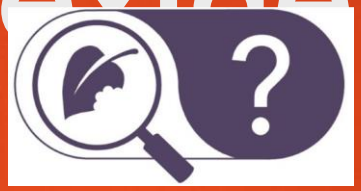
Student Drivers -

Driving question boards empower students to figure out what they really need to know and how they will get there

You can find more storylines and the storyline tools at:

http://www.nextgenstorylines.org



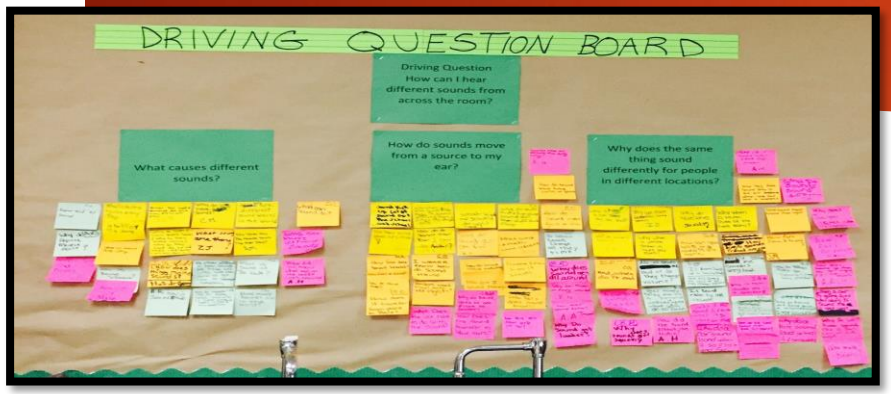
You can find lots of examples of work in our classrooms on Twitter:

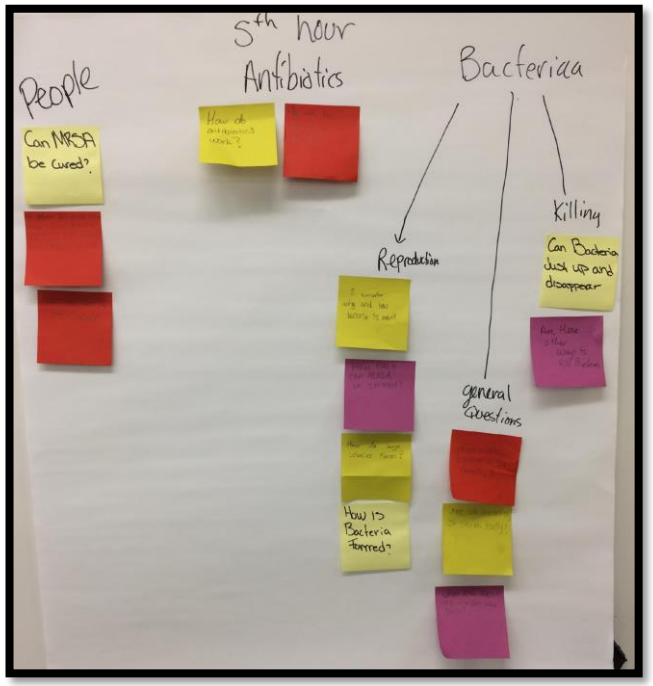
Holly Hereau @hhereau (hollyhereau.weebly.com)

Wayne Wright @wewright1234

The Driving Question Board

Not about how it looks but how it is used!



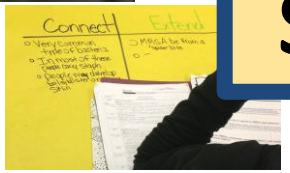


Driving Questions vs. Parking lots

What the difference?

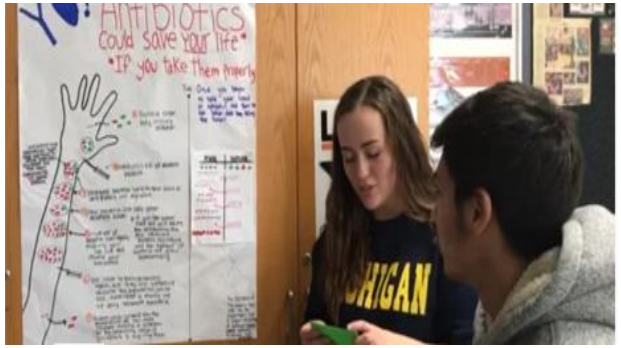
Students are DRIVING their learning using their own Questions

"We figure out the science ideas."



DQB
Student Centered

"We figure out where we are going each step."



"We put the pieces of the science ideas together over time."

STUDENT HAT

Let's do a Driving Question Board!

What would a (well behaved)5th grade version of you notice and wonder about the following phenomena?

Why do dead things disappear over time?

Predictions

- DRAW
- What will this look like in 2 weeks?

- What will this look like in 2 months?

Examples of Student Predictions

Lesson 1 – Student Activity Sheet: **What will happen to the raccoon?** Name: Naajnee Farrell Date: Jan, 30, 19

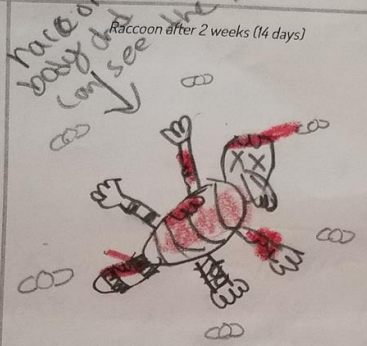
Q1) Draw and label your predictions of what you think the raccoon and the surrounding area will look like over time.

Raccoon after 2 days

What will cause it to look this way?

The raccon looks like that because other raccon and animals killed the raccon.

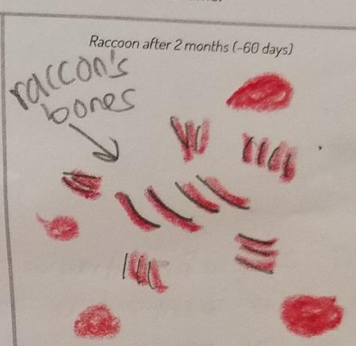
Raccoon after 2 weeks (14 days)



What will cause it to look this way?

The raccon bones are showing because the other animals were eating the raccon and had open the raccon skin.

Raccoon after 2 months (~60 days)



What will cause it to look this way?

The raccon is gone and there are nothing but the bones because the skin have decompose.

Lesson 1 – Student Activity Sheet: **What will happen to the raccoon?** Name: Ariana Strong Date:

Q1) Draw and label your predictions of what you think the raccoon and the surrounding area will look like over time.

Raccoon after 2 days

What will cause it to look this way?

