

# NEXT GENERATION SCIENCE PROFESSIONAL DEVELOPMENT



# PROPOSED DJUSD TIMELINE



**2014-15 Monthly PD Exploring Practices  
Determination of Middle School Sequence**

**2015-16**

**Continue Regular  
Professional Growth  
Development and  
implementation of  
Selected NGSS  
Units**

**2016-17**

**Continued Regular  
Professional Growth  
Development and  
Implementation of  
Selected NGSS  
Units**

**2017-18**

**Continued Regular  
Professional Growth  
Full Implementation  
of NGSS  
Potential Pilot of  
NGSS Assessments**

**Tentative NGSS  
Assessments  
Spring 2019**

# CHANGE IS HARD, AND SLOW



# TRANSITIONS (OR WHAT WE'VE BEEN UP TO)



- Changing a paradigm
- Building communication strategies
  - Dialogue, reading, writing, research
- Grappling with challenges
  - perceived uncertainty,
  - ambiguity,
  - Incoherence
- Sensemaking

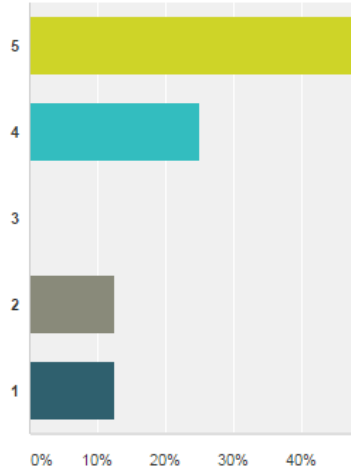
## Science and Engineering Practices

- Asking questions (for science) and defining problems (for engineering)
- Developing and using models
- Planning and carrying out investigations
- Analyzing and interpreting data
- Using mathematics and computational thinking
- Constructing explanations (for science) and designing solutions (for engineering)
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating information

# EFFICACY OF THIS PD

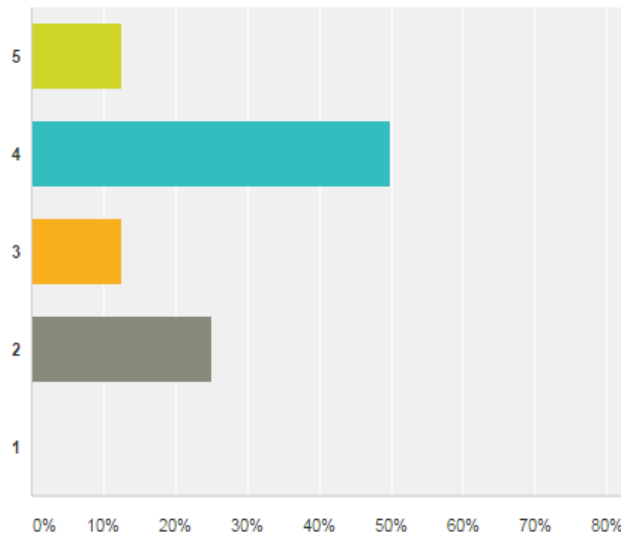
**I have implemented some aspects of the practices based on my experiences in these workshops**

Answered: 8 Skipped: 0



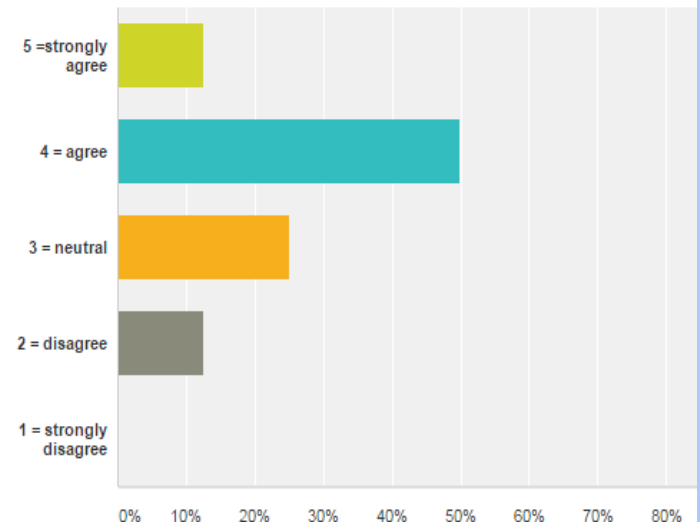
**The science activities focused me on how the practices might work in my classroom**

