Work Concept Builder

Activity 1: Positive, Negative, or Zero Work Question Group 1 Question 1: Consider this situation:

A car skids to a stop along a level highway.

Is this an example of positive, negative, or zero work being done on the car?

Question 2: Consider this situation:

A moving book slows to a stop as it slides across the classroom floor.

Is this an example of positive, negative, or zero work being done on the book?

Question 3: Consider this situation:

A softball player slows to a stop while diving into third base.

Is this an example of positive, negative, or zero work being done on the player?

Question Group 2 Question 4: Consider this situation:

A child slows to a stop while sliding along a lengthy Slip-and-Slide mat.

Is this an example of positive, negative, or zero work being done on the child?

Question 5: Consider this situation: A baseball is brought to a stop upon hitting the catcher's mitt.

Is this an example of positive, negative, or zero work being done on the AAA?

Question 6:

Consider this situation:

The downward moving hammer strikes the nail and slows down.

Is this an example of positive, negative, or zero work being done on the hammer?

Question Group 3 Question 7: Consider this situation:

The lineman push on the weighted sled to accelerate it across the football field.

Is this an example of positive, negative, or zero work being done on the sled?

Question 8:

Consider this situation:

Dad gives the child in the swing a forward push in order to set her into motion.

Is this an example of positive, negative, or zero work being done on the child?

Question 9:

Consider this situation:

The horses pull on the carriage in order to get it started in motion.

Is this an example of positive, negative, or zero work being done on the carriage?

Question Group 4 Question 10: Consider this situation:

The weightlifter lifts the barbell above her head.

Is this an example of positive, negative, or zero work being done on the barbell?

Question 11:

Consider this situation:

The student lifts the book from the floor to the top shelf of the locker.

Is this an example of positive, negative, or zero work being done on the book?

Question 12:

Consider this situation:

In the Autos lab, Suzie uses a hydraulic jack to lift a car off the ground.

Is this an example of positive, negative, or zero work being done on the car?

Question Group 5 Question 13: Consider this situation:

Aaron pulls on the handle of the locked classroom door but fails to open it.

Is this an example of positive, negative, or zero work being done on the door?

Question 14:

Consider this situation:

Jonah holds the dog tightly by its leash to prevent it from moving.

Is this an example of positive, negative, or zero work being done on the dog?

Question 15:

Consider this situation:

While doing her stretches, Abigail pushes on a stationary wall.

Is this an example of positive, negative, or zero work being done on the wall?

Activity 2: What Does Work Do? Question Group 6 Question 16: Consider this situation:

A car with locked wheels skids to a stop while moving along a level highway.

In this situation, work is done on the car by _____. The car's spinning axles The friction between tires and road The road pushing upward on the car The force of gravity acting upon the car

As the result of this work, the car _____ mechanical energy. Gains Loses Does not change its

Question 17: Consider this situation:

A moving book slows to a stop as it slides across the classroom floor.

In this situation, work is done on the book by _____. The floor pushing upward on the book The friction between the book and floor The person who originally pushed the book The force of gravity pulling downward on the book

As the result of this work, the book _____ mechanical energy. Gains Loses Does not change its

Question 18:

Consider this situation:

A softball player slows to a stop while sliding across the infield direct towards third base.

In this situation, work is done on the player by _____. The infield dirt pushing up on the player The player's legs while she was running The earth's gravity pulling down on the player The friction between the player and the infield dirt

As the result of this work, the player _____ mechanical energy. Gains Loses Does not change its

Question Group 7 Question 19: Consider this situation:

A baseball is brought to a stop upon hitting the catcher's mitt.

In this situation, work is done on the baseball by _____. The force of gravity on the baseball The force of the pitcher who threw the baseball The force of the baseball pushing the mitt forward The force of the catcher's mitt pusing against the baseball

As the result of this work, the baseball _____ mechanical energy. Gains Loses Does not change its Question 20:

Consider this situation:

The downward moving hammer strikes the nail and slows down.

In this situation, work is done on the hammer by _____. The nail pushing upward on the hammer The hammer pushing downward on the nail The hand pushing downward on the hammer The wood board pushing upward on the nail

As the result of this work, the hammer _____ mechanical energy. Gains Loses Does not change its

Question Group 8 Question 21: Consider this situation:

The students push on the stationary box to accelerate it across the gym floor.

In this situation, work is done on the box by _____. The floor pushing upward on the box The box pushing backward on the floor The students applying force to the box The Earth's gravity pulling downward on the box

As the result of this work, the box _____ mechanical energy. Gains Loses Does not change its

Question 22: Consider this situation: Dad gives the child in the swing a forward push in order to set her into motion.

In this situation, work is done on the child by _____. The force applied by Dad on the child The seat of the swing holding the child up The Earth's gravity pulling down on the child The frame of the swing holding the swing in place

As the result of this work, the child _____ mechanical energy. Gains Loses Does not change its

Question Group 9 Question 23: Consider this situation:

The weightlifter lifts the barbell above her head.