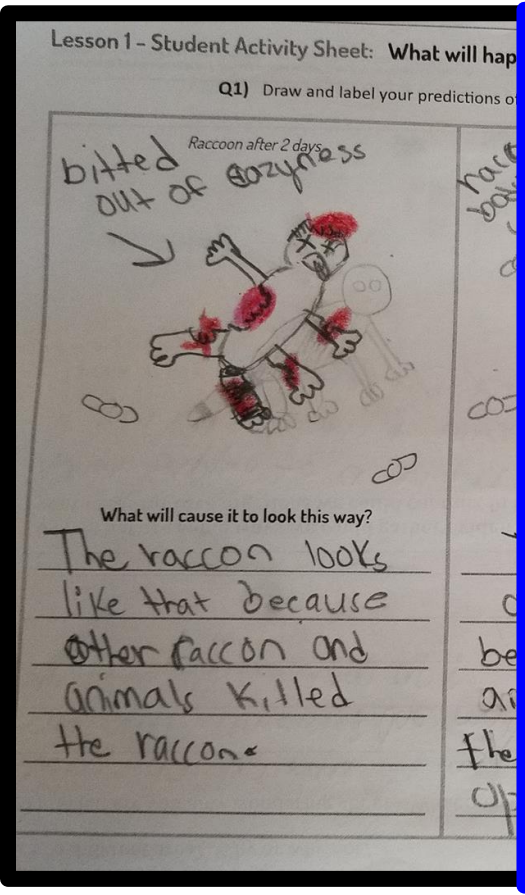
Raccoon after 2 weeks (14 days)

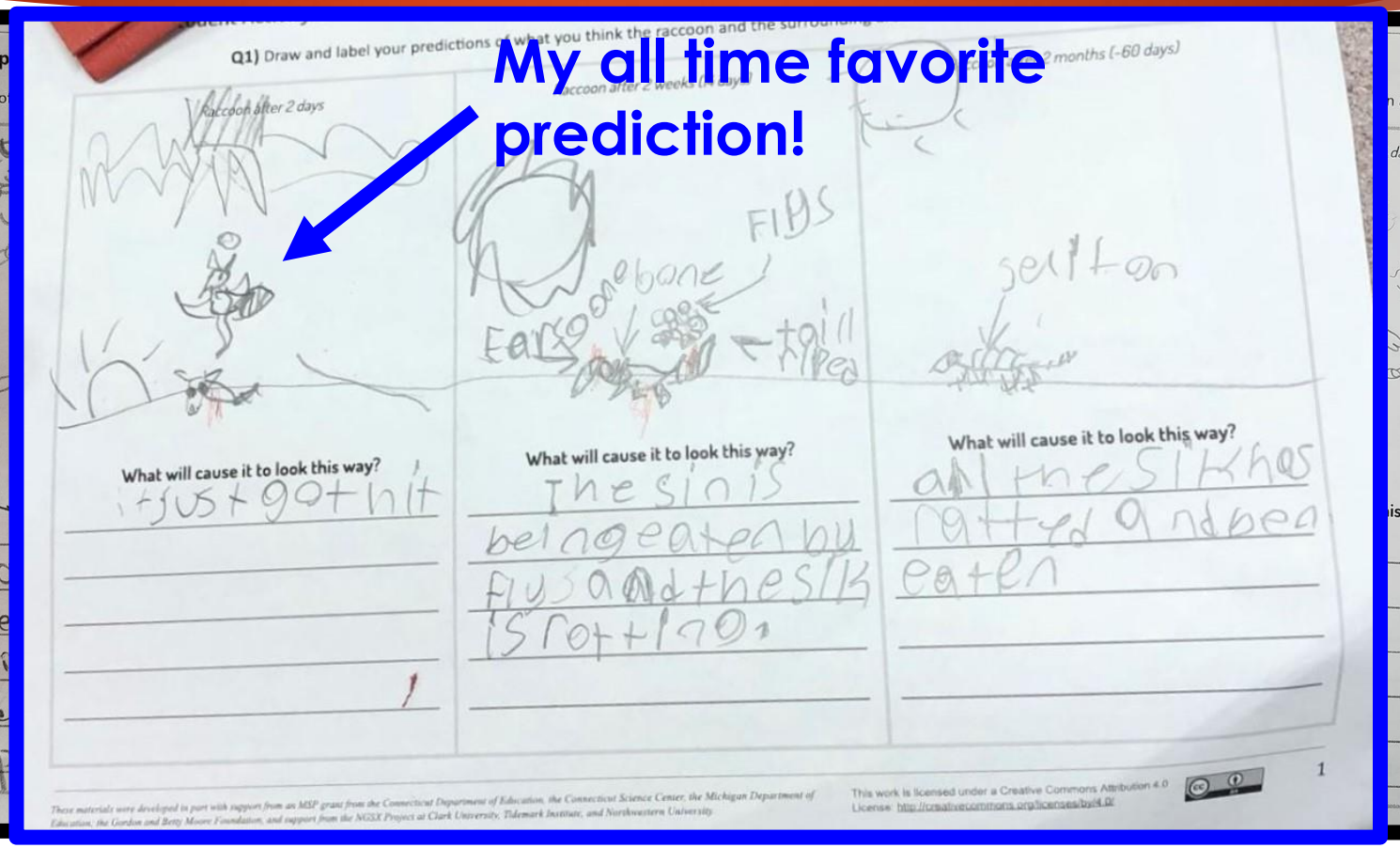
What will cause it to look this way?

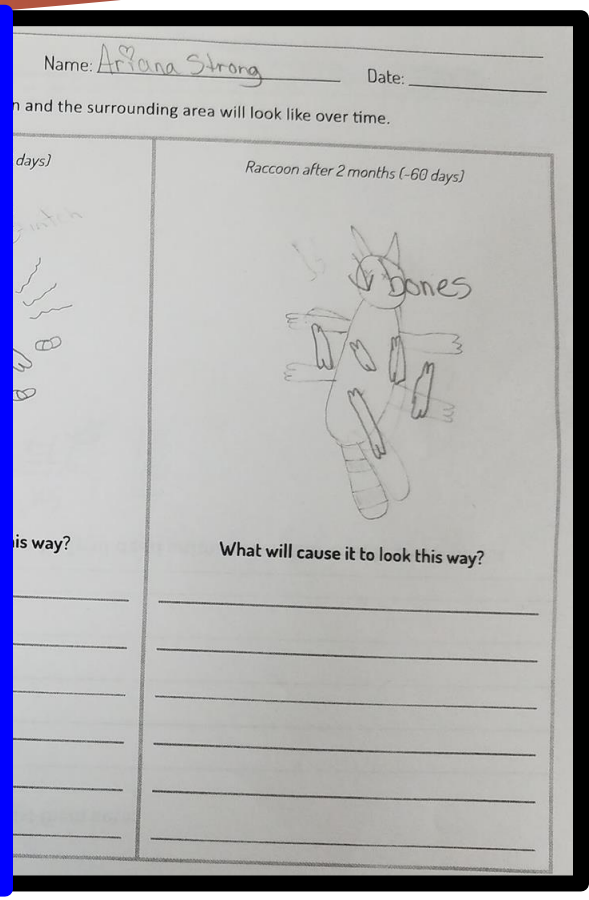
Raccoon after 2 months (~60 days)

What will cause it to look this way?

