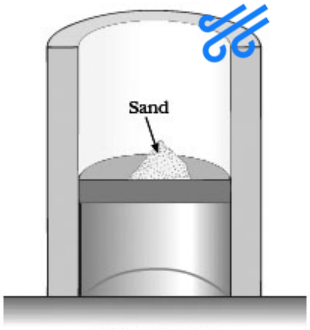
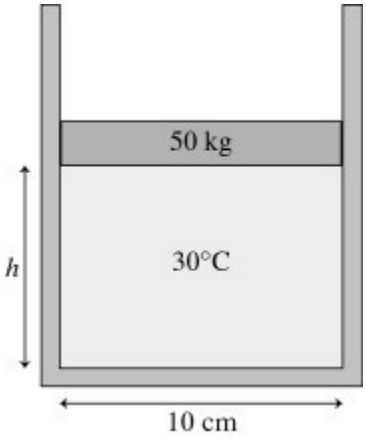
KC's Multiple Select
Ideal Gas

- *Thermodymaics.Ideal.Gas*.**MS.KC.1:** A non-thermally isolated piston traps air in the chamber and is initially in thermodynamic equilibrium with its environment. If sand that is sitting on top of the piston begins to *very slowly* blow off the top of the piston, which of the following statements are true?



  (a) The pressure will remain constant.
  (b) The pressure will increase.
  (c) The pressure will decrease.
  (d) The average speed of the air particles will increase.
  (e) The average speed of the air particles will decrease.
  (f) The average speed of the air particles will stay the same.
  (g) Work is done on the air in the chamber.
  (h) Work is done on the environment by the air in the chamber.

- *Thermodymaics.Ideal.Gas*.**MS.KC.2:** The figure shows a 50 kg lead cylindrical piston that floats on 0.68 mol of compressed air at 30 °C. If the temperature is increased, which of the following statements are true?



  (a) The pressure will remain constant.
  (b) The pressure will increase.
  (c) The pressure will decrease.
  (d) The piston will stay at the same height.
  (e) The piston will decrease in height.
  (f) The piston will increase in height.
  (g) The entropy of the gas increases.
  (h) The entropy of the gas decreases.

- *Thermodymaics.Ideal.Gas*.**MS.KC.3:** Two equally numbered moles of gas are confined to separate insulated containers. The molecular mass of **A** is nine times that of **B** but each has the same total internal thermal energy. Which of the following statements are false regarding this situation?

  (a) The temperature of **A** is nine times that of **B**.
  (b) The temperature of **B** is equal to the temperature of **A**.
  (c) The average molecular speed of **B** is equal to that of **A**.
  (d) The average molecular speed of **B** is three times that of **A**.
  (e) The average kinetic energy of **A** is equal to that of **B**.

- *Thermodymaics.Ideal.Gas*.**CP.KC.4:** Complete the following statement: The absolute temperature of an ideal gas is directly proportional to
    (a) the number of molecules in the sample.
    (b) the average momentum of a molecule of the gas.
    (c) the average translational kinetic energy of the gas molecules.
    (d) the amount of heat required to raise the temperature of the gas by 1 Cº.
    (e) the total potential energy stored in the gas.