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1.3-110

Which of the following has a positive charge?

- (a) a neutron
- (b) an electron
- (c) a proton

## 1.3-120

Which of the following has the smallest mass?

- (a) a neutron
- (b) an electron
- (c) a proton
- (d) a quark

## 1.3-210

Which of the following is a unit of acceleration?

- (a)  $\text{kg m}^2 / \text{s}^3$
- (b)  $\text{kg m}^2 / \text{s}^2$
- (c)  $\text{kg m} / \text{s}^2$
- (d)  $\text{m} / \text{s}^2$

Which is a unit of force?

Which is a unit of energy?

Which is a unit of power?

## 1.3-230

(J / m) is a unit of

- (a) velocity
- (b) force
- (c) acceleration
- (d) energy

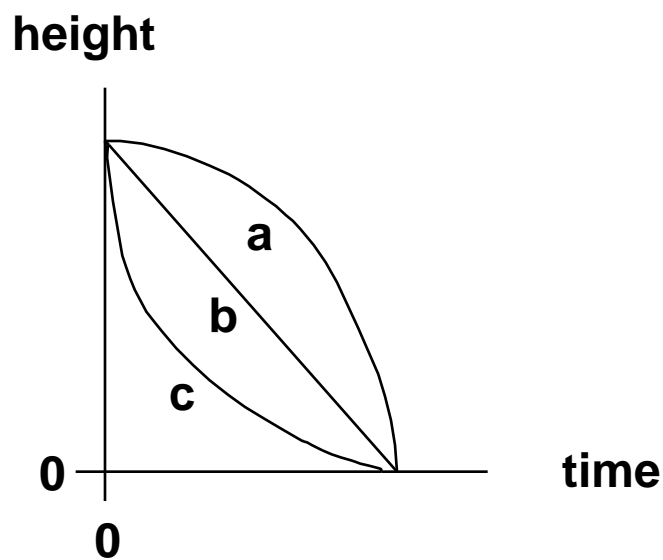
## 1.3-240

$(\text{J} / \text{kg})^{1/2}$  is a unit of

- (a) velocity
- (b) force
- (c) acceleration
- (d) energy

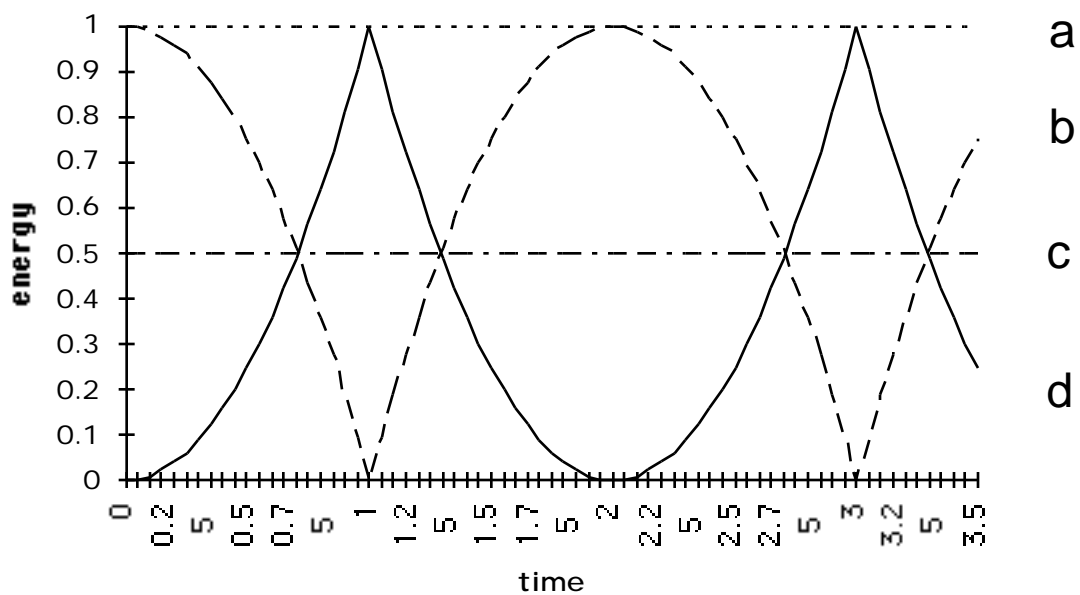
## 1.3-310

A stone is dropped at time zero. The graph of its height vs. time (until hitting the ground) is given by which line?



