

Rally Round the Room Lesson Plan

Teacher

Date

School

SLE # PS.6.5.2 (a-f): Conduct investigations

using: levers (e.g., toothbrush), pulleys, inclined planes-ramps, wedges, and screws, and wheels and axles, PS.6.5.6: Conduct investigations using potential energy and kinetic energy,

Objectives:

Content: I will be able to conduct investigations using inclined planes-ramps.

I will be able to conduct investigations using potential energy and kinetic energy.

Language: I will use the terms potential energy, kinetic energy, motion, and inclined plane while working with my group and in my assignment.

Assessment: Students will be assessed based on completed tables, charts, and graphs. They will also be assessed on their closure writing.

Technology/Materials: Match Box or Hot Wheels cars (1 per team), Inclined Plane (either made from wood scraps or by stacking books and using a piece of cardboard as the ramp), meter tape, triple beam balance or balance scale

Vocabulary: potential energy, kinetic energy, motion, inclined plane

Bloom's: ☒ Remembering ☒ Understanding ☒ Applying ☒ Analyzing ☐ Evaluation ☒ Creating

Questions: When you are on top of a hill, about to roll down it, what kind of energy do you have? What kind of energy will you have once you start rolling down the hill? How will the height of the hill affect the distance that the car travels? Describe the forces in action when the car is moving. Explain what will happen to the distances if you change the height of the starting point.

High Yield Strategies: ☒ Identifying similarities & Differences ☐ Summarizing & Note Taking ☒ Cooperative Learning

☒ Reinforcing Effort & Providing Recognition ☒ Setting Objectives & Providing Feedback ☒ Generating & Testing Hypotheses

☒ Cues, Questions & Advanced Organizers ☒ Homework & Practice ☒ Nonlinguistic Representations

Instructional Strategies:

Engagement: Ask the students the questions listed above. Engage the students in a discussion of NASCAR or Soap Box Derby Racers or some form of a car in motion in order to get the students to understand the concept of the forces in action while a car is moving.

Exploration: Allow the students to have some time to "Explore" the cars that they will be using in the activity. Have the students complete the registration for the rally which includes their name, car number, and specifications. Once they have completed registration sheet, instruct students on how to build their ramps and how to correctly measure the distance (end of ramp to front bumper or wheels). Next, allow the students to complete their testing.

Explanation: While the students are working, walk around the room asking the following questions:

1. What are you noticing about the distances that the car travels?
2. Explain why changing the height on the hill affects the distance the car travels.
3. Describe what forces are in action while the car is traveling.
4. Describe what some factors may be influencing your car's distance.

Elaboration: Allow the students who are done with their testing to compete in different challenges with their cars.

Challenge #1: Pit Stop Parking

Measure 2 meters from the bottom of the hill and place a piece of masking tape. Then measure

15 centimeters from the tape and place another piece of tape. This will serve as the “pit”. In the activity, the students need to release the car from any point on their hill and get the car to stop in the “pit” OR as close to the “pit” as possible. Different point values are awarded based on where the car stops (see student activity sheet). It is best of 2 trials.

Challenge #2: Conquer the Cliff

Place a few ramps on tables with the end of the ramp 3 meters away from the edge of the table. The students will release the car from any point on the hill and try to get the car to stop as close to the edge as possible. Points are awarded based on where the car stops. (See student activity sheet.) The students will be allowed only 1 attempt at this!

Intervention Strategies: See curriculum map for ELL levels, walk throughout the room to facilitate, pair students as needed

Accommodations & Modifications (IEPs) See individual Accommodations and IEPs

Evaluation: Review the SLE’s for the activity. Ask students the questions from above to review material and objectives. Have students share observations that they made while completing the assignment and any of the challenges that they attempted.

Closure: Have the students write 2-3 paragraphs describing the activity and what forces were in action. If they have competed in one of the challenges, then have the students write about the factors that influenced the challenge and any difficulties that they faced. Allow them to make suggestions as to what could be done the next time in order to complete one of the challenges. Also have the students complete a diagram for the activity showing where the car had potential and kinetic energy.

Homework: Find 3 examples of the forces of motion in action in the real world.

Interdisciplinary Items: Students will take the data that they collected from this activity and graph it in their math class.