PTRA: Exploring Physics in the Classroom: Exploratories and Practicums

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TEACHERS TRAINING TEACHERS

Exploatories

Exploratories are:

- Introduction activities to engage students' interest in new materials
- Often a combination of the engage and explore phases of the 5 e learning Cycle
- They should be:
  - ❖ Interesting
  - ❖ Easy to operate
  - ❖ Rugged (kids will be kids)
  - ❖ Cheap
  - ❖ Surprising and unexpected
  - ❖ Student-centered

Exploratory

Use **Chain in a Cup** and illustrations of

Newton's Laws.

All group members will try the

demonstration. A group discussion and Explanation for the class.

Exploratory

Newton's Beads – Chain Fountain
https://stevespangler.com/experiments/newtons-inertia-beads-chain-fountain/

The Physics Teacher Resources

https://instructional-resources.physics.uiowa.edu/1f3020-inertia-motion-standing-pulse-chain

Practicums

Practicums: Real world or authentic Assessment

The Teacher provides the students with a situation to test the students' ability to apply their physics knowledge to solve a physical challenge where measurements are taken.

- ❑ The problem is presented to the class or lab group and the students must agree on the solution
- ❑ Each member is responsible for the explanation of the procedure, data analysis and experimental solution
- ❑ It should be the culminating activity for the unit and may be used as a lab assessment or test review

Crash Up Derby A Lab Practicum

1. Using basic kinematics, design an experimental procedure to determine the location and time of a collision between two tumble buggies starting at a specified separation distance.
2. Write a procedure that would allow anyone unfamiliar with your lab to successfully complete the experiment.
3. Construct a data table to include measured and calculated data. (a minimum of 3 data entries is required)
4. Predicted collision time and location
5. Actual collision point
6. Percent accuracy
7. Error Analysis

Toying Around with Momentum

Problem: How does one calculate the initial velocity of a "popper" as it leaves the table and the time of the snap using the impulse momentum equation? (As a group you must give 1 – 2 sentences as a response)

Materials: Meter stick, balance (0.01 g accuracy), party "popper" NO stopwatches!

Hint: Use kinematics (Think Galileo) all measurements must be in kg, and m.

The distance the popper moves as it leaves the surface is not the popper's height. g = 9.8 m/s^2

1. A minimum of 3 trials organized in a data table on 1 piece of paper with everyone's name will be submitted including error analysis.

2. Show all calculations and formulae used to determine initial velocity of the popper, acceleration of the popper, and the force of the popper on the table and the time of the snap!