Mechanical Energy
Formative Assessment

Name _____
Date _____ Block _____

Answer completely in the space provided. You may do any work on the back.

1. Calculate the work needed to push a block a distance of 10 meters if 8 N of force is pushing the block.

   80 J: W=Fd, W=(8N)(10m)

2. How much power is necessary to do 60 joules of work in 6 seconds?

   10 W: P=W/t, P=60J/6s

3. In order for work to be done the applied force and the distance the object moves must be in the _____ direction.

   same: definition of work

4. How much potential energy does a 3 kg rock have if it is 10 meters above the ground?

   300 J: PE=mgh,
   PE=(3 kg)(10 m/s^2)(10 m)

5. How much kinetic energy does a 8 kg cat have if it's running at a speed of 10 m/s?

   400 J: KE=1/2 mv^2,
   KE=1/2(8 kg)(10 m/s)^2
   =(4kg)(100 m^2/s^2)

6. _____ is the energy due to an object's motion.

   kinetic energy

7. An object's _____ energy is due to its position and stored energy.

potential energy

8. Russell is riding his dirt bike at a speed of 10 mi/h. He has 4000 J of kinetic energy. What would his kinetic energy be if he were to speed up to 20 mi/h?

16,000 J; since the speed is 2 times the original and speed is squared, 2 squared is 4, so 4 times the original KE

9. **TRUE** or **FALSE**: As a can of tomato sauce rolls up a ramp most all of its initial kinetic energy is transferred into potential energy.

True; the can stops at the top for an instant, no KE at that point. NRG must be conserved

10. A rock with 20 J of potential energy is dropped from 2 meters above the ground. About how much kinetic energy will it have when it has fallen 1 meter?

10 J: halfway down is half the PE, the lost PE must change to KE, conservation

11. Natasha does 100 joules of work when lifting a 65 kg box up to a table. How much gravitational potential energy did she give the box?

100 J; conservation, work done is stored as PE

12. Austyn is on a swing at the playground. Describe what happens to his potential and kinetic energy as he makes one swing forward.

Starts with all PE, as he swings the PE changes to KE, he has maximum KE at the bottom of the swing, on the way up his KE changes to PE and he has all PE at the top of the swing