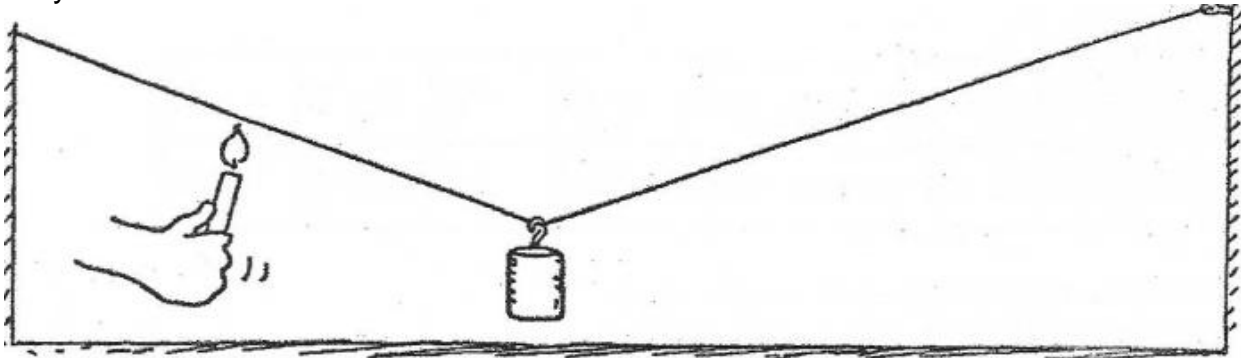
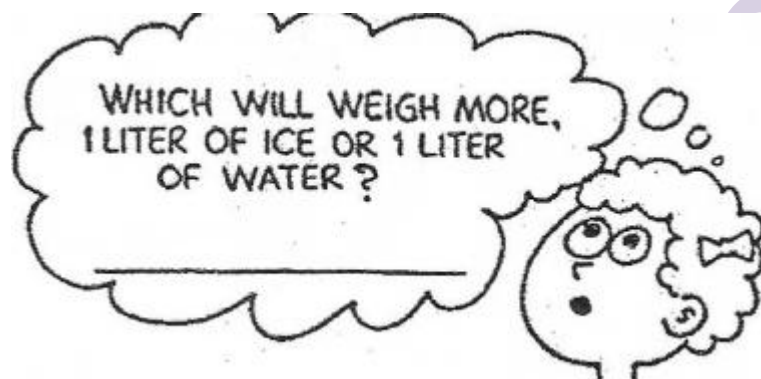


Temperature, Heat, and Thermal Expansion

1. The weight hangs above the floor from the copper wire. When a candle is moved along the wire and warms it, what happens to the height of the weight above the floor? Why?



2.

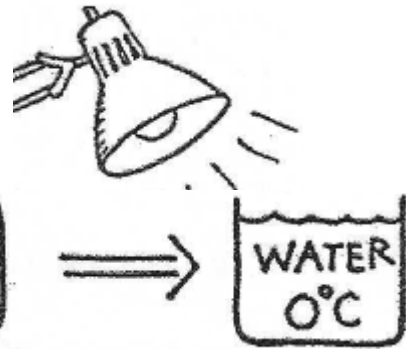


3.

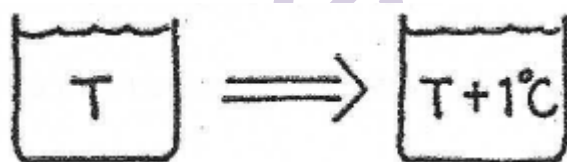


4. Why does a bird fluff its feathers to keep warm on a cold day?

5. What does *convection* have to do with the holes in the shade of the desk lamp?



6. How many calories are needed to change 1 gram of 0°C ice to water?



7. How many calories are needed to change the temperature of 1 gram of water by 1°C ?

8. A 50-gram sample of ice at 0°C is placed in a glass beaker that contains 200 g of water at 20°C .

- How much heat is needed to melt the ice?
- By how much would the temperature of the water change if it released this much heat to the ice?