Answered: 8 Skipped: 0



**I came away from workshops with a clear sense of what I might do differently in my classroom.**

Answered: 8 Skipped: 0

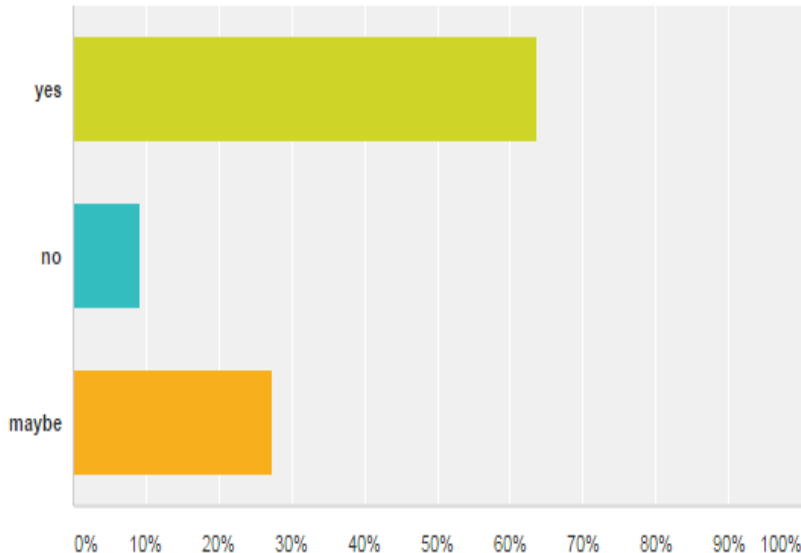


# INTEREST IN ONGOING PD



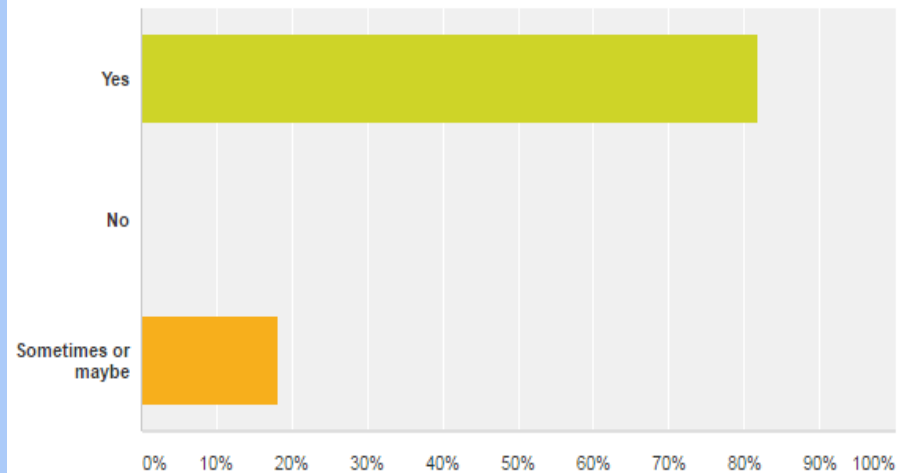
## Are you interested in a 2-day NGSS summer workshop during August?

Answered: 11 Skipped: 0



## Are you interested in participating in monthly PD workshops next year?

Answered: 11 Skipped: 0



# SUMMARY OF CHALLENGES



**While 82% indicated implementing NGSS in their classrooms, they also expressed the following challenges**

- **Time to create lessons**
- **Time to identify and use data resources**
- **More examples of how to employ the practices**
- **Reconciling old and new approaches**



# WHAT TEACHERS ARE SAYING



"NGSS meetings have greatly facilitated my understanding of these new standards, in their breadth, in specific performance expectations, and with regards to implementation.

