Introduction to Innovation

Millis Science Center 324
Case Western Reserve University
June 18-22, 2018

INSTRUCTIONAL STAFF 2018

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SCHEDULE

Monday June 18

Driving Question: How do equal and unequal forces on an object affect that object??

Learning Goals:

- Construct explanations based on evidence.
- Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
- Define a simple design problem that can be solved by applying scientific ideas about magnets.
- Model effective science, engineering, and literacy integration.
- Construct an open-ended, engaging driving question that effectively drives a PBL unit.

Activities:

- Welcome, introductions, background, and context
- Assessment summary 2017 and pre-workshop assessments 2018
- Little Red Riding Hood and the nature and practice of science
- Balancing Forces (Amplify Science)
- Introduction to PBL: Constructing a driving question

Tuesday June 19

Driving Question: How much water can be found in different places on Earth?

Learning Goals:

- Develop a model using an example to describe ways in which the geosphere, biosphere, hydrosphere, and/or the atmosphere interact.
- Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
- Model effective science, engineering, and literacy integration.
- Explore strategies to manage PBL

Activities:

- How Can We Provide Freshwater To Those In Need? (Smithsonian Science Education Center)
- PBL: Managing projects

Wednesday June 20

Driving Question: How are materials similar and different from one another and how do the properties of materials relate to their use?

Learning Goals:

- Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
- Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.
- Make observations and construct an evidence-based account of how an object made of a small set of pieces can be disassembled into a new object.
- Construct an argument with evidence that some changes caused by heating and cooling can be reversed and some cannot.
- Successfully complete a digital fabrication task.

Activities:

- Making crystals, but not the way you think to do it.
- Visit to think[box] – tour and tasks

Note: CWRU will be offering a themed BBQ for lunch. Eat a light breakfast!

Thursday June 21

Driving Question: Can new substances be created by combining other substances?

Learning Goals:

- Make observations and measurements to identify materials based on their properties.
- Conduct an investigation to determine whether the mixing of two or more substances results in new substances
- Explore strategies to assess PBL

Activities:

- Fun with Play-Doh
- PBL: Assessment and culminating design challenge

Note: University Hospitals hosts the North Union Farmers Market every Thursday. Worth checking out.

Friday June 22 *(We will meet at the Cleveland Metroparks Zoo on Friday)*

Driving Question: How do organisms interact in groups so as to benefit individuals?

Learning Goals:

- Construct an argument that some animals form groups that help members survive
- Model effective science, engineering, and literacy integration.

Activities:

- Better Together (NSTA Picture-Perfect STEM Lessons 3-5)
- Habitat design challenge
- Post-assessments 2018