## 1.3-320

For a perfectly bouncing ball, dropped at time zero, which graph of energy vs. time describes its potential energy ?



its kinetic energy ?

its total energy ?

## 1.3-410

A drop of food coloring is placed in a dish of water and the water is stirred clockwise until the color of the solution is uniform. If the water is then stirred counterclockwise, the food coloring will

- (a) recollect in a drop
- (b) remain uniformly spread out
- (c) collect around the edge of the dish

## 1.3-420

A drop of food coloring is placed very gently in the center of a dish of water. If the dish is not disturbed, the food coloring will

- (a) stay put
- (b) spread out
- (c) concentrate toward the center

## 1.3-430

One drop of food coloring is placed in a dish of hot water and one is placed in a dish of cold water. The spread of the food coloring in the hot water will be

- (a) faster than
- (b) slower than
- (c) the same as

the spread in the cold water.

## 1.3-440

Touch a stretched rubber band to your lips.  
When you release the tension, the rubber band  
feels

- (a) cooler
- (b) warmer
- (c) the same

## 1.3-442

When a stretched rubber band is released it feels cooler because it is

- (a) losing energy
- (b) taking up energy
- (c) neither of the above

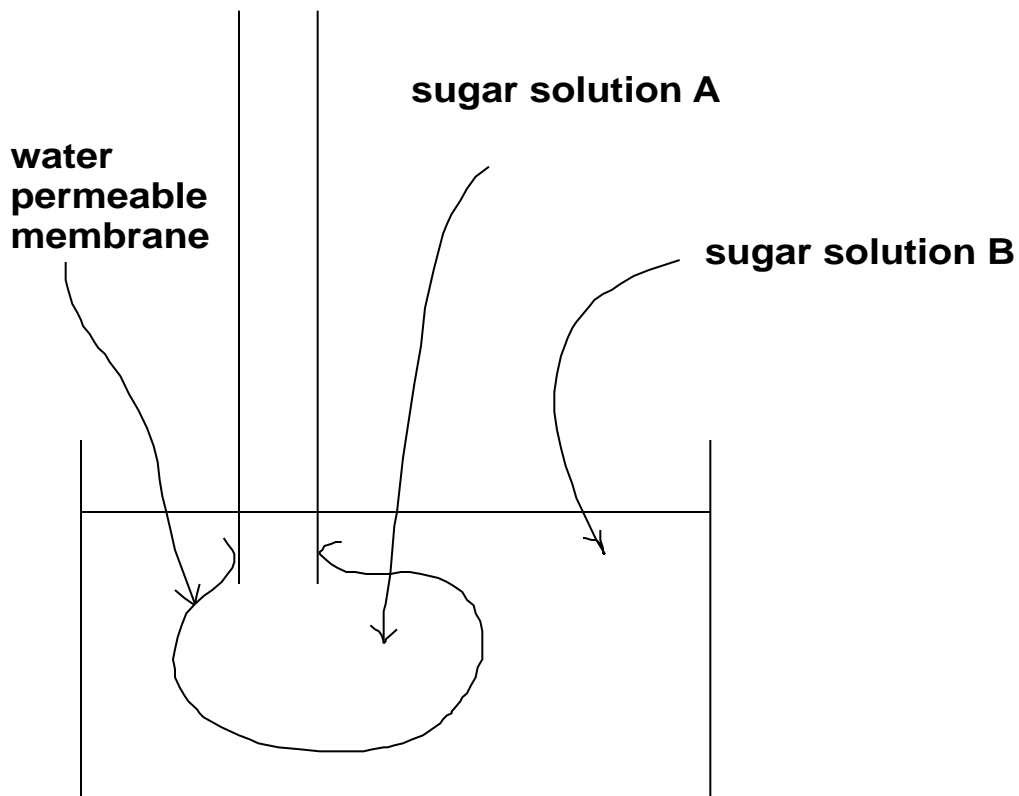
## 1.3-444

When a stretched rubber band is released it takes up energy. For this uptake of energy to occur, what does the 2nd Law require of the material in the rubber band?

- (a) that it become more ordered
- (b) that it become less ordered
- (c) nothing

## 1.3-460

Sugar solutions of different concentrations are placed on either side of a dialysis membrane that is permeable to water but not to sugar. Both solutions open to the atmosphere, as shown below.



With time it is observed that the level of the liquid inside the tube rises and outside the tube falls. Which solution has the higher sugar concentration?

- (A) the solution inside the tube
- (B) the solution outside the tube
- (C) neither