~ Ken McKim, Holmes Jr. High, ISTAR Participant

"This is the best PD I've done in my whole teaching career, led BY teachers FOR teachers."  
"

~ Kristi Dunbar, Cesar Chavez



# ASKING QUESTIONS

## PHENOMENON: RADIOMETER

- why is it black and white? Can telekenisis work to make it move?

- What causes it to move?

- Why is it moving clockwise? - How can we speed it up?

- Is it light or heat sensitive? How can we tell if...

- How do we know if... outside air get into the glass chamber?

What is the effect of... colors other than black & white? Could it have more paddles

- How can we make... it go the other direction?

- Will it rotate if upside down?

- Why is it spinning clockwise?

- Why don't we use these to collect wind turbine?

- Will any light source work?

How does different light sources affect the rate of speed of the radiometer?

1. Test radiometer:

1. sunlight
2. infrared light
3. incandescent

2. Graph Results

	Fast Movement	Med. movement	Slow movement
Sunlight	↑		
UV		↑	
Incandescent			↑

incondescent

UV

sun

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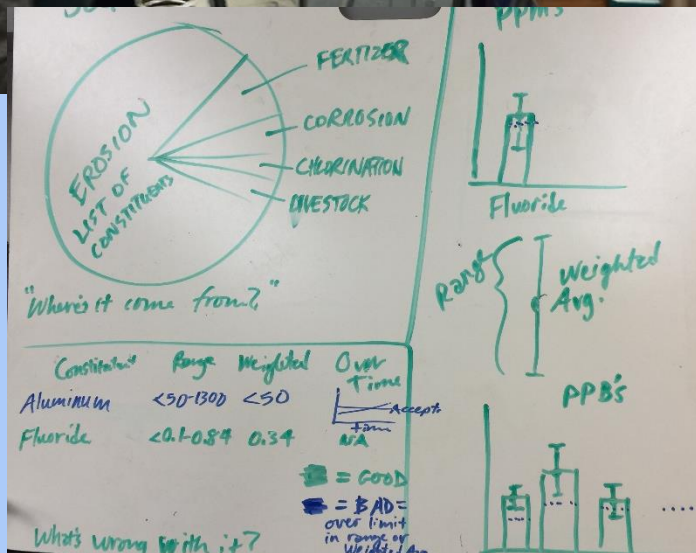
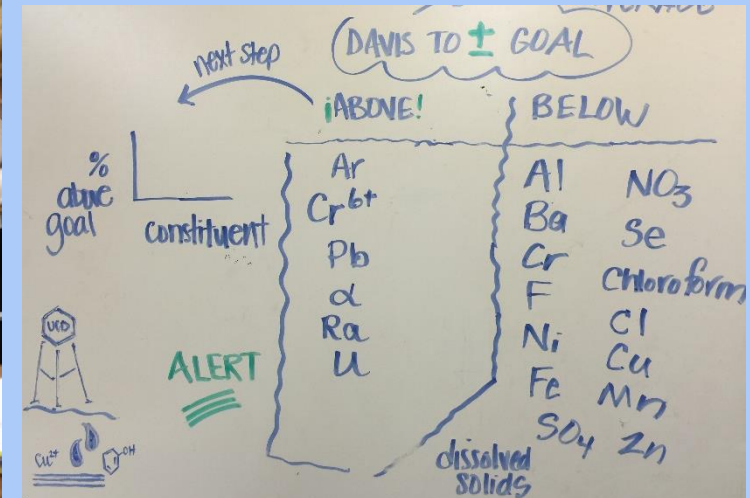
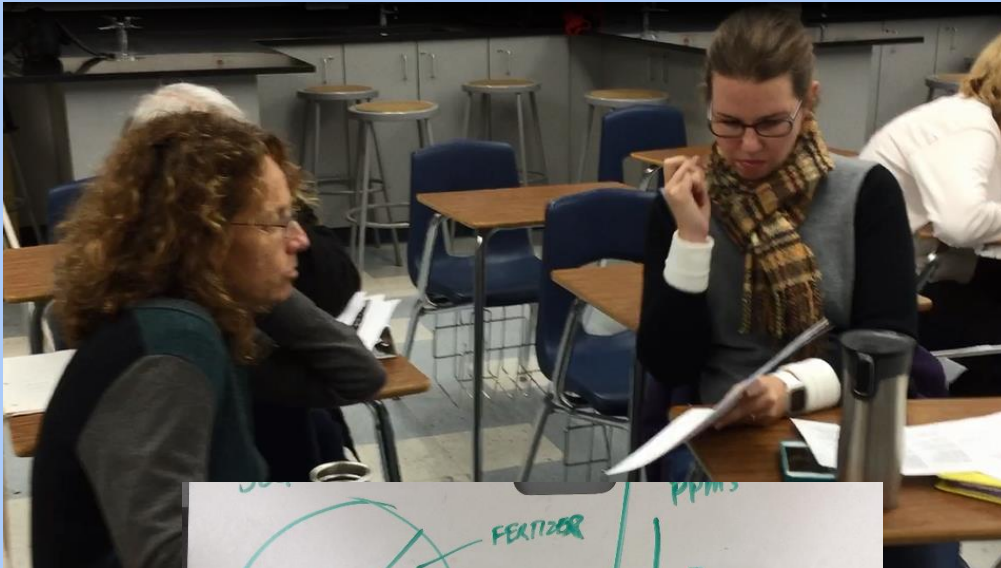
incondescent

