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**Dropping the Ball Homework**

**What is Energy?**

Scientists define energy as the ability to do work. Energy makes change possible. We use it to do things for us. We have learned how to transfer energy from one form to another and use it to do work for us and live more comfortably.

**Forms of Energy**

Energy is found in different forms including light, heat, chemical, and motion. They can all be put into two categories: potential and kinetic.

Potential energy is energy that is stored, or not in motion.

Kinetic is energy of motion, in action — for instance, that’s the case with electricity, heat, light, motion, and sound.

**Collisions:**

What happens to energy when objects collide, for instance if you drop a ball? Energy cannot be created or destroyed, but can be transformed**.** If a ball drops, energy is transferred and transformed. For example the energy can be turned into sound, but the total amount of energy remains the same.

**Dropping the Ball:**

Before dropping a ball, you must lift it up from its resting surface. When you do this, you are transferring energy from your muscles to the ball and giving the ball gravitational potential energy: the higher you lift it, the more potential energy it has**.**

As the ball falls towards the ground, its potential energy is transformed into kinetic energy, which will continue increasing as it gains momentum, until it finally collides with a surface.

**Bouncing Back:**

Elastic potential energy is what causes a ball to bounce, or rebound, because it is transformed into kinetic energy, which is then used to bring the ball back up. However, the ball won’t get as high as where it started from, because some of its energy has been transferred to the floor or transformed into sound (in the noise it makes upon impact) and thermal (heat) energy.

Furthermore, even though we can’t see it, as the ball hits the ground, or a table, it changes shape for a split second, which requires energy.

This is why the height of each bounce is a little less than the height of the previous one. Some of the kinetic energy the ball has when it strikes the floor is retained, but other is transformed, so each time the ball bounces it loses a bit of its kinetic energy, and after several bounces it has so little of it left that it ceases to bounce.

1. What is energy?

**A** change in motion

**B** light and heat that an object stores

**C** any work that an object does in motion

**D** the ability to do work

1. Why does the author describe what happens when a ball is dropped?

**A** to explain how energy is transformed

**B** to explain how energy is created and destroyed

**C** to explain that dropping a ball is not a real form of work

**D** to explain that the amount of energy in an object remains constant

1. The ball has less energy after it bounces than it does as it is falling to the ground. Which evidence from the text supports this statement?

**A** Elastic potential energy is what causes a ball to bounce, or rebound.

**B** Each time the ball bounces on the ground, it loses a bit of its kinetic energy.

**C** The higher the ball is lifted, the more potential energy it has.

**D** As the ball falls towards the ground, its potential energy is transformed to kinetic energy.

1. During the process of dropping a ball, when does the ball have the least amount of energy?

**A** as it is falling to the ground

**B** after the first bounce

**C** as it is being lifted in the air

**D** after the last bounce

1. What is “Dropping the Ball” mostly about?

**A** how energy is transferred when a ball is dropped

**B** how to drop a ball

**C** how potential energy is converted to kinetic energy

**D** why a ball changes shape for a split second after it hits the ground

1. Read the following sentence: “As the ball falls towards the ground, its potential energy is transformed into kinetic energy, which will continue increasing as it gains momentum, until it finally collides with a surface.” What does the word “momentum” mean?

**A** the ability of an object to stay in one place

**B** the ability of an object to change direction

**C** the ability of an object to change mass

**D** the ability of an object to go faster

1. After the ball hits the ground, why doesn’t the ball rise to the height where it started?

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1. Explain how energy is transformed when a ball is dropped. Be sure to explain what happens when the ball is lifted, when a person lets go of the ball, when the ball collides with the ground, and bounces back up.

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1. How can you give an object more potential energy?

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1. How can you give an object more kinetic energy?

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