**Monsoon Science** **Student-Designed Investigations Report Card** (2/19)

**Another report card so soon?:**

I told you last time ***Student-Designed Investigations*** (S-DI) was a mini-unit! The focus was science process skills and practices. Here were the goals:

**Science Process Skills & Practices:**

Students can recognize scientifically testable questions and make plausible predictions. Students can carry out safe investigations, control variables, recognize controls, measure accurately, and record data in a table that they can design themselves. Students can analyze data, graph results, draw conclusions based on evidence, and communicate these results. (All above based on Appendix H of NGSS--Nature of Science.)

These skills are more challenging than science content for most students simply because they have so little experience practicing them.

First, we did a "Getting Ready for Investigations" exercise. Then, each group was assigned a different problem. Students planned and carried out safe, reliable investigations. Topics included these types of questions:

*How does the mass of a sphere affect its time to stop rolling on a stringless pendulum?*

*Does doubling the distance a marble rolls down a ramp double its speed? (More than double? Less than?)*

*Does doubling the number of ring magnets stacked together double their attractive strength? (More than double? Less than?)*

**Scores on Aspen:**

Here is a description of the tasks you will see in Aspen for ***Student-Designed Investigations.***

## POP:

**S-DI POP Week 1, 2, 3...:** These weekly scores describe how well students did their jobs in class (followed directions, handled equipment properly, brought materials to class, remained on task) during our unit.

## Academic Standards (SPS--Science Process Skills):

**1. Predictions:** Students should be able to recognize possible outcomes and communicate what they expect will happen to what they are measuring when they change a variable. Here are three **complete, plausible** predictions for *Does doubling the number of ring magnets stacked together double their attractive strength? (More than double? Less than?)*

I predict doubling the number of magnets will double their attractive strength.
I predict doubling the number of magnets will more than double their attractive strength.
I predict doubling the number of magnets will less than double their attractive strength.

Here are flawed predictions made by students who have limited experience ***doing*** science.

I predict the number of magnets will change their strength. (This is a 1. No mention of how students will change the number of magnets nor how the strength will change.)

I predict doubling the number of magnets will increase their strength. (This is a 2. Doesn't answer the question of whether strength doubles, more than doubles, less than doubles.)

**2. Conclusions:** Once groups completed their investigation they needed to look at their data and draw appropriate conclusions. Conclusions must be supported by their data! Again, this is not a trivial skill.

**3. Graphs:** Students concluded their investigations by making individual graphs. Graphs offer a more visual display of data than tables.

**[Student-Designed Investigations Socrative Assessment:** There is a Socrative Assessment for this unit, but we are doing it in class together.]

**Parent question:** If my child has 1s and 2s for this unit, should they come in for Storm Time help?
**Answer:** Unlike science content, science process skills take time and experience--lots of time and experience. The goal is for each student to steadily improve their ability to master these sophisticated skills as they move through the middle school. There is no "quick fix" to writing clear predictions and conclusions (i.e. some worksheet). We will do Student-Designed Investigations II in June. In addition, we continue to practice these skills within content units. **Graphs are another story.** These should be redone if they were poorly done.

**Electricity:**
Our next unit has three content goals.

I. ***Define*** energy and, using an activity from this unit, ***demonstrate*** why electricity qualifies as a type of energy.

II. ***Name*** a device that produces electrical energy, and ***explain*** what type of energy in the device changes into electrical energy.

III. ***Demonstrate*** evidence that electric fields exist. (You may use an activity from this unit or think of your own activity.)

**Family Science:**

Speaking of needing practice **doing** science… I've just assigned our second Family Science Project of the year--Slow Down! The winner of this race will be the ***slowest***. See the explanation video on the Family Science page of my website. As students design and redesign their entries, they are working on most of the Science Process Skills & Practices I described at the top of this report card. Projects are due Thursday, March 14. Although Family Science Projects are optional (and no credit other than experience is given), I can think of no compelling reason ***not*** to attempt it. Can you?

**Questions? Visit?**

Let me know if you have any questions. Feel free to visit our classroom any time.