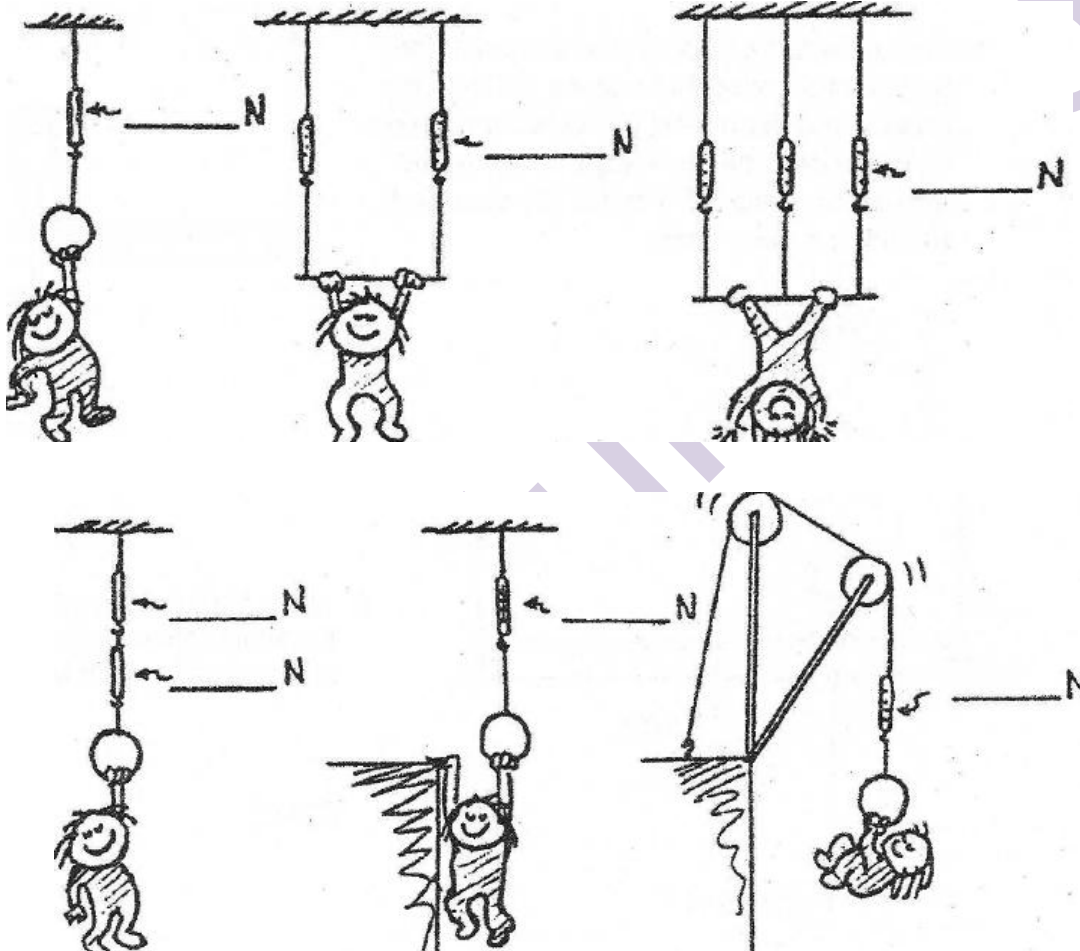
9. Why do you feel colder when you swim in a pool on a windy day?

10. Why does your skin feel cold when a little rubbing alcohol is applied to it?

Newton's First Law of Motion-Inertia

Static Equilibrium

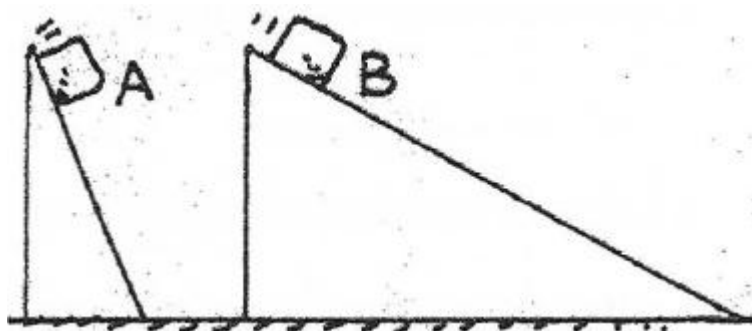
1. Little Nellie Newton wishes to be a gymnast and hangs from a variety of positions as shown. Since she is not accelerating, the net force on her is zero, That is, $\sum F = 0$. This means the upward pull of the rope(s) equals the downward pull of gravity. She weighs 300 N. Show the scale reading(s) for each case,



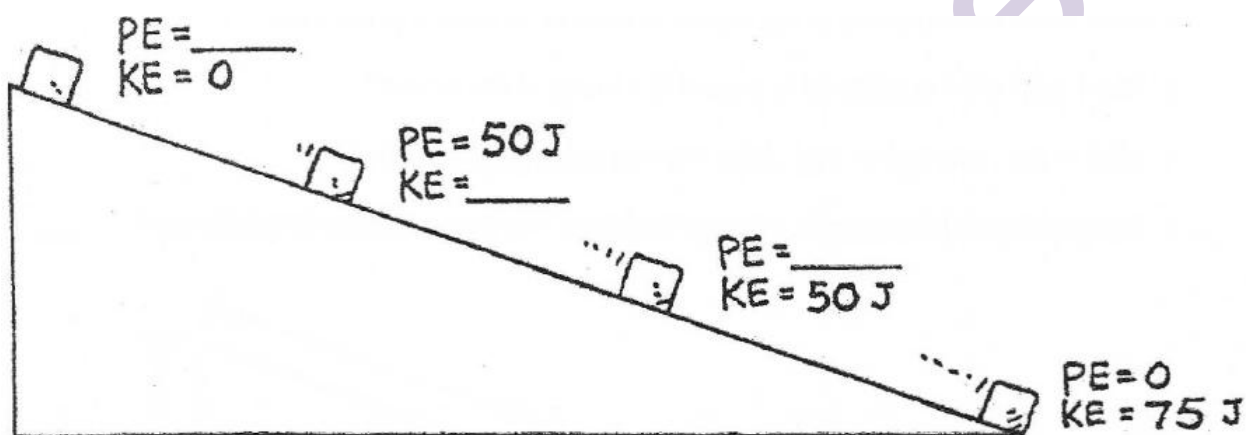
Work and Energy

1. Which block reaches the bottom of the incline first?
Assume no friction. (Be careful!)

Explain your answer.



2. Both the KE and PE of a block freely sliding down a ramp are shown below only at the bottom position in the sketch. Fill in the missing values for the other positions.



3. A big metal bead slides due to gravity along an upright friction-free wire. It starts from rest at the top of the wire as shown in the sketch.

How fast is it traveling as it passes

Point B?

Point D?

Point E?

At which point does it have Maximum speed?