UV

sun

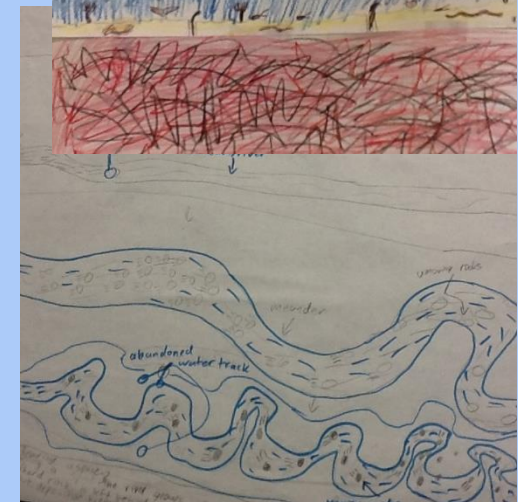
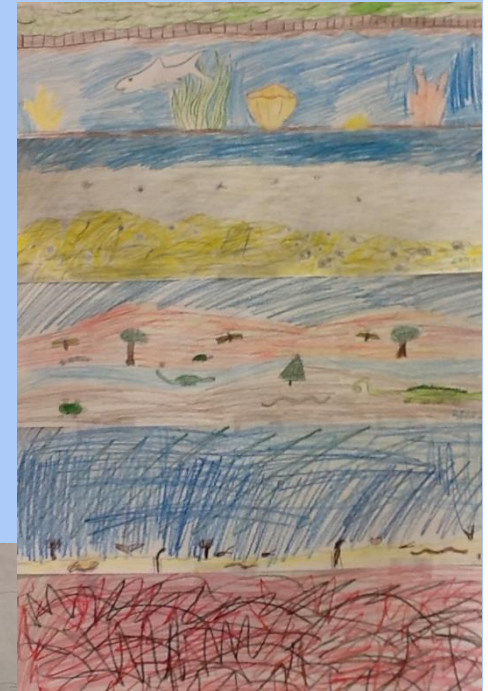
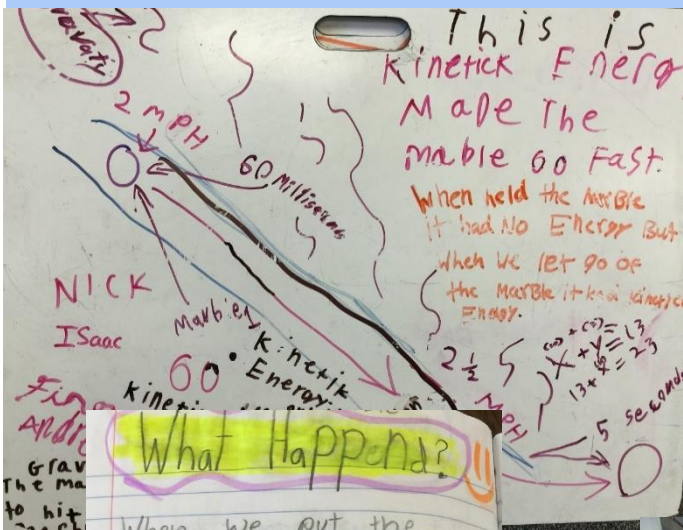


