

WANTED

outreach program volunteers

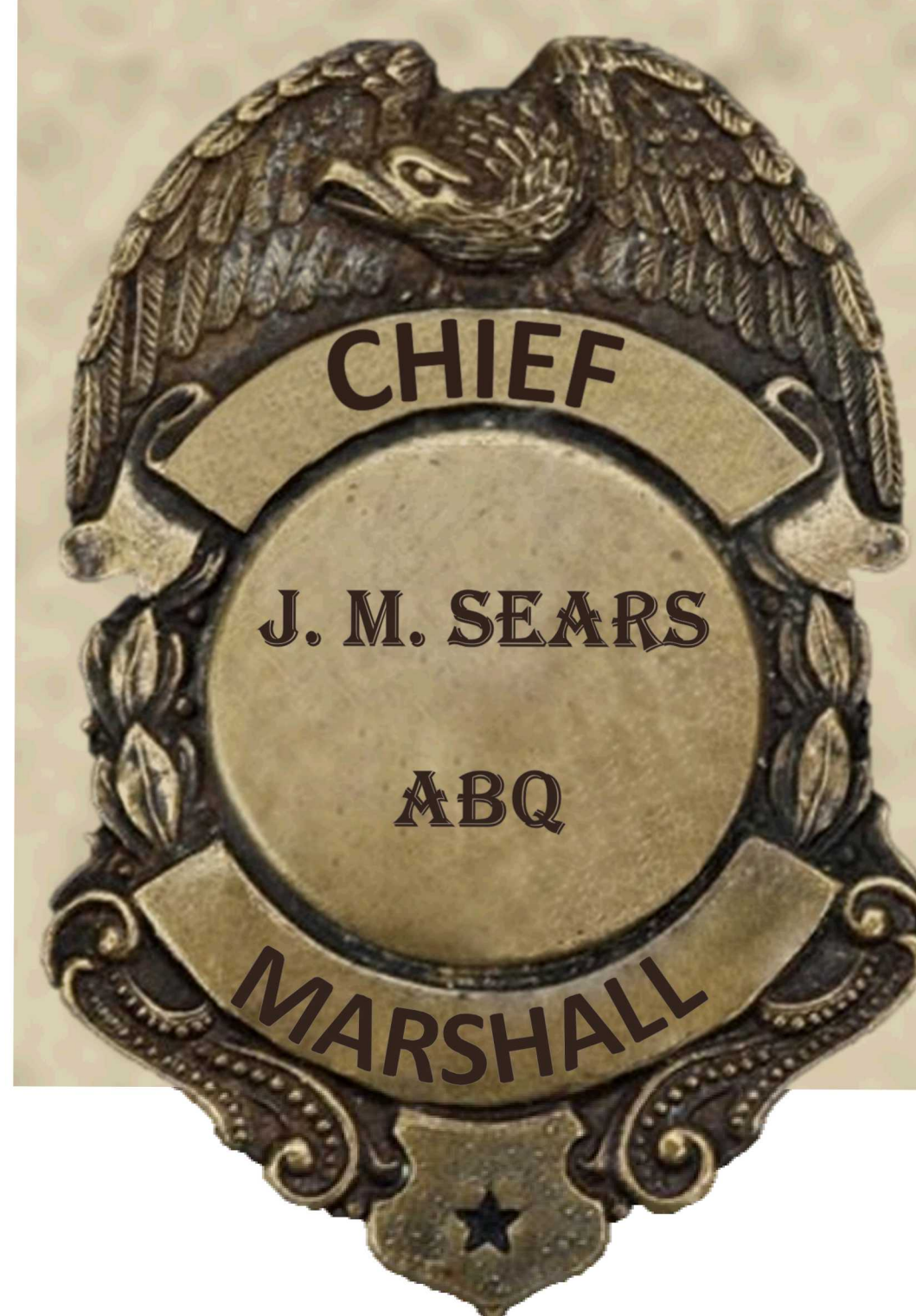


CHEMISTRY MAGIC DOG

for 4th grade students all over New Mexico

By order of Jeremiah Sears Chief Marshall, ABA

WANTED
DEAD OR ALIVE



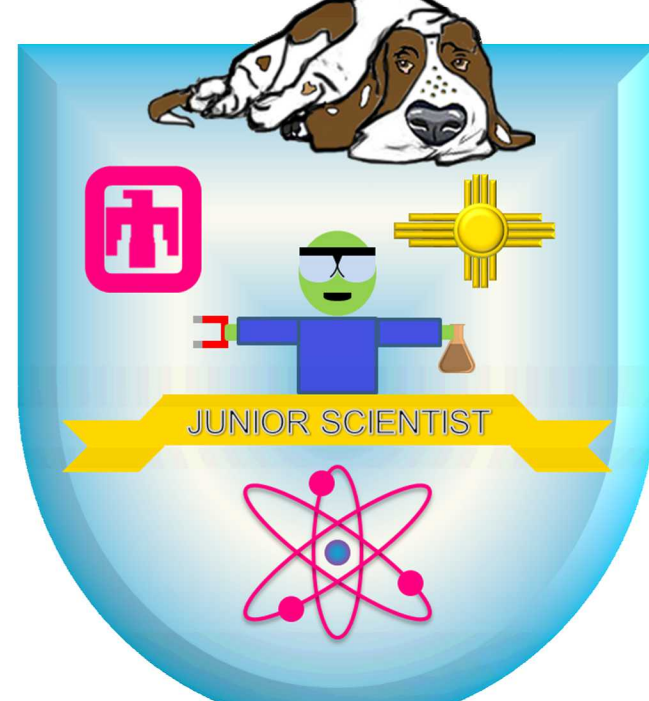
REWARD

CSI: DOGNAPPING WORKSHOP – a Sandia Outreach Program

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CSI DOGNAPPING

Coming
JANUARY
2017
Hurry!
