Friction – Friend or Foe?

Using Spheros

Friction has a bad rap – we always hear about how it causes problems, like slowing things down or causing wear on our tires and sneakers. But can friction be useful? Let's find out!

Part 1: Racing Spheros without any coverings

1. Wake up your Kindle Fire tablet by tapping the screen or quickly pushing the power button.
2. If Sphero Edu app is not already running, click on its icon to start it. When prompted, click as a Guest user.
3. Tap on the second icon along the bottom to open the programs. Find "Friction – Friend or Foe" and tap on it.
4. You will see a blank screen. Please do not alter any part of it!
5. Now you need to pair the tablet with your Sphero. Along the top, there are three icons on the right. Tap on the middle one (looks like a semicircle with speed lines extending to the left). Find your Sphero ID in the list and tap on it.
6. Once your Sphero is connected to the Kindle Fire, tap on that same icon again. On this screen, you can "drive" the Sphero just like you are holding a joystick.
    a. Set your color to help you identify your Sphero more easily.
    b. In the bottom left corner, you will see an icon AIM. Click on it and drag the blue dot until the blue taillight of the Sphero is facing you (away from the direction you want the Sphero to go).
    c. Now use the larger blue dot to drive the Sphero forward, backward, right, left, etc. You can adjust the speed with the slider button above the joystick.
7. When you are instructed, try to race your Sphero around the track for 3 laps. Use a stopwatch to measure how long it takes to go 3 laps and record it here: _____
8. Take notes on how well Sphero stayed on track as you raced it:

Part 2: Racing Spheros with their blue covers

1. Put the blue cover onto your Sphero and repeat steps 6-7 from Part 1. Time: _____
2. What did you notice about the difference in how Sphero behaved as you raced it around the track?

3. Was there any difference in race time between your two trials?

Adapted from SpheroEdu: Olympic Speed Skating

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Part 3: Design your own cover

1. Using materials provided, design your own cover for your Sphero.
2. Make a prediction: how will your cover perform compared to the trials without a cover? With the blue cover?

3. Repeat steps 6-7 from Part 1. Time _____

4. How well did your prediction match your actual results?

5. When everyone is ready, we will have a race to see who made the best cover. Get ready! (While you wait, answer the questions below.)

Data Analysis

1. What was different about the Sphero itself during these three trials? (in other words, *why* did the covers make a difference?)

2. Brainstorm with your partner and think of another instance where friction is helpful to us:

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