# ANALYZING AND INTERPRETING DATA: DAVIS WATER





# 4<sup>TH</sup> GRADE



When we put the angle steeper the marble on the bottom went farther than when the angle was not as steep the marble went not as far.

Modeling

Because The gravity energy made the marble go down and then the the force moved the other marble

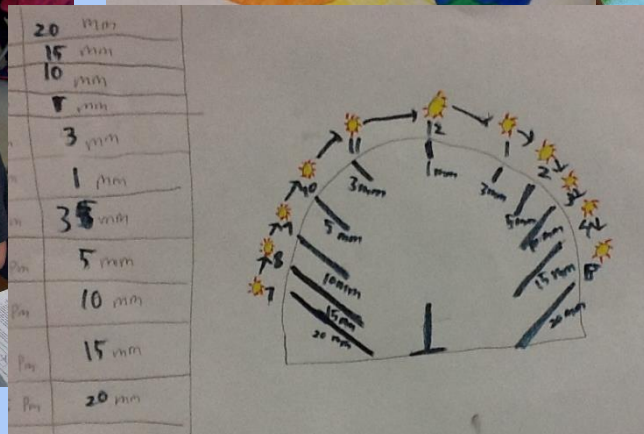
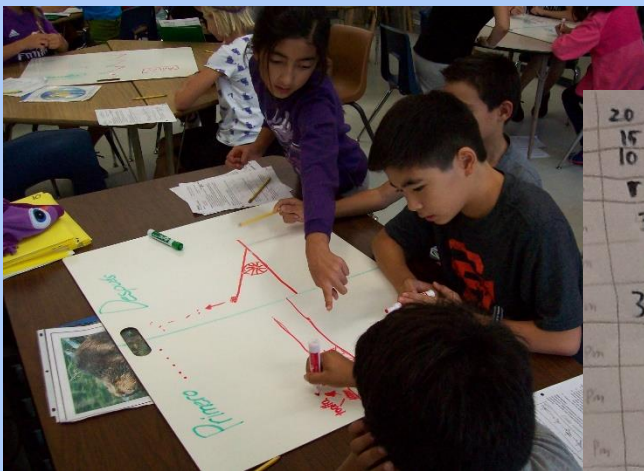
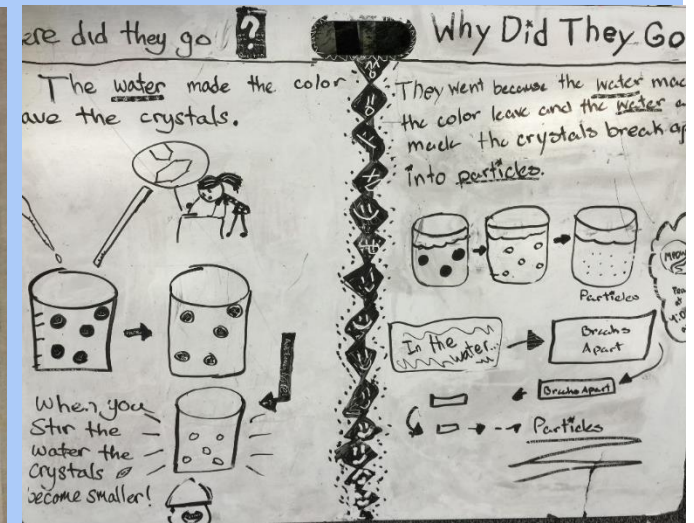
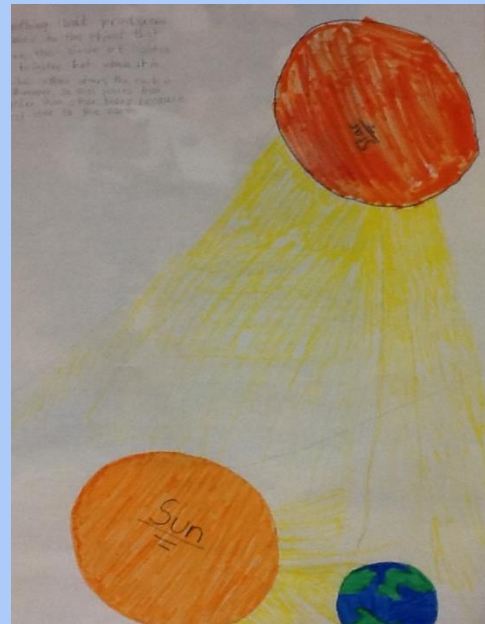
Reflections

