Name:_____

Energy Transformations – Version A

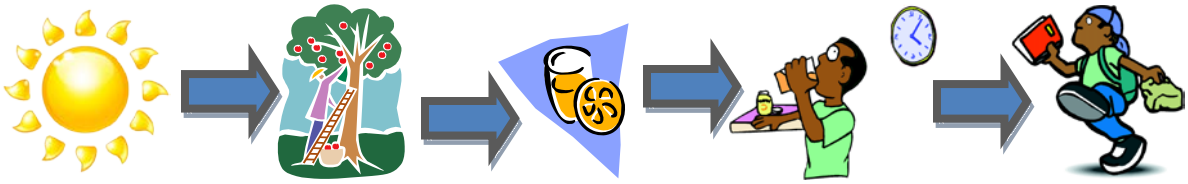
Please identify the energy conversions in the following examples:

1. Plants convert_____energy to _____energy.
2. When a match is lit, _____energy converts to _____and _____energy.
3. In the sun, _____energy is converted to _____ and _____energy.
4. A windmill converts _____energy to _____energy.
5. A flashlight converts_____energy to _____energy.
6. A microwave converts _____energy to _____energy.
7. When you pedal a bicycle, you convert _____energy to _____energy.

Please give an example of the following energy conversions:

8. Chemical to heat_____
9. Chemical to mechanical_____
10. Chemical to light_____
11. Mechanical to heat_____
12. Mechanical to light_____
13. Mechanical to electromagnetic_____
14. Nuclear to heat_____
15. Nuclear to electromagnetic_____
16. Electromagnetic to heat_____
17. Electromagnetic to mechanical_____
18. Heat energy to mechanical energy_____

Please identify the energy transformations in the following energy chain:



_____energy from the sun is converted into _____energy by the _____ of an orange tree. This form of energy is used by the orange tree to grow oranges which also store _____energy. Someone picks the oranges and makes orange juice with them. The orange juice contains all of the _____energy of the orange. You drink the orange juice. The _____ energy from the orange juice becomes _____energy in your body. (Which are both _____ energy) You realize that because you took the time to drink the orange juice you are late for school. You use the energy from the orange juice as _____ energy as you run to get to class. Some of the energy is also transformed into _____energy, because you sweat as you run to school.

Think about what chain of steps it requires to get a car to move beginning with turning the key. For each step, identify what energy conversion is happening.

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Kinetic and Potential energy practice problems

1. If we know the total energy in a system is 30 J, and we know the PE is 20 J. What is the KE?

Circle the one with more Potential energy and briefly explain why.

2. A 25 kg mass or a 30 kg mass at the top of a hill?
3. A car at the top of the hill or the bottom of a hill?
4. A plane on the ground or a plane in the air?
5. A full plane or an empty plane (both are flying)?

Circle the one with more Kinetic energy and briefly explain why.

6. A 25 kg mass or a 30 kg mass going 5 m/s.
7. Two 10 kg masses, one going 75 m/s, one going 45 m/s.
8. A car at rest or a car rolling down a hill.
9. A heavy bike or a light bike.

For the following questions……..PE or KE?

___ A car is traveling 45 mph.
___ A rock is on a ledge 5 meters high.
___ A car is resting at the top of a hill.
___ A ball is thrown into the air and is still moving.
___ A ball rolling on the ground.

Calculations (Use your formulas and show ALL of your work)

10. A 4 kg rock is rolling 10 m/s. Find its kinetic energy.

11. A 8 kg cat is running 4 m/s. How much kinetic energy does it have?

12. A 4 kg bird is flying with a velocity of 4 m/s . What is its kinetic energy?

13. Find the work done by a 25 N force applied for 6 meters.

14. Calculate the potential energy of a 5 kg object sitting on a 3 m ledge

15. A rock is at the top of a 20 meter tall hill. The rock has a mass of 10 kg. How much potential energy does it have?

16. CHALLENGE QUESTION: How high up is a 3 kg object that has 300 joules of energy?

17. CHALLENGE QUESTION: A rolling ball has 18 joules of kinetic energy and is rolling 3 m/s. Find its mass.