Examples of Student Predictions







What do we Notice/ Wonder?

https://www.youtube.com/watch?v=E93rNE5F-LE

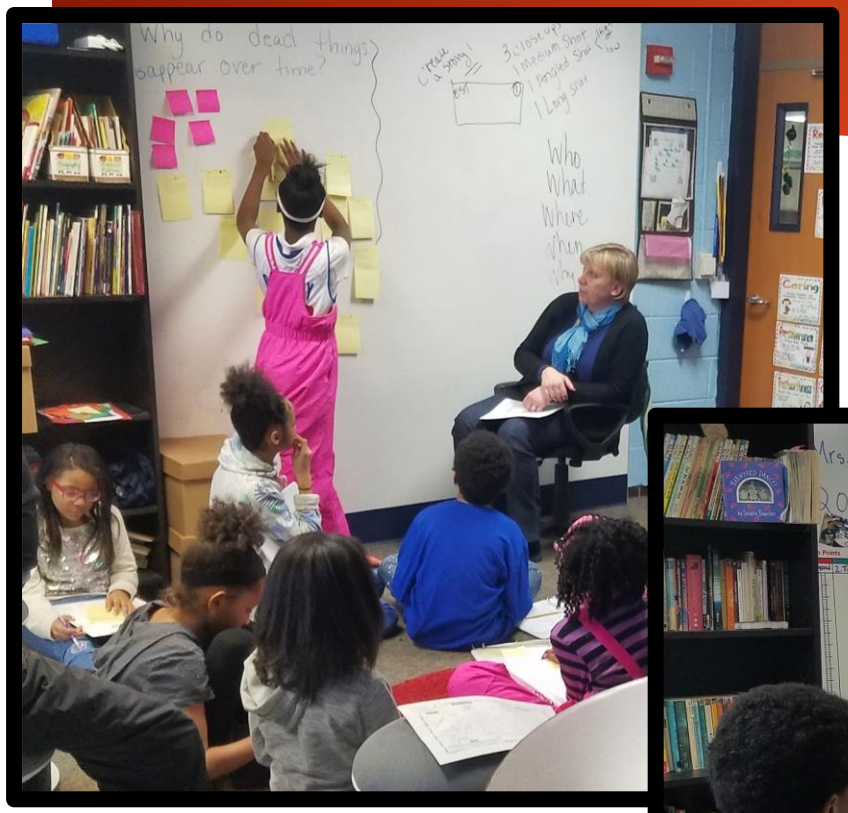
Driving Question Board
Why did this dead thing disappear?

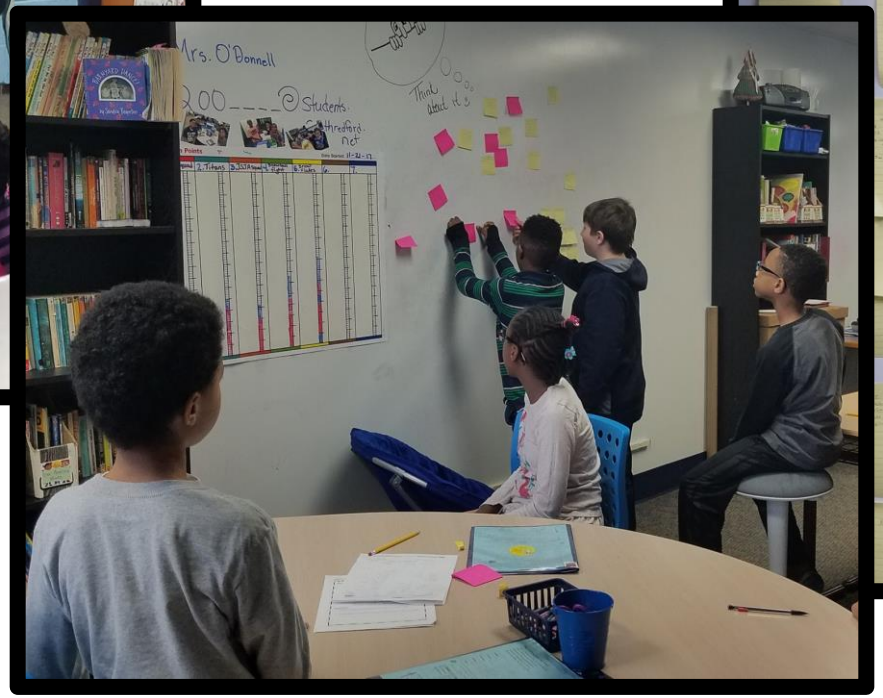
Day 1

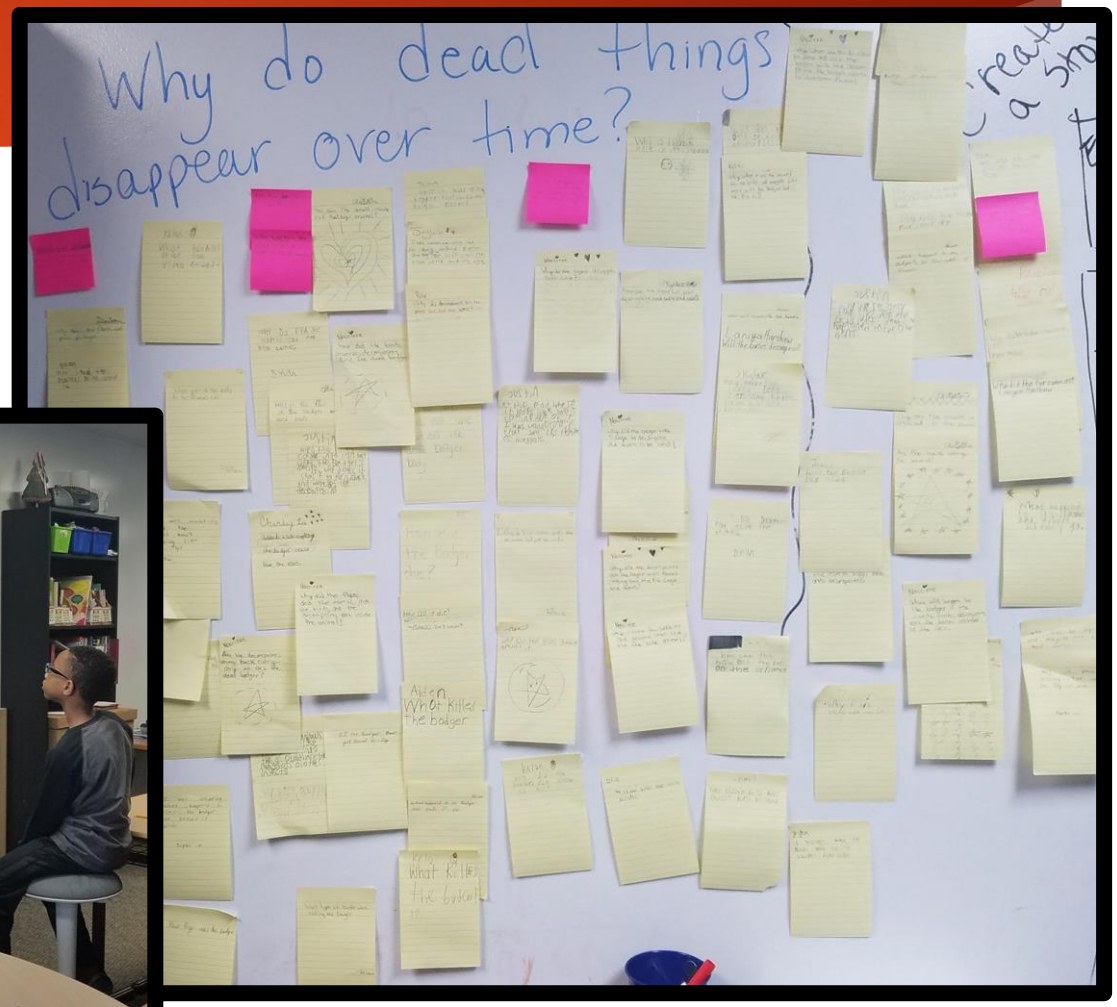
Day 9

Day 5

Driving Question Board in Lynda's Class







Examples of Questions

- What are those insects doing on the carcass? Where did they come from?
- What happens to all the parts of the badger like the inside muscles and organs, fur, and bones?
- Do some parts of the badger go into the soil? Does some get washed away? Does it get eaten etc.?
- Is this the same thing that happens to leaves, or fruit or wood when it rots?
- How do new plants grow from parts of plants that seem like they are dead?

