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Tech Thursday: Virtual Labs on Friction and Mechanical Energy

1. Science Starter: Chromebook

* Access [www.discoveryeducation.com](http://www.discoveryeducation.com)
* Sign-in using your login information
  + student#\_cms
  + Password: Student #
* Hit the “Assignments” Tab
* You have an activity called “SET TO GO” assigned. Place the tiles in the correct location. **Please take the time to read the pop-outs.**

1. Virtual Lab: Moving On (See Student Sheet)
   * Access this assignment via the “Assignment” Tab.
   * Read the Introduction and click the Continue button.
   * Identify the exploration components. Recall that potential energy is energy determined by position.
   * Select the mass of ball and height of ball. Click on the Play button
   * Watch and observe as the ball bounces. Record Data on your student sheet.
   * Continue to record for other mass and drop distances.
   * Answer the follow up questions.
2. Virutal Lab: Knock the Pin to Win (See Student Sheet)

* The Problem: You and your friends are setting up a school fair. You are responsible for creating a game for students to play during the fair. This game uses a ball that goes down a hill, through a loop and up another hill to knock over a bowling bin. You want to design a game for the fair that is fun to play but difficult enough that not every person can win.
* Mission: Design a game that only one ball knocks down the pin.
* Read the Introduction.
* Click on the mission Tab. You can read by scrolling down or clicking the PDF button in the top right corner.
* Click on explore. Play around. This is your opportunity to practice with the different masses of the balls, the game features, etc.
* When you are ready, click on the “Plan” tab. There are articles and videos available for you to gather information in making your design. You will need to make the following decisions: Height of Launch, Whether or Not it has a sand feature, The height of the final drop, and the mass of the ball.
* When you are ready, start designing your ride. You can retry until you get it correct. All of the “KNOCKS IT OVER” column should say “NO” with the exception of one ball.
* Your attempts will be recorded and available to me electronically so I will know how hard you worked on this lab. When you discover the answer, write in the information on your student sheet.

1. Virtual Lab: Amusement Part Challenge

* Please raise your hand to ask Mrs. Ward for this sheet.
* Attach your other lab sheet into Page 36
* Record your answers to the Virtual Lab onto Page 37

1. Virtual Lab: Speedy Lube
   * If time allows, please complete this lab. No recording of data is required.

Virtual Lab: Moving On

How far did the ball bounce back?

|  |  |  |  |
| --- | --- | --- | --- |
| Ball Mass/Height | # of bounces | ~Height of 1st bounce (m) | Potential Energy (J) |
| 1 kg / 5 m |  |  |  |
| 2 kg / 5 m |  |  |  |
| 4 kg / 5 m |  |  |  |
| 1 kg / 10 m |  |  |  |
| 2 kg / 10 m |  |  |  |
| 4 kg / 10 m |  |  |  |
| 1 kg / 20 m |  |  |  |
| 2 kg / 20 m |  |  |  |
| 4 kg / 20 m |  |  |  |

Analysis Questions:

1. How did changing the mass of the ball change:
   1. The number of bounces?
   2. The height of the first bounce?
   3. The potential energy exchange?
2. How did changing the distance of the drop change:
   1. The number of bounces?
   2. The height of the first bounce?
   3. The potential energy exchange?
3. How did the blue (potential) and the red (kinetic) lines relate to one another as you completed the lab?

Virtual Lab: Knocking the Pin to Win

* Launch Height: High or Low
* Sand Trap: Yes or No
* Pin: High or Low

Analysis Questions:

1. How did changing the Launch Height affect the motion of the ball?
2. What do you think the height had to do with the potential energy of the ball?
3. How did the Sand Trap affect the motion of the ball?
4. What force was the Sand Trap applying to the ball?
5. How did changing the height of the pin affect the motion of the ball?
6. How do you think the height of the first hill and the second hill are related?