

Atmospheric Retention – Pretest

Answer the following questions.

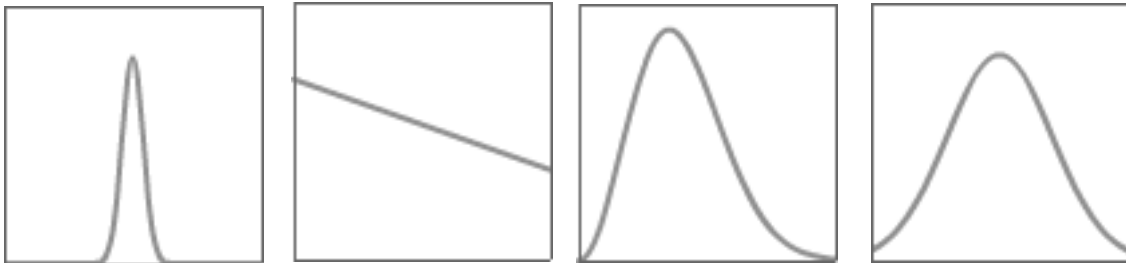
Question 1: If a particle is launched from the surface of the earth with a velocity of 5 km/s, what happens to the particle?

- a) It will go up and keep on going, never coming back down.
- b) It will go up, but must come down.
- c) It will go up with just enough speed to not come back down.

Question 2: Planet A has a mass M and radius R . Planet B has a mass $1/4 M$ and a radius $0.5 R$. How do the escape velocities of the two planets compare?

- a) Planet B's escape velocity is less than planet A's escape velocity
- b) Planet B's escape velocity is equal to planet A's escape velocity
- c) Planet B's escape velocity is greater than planet A's escape velocity

Question 3: Which of the following looks most like the distribution one would expect for the speeds of gases at a particular temperature?



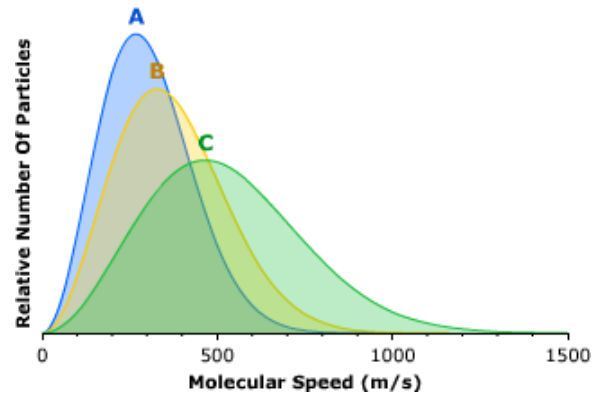
Question 4: What fraction of particles will have a speed less than the average speed?

- a) more than half of the particles
- b) less than half of the particles
- c) exactly half of the particles

Question 5: How does the average kinetic energy depend on temperature?

- a) $K \propto T^2$
- b) $K \propto T$
- c) $K \propto 1/T$
- d) $K \propto 1/T^2$

Question 6: All three gases have the same temperature. Which gas is the most massive?



Question 7: Which gas is most easily retained?

- a) CH₄
- b) N₂
- c) Xe

Question 8: All of the bodies below have reasonably close escape velocities. Which has an atmosphere?

- a) Mercury
- b) Moon
- c) Titan