Reserve Your
Class Now by
Oct 11,
2016!



WANTED:
4th Graders
to Help Save
Our
Chemistry
Magic Dog!!!
We Need
Your Help!

WILL YOUR CLASS SAVE OUR CHEMISTRY DOG?

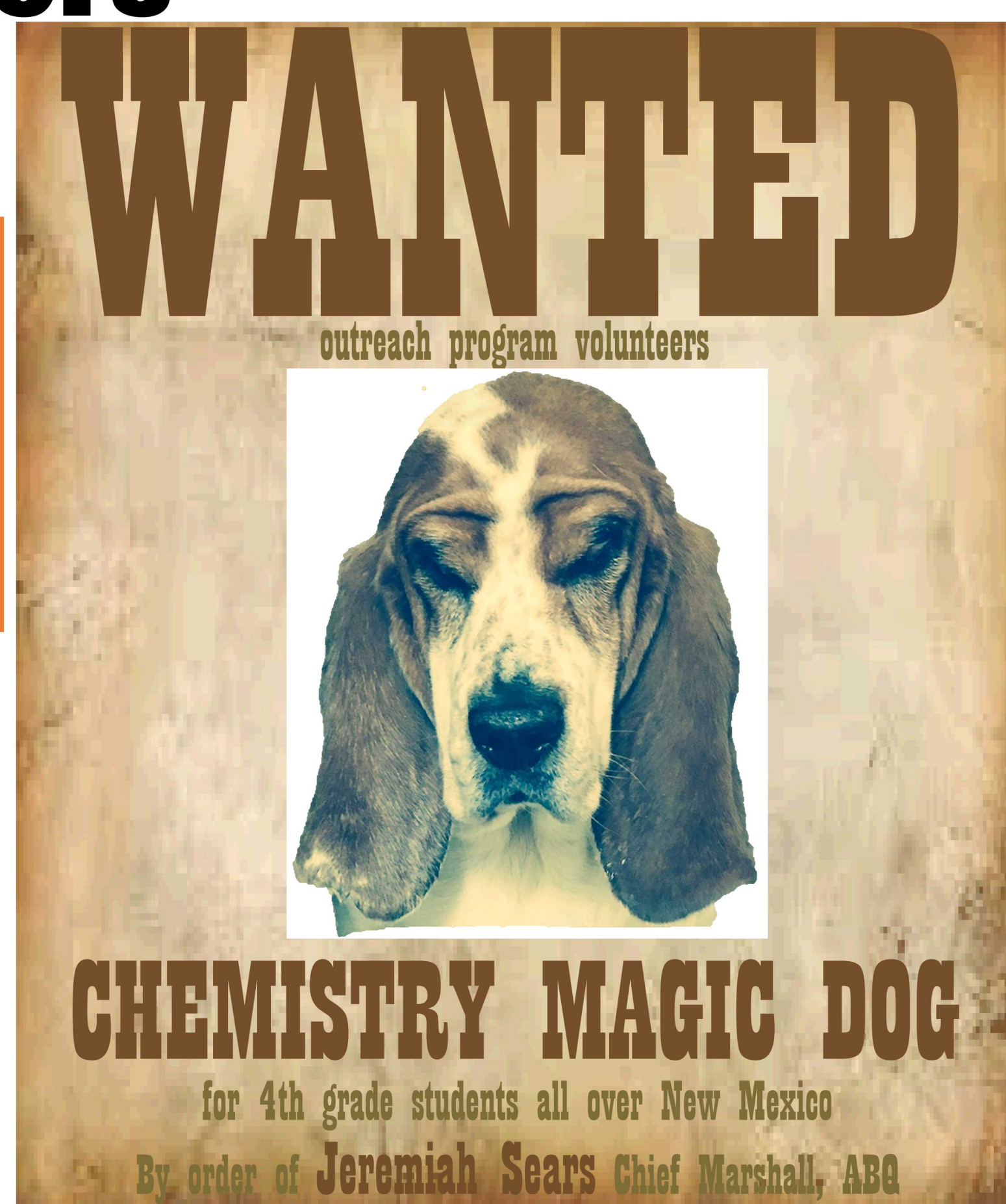
- A Free 4 hour field trip for your 4th grade students designed to give:
- ✓ A fun hands on experience with NM State Science Standards
 - ✓ Meet national laboratory scientists & engineers
 - ✓ Solve a 'crime' & get ice cream

