, and you can decide what to make of it.”

Why do I have to complete the online motor vehicle record check form (MRVC)?

In order to drive a University vehicle or be reimbursed for driving your own vehicle, you must prove you are a qualified driver with a satisfactory driving record. This is accomplished through the motor vehicle record check.

Why am I constantly doing journal entries, turning in activity tracking forms, taking surveys, attending formative evaluation meetings, etc.?

Data collection is a large part of the requirements for our grant. We are required to collect statistics as a condition of our funding, and we use these data to improve the program and justify our funding.

• Results reported by WYSAC are reported as a group with no individual identification of people or schools.

• NSF requires us to provide demographic information on project participants, including race, ethnicity, socio-economic and English Language learner status. NSF has been known to ask for data on short notice and to change the data and collection format on short notice. Please respond as quickly as possible to requests for data from the Coordinators as they scramble to collect information for NSF.

Why do I have to write lesson plans?

The Science Posse is supported by NSF GK-12 Project # 084129
Lesson plans have several purposes. They are posted on the website as a resource for teachers who may wish to use the lessons in their classrooms, or bring the Science Posse in to teach the lessons. The lesson plans are also a guide for future Fellows who may decide to teach those lessons as a Science ALIVE! module.

The Science Posse Coordinators will provide lesson plan templates to guide you in formalizing your lesson plans for publication. As you complete the template, realize that you are not writing notes to help you remember what you plan to do, but rather you are writing a road map to help someone else teach the lesson. This requires being able to picture your lesson step by step and communicate this structure and sequence to whoever is reading them. You must also include background information for the teacher to give them a basic understanding of what they will be teaching, and all handouts and worksheets given to students. (Feel free to include web references that will give even more background.)

Be sure to give credit to NSF in your lesson plans.

How do I properly acknowledge NSF funding in my lesson plans, personal research presentations and publications?

Any of your research that is completed while on the NSF GK12 Fellowship should acknowledge your funding with the grant number, NSF GK-12 Project # 0841298. The wording should be something like that at the footer of this page.

Why do I have to send the coordinators information on my personal research presentations and publications?

One section of the Annual Report (which is required for continued funding) requires a listing of professional research presentations and publications completed by the Fellows during the previous year.

Will the Science Posse pay for me to attend professional conferences in my field?

The Science Posse will only contribute money for professional conferences if the Fellow is presenting a session about the Science Posse. (Examples: A presentation on math outreach activities conducted by the Science Posse at the Mathematical Association of America was funded. A presentation at the Technoscience as Activism Conference on using the Arduino to engage underrepresented groups and women in STEM was funded. Attending the sessions at the Society of Professional Engineers Annual meeting was not funded. Presenting a research paper at the Psychology of Mathematics Education conference in Reno was not funded.)

VII.6 Helpful Hints (The Collected Wisdom of the Posse)

• When you are headed to a classroom (particularly for mini-lessons) try to find out if the students have done anything similar recently. It is pretty tough to go into a classroom with a demo and have the kids say, "oh yeah, Mr. So-and-So just showed us that last week!"
• Turn in any receipts as soon as possible. It may take several months before you are reimbursed.
• Keep your advisor in the loop. The whole operation works smoother if everybody is on the same page.
• Keep the students’ age in mind when doing visits. They won’t have the same attention span as college students, so expect and accept a little bit of chaos.
• Prior to a visit, make sure you know where the school is. Even if you know where a school is, leave plenty of time to get there early. And then add another 15 minutes.
• Although the book was called “My Posse Don’t Do Homework”, the reality of most classrooms today is "The Students Don’t Do the Posse’s Homework"! Getting assignments turned in is one of the major problems most teachers (who see the students every day) struggle with. If you assign students homework, you will have more who don’t do it than who do. If your next lesson depends on information that was supposed to be done as homework, you need find a different way of gathering that information because the students probably won’t have it!
• Follow your passion because you get as much out of this experience as you put in.
• Recognize your own limitations. There’s a limit to what each person can do. And to not go absolutely nuts, or cause an advisor meltdown, every new Fellow needs to become one with their own capabilities.
• No matter what, your research and graduate program needs to come first.

