

## Quiz 18 – Energy

Name: \_\_\_\_\_ Group: \_\_\_\_\_

1. Circle the items below that are forms of energy and put x's through the items that are not forms of energy.

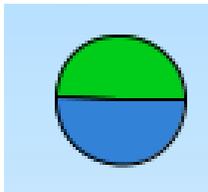
Chemical	<del>Air</del>	Sound	Electrical
Power	<del>Banana</del>	Gasoline	Nuclear
Thermal	<del>Water</del>	Light	<del>Wood</del>

2. Does energy have mass? Please provide examples.

No, Energy does not have Mass. Consider a bowling ball sitting at rest on a floor compared to rolling across the floor after you push it. While at rest it has the same mass as it does while rolling. However it clearly has more energy while rolling than it did while at rest. Adding energy did not add mass.

Another example would be having a person stand at the top of a flight of stairs. They weigh the same and they have the same mass as they do when they stand at the bottom of the stairs. But they have more potential energy when standing at the top. That energy does not have mass.

3. Draw a pie chart that matches this bar graph shown.

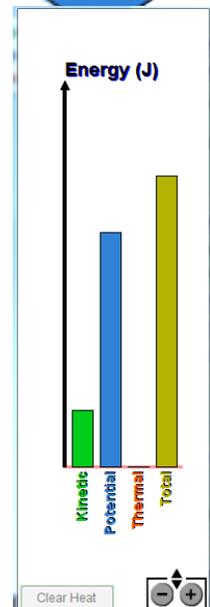
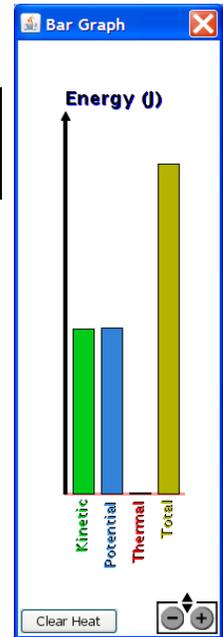


4. Draw the bar graph that matches the pie chart shown.

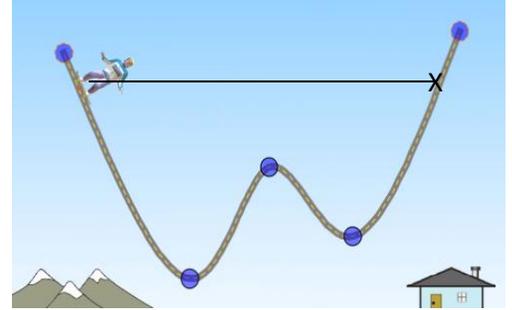
The bar graph is shown to the lower right.

5. How does a giant windmill harvest wind energy and convert it into electrical energy?

Wind blows into the blades and causes them to turn. This is kinetic energy of air movement turned into kinetic energy of the blades moving. The turning blades turn a shaft inside the windmill. Through some gears the big shaft turning causes a smaller shaft to turn faster. Kinetic energy of the large shaft is transformed into kinetic energy of a smaller shaft. The small shaft turns magnets causing a changing magnetic field. A changing magnetic field (moving magnets) causes electrons to move. Moving electrons are electricity. So the kinetic energy of the small shaft goes into kinetic energy of magnets moving, which turns into the motion of electrons which by definition is electrical energy.



6. If there is no friction on the track, how high does the skater get on the right side if he starts from rest at the spot shown? Mark the exact spot with an X.



### Multiple Choice Section

Please put your answers for the following items on your scantron answer sheet.

1. Sally says “kinetic energy can turn into thermal energy.” Jean says, “No, you are wrong. Energy cannot be created nor destroyed which must mean that you cannot create thermal from nothing and you can’t destroy the kinetic.”

Who’s correct?

**A. Sally** When Jean says, “energy cannot be created nor destroyed” it is true; but, the rest does not fit what Sally is talking about. Jean says, “you cannot create thermal from nothing.”; but, Sally is saying you turn kinetic into thermal. She did not suggest that the thermal is created from nothing, it just changed form.

B. Jean

C. Both Sally and Jean

D. Both are incorrect.

2. A battery contains which type of energy?

A. Thermal

B. Electrical

C. Nuclear

**D. Chemical**

E. Mechanical

3. A running buffalo contains which of the following types of energy?

A. Thermal

B. Mechanical

C. Chemical

**D. All of the above**

E. None of the above

4. A car stopped at a red light on the top of a hill has which of the following types of energy?

A. Kinetic

**B. Potential**

C. Nuclear

D. Light

5. When a car begins from rest and speeds up to 50 mi/hr, energy begins as \_\_\_\_\_ and ends up as \_\_\_\_\_.

A. Chemical, Thermal

**B. Chemical, Kinetic**

C. Kinetic, Thermal

D. Kinetic to Potential

E. Potential, Kinetic

6. When a rock drops from a tall building, energy begins as \_\_\_\_\_ and ends up as \_\_\_\_\_ before it hits the ground.

A. Chemical, Thermal

B. Chemical, Kinetic

C. Kinetic, Thermal

D. Kinetic to Potential

**E. Potential, Kinetic**

7. When a car is parked on a hill and its brakes fail, it begins rolling towards the bottom picking up speed, energy begins as \_\_\_\_\_ and ends up as \_\_\_\_\_.

A. Chemical, Thermal

B. Chemical, Kinetic

C. Kinetic, Thermal

D. Kinetic, Potential

**E. Potential, Kinetic**

8. When a person tosses a baseball straight up into the air, after leaving the person's hand the ball goes up and stops before falling back to the ground. Energy begins as \_\_\_\_\_ and ends up as \_\_\_\_\_ at the top of the flight.

A. Chemical, Thermal

B. Chemical, Kinetic

C. Kinetic, Thermal

**D. Kinetic, Potential**

E. Potential, Kinetic

9. When Nicole runs a marathon from the start of the race to the end when she's hugging her opponent, energy begins as \_\_\_\_\_ and ends up as \_\_\_\_\_.

**A. Chemical, Thermal**

B. Chemical, Kinetic

C. Kinetic, Thermal

D. Kinetic to Potential

E. Potential, Kinetic

10. When the burner on a stove top turns red hot, energy begins as \_\_\_\_\_ and ends up as \_\_\_\_\_.

- A. chemical, thermal
- B. Electrical, thermal and light**
- C. Electrical, thermal only
- D. Thermal, light
- E. Kinetic, Thermal

11. Power is

- A. energy output per unit time**
- B. a form of Energy
- C. a force
- D. All of the above
- E. None of the above