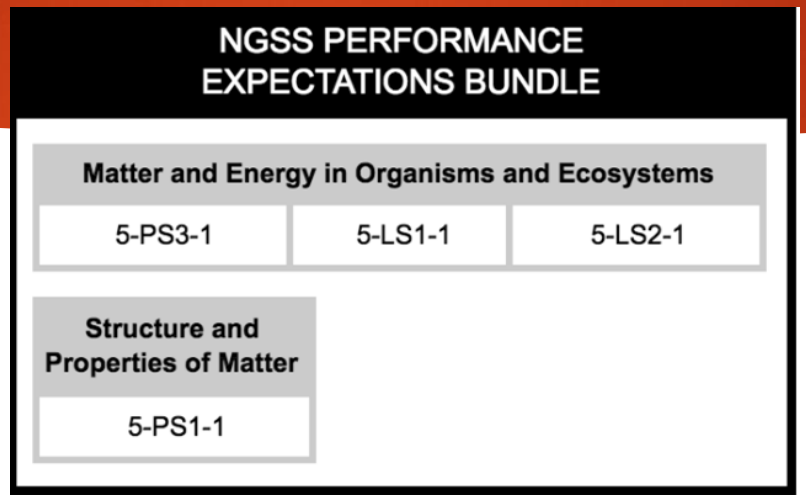
SEP: Asking Questions/ Defining Problems

1. It isn't just about students writing any questions

1. All questions are not necessary/helpful to help us figure out the phenomena (DCI).

we need to purposefully scaffold our DQB to make sure students give meaningful questions that will help us figure out our phenomena (DCI)

Effective DQB are beneficial to both teachers and students because…



Teacher's Perspective

By the end of grade **5.** Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means (e.g., by weighing or by its effects on other objects). For example, a model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects (e.g., leaves in wind, dust suspended in air); and the appearance of visible scale water droplets in condensation, fog, and, by extension, also in clouds or the contrails of a jet. The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish (e.g., sugar in solution, evaporation in a closed container). Measurements of a variety of properties (e.g., hardness, reflectivity) can be used to identify particular materials.

Students' Perspective

We have a lot of questions about where dead things go and we need to figure this out

Effective DQB are beneficial to both teachers and students because…

Teacher's Perspective

NGSS PERFORMANCE EXPECTATIONS BUNDLE

Matter and Energy in Organisms and Ecosystems		
5-PS3-1	5-LS1-1	5-LS2-1

Structure and Properties of Matter
5-PS1-1

***By the end of grade* 5.** Matter of any type can be subdivided into particles that are too small to see, but even then the matter still exists and can be detected by other means (e.g., by weighing or by its effects on other objects). For example, a model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations, including the inflation and shape of a balloon; the effects of air on larger particles or objects (e.g., leaves in wind, dust suspended in air); and the appearance of visible scale water droplets in condensation, fog, and, by extension, also in clouds or the contrails of a jet. The amount (weight) of matter is conserved when it changes form, even in transitions in which it seems to vanish (e.g., sugar in solution, evaporation in a closed container). Measurements of a variety of properties (e.g., hardness, reflectivity) can be used to identify particular materials.

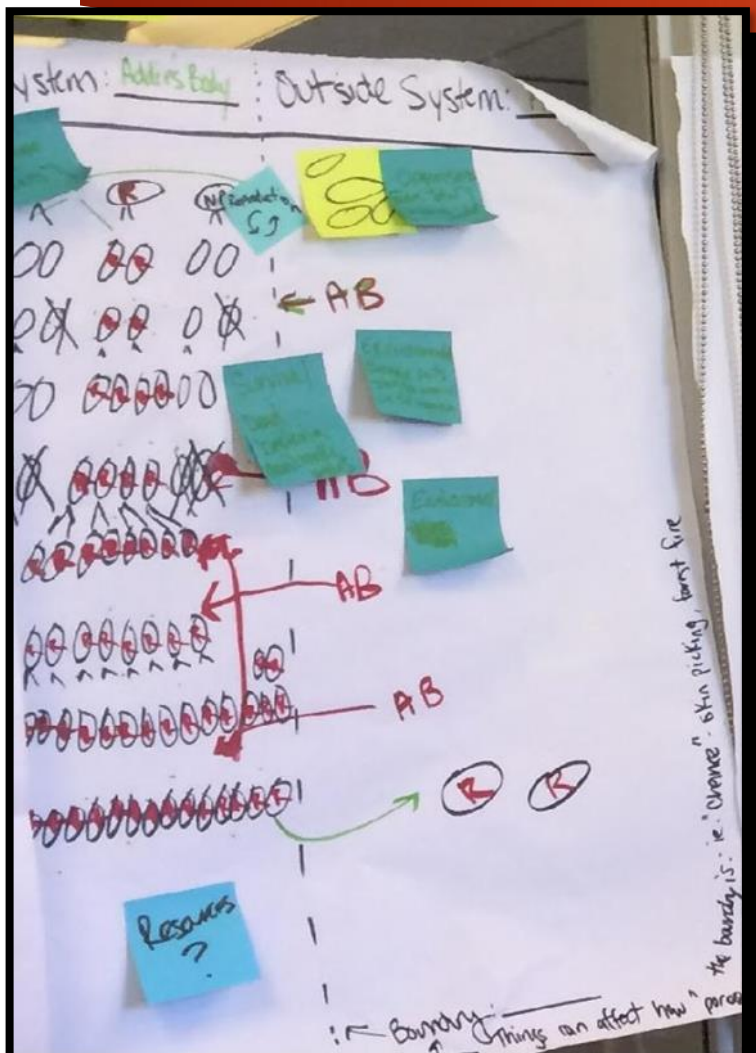
An effective DQB meets the goal from both perspectives