It was different because the speed was way faster.

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# 5<sup>TH</sup> GRADE




# 6<sup>TH</sup> GRADE

**Theory:**  
In weather terms,  
high pressure means  
a sunny day, low pressure  
means some sort of weather,  
like rain. Squeezing the bottle  
increases the pressure. These  
two bits of information may  
be related.

The increase in pressure causes  
the cloud to vanish, but lowering  
the pressure allows it to come back.

*Sara*




**Symbol** = created by Sara

~ = amount used  
! = Energy used  
◇ = Material used

we had 1/2 of our ◇, water. Our ! is  
from the sun. The ! goes in to  
our beakers filled with the ~  
of our ◇

*DO NOT COPY!*

**Model For Cloud in a Bottle**

**High Pressure**  
When you increase the pressure, the particles move faster and become a gas, which we cannot see.

**Low pressure**  
When you decrease the pressure, it starts turning into liquid again, so we can see because it's denser.

Gas  
Liquid

By, Zane and Puri

**Sun Rays**

Less Hot  
Hot Particles are moving faster  
Less Hot

The Sun sends more heat in the middle because it's closer and less in other areas.

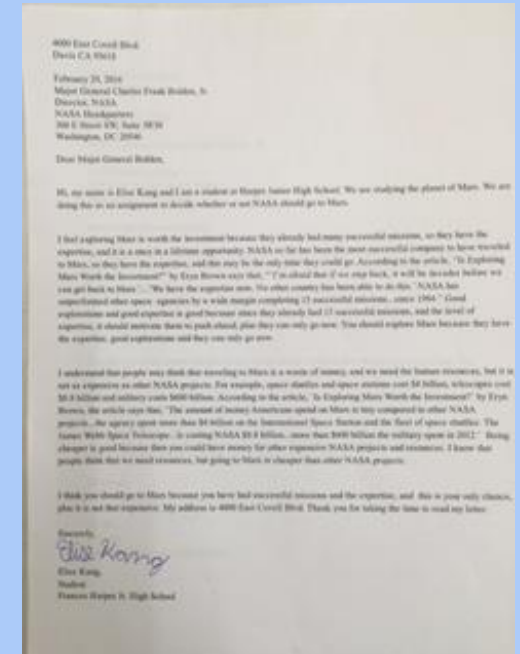
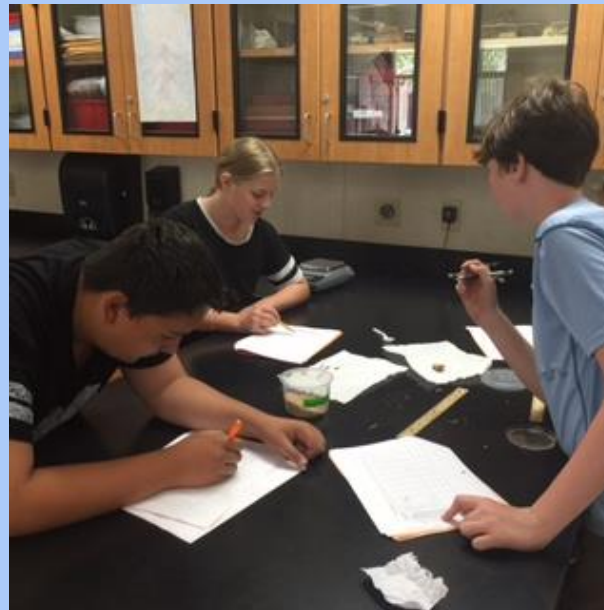
Cold Particles move slower

