

Name _____ Period _____ Date _____

WORKSHEET: KINETIC AND POTENTIAL ENERGY PROBLEMS

1. Stored energy or energy due to position is known as _____ energy.
2. The formula for calculating potential energy is _____.
3. The three factors that determine the amount of potential energy in an object are _____, _____ and _____.
4. Potential energy is measured in units of _____.
5. Mass must be measured in units of _____.
6. Gravitational pull must be measured in units of _____.
7. Height must be measured in units of _____.
8. Calculate the **potential energy** of a rock with a mass of 55 kg while sitting on a cliff that is 27 m high.
9. What **distance** is a book from the floor if the book contains 196 Joules of potential energy and has a mass of 5 kg?
10. An automobile is sitting on a hill which is 20 m higher than ground level. Find the **mass** of the automobile if it contains 362,600 J of potential energy.
11. Energy of motion is known as _____ energy.
12. The formula for calculating kinetic energy is _____.
13. The two factors that determine the amount of kinetic energy in an object are _____ and _____.
14. Kinetic energy is measured in units of _____.
15. Mass must be measured in units of _____.
16. Velocity must be measured in units of _____.

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17. Calculate the **kinetic energy** of the rock in problem #8 if the rock rolls down the hill with a velocity of 8 m/s.

18. Calculate the **kinetic energy** of a truck that has a mass of 2900 kg and is moving at 55 m/s.

19. Find the **mass** of a car that is traveling at a velocity of 60 m/s North. The car has 5,040,000 J of kinetic energy.

20. **How fast** is a ball rolling if it contains 98 J of kinetic energy and has a mass of 4 kg?

HOMEWORK PROBLEMS:

7. PE =
m = 3 kg
g = 9.8 m/s²
h = 40 m

8. PE = 52 J
m = ?
g = 9.8 m/s²
h = 18 m

9. PE = 74 J
m = 3.8 kg
g = 9.8 m/s²
h = ?

10. PE = ?
m = 5 kg
g = 9.8 m/s²
h = 22 m

11. What potential energy is acquired by a hammer with a mass of 0.75 kg when raised 0.35 m?
12. A book with a mass of 1 kg is dropped from a height of 3 m. What is the potential energy of the book when it reaches the floor?
13. At what height is an object that has a mass of 50 kg, if its gravitational potential energy is 9800 J?
14. What is the mass of an object if its gravitational potential energy is 3822 J and it is 15 m above the ground?
15. An object with a mass of 20 kg and potential energy of 584 J is what distance above the ground?

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6. A worker pushes a 1500 N crate with a horizontal force of 345 N a distance of 24 m. Assume the coefficient of kinetic friction between the crate and the floor is .22.

a. How much work is done by the worker on the crate?

b. How much work is done by the floor on the crate?

c. What is the net work done on the crate?

7. A .075 kg ball in a kinetic sculpture moves at a constant speed along a motorized vertical conveyor belt. The ball rises 1.32 m above the ground. A constant frictional force of .35 N acts in the direction opposite the conveyor belt's motion. What is the net work done on the ball?

8. For each of the following statements, identify whether the everyday or the scientific meaning of work is intended.

a. Jack had to work against time as the deadline neared.

b. Jill had to work on her homework before she went to bed.

c. Jack did work carrying the pail of water up the hill.

9. Determine whether work is being done in each of the following examples:

a. a train engine pulling a loaded boxcar initially at rest

b. a tug of war that is evenly matched

c. a crane lifting a car

Worksheet: Work

Write the equation and units for work:

1. How much **work** does Bobby perform in pushing a 35 N crate a distance of 4 meters?

list known values	formula	substitution	answer & units

2. **How far** will a 70 N crate be moved if 3500 J of work are accomplished?

list known values	formula	substitution	answer & units

3. What **force** is needed to move a barrel 25-m if 225 J of work are accomplished?

4. Peggy uses a force of 40 N to move the grocery basket 18 meters. How much **work** did she perform?

5. **How far** will a 150 N crate be moved if 600 J of work are performed?

6. What **force** is needed to lift a box that weighs 300 N if 15000 J of work are accomplished?

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Worksheet: Work

7. **How far** will a 700 N crate be moved if 2800 J of work are accomplished?

8. What **force** is needed to move a barrel 45-m if 3600 J of work are accomplished?

9. How much **work** does Billy perform if he pushes the 8000 N stalled car a distance of 25 meters?

10. Grant stands 3 meters from the check out at the grocery store holding a 20 N bag of potatoes for 10 minutes. How much **work** does he perform?