**FPS – Energy Skate Park Lab**

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period\_\_\_\_\_\_\_\_\_\_

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| I can… |
| *Define energy and distinguish between kinetic and potential energy, and calculate both.* |

* ***Go to http://shhsphysicalscience.weebly.com***
* ***Mouseover Foundations Physical Science*** 🡪 ***Click Quarter 2 Week 2*** 🡪 ***Friday*** 🡪***Click the link “Energy Skate Park Lab”***

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| ***Energy Skate Park lab*** | |
| 1. Click the “Intro” section.  Then, check the boxes as shown below.  **Predict** what will happen to the *kinetic* and *potential* energy when you add the skateboarder. Use complete sentences. |  |
| 1. Add your skateboarder to the ramp. What does he do? Describe in general. |  |
| 1. Now, look at the bar graphs. When does the skateboarder have the MOST **potential** energy? WHY? |  |
| 1. Now, look at the bar graphs. When does the skateboarder have the MOST **kinetic** energy? WHY? |  |
| 1. Pause the skateboarder when he is at about 2 meters high on either side. Sketch the bar graphs to the right, with axes and labels. |  |
| 1. Pause the skateboarder when he is at about 4 meters high on either side. Sketch the bar graphs to the right. |  |
| 1. Compare your two bar graphs. What differences/similarities do you notice? WHY? |  |
| 1. Based on your answer to #7, how do you think we can find **total** energy? |  |
| 1. Write the formula for #8. What do we call the **total** energy? |  |
| 1. Check the box that says “Speed” and press play.  Describe how the speed changes as the skateboarder goes up and down. Use complete sentences. |  |
| 1. Why does his speed change this way? How does this change the kinetic energy? (Reference the formula for KE) |  |
| 1. Make his mass LARGE. How do the bars on the graph change? WHY? |  |
| 1. Make his mass small. By referencing both the formula for GPE and KE, describe WHY the bars on the graph get smaller. |  |
| 1. Click the Friction tab at the bottom. Change the friction to “None”  If you let the skateboarder keep going, will he stop? WHY NOT? |  |
| 1. Add “Lots” of friction and observe. Draw the **free-body** diagram for this motion. |  |
| 1. Notice the bar graphs when the ramp skate park has “Lots” of friction. You should notice the “Thermal” bar has come into play. WHY? (try looking up “Thermal energy” on google) |  |
| 1. Click the Playground tab and make your own skate park. Sketch your creation. ☺ |  |
| **The Quiz!** | |
| Answer these questions using the formulas below!  GPE = m g h KE = 0.5 m v2   1. What is the skateboarder’s gravitational potential energy if he is 75 kg and is 6 meters high on the ramp? (Assume we are on Earth.) 2. The skateboarder travels to the moon (g=1.6 m/s2) and stands at the top of a 6 meter ramp again. What is the GPE? 3. Compare your answers to 1-2. How does the energy change? WHY? 4. The skateboarder is on the ground and still weighs 75 kg. What is his GPE? (Assume we are back on Earth.)      1. When the same skateboarder (75 kg) is travelling at 6 m/s, what is his kinetic energy? 2. The skateboarder goes to Taco Bell and gains 5 kg. What would happen to his GPE? What about his KE? 3. You design a skate park with a ramp triple the height at 18 meters high. (Try it on the lab!) What will happen to the GPE? Calculate it. 4. You design a skate park with a ramp triple the height at 18 meters high. What will happen to his maximum speed? | |

What did you think of this lab?

Fun Helpful Not fun Difficult Easy Not Helpful

If I were to change this lab, I would… \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
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