The Sun is bringing more heat because it's closer

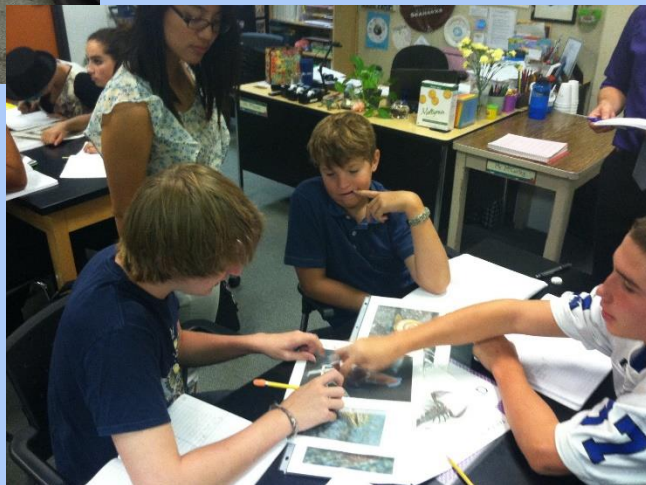
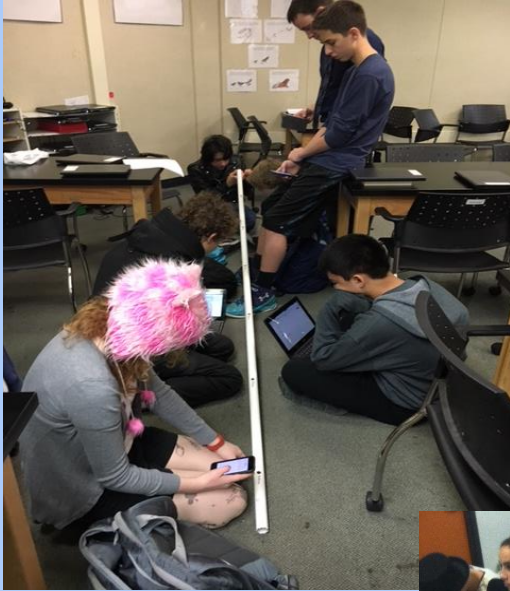
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# 7<sup>TH</sup> GRADE



# 8<sup>TH</sup> GRADE



# BIOLOGY

Is the H. family related to Jeff?

