Scientific Models

Norms

The Buckets

Doing Science

The Art of Conversation
Ask your neighbor….

1. Ask your neighbor what was the name of the last movie they saw
2. Take the time to really listen (Pause) You may even ask them to repeat.
3. Acknowledge your partner by restating what they just said (paraphrase) and then asking another question (probe).

Possible question starters:

**Was ____ as good as the trailers made it look?*

**Who was your favorite actor in _____?*

**??????????????????????*

The Buckets

Play!

Here are the parameters

Do not touch the bucket in any way; DO NOT tilt, lift, shake, remove the funnel, twist , seriously do not touch the bucket!

But do play, you have beakers, water and a bucket.

As a Scientist, what do you Do?

You have 6 minutes

GO!!!!!

Observation

On your half sheet of paper:

Write down all that you, the scientist, have noticed about the bucket

Next write down what you would like to do (given the parameters) to further experiment.

You have 4.2 minutes

Talking Sticks

The Art of Conversation

1. Each person place his/her pencil (or pen) on the table.
2. Take turns making a statement or a comment

(to take a turn pick up your pen). Others are silent and listening!

3. After you comment, keep your pen
4. After everyone has commented* (all pencils are picked up) put them back on the table, and repeat the process, adding new ideas

Sample comment starters:

"I agree with…"

"I agree with Joe but I would add…" or "I would change…"

"I'm interested in hearing more about…"

"I'm still confused about…"

"Just like Joe I think…"

"I disagree with Joe because I think that…"

"One thing I thought about is…

***Everyone comments!**

If you have nothing new to add you may comment on what someone else has said.

Phenomenon?

What could we do to better understand the phenomenon ?

Collect data in a systematic way

How can we do this?

Data Collection

- Use increments of 150 ml
- Test and Record 11 consecutive Attempts
- Record the “amount out” on the board
- Look for patterns

- What are we trying to figure out?

The Art of Conversation

As a group discuss

What would you do if you could fly

Talking Sticks

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What are we trying to figure out?

What is in the Bucket?

As Scientists we now set out to answer our question.

We set out to build a model, or set of ideas to explain the phenomenon and answer our question.

What is a scientific model?

A set of ideas that explain a phenomenon

How to Start?
On your white boards

- Begin with what objects must be in the bucket in order for the water to follow the pattern of

  Nothing

  A little

  A lot

- Now, how are the connected in order to fit the pattern?
- Draw your ideas and then write an explanation (a set of ideas) explaining the phenomena.
- Next, transfer your ideas to your poster

Model Criteria

- ✓Simple
- ✓Match our observations (fits the data)
- ✓Realistic
- ✓Use to make predictions

Gallery Walk
Peer Review

In groups, Examine each poster explanation

Put a sticky dot on the poster if it does not meet the model criteria

Be prepared to explain why you placed the dot on the poster

Remember, this is not about right verses wrong

Judge the model by the criteria

Does it make sense or not, and why

Relation to Science
Think about:

- the similarities and difference between this bucket experience and what you know about science.
- an example of how your experience with the buckets relates to what you know about science.
- Do scientists get to “look” and see if they are “right?” Or do they have to trust their models?

The Art of Conversation
Using your Norms: Discuss…….

What is Biology?