Supplied: **BUSES, Safety Equipment, GOODIE BAGS, DESSERT, FUN DAY OFF for Teachers!**

See us in action:

<http://www.sandia.gov/news/publications/labnews/articles/2016/22-01/dognapping.html>

<http://cenblog.org/the-editors-blog/2011/01/csi-dognapping-at-sandia/>



Magical Showdown



Scientists compete to work with the chemistry magic dog. Experiments showcased are foggy bubbles, silver mirror flask, rainbow in a flask and elephant toothpaste. Experiment recommendations are always welcomed. At this point I am unable to locate our magic chemistry dog and our guests become

SUSPECTS!

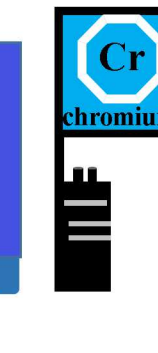
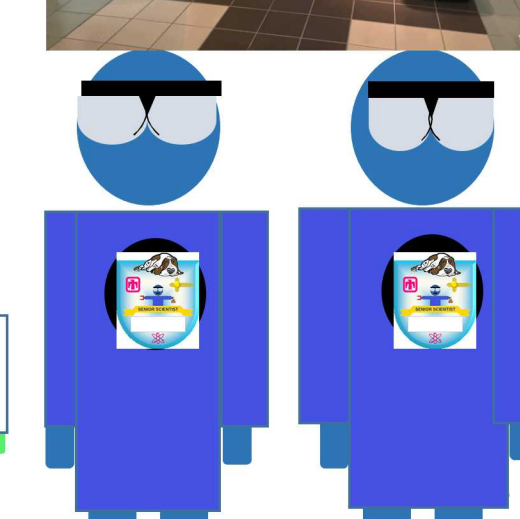
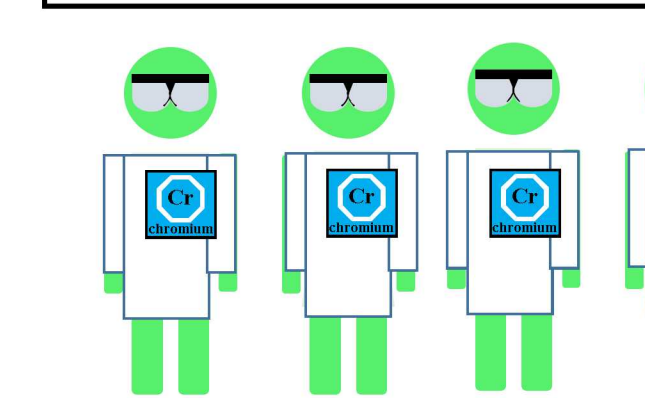


Safety First



Student interaction begins with a school visit that introduces the 'magic' we are capable of. The students help us identify the five senses and how we can protect them to make observations. This time is also used to showcase our magic dogs and two former laboratory workers whose habits were not to our standards. Can you identify all of the Alia's and Sam's errors below? Are our magic chemistry dogs ready for laboratory work?

Students then visit our house (AML) equipped with badges that we provide. Our guests are promptly adorned in lab coats and goggles. The symbols on their badges are identified as well as the day's instructors.