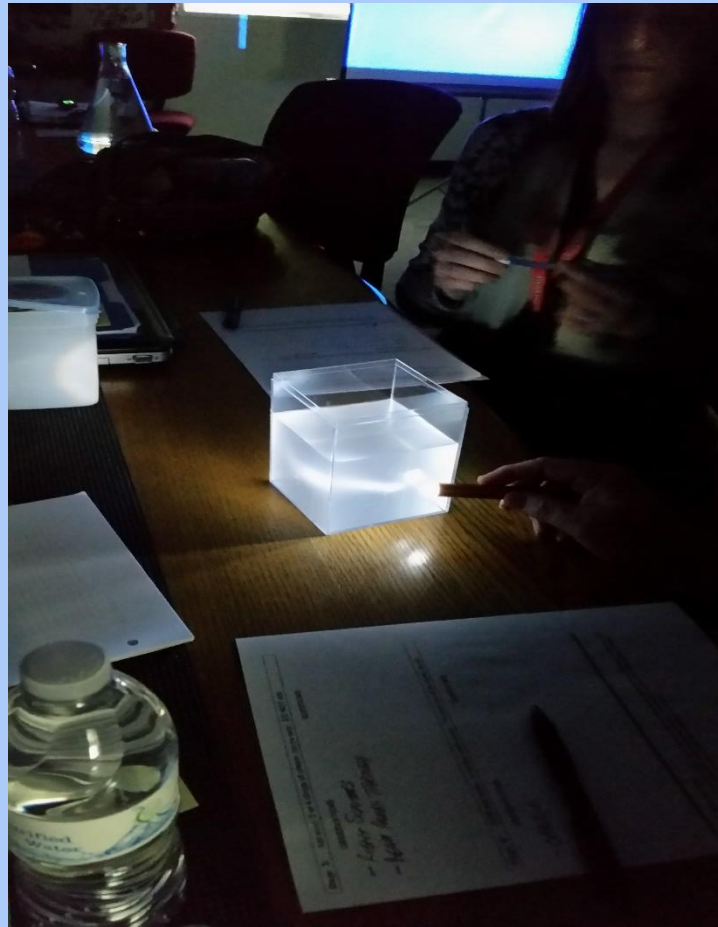
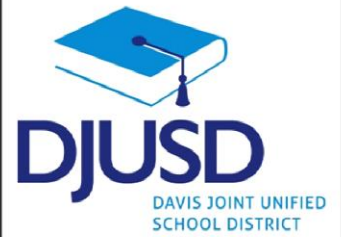
Claim: Jeff IS related to the H family because his STR matches both mom's & dad's.

Evidence:  
On chromosome 21 his STR his father's genes. And on chromosome 13, his STR matches both parents'.

Justification:  
Even though the dad is dead we were able to figure out the evidence for Jeff's identity.



# PHYSICS



# FOURTH/FIFTH GRADE IMPLEMENTATION PLAN



Grade		2015-16	2016-17	2017-18
4	Current Topic	Ecosystems Weathering and Fossils	Weathering and Fossils Energy Waves	Weathering and Fossils Energy Waves Plant/Animal Structure and Function
	New Topic	Energy Wave	Plant/Animal Structure and Function	Natural Resources/Human Impact
	Removed Topic	Electricity and Magnetism Rocks and Minerals	Ecosystems	
5	Current Topic	Matter Human Body	Matter Human Body Sun, Stars and Gravity	Matter Sun, Stars and Gravity Interaction of Spheres
	New Topic	Sun, Stars, and Gravity	Interaction of Spheres (geo, bio, hydro and atmosphere)	Ecosystems Natural Resources/Human Impact
	Removed Topic	Weather		Human Body

# NGSS RECOMMENDATION FOR 2016-17



- Maintain our course of slow implementation, but continue 'pilot' of integrated approach for middle school years (grades 6-8) as most of us have only begun to implement actual topic changes and NGSS approach, and are not yet integrating.
- Begin looking at sample assessments from various organizations (Concord Consortium/Research & Practice Collaboratory) as models to begin creating assessments for the work we are doing.
- Adapt lessons we have in CPO and Foss to make more NGSS, look for lessons from others, design our own
- Design and offer one NGSS workshop per trimester for primary
- Maintain a .2 FTE PD coordinator to facilitate the above, and further involve teachers in presenting their lessons and work.

# QUESTIONS?



*Thank you for listening,  
and for your ongoing support  
of our efforts  
to incorporate NGSS  
into science in DJUSD*