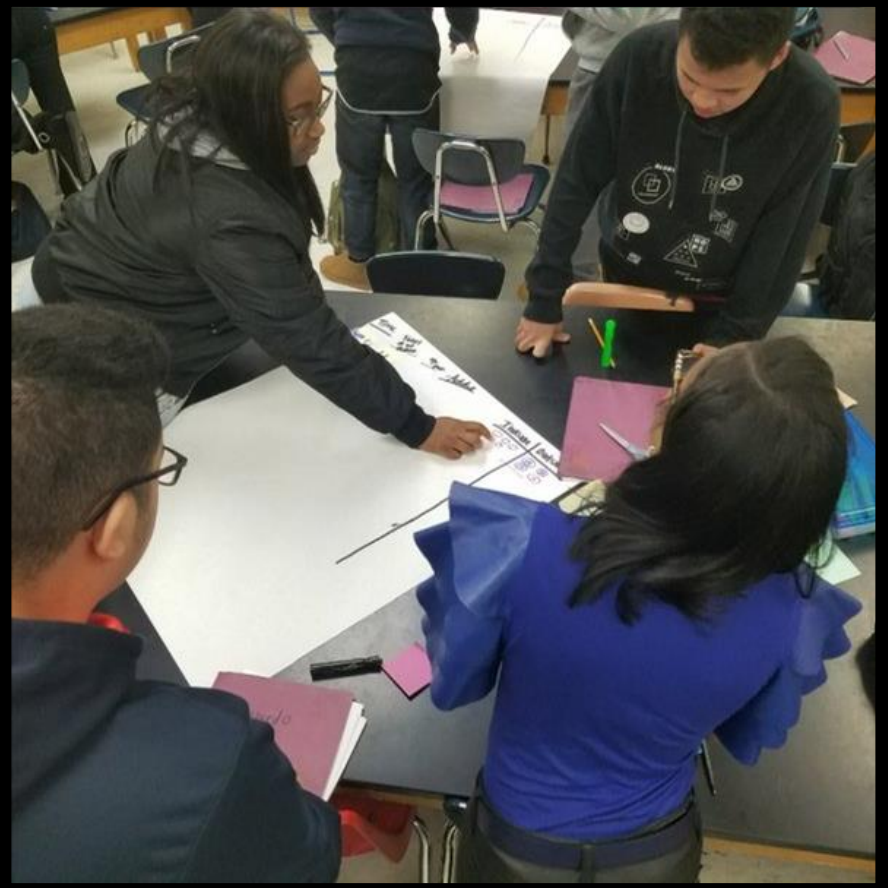
Students' Perspective

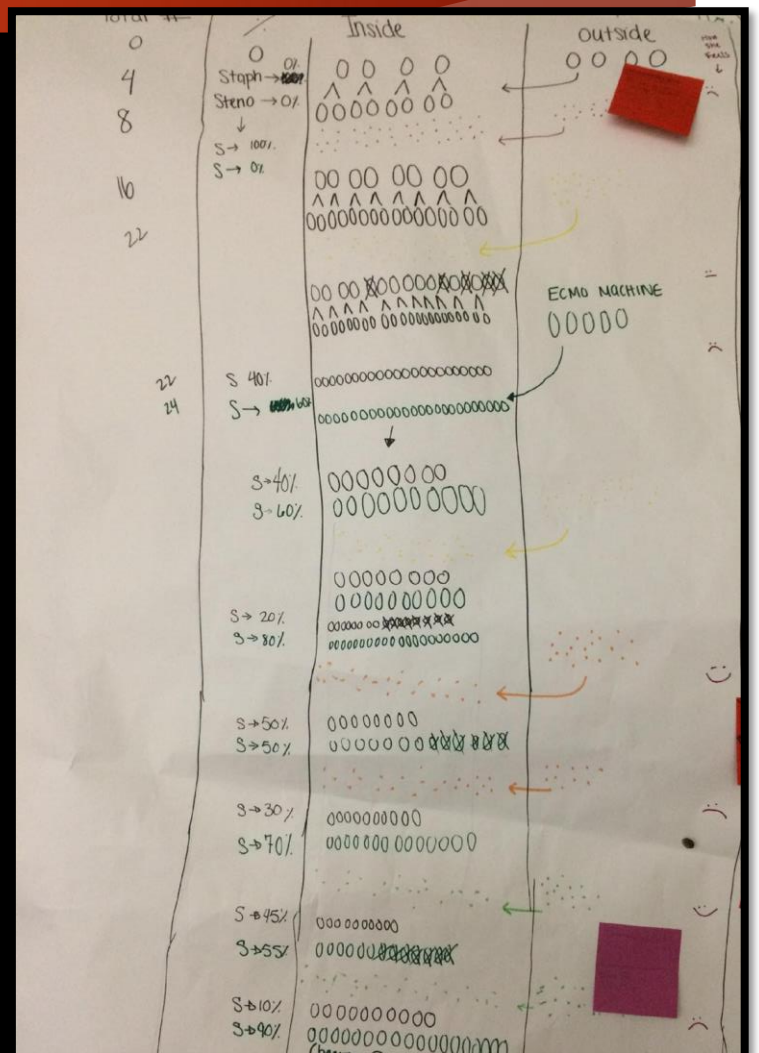
We have a lot of questions about where dead things go and we need to figure this out!

Having the END in Mind!

What do you want students to produce?







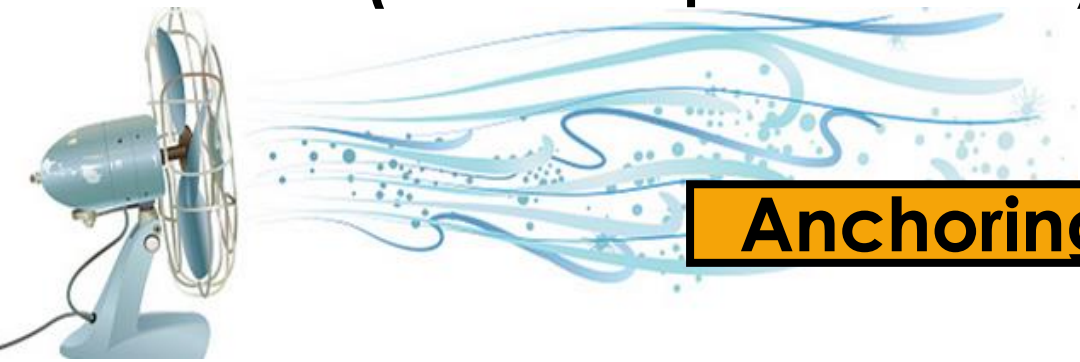
How Do We Make Sure Our DQB is Effective?

1. Timing- when your DQB happens…
2. Framing your DQB…
3. Student Engagement with the DQB

1.Timing is Everything….

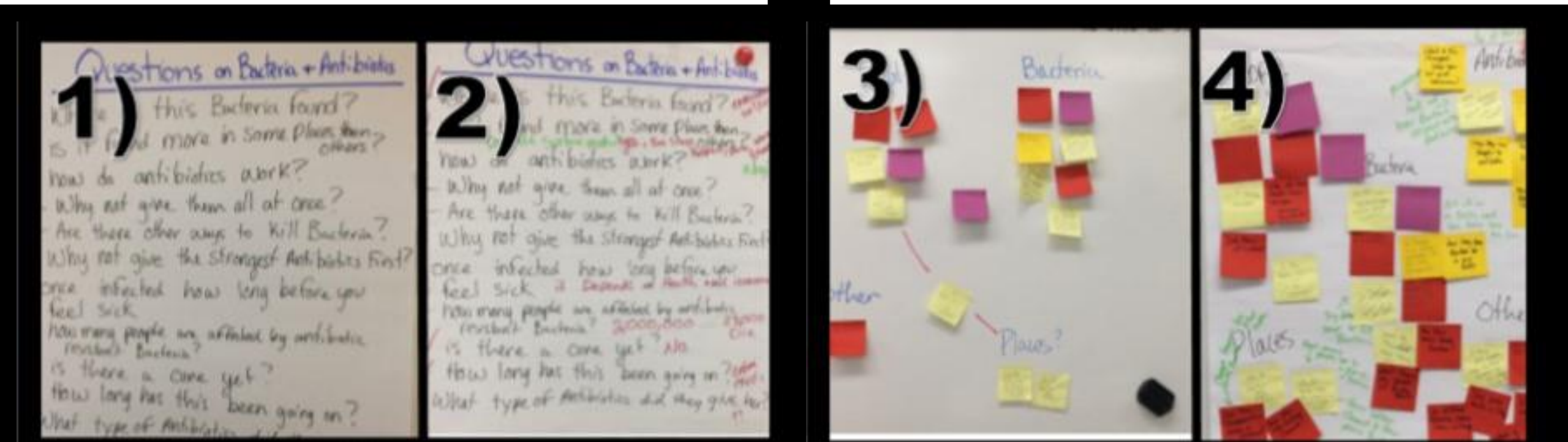
You need to be purposeful about when you do your DQB within your instructional sequence to make sure your students ask questions that lead to the DCI's .

