

**Work each of the following problems. SHOW ALL WORK.**

1. A 2 kg toy car moves at a speed of 5 m/s.

a. What is the kinetic energy of the car?

b. If a child applies a 3 N force for 2 m in the same direction the car is already moving, how much work is done on the car?

c. What is the change in the car's kinetic energy from the applied force?

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d. What is the final kinetic energy of the car?

e. What is the velocity of the car after the child applies the 3 N force?

**Work each of the following problems. SHOW ALL WORK.**

2. A 3 kg ball is thrown downward at 4 m/s from a height of 1.5 m.
- a. What is the kinetic energy of the ball as it leaves the thrower's hand?

b. What force is doing work on the ball as it falls?

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c. How much work is done on the ball as it falls?

d. What is the final kinetic energy of the ball?

e. What is the velocity of the ball as it strikes the ground?

**Work each of the following problems. SHOW ALL WORK.**

3. A 75 kg baseball player runs at a velocity of 6 m/s before sliding to a stop at second base.
- What is the kinetic energy of the runner before he begins his slide?
  
  
  
  
  
  
  
  
  
  
  - What is the kinetic energy of the runner once he reaches the base?
  
  
  
  
  
  
  
  
  
  
  - What is the change in the kinetic energy of the runner?
  
  
  
  
  
  
  
  
  
  
  - How much work is done by friction in stopping the runner?
  
  
  
  
  
  
  
  
  
  
  - If the runner slides for 2 m, what is the force of friction that acts upon him?
4. Runaway truck ramps are common on mountainous highways in case the brakes fail on large trucks. If a runaway 60,000 kg truck is moving at 27 m/s, how much work must be done to stop the truck?

