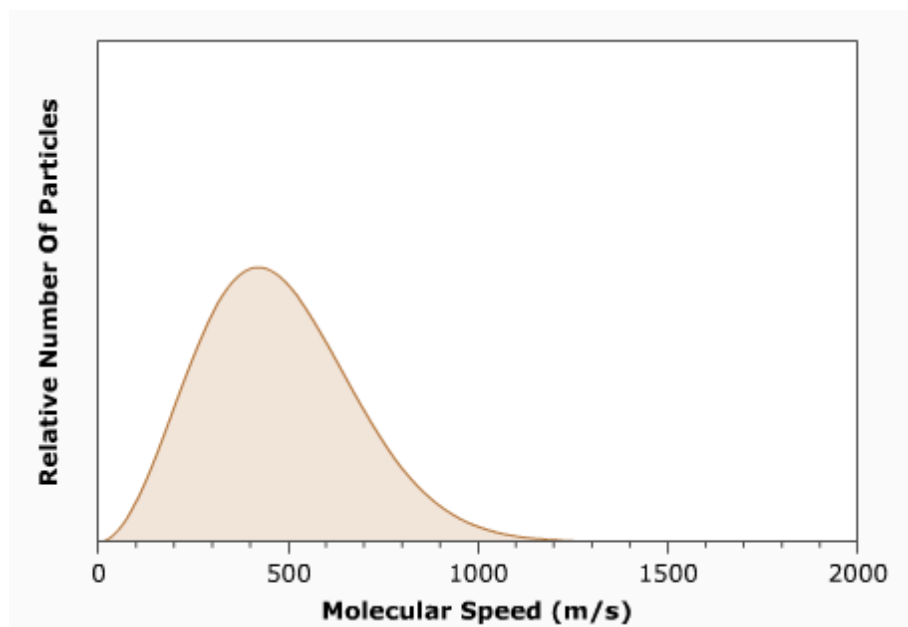


## Astronomy Demonstration Video –Temperature 1 – Worksheet

to follow viewing of the astronomy demonstration video at [https://www.youtube.com/watch?v=Dif3\\_sao1HI](https://www.youtube.com/watch?v=Dif3_sao1HI)



1. The graph above shows the distribution of speeds for the air particles in a balloon at room temperature. Answer each of the following questions related to the on the graph.

- Imagine that you were verbally describing the distribution of speeds graph to someone who had never seen one. Write out your description of the curve shape in the space below.
- Draw in a vertical line indicating the speed held by the largest number of particles (and label it  $v_{mp}$ ).
- Shade a region of the graph corresponding to the fastest moving 10% of the air particles.
- Draw in a vertical line estimating the average speed of the air particles (and label it  $v_{avg}$ ).
- Imagine that the balloon were taken inside a greenhouse on a hot summer day which would raise the temperature of the air particles in the balloon by about  $10^{\circ}\text{C}$ . Draw in the resulting curve for the new speed distribution of the air particles in the balloon. (Keep in mind that the area under the curve representing the number of air particles remains constant while  $v_{mp}$  and  $v_{avg}$  will increase.) Do you think the balloon would change in size? Explain your thinking.
- Imagine instead that the balloon were placed in a diver's hyperbaric chamber and the pressure is set to be twice as great as atmospheric pressure (but the balloon is kept at room temperature). Do you think the balloon would change in size? Explain your thinking.