

How Force and Energy Work Together

READ ALOUD PASSAGE

A force and a moving object are closely connected. Think about hitting a ball with a bat. The bat has kinetic energy because it is moving, and when it strikes the ball, it pushes on the ball with a force. That force is what passes the energy from the bat over to the ball, sending it flying.

In a wound-up toy, the spring stores potential energy. When the spring unwinds, it pushes on the gears inside with a force, and that force is what turns the stored energy into the toy's movement. A balloon works the same way. Air pressure inside the balloon pushes outward with a force, and that force turns the balloon's stored energy into its jetting, zooming motion once you let it go.

Gravity is a force too, and people have found ways to put it to work. Water flowing downhill, pulled by gravity, can turn a waterwheel or spin the generators inside a hydroelectric dam. But gravity cannot make energy out of nothing. Whatever comes down has to be lifted back up somehow, and lifting it takes just as much energy as was gained by letting it fall.

The water that turns a dam's generators gets lifted back into the sky again by heat from the sun, which evaporates it, and by wind, which carries it along until it falls again as rain. Wind blows mostly because sunlight heats the air unevenly across the Earth. Even magnets cannot create energy from nothing, since pulling something away from a magnet takes just as much energy as the magnet used to pull it in.

Activity 1: Word Builder

Answer each question with your own words.

1. List four nouns that have kinetic energy when they move.

1. _____

2. _____

3. _____

4. _____

2. List three better verbs for move that tell how a balloon goes when you let it go.

1. _____

2. _____

3. _____

4. _____

Activity 2: Sentence Scramble

These words are mixed up. Put them in order to make a sentence. Start with a capital letter and end with a period.

1. connected / moving / closely / a / object / a / force / are / and

Activity 3: Sentence Scramble

These words are mixed up. Put them in order to make a sentence. Start with a capital letter and end with a period.

1. ball / the / on / bat / the / pushes

2. pulls / gravity / water / downhill

3. wind / water / carries / the / vapor

Activity 4: Because, But, So

Finish the sentence three ways. After because, tell why. After but, tell something different or surprising. After so, tell what happened next.

The spring unwound **because**

The spring unwound, **but**

The spring unwound, **so**
