Figure 8. Student Handout For Lesson 5: Ball B (Happy Ball). The handout was available in paper and electronic form. The student paper version included more space for answers.

Name: Date: Period #:

7th Grade Physics **Lesson 5: Ball B**

**Introduction and Goals**

Today you will study the behavior of a ball (ball B) and try to figure out **why it starts, keeps going, and stops**. You are not expected to figure it all out today. Over the next few periods we will study different apparatuses and put together the information we get from each to get to the answers. Along the way you are expected to **build your vocabulary around energy; develop skills in communication, collaboration, and cooperation; explore ways of modeling energy changes; learn to ask good (testable) questions; and develop as systems thinkers.**

The expectation is that you will come back to this activity to add to/further develop your answers so do not feel like you have to use all the space when filling in your answers now. Expect to work back and forth through the handout(s) as your ideas develop. Skip questions when you are stuck. You can staple more pages to this if you need more space to work. You will build on/modify your answer as you go. Please do not erase. If you no longer think something is true, just put a line through it. This will help you track your thinking.

**Activity**

1. Write your observations of ball B.
2. Release ball B from a height of 20cm (so the base of the ball is 20cm off the table) and record you observations of what happened once you released the ball.
3. Watch the [video of a bouncy ball bouncing in slow motion](https://www.youtube.com/watch?v=3jI57WMOzbU).

**What you think happened?** (Again, you will build on this/modify your answer as you go. Please do not erase. If you no longer think something is true, just put a line through it.

1. Why did the ball start?
2. Why did the ball stop?
3. Why did the ball keep going?

**Trying to understand what happened**

1. Systems Thinking
   1. List the parts of the system.
   2. How do the parts interact?
   3. What are the energies involved?
   4. What happens to the energy?
   5. Model what you think happened?
   6. What is the boundary to your system?
2. Asking Questions:

What questions do you have? Good questions develop into hypotheses. Don’t just ask, Why did…?”, go further and think about what might be happening. Good questions include things like, “Does \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ happen because…” and, “If I changed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, would \_\_\_\_\_\_\_\_\_\_\_\_\_\_ happen?”