In this situation, work is done on the barbell by _____. The force of gravity pushing up on the barbell The force of the floor pushing up on the weightlifter The force of the barbell pushing down on the weightlifter The upward force applied by the weightlifter to the barbell

As the result of this work, the barbell _____ mechanical energy. Gains Loses Does not change its

Question 24: Consider this situation:

The student lifts the book from the floor to the top shelf of the locker.

In this situation, work is done on the book by _____. The downward force of the book on the student The upward force of Earth's gravity on the book The force of the floor pushing up on the student The upward force applied by the student to the book As the result of this work, the book _____ mechanical energy. Gains Loses Does not change its

Question 25:

Consider this situation:

A rope is used to pull a bucket of water out of a deep well.

In this situation, work is done on the bucket by _____. The force of the bucket pulling upward on itself The force of well pushing upward on the bucket The force of the rope pulling upward on the bucket The force of the motor pulling upward on the rope

As the result of this work, the bucket _____ mechanical energy. Gains Loses Does not change its

Activity 3: Energy Transformations

Question Group 10 Question 26:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

A car with locked wheels skids to a stop while moving along a level highway.

This situation can best be described as a transformation of _____. Kinetic energy into Potential Energy Chemical energy into Kinetic energy Potential energy into Chemical energy Kinetic energy into Dissipated energy (e.g., heat and sound) Chemical energy into Dissipated energy (e.g., heat and sound)

Question 27:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

Along the horizontal section at the bottom of a tall slide, a child slows to a stop.

This situation can best be described as a transformation of _____. Potential energy into Kinetic energy Potential energy into Chemical energy Kinetic energy into Chemical energy Kinetic energy into Dissipated energy (e.g., heat) Chemical energy into Dissipated energy (e.g., heat)

Question Group 11 Question 28:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

A softball player slows to a stop while sliding across the infield dirt into third base.

This situation can best be described as a transformation of _____. Kinetic energy into Chemical Energy Chemical energy into Kinetic energy Potential energy into Chemical energy Kinetic energy into Dissipated energy (e.g., heat and sound) Chemical energy into Dissipated energy (e.g., heat and sound)

Question 29:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

A baseball is brought to a stop upon hitting the catcher's mitt.

This situation can best be described as a transformation of _____. Kinetic energy into Potential energy Kinetic energy into Chemical energy Chemical energy into Kinetic energy Kinetic energy into Dissipated energy (e.g., heat and sound) Potential energy into Dissipated energy (e.g., heat and sound)

Question Group 12 Question 30:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

The lineman push on the weighted sled to accelerate it across the football field.

This situation can best be described as a transformation of _____. Kinetic energy into Potential energy Chemical energy into Kinetic energy Chemical energy into Potential energy Potential energy into Chemical energy Potential energy into Dissipated energy (e.g., heat)

Question 31:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

Dad gives the child on the sled a long push to set him in motion along the level surface.

This situation can best be described as a transformation of _____. Potential energy into Kinetic energy Kinetic energy into Chemical energy Chemical energy into Kinetic energy Chemical energy into Potential energy Dissipated energy (e.g., heat) into Kinetic energy

Question 32:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

The light turns green, the driver steps on the gas, and the car accelerates from rest.

This situation can best be described as a transformation of _____. Chemical energy into Kinetic energy Kinetic energy into Chemical energy Potential energy into Kinetic energy Chemical energy into Dissipated energy (e.g., heat) Dissipated energy (e.g., heat) into Kinetic energy

Question Group 13 Question 33:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

The weightlifter lifts the barbell above her head.

This situation can best be described as a transformation of _____. Potential energy into Kinetic energy Chemical energy into Potential energy Kinetic energy into Dissipated energy (e.g. heat) Dissipated energy (e.g., heat) into Potential energy Chemical energy into Dissipated energy (e.g. heat)

Question 34:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

The student lifts the book from the floor and places it on the top shelf of the locker.

This situation can best be described as a transformation of _____. Potential energy into Kinetic energy Kinetic energy into Potential energy Chemical energy into Kinetic energy Chemical energy into Potential energy Chemical energy into Dissipated energy (e.g., heat and sound)

Question Group 14 Question 35:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

Under the influence of gravity, the ball falls from the second story window to the ground.

This situation can best be described as a transformation of _____.

Options: Chemical energy into Kinetic energy Kinetic energy into Chemical energy Potential energy into Kinetic energy Potential energy into Chemical energy Dissipated energy (e.g., heat) into Kinetic energy

Question 36:

Work done on an object or system of objects causes a transformation of energy. Consider the following situation:

Starting from rest at the top of the friction-free slide, the child slides to the bottom.

This situation can best be described as a transformation of _____.

Options: Kinetic energy into Chemical energy Chemical energy into Kinetic energy Potential energy into Kinetic energy Potential energy into Chemical energy Dissipated energy (e.g., heat) into Kinetic energy