Tech Tools Mini Lesson #2
Kevin Knodl

Benchmark

8P.1.2.1.2 Plan and conduct an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. (P: 3, CC: 7, CI: PS2)

Science Practice

Practice 3 - Planning and carrying out an investigation.

Practice 4 - Analyzing and interpreting data

Tech Tool

https://phet.colorado.edu/sims/html/projectile-motion/latest/projectile-motion_en.html

Links to an external site.

Students will use the tool to simulate projectile motion, analyze the data produced, and write a report with their conclusions.

PICRAT

This tool would land on IA in the PICRAT matrix. The students would interact with it by changing the sliders' values and seeing their effect on the projectile path. It would amplify the teacher's practice by providing a visual. Watching the projectile move with the vectors superimposed is an excellent addition to class. The page can also be operated like performing a lab where students can change variables and then use measurement tools to collect data from subsequent trials.

Essential Questions

What forces are on moving objects?

How do the forces combine to change velocity and acceleration rates?

How do forces in perpendicular directions affect the motion of an object?

How does gravity affect objects of different masses?

Benchmark Connection

The benchmark is about investigating how things move relating to Newton's laws. This tool can act as both an exploration tool and or concept builder. As well as an alternative / simulated lab. This tool lets students experiment and see the results in a simulated manner in real-time with no safety issues with moving projectiles.

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Lesson Procedure

1. A short reminder of force diagrams and balanced and unbalanced forces.
2. Explain the tool and show an example
3. Explain project
4. Students work in pairs on projects for the rest of the class
    1. Students will determine a set of variables to test
    2. Students will run tool to gather data
    3. Students will write up results and conclusions

Assessment

Formative assessment - students will be observed as they work together and run the simulation. (Students will get stamps for effective teamwork and creativity as the teacher surveys students.)

Summative Assessment - the report generated will be used as a summative assessment for the lesson (how well the they explained their process and results)