Name Clearing

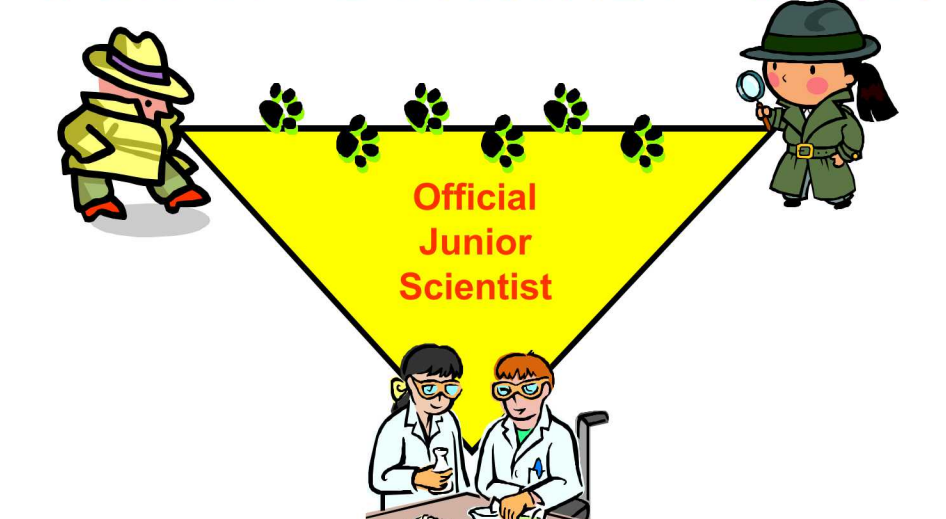
Turns out we have 5 pieces of evidence from the dognapper: a fingerprint, a voiceprint, the individual's height, their background radiation reading, and their footprint. The students rotate through these five stations, fill out their cards, and are able to clear their name. Once cleared, the students are sworn in as junior scientists and aide us in identifying the culprit from four possible suspects.

Suspect	Identification Card
Fingerprint:	Voiceprint:
Type:	Line Up:
Footprint:	Height (mm):
Length: (cm)	Geiger Count Levels:
	Background: Suspect:

Will YOU help find the CHEMISTRY MAGIC DOG?



Junior Scientist Oath



I promise to:
wear my **safety glasses**.
not eat or taste the evidence.
ask lots of **questions**.
wash my hands when done.

Who do you think looks guilty?

TAKE A VOTE!



Suspect 1:

VOTE



Suspect 2:



Suspect 3:



Suspect 4:

Analysis

The crime scene is located and brought to the junior scientists via our exclusive AML mobile crime scene unit. Ten items that do not belong are identified from those that belong on a dog bed. What items don't belong?



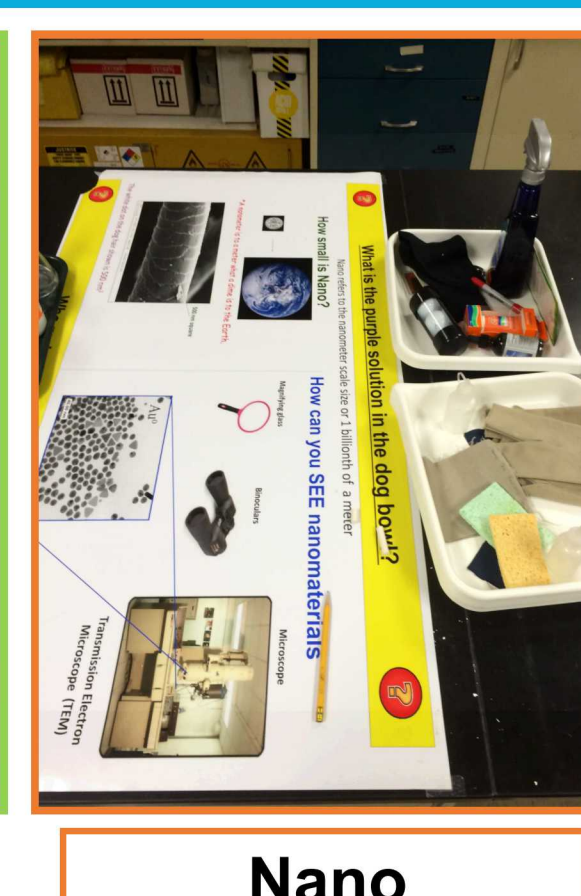
Clue Sheets



Small groups of Junior Scientists rotate through ten stations with clue sheets. Each station focuses on a scientific concept. The clue sheets use topics from the stations for the identification of the dognapper. Have an idea for a station? Let me know!



