

ACTIVITY 2



Materials:

- ▲ 30 cm cardboard ramp (from Activity 1)
- ▲ Meter stick(measuring tape)
- ▲ What is a Hypothesis handout
- ▲ Kinetic Energy and Potential Energy handout
- ▲ Variable handout and IV/C/DV Chart Student Processing Out form
- ▲ Table

Procedure: Hypothesis

Open the lesson with a discussion about hypotheses. Possible conversation starters could be:

- ▲ “Who knows what a hypothesis is?”
- ▲ “What is a hypothesis?”
- ▲ “Who uses or makes hypotheses?”
- ▲ “How do you make a hypothesis?”



Distribute the student handout “What is a Hypothesis?”. As a class, read through the information, answering any questions students may have about the content.

Spend time carefully reading the two hypothesis examples. What words are common to both examples? Is there a pattern each hypothesis follows?

Students should learn that a hypothesis is not an “educated guess”. A hypothesis is developed from careful observation. Often a hypothesis is formed in response to guiding questions related to observations: “why did that happen?” or “how did that happen?” The hypothesis itself is not a question. When learning how to write a hypothesis, using an “if/then” format can be helpful. It is important to note that “if/then” formats are not used by practicing scientists, but most scientists starting learning how to write hypotheses using “if/then” format – just like your students!

Stress to the students that a hypothesis is a testable statement. To help students become familiar with the concept that a hypothesis must be testable, they will work in pairs to design an experiment that will test one of the hypothesis examples. Allow time for students to collaborate and share their answers with the class. **Alternative:** Divide the class into small groups and assign groups an example.

GRANNY ON THE RAMP



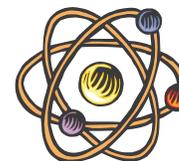
Activity 2

GRANNY ON THE RAMP



Procedure: Kinetic Energy and Potential Energy

Next, distribute the student handout “Understanding Kinetic Energy and Potential Energy”. As a class, read through the information, answering any student questions.



At the bottom of the handout, students will identify the pictures as either samples of kinetic energy or potential energy. This can be done individually, in small groups, or as a class.

Procedure: Variables

Finally, pass out the student handout “Independent and Dependent Variables” and the “IV/C/DV” handout. As a class, read through the information about independent and dependent variables. Answer any questions the students may have about independent variables, dependent variables, and controls.

An IV/C/DV chart is a tool to help identify the Independent Variable (IV), Controls (C), and Dependent Variable (DV). To use the chart, students will use the same hypotheses examples from the hypothesis handout.

An IV/C/DV chart will help organize variables and assist with hypothesis writing and experiment design. There can only be one independent variable and one dependent variable when using the chart. All other variables will be considered controls. There can be many controls. To change an experiment or hypothesis, switch out one of the controls for the independent or dependent variables.

Working in small groups, the students will complete an IV/C/DV chart for each example. Students are to **circle** the independent variable in the hypothesis. They are then to write the independent variable under the IV section of the chart. Next, they are to put a **box** around the dependent variable. Then they are to write the dependent variable under the DV section of the chart. Finally, they are to take all other variables in the hypothesis (and other variables that are not included in the hypothesis) and list these under the C section of the chart.

Processing Out:

Distribute the Processing Out handout. Students are to run another trial using “Granny”, the “wheelchair”, and the “ramp”. They will record the same information as from Activity 1. However, this time, they will answer different questions about the experiment.

After all students have completed Activity 2, the second trial, and have completed their processing out sheet, answer any questions the students have about writing a hypothesis, identifying types of variables, and kinetic energy and potential energy.