

Mechanical Energy – A Moving Experience

You need energy to do the things you do every day. When you eat food, your body can use the chemical energy in the food to make your muscles move so you can breathe, walk, run, jump, lift things, and do all the other things you need to do to live. The chemical energy in the food gets changed into the mechanical energy of moving muscles.

Materials:

- Yourself

Procedures:

1. If you are sitting, stand up. Do you think standing up took a little energy? Try jumping up and down 5 times.
2. In order to stand up or jump, your body changes the chemical energy stored in food you have eaten into the mechanical energy of moving muscles.
3. If you jump up and down a lot (maybe 50-100 times) you might feel a little warm or even hot. Try it if you want. Where do you think that heat comes from?
4. When your body changes chemical energy into mechanical energy of moving muscles, it doesn't do it perfectly. Some of the energy from the food gets changed into heat energy.
5. Here's one that's a little different: What if your body changed the chemical energy in your food into the mechanical energy of rubbing your hands together? When you do this, what type of energy does the mechanical energy from your moving hands get changed into?
6. Some of the mechanical energy from your moving hands gets changed into heat energy and some even into sound energy. You could change mechanical energy into sound energy better by clapping your hands together.
7. How about if you had a bicycle that was hooked up to an electrical generator? Wow! Think of all the different energy changes going on in this one!

- Light energy to chemical energy
- Chemical energy to mechanical energy
- Mechanical energy to electrical energy
- Electrical energy to heat energy
- Heat energy to sound energy

Think about this ...

In different parts of the country, windmills are used to make electrical energy. The mechanical energy of moving air causes the windmill blades to turn. The spinning blades turn a coil of wire inside a generator that is directly behind the blades. The generator changes the mechanical energy of the moving blades into electrical energy. How do you think moving water could also be used to generate electricity?

Where's the Chemistry?

The energy in any food that we eat really came from the sun. Food is like fuel for living things. In fact, the energy in fuels like gasoline or oil also comes from the sun. The energy in sunlight is used by plants to make chemicals. These chemicals have some of this energy stored in them as chemical energy. When we or other animals eat the food, we change the chemical energy into mechanical energy of a living, growing, and moving body.

There are lots of plants that living things do not eat. These plants die and over a very long time become coal or oil. But the chemical energy is still in them. When we burn them, the energy is changed from chemical energy into heat and light.



The American Chemical Society develops materials for elementary school age children to spark their interest in science and teach developmentally appropriate chemistry concepts. The *Activities for Children* collection includes hands-on activities, articles, puzzles, and games on topics related to children's everyday experiences.

The collection can be used to supplement the science curriculum, celebrate National Chemistry Week, develop Chemists Celebrate Earth Day events, invite children to give science a try at a large event, or to explore just for fun at home.

Find more activities, articles, puzzles and games at www.acs.org/kids.

Safety Tips

This activity is intended for elementary school children under the direct supervision of an adult. The American Chemical Society cannot be responsible for any accidents or injuries that may result from conducting the activities without proper supervision, from not specifically following directions, or from ignoring the cautions contained in the text.

Always:

- Work with an adult.
- Read and follow all directions for the activity.
- Read all warning labels on all materials being used.
- Wear eye protection.
- Follow safety warnings or precautions, such as wearing gloves or tying back long hair.
- Use all materials carefully, following the directions given.
- Be sure to clean up and dispose of materials properly when you are finished with an activity.
- Wash your hands well after every activity.

Never eat or drink while conducting an experiment, and be careful to keep all of the materials used away from your mouth, nose, and eyes!

Never experiment on your own!

For more detailed information on safety go to www.acs.org/education and click on "Safety Guidelines".