Fibers



Nano

LUNCH!

The answers from each station are discussed as a group. The tallies from each suspect are counted and the culprit is identified. The culprit apologizes for stealing the dog and is absolved of the "crime" via providing ice cream for everyone.

All members of the workshop have lunch together. This time is used for the students to review their day and allow further interaction with scientists and engineers. The workshop is completed when the students receive their ice cream.

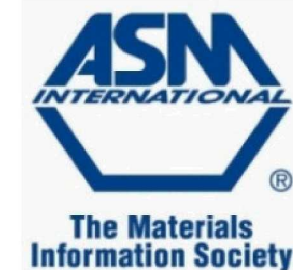


Acknowledgments

The CSI:Dognapping Workshop was supported by Sandia National Laboratories, Lockheed Martin, Center 1800 Director (Terry Aselage), volunteers and donations from over 65 employees of Sandia, the New Mexico State Fire Training Academy, and the professional societies listed here. Thank You!



LOCKHEED MARTIN

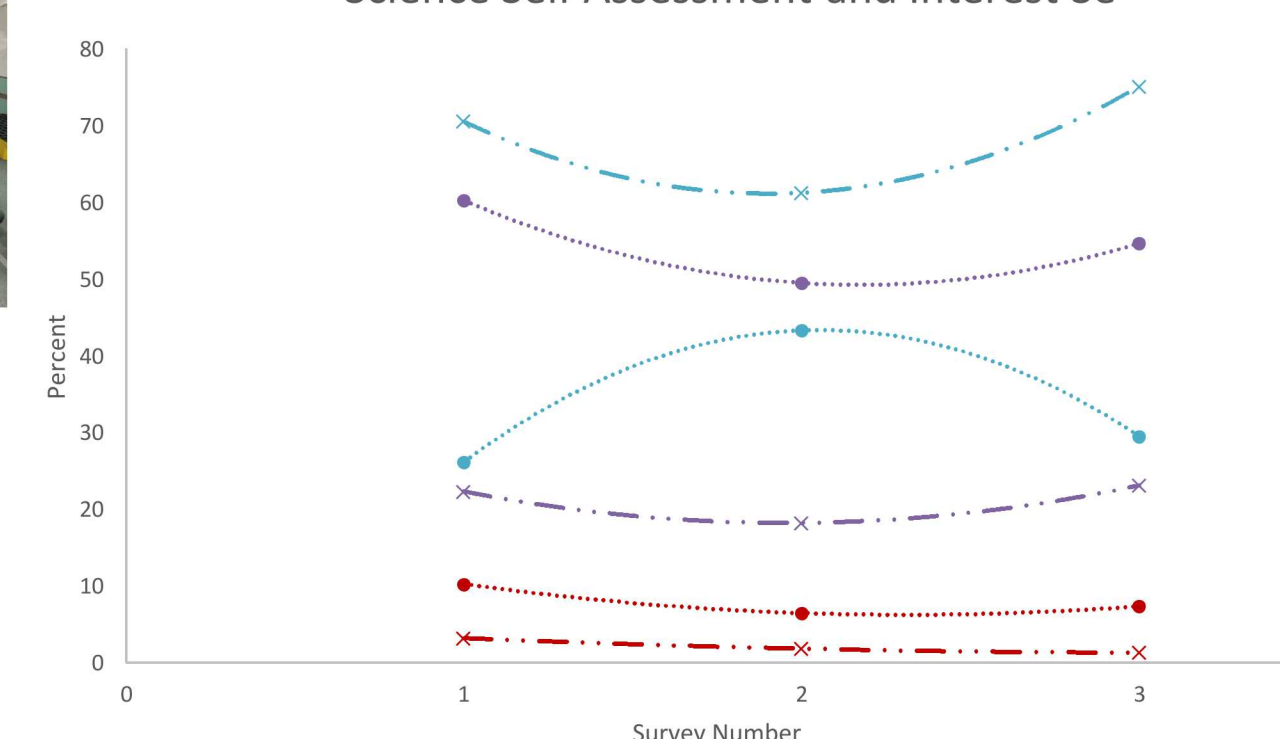


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Workshop Impact

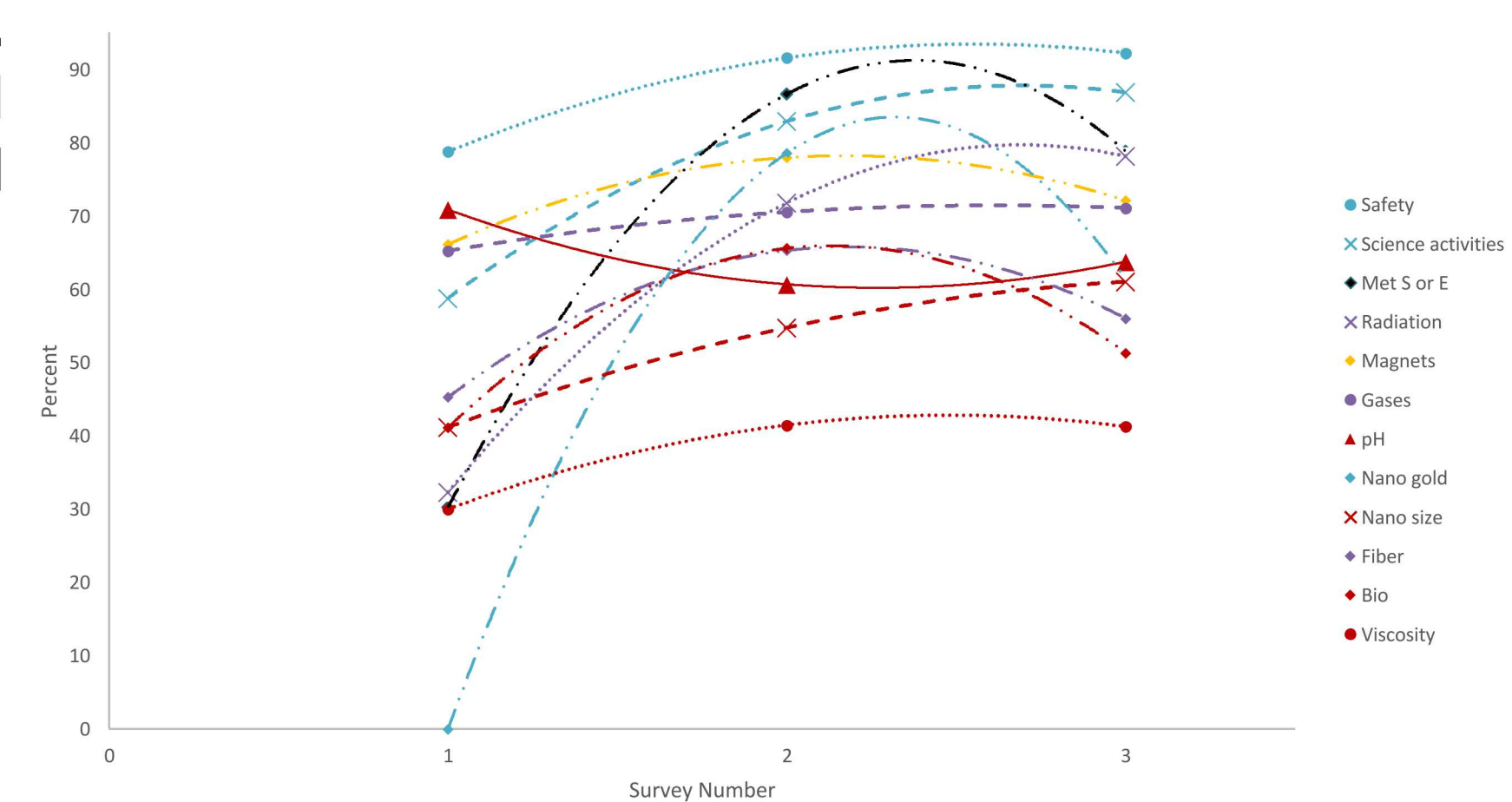


Science Self Assessment and Interest Se



Plot of responses to scientific interest/ ability questions from the same survey given at (a) pre- (survey 1), (b) post- (survey 2), and (c) timed (survey 3) intervals. ● denotes science self-assessment and x denotes science interest.

Science Questions



Plot of information garnered by the same survey given at (a) pre- (survey 1), (b) post- (survey 2), and (c) timed (survey 3) intervals. ● denotes answers with the general trend of a positive plateau, x denotes answers with the general trend of sequential growth, ◆ denotes answers with the general trend of a parabola, and ▲ denotes answers with the general trend of a negative plateau.