On time commitment, organization and time management
• Ask returning fellows about their experience, what they’ve learned and how they manage their time.
• First off, learn how to manage your time. After three years, I feel as though this is my go to comment. However, gaining good time management skills is potentially one of the most utilitarian products of my Posse’ing time. Learning how to use Outlook’s calendar feature was a total eye-opener for me. Previously I sort of flew by the seat of my pants hoping that the occasional lapse in scheduling memory didn’t prove life threatening. In the long run, for both the Posse and academic life in general, that strategy does not pay! Along with this is the ability to get research done in spite of an often-inconsistent schedule. Having Monday-Wednesday travel teams has certainly ironed out a fair bit of this, but a typical day is still somewhat fragmented by classes, research, science posse, etc. So, a newcomer needs to be able to work without long blocks of time available for research.
• Make sure you are able to manage your time. SP breaks up a lot of days, but you can learn to work in smaller chunks of time on your own research. Make sure you do this effectively.
• The only thing I really wish I had known was that the travel requirements really aren’t that bad. Science Posse seems to have a reputation for being a massive time-suck, and
that’s really not true. Some weeks are busier than others, but it averages out into something very reasonable.

- Try to plan ahead and organize during the weeks where you aren’t doing as much travel or other Science Posse stuff.
- Plan on spending more time that you anticipated you would in the beginning. You’ll likely spend less time as you get the hang of teaching kids.
- It may take a lot of time, but the experiences you have will be very rewarding.
- Lists are very helpful.
- Keep track of your hours on something quick and easy like a calendar or a notepad if you are like me and don’t enter it in the spreadsheet right away. It makes it a lot easier at the end of the month.
- Use folders in Outlook to help keep your emails organized. I set up a folder for every event that I’m doing and keep all emails related to that event in that folder. That makes the reservation number, or number of kids in the request much easier to find! (And when the event is over, cleaning out those emails is easier, too!)
- **KEEP YOUR RECEIPTS!**

On lessons and planning

- Cut down on the lecture and turn up the hands on activities! It took me an inexplicably long time to fully grasp the importance of this point. However, constructing activities that are long on action and short on the spoken word produce a much happier audience. The challenge is to still incorporate learning opportunities and hopefully a dash of your research. By and large, this approach fits in great with the inquiry concept and is a welcome change for most students.
- Do your best to incorporate data analysis. And by data analysis I mean simple graphs and if you’re feeling lucky maybe calculate a few means. Most students I’ve interacted with have really crappy graphing skills, but ironically also showcase a great deal of reverence for the plotted word. I don’t know why, but I think it adds an air of officialness to the most mundane exercise. Plus, you’re giving students a hands on activity that has a practical, real-world application.
- Keep in mind that they are kids, not college students.
- Embrace the freedom to develop lessons you’re interested in. In our department, teaching opportunities are limited to lab instruction. And the format of those labs is largely set in stone by professors and lab managers. So, opportunities to develop your own lab exercises are incredibly limited (unless you’ve attained grad student tenure). That’s what makes being a science posse Fellow so great. You have the freedom to write protocols that you think are engaging and fun. I know teachers across Wyoming would shudder to hear me say it, but it’s also a great venue for testing the untried. I think(my adviser) was finally sold (well, maybe that’s a bit strong) on science posse because of the new equipment and techniques I experimented with while developing science posse lessons.
• Make the lessons as student centric (hands on, doing stuff) as possible
• Get a few mini-lessons or ideas together early with supplies, etc. to be able to have in short notice
• For your mini lessons make sure you have some back up plan if you use materials that cannot be transported on the plane or that cannot make a long car ride. I like to do things with phases of matter and I prefer to work with liquid nitrogen but if we take the plane or it’s too far I can switch to dry ice and pick that up when we get there
• If you take over a lesson or part of a specialized lesson, it is okay to modify it and make it more suited to your strengths/knowledge because you are the one that has to teach the lesson. It will be easier for you and also better for the students.
• If you have questions about how to organize a lesson or how to approach anything Jan and Meg are fantastic resources!

Logistics of setting up visits
• The biggest thing that I have learned when working with teachers is that you need to have them specify the exact time restrictions you have and exactly what topic they want you to teach or to work with. Often there are teachers that don’t really know what they want they just say “whatever”. Often that makes it harder for the Fellow to prepare because you don’t really have the background of the students and what they have studied or have already seen. You also don’t really know if you are even covering something that is even relevant to their type of class.
• Make sure you keep in contact with the teachers. It will make your life much easier when it comes to planning your visits.
• Enjoy the “diversity” of food you will encounter in the many towns you will visit in our fair state. On a similar note, get ideas for where to eat from teachers, not students.

VII.7 Bridging the gap: Understanding the World of the Schools
The following sections are adapted from the Project Fulcrum Handbook. Project Fulcrum is a GK-12 project at the University of Nebraska whose graduate Fellows work in the Lincoln, NE public schools.

VII.7.1 What is it like being a teacher?
A Lead Teacher for Project Fulcrum explained “Teaching is probably one the most difficult professions to accurately paint a picture of. It is a balancing act like no other. Responsibilities are continually added to teachers’ already full plates with an entire community expecting results. Teachers deal with peoples’ children - think of all the expectations parents have for their children’s futures. Many parents believe it is the responsibility of the teacher to shape the children.”
Teachers have far more responsibilities than just teaching. Their many “hats” include instructor, counselor, nurse, referee, mentor, facilitator, warden, director, and coordinator to name a few. Even in a state like Wyoming, teachers must deal with great diversity—non-English speaking students, students with abusive parents, high mobility rates, and latchkey children. Many students have learning disabilities, behavior problems,
and other special needs. Many teachers have additional leadership responsibilities within
their schools and districts, such as science liaison or team leader. Many also are working on
advanced degrees or taking classes to meet state and federal professional growth
requirements to renew their teaching certificates. In addition, there are unique challenges
when teaching science. One teacher said, "Science is not the easiest of subjects to teach.
It requires more planning, more materials, and more logistical decisions than other
subjects do. Preparation time is lengthy because students have to learn the subject
matter by "doing" science. The science objectives are just a small part of each lesson.
Knowing how to gather, interpret, and communicate data is a skill that all students have to
be taught how to do."

A teacher’s workweek is similar to a graduate student’s in that it stretches to include all
the things that have to be done. This may include daily or weekly after-school building
meetings, monthly district meetings, and meetings with parents. Many teachers must
handle lunch duty, playground duty, or early morning duties such as bus supervision or
supervising breakfast time. Time is the most precious commodity for a classroom teacher.
Teachers have to work with each student as an individual, which means that there is a lot
of paperwork. Teachers must maintain a discipline plan and/or special plan (sometimes
called a 504 plan) for students who are unable to operate within a regular school day
because of behavior or educational problems. A yearly pacing plan showing approximate
dates for completion of units has to be handed in and approved by their principals. Some
schools require teachers to make daily lesson plans identifying which standard(s) they are
teaching and submit these plans to their principals to prove that every student is getting
an opportunity to learn. The federal "No Child Left Behind" act (aka 'NCLB') places great
pressure on teachers due to its emphasis on high-stakes testing. Testing stresses students
and their teachers. All schools must publish their students’ test scores in reading, math,
writing, and science. There are serious consequences for schools that do not meet federal
standards, which can include firing teachers and principals, and allowing students in that
area to switch to other schools. Many things in the schools, including Science Posse visits,
are scheduled around PAWS.

VII.7.2 Students: How they’ve changed since you were in school.
Students come in all sizes, shapes, and levels of emotional and intellectual development. A
few of the generalities that you need to know are outlined here.
Developmental Levels and Other Factors
• Children younger than 10-12 years of age base their social values and find their primary
security in their family. As they enter puberty there are physical as well as social and
emotional changes. Their peer group becomes increasingly significant in their lives at the
expense of family, and they begin to question values and try on new behaviors (some of
which are strange and others of which are genuinely dangerous). This can be a time of
great emotional upheaval for children and parents alike. Some students pass through this
stage by 15 and others are still there into their twenties.
• Changes in intellectual development also occur with age. Virtually all elementary school children are concrete thinkers, meaning that they think in relatively simple terms about what they can see, touch, and detect with their other senses. As they mature, most children make the transition to abstract thinking, where they can generalize, project into the future, and deal with less tangible issues. Some people make this intellectual transition around age 11-14, but for many it does not occur until they are 15-20.

• For example, a concrete way to represent the effects of water on plant growth is to have plants of varying heights and graduated cylinders filled to show how much water each had received arranged on a table in order of increasing height. Moving away from the concrete, the next level of abstraction would be showing pictures, rather than real plants and water. Progressively higher levels of abstraction would be numerical data, a graph of the data, and an equation representing the effect of water amount on plant growth. (An excellent overview of intellectual development is presented in "A Biological Basis for Thinking and Learning", available in print or videotape from Lawrence Hall of Science.)

• An increasing number of children carry heavy personal baggage. Family disputes and breakups, substance abuse (by themselves or their family members), families with little commitment to the importance of education, inadequate or improper food, clothing, or parental support, self-doubts, and the need to impress peers (particularly in the middle school years) weigh heavily on far more youngsters than you might think. In some cases, teachers may have information about students’ background that they cannot share with you. Let the teacher be your guide. Do not be judgmental because you may not know the whole story about a situation.