Initial Questions (too Specific)



Driving Questions (General)

Anchoring Phenomena Routine



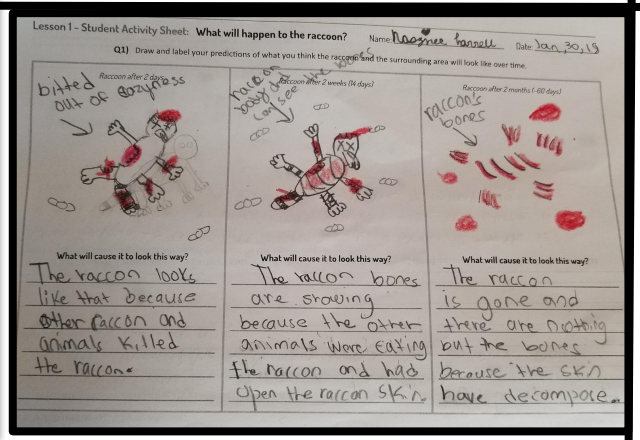
Explore Anchoring Phenomena

What do we notice?

What will happen to the body of this dead raccoon over time?

Attempt to Make Sense

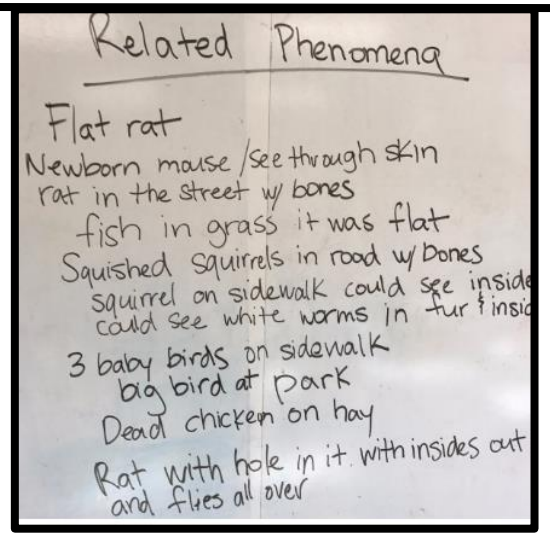
How can we explain this? Do our explanations agree?



we have different predictions about what will happen?

Identify Related Phenomena

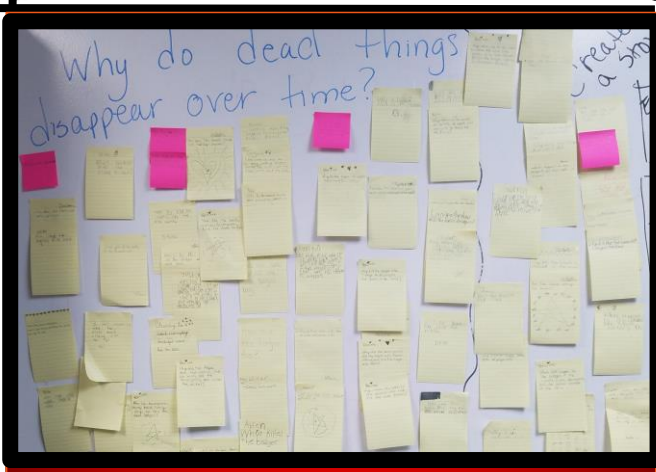
Where else does something similar happen?



We have come across other dead animals outdoors.

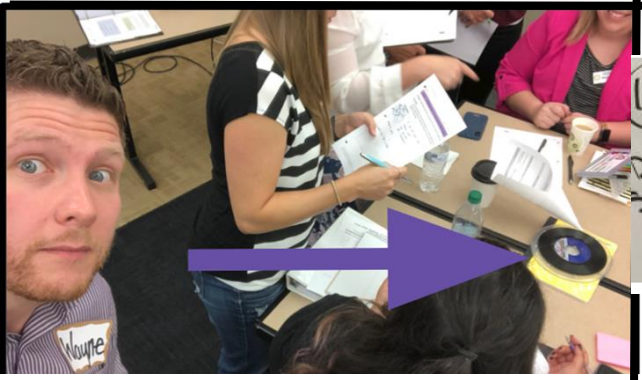
Develop Questions and Next Steps

What can we do to figure out how to explain all this?

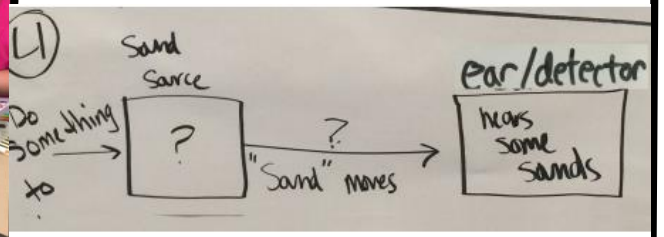


What will happen to the body of dead things over time?

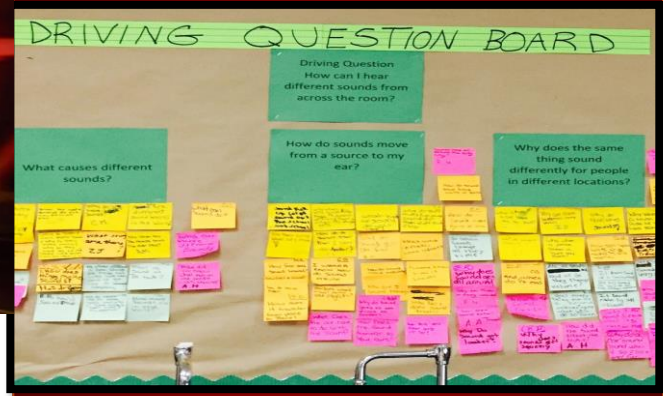
Explore Anchoring Phenomena	Attempt to Make Sense	Identify Related Phenomena	Develop Questions and Next Steps
			
What do we notice?	How can we explain this? Do our explanations agree?	Where else does something similar happen?	What can we do to figure out how to explain all this?



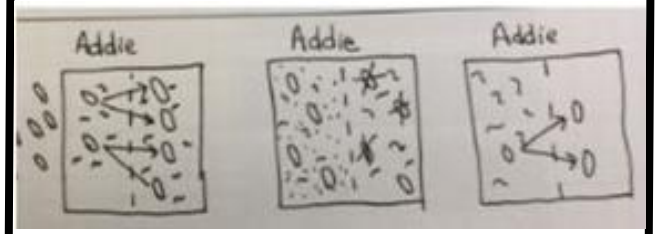
How can we hear so many sound when the record spins?



We Notice…
1.There is a sound starter.
2. Sound moves through air.
3. something catches the sound



what questions do we have about sound or about how we hear noises?

Explore Anchoring Phenomena	Attempt to Make Sense	Identify Related Phenomena	Develop Questions and Next Steps
			
What do we notice?	How can we explain this? Do our explanations agree?	Where else does something similar happen?	What can we do to figure out how to explain all this?
			
How did addie get so sick?	**We have a lot of different ideas about how the antibiotics stopped working.**	**1. Have you ever gotten sick before?** **2. how often does antibiotic resistance happen?**	**Why don't antibiotics work like they use to?**

2. Frame the DQB Board.

How you frame the Driving Question Board is important in what types of questions you will get.

