

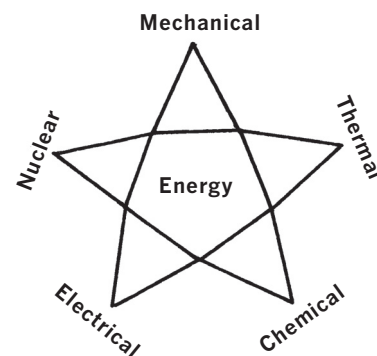
Energy Centers

Energy Center 1: Research Center

Materials: Internet access and research materials about energy (books, magazines, newspapers); Star Organizers; Resources Organizers; writing paper

Activities:

- Define the following terms, and use a Star Organizer to record facts about them: *mechanical energy*, *thermal energy*, *chemical energy*, *electrical energy*, and *nuclear energy*. Write the topic *Energy* in the center of the star organizer, and write facts about each of the five forms of energy in the five points of the star. Use a Resources Organizer to keep track of the resources used.
- List the five forms of energy down the left side of a sheet of paper. As you read through newspapers and magazines articles, place a tally mark in the appropriate row every time a particular form of energy is mentioned. Make a bar graph of your results, drawing a bar for each form of energy. Summarize your bar graph.
- Find out how kinetic energy, potential energy, and gravitational potential energy are related to mechanical energy. Then write a fictional story about their relationship.



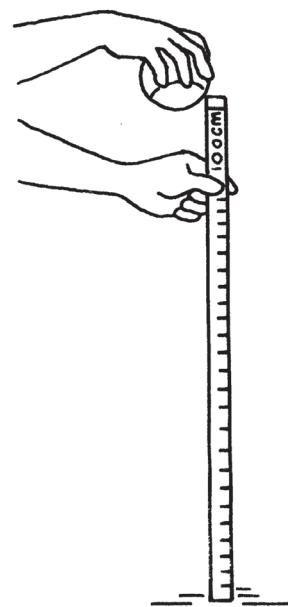
Energy Center 2: Gravitational Potential Energy

Materials: meter sticks, large and small balls, calculators

Activity:

1. Hold a meter stick vertically with one end on the ground.
2. Predict how high the larger ball will bounce when dropped from 50 cm. Then drop the ball from the 50-cm mark, and record the height of the first bounce. Repeat two more times. Find the average height of your results ($\text{average} = \text{sum}/3$).
3. Repeat Step 2 from the 100-cm mark. Record your results.
4. Now use the smaller ball and repeat Steps 1–3. Record your results.
5. Summarize your results. What can you conclude about gravitational potential energy and height?

Optional Challenge: Research what Sir Isaac Newton discovered about gravity. How are your results similar? How are they different?

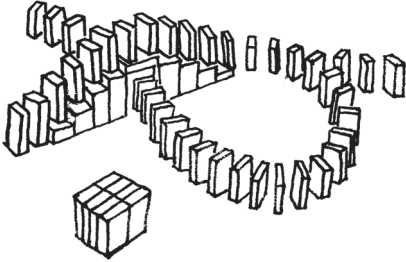


Energy Center 3: Domino Effect

Materials: several boxes of dominoes, items for building a domino obstacle course, drawing paper, pencils, stopwatch

Activity:

1. Construct a domino obstacle course that can be knocked down from start to finish with a single push. Use at least 50 dominoes, and include at least one ramp and two turns in the design. You may also include other items in your obstacle course.
2. Draw a picture of your obstacle course before you test it. Below your picture, write about how you built your obstacle course, including how many dominoes you used, and explain how potential and kinetic energy will be used to knock them all down.
3. Time how long it takes for all your dominoes to fall down. You may only push the first domino in the design. If the dominoes stop falling before the end of the obstacle course, fix the problem, set up the dominoes, and start again.

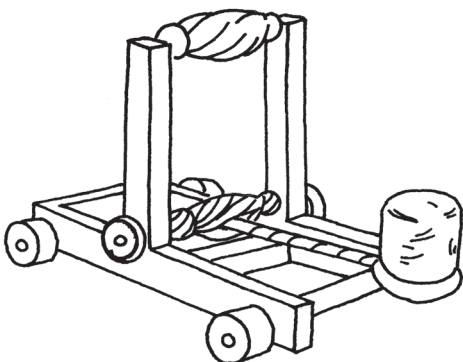


Energy Center 4: Build a Catapult

Materials: Resources Organizers, references about how to build a catapult, shoe boxes, craft sticks, rubber bands, plastic spoons, marshmallows, other materials for building a catapult

Activities:

- Research and summarize how catapults are built. Use a Resources Organizer to help you keep track of your references.
- Design a catapult. Draw a picture of your catapult, indicating where it has the greatest potential energy. Then explain how that potential energy is transferred to kinetic energy.
- Use craft items to build a catapult that can propel a marshmallow. Have a catapult contest with classmates to see whose catapult works the best. After the contest, summarize your results, including the following information:



How did you build your catapult?

How did your catapult set the marshmallow in motion?

Whose catapult worked the best? How do you know?

What could you have done to make your catapult better?

What helped your catapult work as well as it did?

What did this activity teach you about motion and forces?

Name _____ Date _____

Project Review

Name of project: _____

Completed by: _____

Name of reviewer (your name): _____

Directions: Evaluate the project. Circle a score for each category.

Use of information	1	2	3	4	5
Accuracy of information	1	2	3	4	5
Visual appeal	1	2	3	4	5
Overall presentation	1	2	3	4	5

What did you like best about this project?

What did you like the least?

How would you improve the project?

Other comments or questions:
