# The Structure And Motion of Matter (SAMM) Survey

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1. **Imagine that someone breaks a glass of perfume on one side of a room and that you are standing on the other side of the room. You begin to smell it after a short while because the perfume molecules get from the spill to your nose.**

   a. **Draw a picture to explain <u>how the molecules move from the spill to your nose</u>.**

**Drawing**

   b. **Use words to explain <u>how the molecules move from the spill to your nose</u>.**

   c. **Use words to explain where the <u>molecules' ability to move</u> comes from.**

**d. Draw a picture to explain <u>the movement of ONE perfume molecule going from the spill to your nose</u>.**

***Please make sure to also represent the AIR in the room.***

**Drawing**

*One perfume molecule (not drawn to scale)*

**e. Explain why the molecule of perfume has the specific movements that you just drew in part d.**

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2. **Now, imagine that we have two identical balloons containing <u>an identical amount</u> of a <u>scented gas</u>. One balloon is placed in Room 1 and the other in Room 2. The two rooms are <u>identical</u> except that <u>Room 2 is hotter than Room 1</u>. You are standing in each room at the <u>same distance away from the balloon.</u>**

Room 1 Room 2

a. **If the balloon were popped, would the smell be stronger in one of the rooms?**

- ☐ Yes; **Which one?** _____
- ☐ No, the strength of smell will be the same in both rooms.
- ☐ Other; **Please specify:** _____

b. **If the balloon were popped, would you smell the perfume faster in one of the rooms?**

- ☐ Yes; **Which one?** _____
- ☐ No, you will smell the perfume at the same time in both rooms.
- ☐ Other; **Please specify:** _____

c. **Draw the <u>perfume molecules and their movements</u> in the <u>cold</u> room and in the <u>hotter</u> room, soon after the balloons with the gases are popped, to explain your answers to part a and part b. Use the lines below each picture to explain your drawings.**

***Please make sure to also represent the AIR in the room.***

**Cold room** **Hotter room**

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

_____ _____

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3. **Now, imagine that we have two identical balloons containing <u>the same amounts</u> of two <u>different</u> scented gases, Gas A and Gas B. One balloon is filled with Gas A and the other balloon is filled with Gas B. The balloons are placed in a room at the <u>same distance away from your nose.</u>**

**The balloons are popped <u>at the same time.</u>**

a. **Is there one gas that would smell stronger than the other?**

- ☐ Yes; **Which one?** _____
- ☐ No, they both will have the same strength of smell.
- ☐ Other; **Please specify:** _____

b. **Is there one gas that you would smell first?**

- ☐ Yes; **Which one?** _____
- ☐ No, you will smell them both at the same time.
- ☐ Other; **Please specify:** _____

c. **Draw <u>Gas A and Gas B perfume molecules and their movements</u>, soon after the balloons are popped to explain to explain your answers to part a and part b. Use the lines on the right side of the picture to explain your drawings.**

***Please make sure to also represent the AIR in the room.***

_____
_____
_____
_____
_____
_____
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_____
_____
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