“What Questions would we need to ask thats answer would help us figure out…”

3. Student Engagement

1. Create the culture that everyone is going to get a question on the board. All student questions and ideas are valued.

2. The facilitator listens and asks clarifying questions to lift the important ideas voiced by students

2. Scientist circles are

important.

High School Example - Junco Evolution

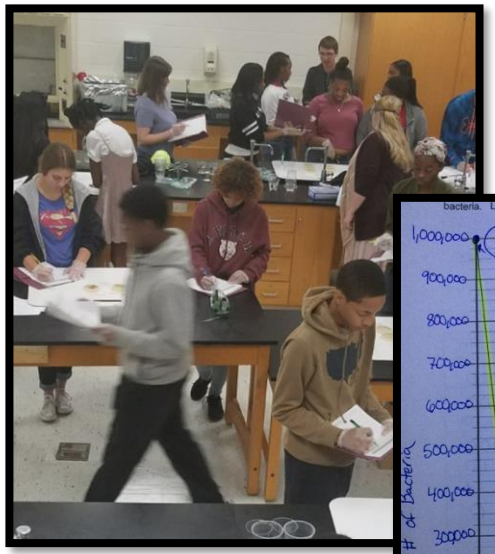
3. Student Engagement

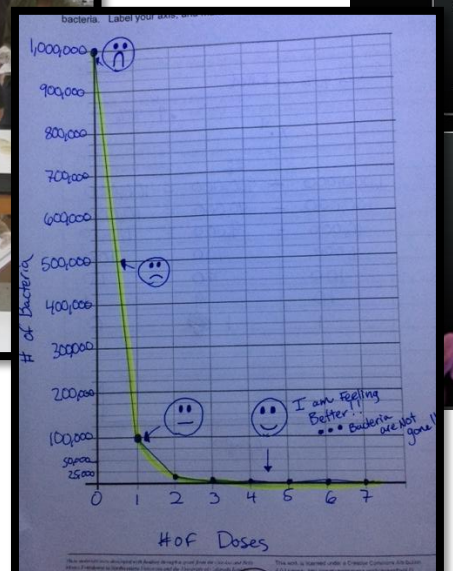
4. Students need to listen to classmate's questions to see how their questions connect.

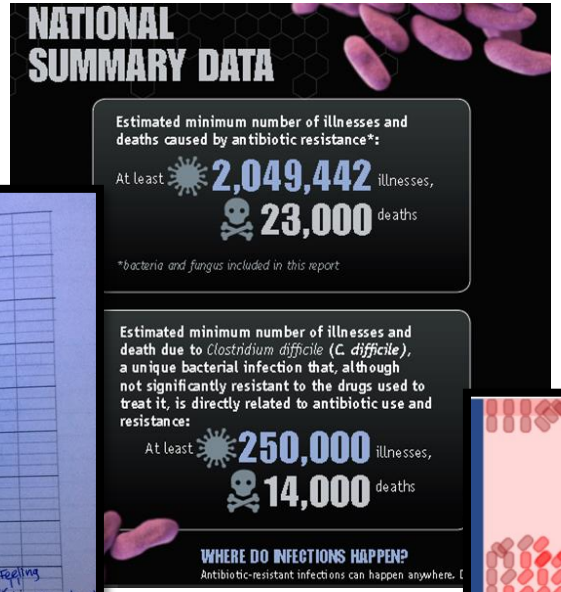
5. The class works together to categorize the questions into groups

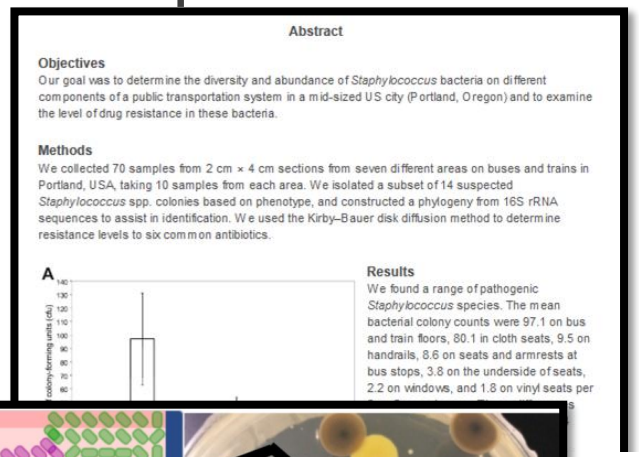
3. Student Engagement

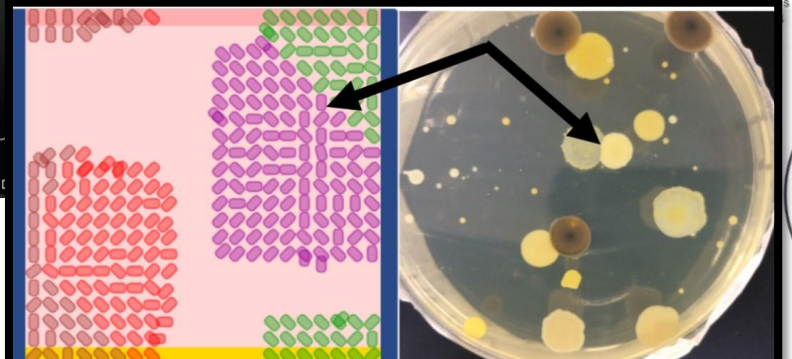
6. The DQB motivates students to plan investigations that will attempt to answer these questions







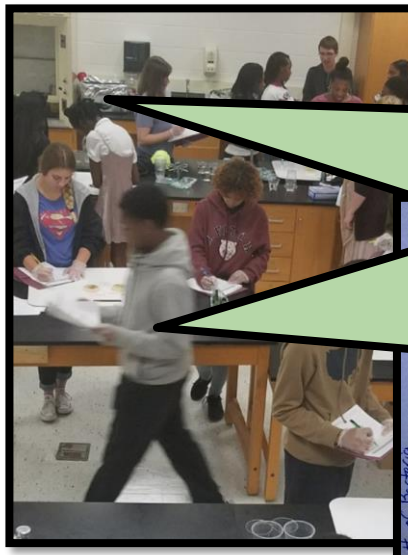


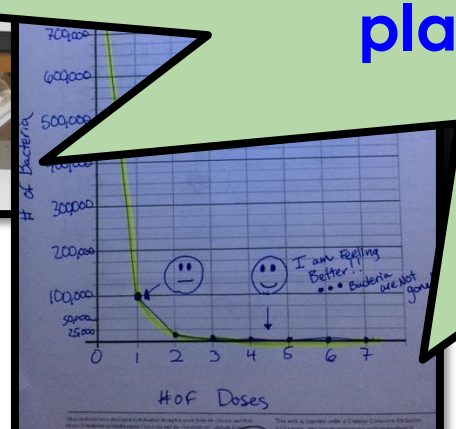


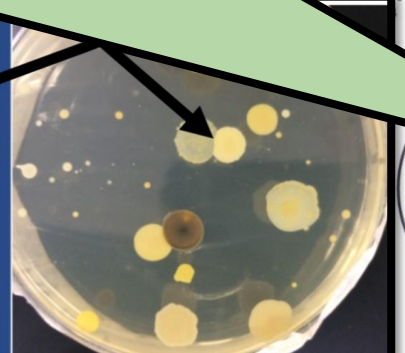
3. Student Engagement

5. The DQB motivates students to plan investigations that will attempt to answer these questions

What we figure out from those investigations often lead to new questions that motivate students to plan another investigations!

