

## Skill 32: Internal Energy

.025kg

80. A 25-gram paper cup falls from rest off the edge of a tabletop 0.90 meter above the floor. If the cup has 0.20 joule of kinetic energy when it hits the floor, what is the total amount of energy converted into internal (thermal) energy during the cup's fall?

- A) 0.02 J      B) 0.22 J  
C) 2.2 J      D) 220 J

$$Q = PE_{\text{top}} - KE_{\text{bottom}} \\ = .22 - .2$$

81. Two pieces of flint rock produce a visible spark when they are struck together. During this process, mechanical energy is converted into

- A) nuclear energy and electromagnetic energy  
B) internal energy and nuclear energy  
C) electromagnetic energy and internal energy  
D) elastic potential energy and nuclear energy

82. A car uses its brakes to stop on a level road. During this process, there must be a conversion of kinetic energy into

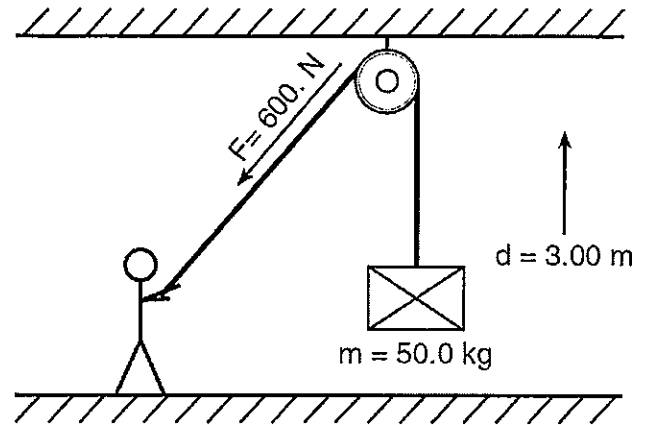
- A) light energy  
B) nuclear energy  
C) gravitational potential energy  
D) internal energy

83. A 0.2 kg mouse runs up a clock to a height of 1.5 m and slides down a piece of wood back to the base. The mouse has 2J of kinetic energy when he reaches the base. How much work was done against friction during the slide?

- A) 3 J    B) 1 J    C) 2 J    D) 0.3 J

$$Q = PE_{\text{top}} - KE_{\text{bottom}} \\ 2.9 - 2$$

84. As shown in the diagram below, a student exerts an average force of 600. newtons on a rope to lift a 50.0-kilogram crate a vertical distance of 3.00 meters.



Compared to the work done by the student, the gravitational potential energy gained by the crate is

- A) exactly the same    B) 330 J less  
C) 330 J more    D) 150 J more

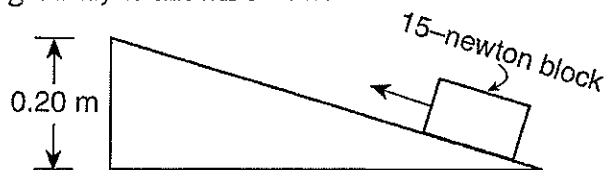
$$W = 1800 \text{ J} \\ PE = 1470 \text{ J}$$

85. When a force moves an object over a rough, horizontal surface at a constant velocity, the work done against friction produces an increase in the object's

- A) weight    B) momentum  
C) potential energy    D) internal energy

### Skill 32: Internal Energy

86. A block weighing 15 Newtons is pulled to the top of an incline that is 0.20 meter above the ground, as shown below.

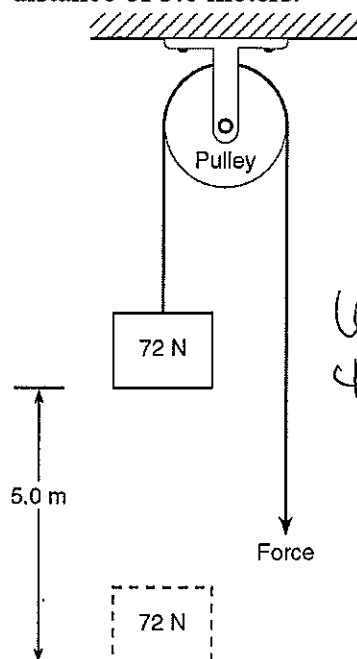


If 4.0 joules of work are needed to pull the block the full length of the incline, how much work is done against friction?

- A) 1.0 J B) 0.0 J C) 3.0 J D) 7.0 J

PE gained = 3 J  
W = 4 J

87. In the diagram below, 400. joules of work is done raising a 72-newton weight a vertical distance of 5.0 meters.



$W - PE = Q$   
 $400\text{ J} - 360\text{ J} = Q$   
 $40\text{ J} = Q$

How much work is done to overcome friction as the weight is raised?

- A) 40. J B) 360 J  
C) 400. J D) 760 J

88. Work energy is completely converted to heat energy when all of the work done on an object is used to overcome

- A) momentum B) gravity  
C) inertia D) friction

89. A force causes an object on a horizontal surface to overcome friction and begin to move. As this happens, the object's internal energy will

- A) decrease B) increase  
C) remain the same