Descriptions of Grade Level Bands

• Elementary students are curious, exuberant, cute, and relatively unjaded, which means that they may be easier to work with than their older brothers and sisters. Elementary-school-level children require concrete experiences to cement their understanding. Many elementary teachers receive little preparation in science and are eager for help.

• Our current grant is focused on middle school students (grades 5 to 8) because this is where the Science Posse can have the greatest impact and experience the greatest satisfaction. Students begin learning specific science content in these grades, but perhaps the greatest needs are to encourage positive attitudes toward science and develop science process skills, such as experimenting, measuring, observing, and drawing conclusions from information. Middle school is where the greatest number of students either catches the spark of excitement for science or intellectually drops out, so there is potentially high impact working with this age group. The primary challenge is to help them associate interesting and relevant applications with science principles. The physical, emotional, and social changes associated with these in-between years, however, make these students less predictable than either elementary or high students, so they have the reputation of being the most challenging to work with. Middle school teachers vary widely in their training and knowledge of science content. Some have trained as
elementary teachers and have little formal science background, whereas others have trained to be secondary teachers and have extensive knowledge in one or more science disciplines.

- High schools typically have science teachers well versed in the content they are teaching, but who frequently are eager for help in areas such as science applications and new developments, as well as for loans of or assistance with specialized equipment and experiments. High-school students frequently need help in understanding content, applications, and relationships between science topics and career and college choices. Lower socioeconomic neighborhoods often have highly motivated students whose families are ill prepared to help them with academic and career issues who can benefit enormously from mentoring relationships.

Relevance and Interest
- The old dictum of 'learn this because you should' does not work today. Decline in interest in science and the development of actively negative attitudes toward science typically occur between the third and eighth grades. These are especially critical times because children can close off pathways by neglecting to take or do well in science. Applications and hands-on activities generate interest, especially if the application is one that the children find relevant. Anything involving food, for example, is of more interest than a ball rolling down an inclined plane. The traditional approach of teaching theory first and applications later is fundamentally unmotivating. (This applies to college as well as to K-12.) Do not forget that 'relevant' is a relative concept. You may find cells or electrons intrinsically fascinating, but your students need to be convinced that they are.
- Students involved in doing are likely to learn much more than those who watch or listen. The ideal is to have students discover things for themselves, although this is not always possible in the length of time the Science Posse has to work with students. The idea of internal conflict - where someone sees something that does not make sense in the context of what he or she already knows - is a great stimulator for learning. Teachers often refer to this as the 'discrepant event': when you turn a glass full of water upside down and the water does not fall out, for example. This is the same principle that makes magic so engaging. (This is known as the conceptual change model, and is something that the Science ALIVE! Myth Busters lessons address.)

Learning Styles and Levels
- Students who learn science well by listening or reading (auditory and print-oriented learners) typically do well in the traditional education system. Chances are that you were one of these types of learners. Others students learn more effectively by seeing things work (visual learners), by being physically involved in games or activities which simulate scientific phenomena (kinesthetic learners), or by solving problems in groups (group interactive learners). The best learning experiences are those that involve a variety of learning modalities. Do not get
caught in the trap of thinking that, just because you are a print-oriented learner, anyone who really wants to can learn just by reading books. A problem is that some students have been told 'you're a visual learner' and will try to use this as an excuse not to read or participate in activities. The reality is that most students use one or more learning styles and that a combination of learning styles works best to reach not only groups, but also individual learners.

- Perhaps the natural inclination of most mathematicians, scientists and engineers is to focus on high achievers. The payoff may be great, as these students will be the next generation's leaders. In addition, they are typically highly motivated, serious about learning, well behaved, and show their appreciation for your efforts. In short, they are probably very much like you were at that age. Resist the urge to focus only on this group.

- At the other extreme are the at-risk students -- those who, for a variety of family, peer group, socioeconomic, or other reasons, are in danger of becoming adults who cannot function in society. Unless a major portion of this growing group is successfully motivated and enabled to become productive citizens, society itself is in jeopardy. While the challenges are great, the needs are enormous, and those whom you help will remember you forever. There may not be as much of an immediate reward as there is working higher-achieving students, but the long-term impact is likely to be very important.

- Finally, there is the great middle group -- those who are neither gifted nor at-risk. This group will form the bulk of tomorrow’s work force and voters who will be responsible for ensuring our well being when we are retired. They are perhaps in the most need of developing the tools necessary to work, live, and vote intelligently in an increasingly complex technological world.

VII.7.3 Classroom Management Tips.
Science Posse Fellows should not have to deal with major discipline problems when working with students. That is the job of the teacher or chaperone. However, Fellows still benefit learning techniques and strategies for managing student behavior (and therefore student learning.)