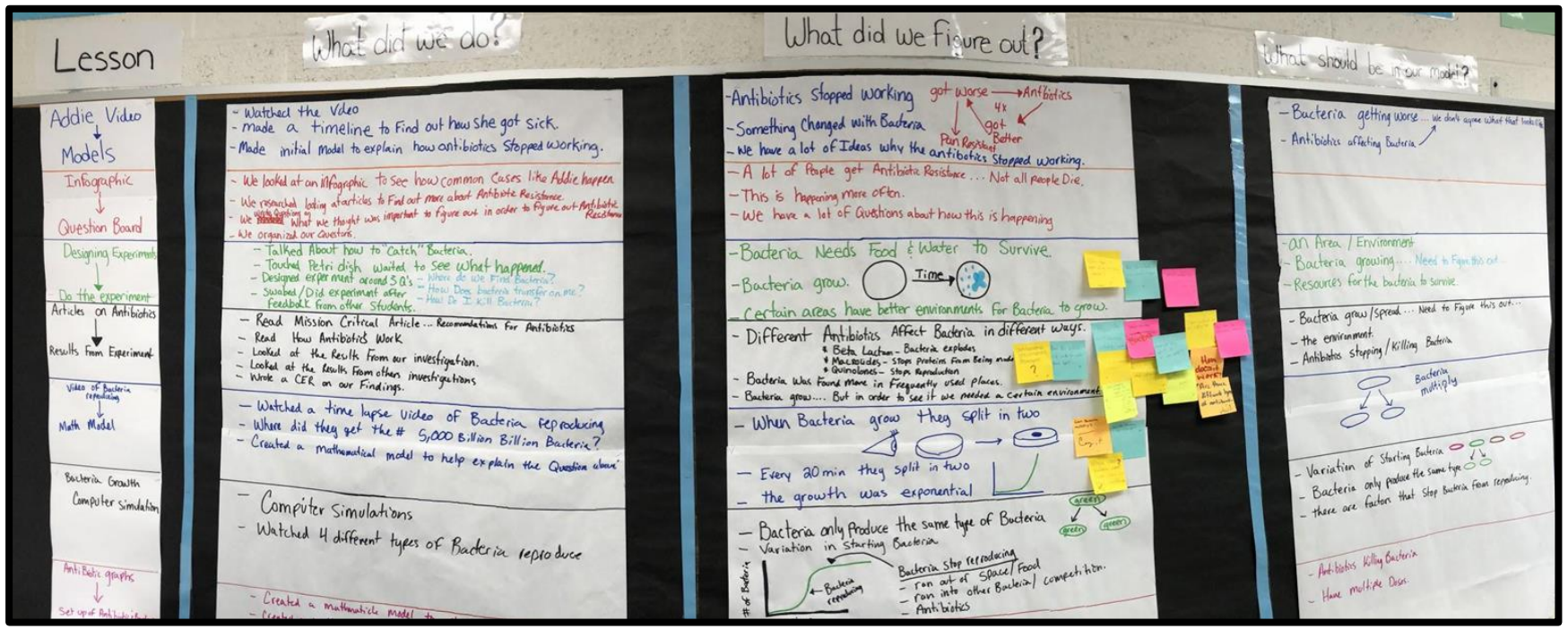




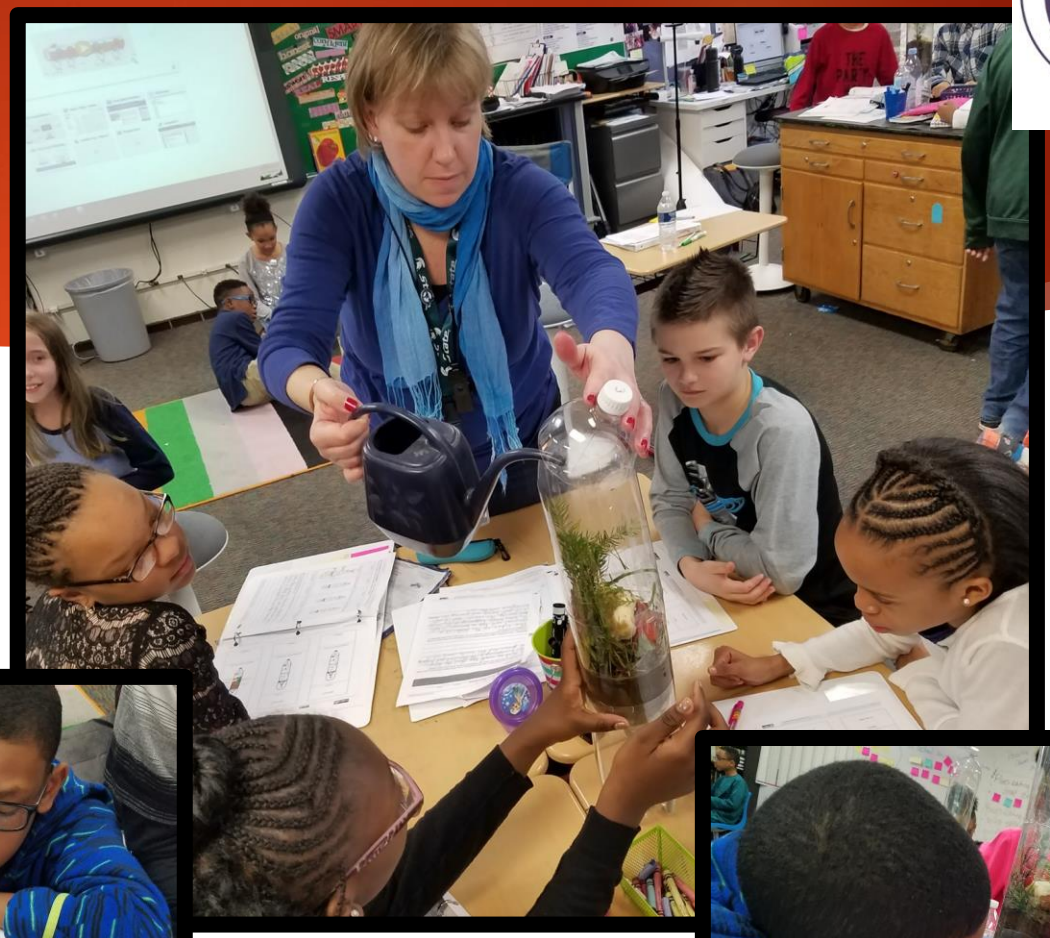


3. Student Engagement

7. We return later back to the board throughout the unit to see how we have answered our questions.



Lynda's Class



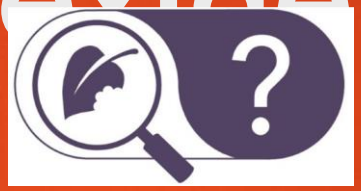
Thank you to:

The incredible teachers and researchers around the country that created and piloted these materials

The Next Generation Science Storylines Team at Northwestern University

You can find more storylines and the storyline tools at:

http://www.nextgenstorylines.org



You can find lots of examples of work in our classrooms on Twitter:

Holly Hereau @hhereau (hollyhereau.weebly.com)

Wayne Wright @wewright1234