

Name of Student Teacher: ANNE CRISLER		CT: Robin Paul 5 <sup>nd</sup> Grade Blossomwood	
Subject: <b>SCIENCE UNIT</b>		Date: Monday, October 31, 2011	
Lesson Plan Title: <b>The Ball Drop Experiment: Potential versus Kinetic Energy</b> <b>Chapter 14 TE &amp; SE pages 448-453</b>			
<b>ALCoS Standards:</b> 5 <sup>th</sup> Grade Science 4.) Describe forms of energy, including chemical, heat, light, and mechanical. • Identifying types of potential and kinetic energy			
<b>Specific Objectives:</b> The Students CAN <ul style="list-style-type: none"><li>• Define and distinguish potential and kinetic energy.</li><li>• Explain relationship between potential and kinetic energy.</li><li>• Hypothesize possible results of experiment.</li><li>• Conduct experiment according to class rules and lesson objectives by following instructions and BEEing respectful, responsible, and resourceful.</li><li>• Work cooperatively with peers.</li><li>• Collect, record, and calculate data.</li><li>• Analyze data and graph results.</li><li>• Evaluate accuracy of alternative hypotheses based upon results.</li><li>• Consider, debate, and answer critical thinking questions that extend results.</li></ul>		<b>Required Materials:</b> <ul style="list-style-type: none"><li>• Student science notebooks</li><li>• Daily content notes to be distributed &amp; inserted into notebooks; teacher version of notes for ELMO, highlighters.</li><li>• Internet access, laptop, ActiveBoard, Elmo.</li><li>• For experiment: 2x4 that is 64 inches tall. Pre-measured and marked every inch on the 2 in. side. On 4 in. side draw lines at 21 inches from the bottom, 42 inches from the bottom, and 64 inches from the bottom (or very top).</li><li>• Small ball that bounces well. A Sky Ball works well.</li><li>• Date sheets and critical thinking fill-in-the-blank questions.</li><li>• Graphs and optional colored pencils.</li></ul>	
<b>Engagement:</b> How does a rollercoaster work?			
<b>Step-by-Step Procedures:</b> <ul style="list-style-type: none"><li>• Engage students in class discussion on Engagement question. Formatively assess what they already know about potential and kinetic energy.</li><li>• Inform them that they will be doing a computerized rollercoaster simulation exercise Wednesday in computer lab. I will discuss this more with them on Tuesday.</li><li>• Ask more open-ended and scaffolded questions from Friday’s lesson as a review.</li><li>• Reward with tickets as appropriate.</li><li>• Distribute notes on Kinetic v. Potential Energy and display teacher version on ELMO</li><li>• Have a student distribute highlighters.</li><li>• Go over notes through a combination of direct instruction, pair/shares, class discussion, individual response with wait time, etc.</li><li>• Reward with tickets as appropriate.</li><li>• Distribute Ball Drop Data Sheets.</li><li>• Display 2x4 and ball, explain procedure and purpose. Demonstrate a sample trial.</li><li>• Ask students to propose several hypotheses about possible results. If alternative ones are suggested, have class vote on best alternative. Ask WHY students are suggesting or voting for a particular hypothesis.</li><li>• Go outside and have students take turns in each trial with who drops the ball and who evaluates the ball’s bounce height.</li><li>• Walk about and monitor students to make sure all are working well together and staying on task. Do not intervene unless necessary.</li></ul>			

- See if everyone is getting accurate and consistent results and recording data properly on data sheets.
- When all trials are complete, return to room and have students calculate averages of three trials. If necessary, model on board how to find an average.
- Distribute graphs and instruct students to graph data based on calculated averages.
- What do these results reveal about potential and kinetic energy?
- How do these results compare to the hypothesis/hypotheses discussed prior to the experiment?
- Can you find evidence for your responses in the class notes or textbook?
- Begin class discussion on critical thinking questions listed on data sheet.
- Reward with tickets as appropriate.

**Plan for Independent Practice:**

Allow students to work with each other during experiment but independently from the teacher as much as possible.

**Homework:**

Workbook page 140 (due Thursday)

Bring in a notecard with name and number. Write on card a description of a sound using an onomatopoeia.

**Closure:** Show two-minute video on how a rollercoaster works. We will discuss this more tomorrow.

<http://videos.howstuffworks.com/howstuffworks/4661-how-roller-coasters-work-video.htm>

**Assessment Based on Objectives:**

- Monitor how students answer questions verbally, thumbs up, pair/share, etc.
- Monitor types of questions students ask.
- Performance on handouts, homework, and worksheets.
- Check information students record in their science journals.

**Adaptations/Accommodations:**

- Use physical proximity to check progress.
- Use visuals whenever possible.
- Work one-on-one with students who need extra assistance or partner with a helping student.

**Extensions:** None for this lesson

**Notes/Reflections:**