The following are adapted from Five Top Classroom Management Strategies - They Really Work by Kelly Hayden

- Kids are kids. If their energy is not channeled and they are not actively engaged in the lesson, they will become actively engaged in something else - disruptive behavior.

- Strategy number 3 - Keep the lesson moving. If you have a forty-five minute period, plan three different activities. Try to get them up out of their seats at least once during the class period. Those students with pent up energy will thank you for it.

- Strategy number 2 - Don’t lecture for the whole period. Students who are
actively engaged in a learning activity are generally not disrupting the class. Hands-on activities work great for vivacious classrooms.

- **Strategy numbers 1** -- When students are being disruptive by talking, poking, pulling or crumpling paper, go stand by them if possible. This sends them a direct message to stop what they are doing while allowing you to continue what you are doing. If you cannot move to stand by the students, stop what you are doing and wait quietly until you have their attention and then continue. Most of the time they stop and get back to work.

- **If you have kept the student busy with lessons, provided hands-on activities, stood by them/stood quietly to get their attention and they still are disruptive, ask the teacher or chaperone to take them out of the classroom.**

The following is adapted from Tips for Substitute Teachers: Classroom Management Strategies and Techniques by Kristin Ketteringham.

- **Don’t yell!** Classroom management is not about yelling. Kids are used to being yelled at, and it doesn’t faze them at all. Instead you should use a firm and confident voice that lets your students know that their behavior is not acceptable. Your tone of voice and your body language tell a story to your classroom. Generally it is best to lower the volume of your voice as the volume of the students' voices increases. Using a quiet and strong voice is much more effective than trying to shout over a classroom full of out-of-control children.

- **Get moving!** One of the easiest things you can do to maintain order is to walk around while students are working independently. Show interest in their work and comment on what you see. The best teachers rarely sit at the teacher’s desk. You also want to keep moving when you are directing a lesson. Walk from side to side, and around and into the area occupied by the student’s desks. If you notice that a child is off task, get a little closer to them. This can many times get the student back to work without you ever having to say one word.

- **Pay attention to your students.** The pace of your presentation is important and you need to watch your students’ faces and body language to determine how a lesson or activity is to be played out. If you pace the lessons too slowly, students will get bored and act out. If the lesson is paced too quickly, you’ll lose some students and may even finish too early leaving you with time to fill. Pay attention to your students to see if they are interested in a topic. When the class is very interested in an activity or really involved in a discussion, continue on with that part of the lesson. On the other hand, if children appear bored and disinterested, you’ll need to adjust your pace and move on to a more interesting activity.

- **You should always start your presentation with a short introduction and then move right into your lesson activities.** Get started immediately so that students see that you’re in the classroom to teach them.
• Establish a noise or action that means "Stop, Look and Listen!" You should show the class this action at the very start of the presentation. Explain that whenever you want them to stop, look and listen quickly, you will do this certain action or make this certain noise. Have the students practice making the noise or acting out the motion themselves so that they fully understand what to look out for throughout the day.

The following is adapted from Non-Verbal Communication: Actions Speak Louder Than Words!!

• Body language is sooo important! - students can read you. Crossing your arms a lot is seen as a negative stand and could put students on the defensive for no reason.

• Be aware that your students also communicate their feelings as well as other messages through non verbal cues and signals. Listen to your students' body language.

• Eye contact is the most powerful method of non-verbal communication between people. Be sure to establish eye contact with your students to gain their trust and make positive impressions.

• Before you begin teaching/talking always "scan" the classroom and make sure "all eyes on me".

• If the classroom is very noisy with students talking but they know that you want to start your lesson, one extremely effective tactic is to stand still and stare at the clock (wherever it is in the room) and wait patiently and calmly until they stop talking (do not cross your arms).

• The 5 second stare - When teaching and a student is talking, stop talking, even in mid-sentence, wait patiently staring at the student while counting to five (to yourself), and then continue teaching the lesson (stare at them, not through them - most effective).

• Circulate around the room as you teach (when applicable)- you’re not glued to the front of the class - too hypnotizing.

• When circulating around the room and talking, touch or put your hand gently on the shoulder of the student who is not focused and then continue walking.

• Touching is a very tricky subject in today’s society. Touching in any form as a behavioral deterrent must be avoided. Touching as a sign of congratulations in younger children is accepted but should be avoided for older students.

• While circulating and "scanning" the classroom, as you are teaching, you notice a student who is writing or reading. Gently put their pencil, marker, or paper down on their desk and continue walking and smiling as you walk away, without losing a beat.