

Name _____

Class _____

Date _____

By the end of this worksheet I can...

- ☐ describe how potential and kinetic energy change on a track
- ☐ explain conservation of energy in a closed system
- ☐ investigate the effect of mass and friction
- ☐ design a track that keeps energy losses low

I DO**Before you start** Simulation instructions

Open the PhET simulation: phet.colorado.edu, then search for "Energy Skate Park". Use the **Intro** tab for Parts 1–3 and the **Playground** tab for Part 4.

Remember

Potential energy is greatest at the highest point; kinetic energy is greatest where the skater moves fastest. With no friction, $E_p + E_k$ stays the same.

YOU DO**Simulation tasks** Answer in full sentences as you use the simulation.**Part 1: Getting started**

1 Place the skater at the top of the ramp and release them. What happens?

2 Turn on the bar graphs and pie chart. What do they show?

Part 2: Energy observations

3 What do you notice about the total energy at each point on the track?

4 How does the skater's speed relate to their kinetic energy?

Part 3: Experimenting with variables

5 Increase the skater's mass. What happens to:

a) their potential energy?

b) their kinetic energy?

6 Add friction to the track. What happens to the energy over time?

Part 4: Design challenge

7 In the Playground tab, design a track where the skater reaches maximum speed without flying off. Sketch or describe it.

8 What design features helped reduce energy losses?

Reflection

9 Explain, in your own words, how energy is conserved in the simulation.

10 Why is conservation of energy important for engineers?

Check and reflect

Mark your answers with the answer sheet. Which “I can” statement above still needs work? Look back at the notes for that topic on the site.
