**Science 8: Osmosis/Diffusion Design Lab.** Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Based on what you learned in the first gummy bear lab, you will Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Blk: \_\_\_

now design a lab to “Investigate Osmosis” in a more scientific manner.

You must now try to frame the question as “what is the relationship between *dependent variable* *and independent variable*, and then design an appropriate experiment to investigate this.

***Before the Lab***

1. First, **describe** the problem or question the lab is trying to answer:

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1. **Variables**: Variables are the parts of your experiment that you will change and measure. By choosing **only one Independent variable** and **one dependent variable**, you will ensure **a fair test.** All other variables must be controlled and kept **constant**.

**Outline** your variables in the table below:

|  |  |  |
| --- | --- | --- |
| **Independent variable**:  *What will I be changing?*  *(x-axis)* |  | Data range:  *How much will I change it?* |
| **Dependent variable**:  *What will I be measuring?*  *(y-axis)* |  | *How will I measure this?* |
| **Control variables**:  *What will I be keeping the same?* |  | *How will I make these stay the same?* |

1. **Hypothesis**: The hypothesis is a statement you make **BEFORE** you do the experiment, which describes what you think will happen. Use your independent and dependent variables to create an “If…, than…” statement. It is ok if your hypothesis is wrong, they often are! After the experiment, you will see if the data ***supports*** or ***contradicts*** your hypothesis.

**State** and **explain** your hypothesis:

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1. **Materials**: Before doing the lab, write a list of everything you will need for the lab – **materials** and **equipment**. Be specific and thorough. Include the **quantities** (or amounts) of what you need. (eg. “*10.0g of salt*” or *“a 250mL beaker*”)

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1. **Procedure**: Before doing the lab, write down all the **steps** in your experiment, one by one. Be as **detailed** and **logical** as possible, as if a complete stranger could read this and perform the exact same experiment as you did. Include any **safety** precautions and **ethical** concerns.

Include how you will **collect** your data or observations. More data is better! Why not do the test **multiple** times? 3? 5? 10? 20 times? Use a **numbered list**.

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***During the Lab***

1. **Data Table**: Create a **table** below to collect, organize, and present your **data**. Include space for your **quantitative** AND **qualitative** observations, as well as the number of tests (trials) you have planned for.

***After the Lab***

1. **Results**: Look at your data and observations. **Interpret** your data and **describe** the results of your experiment in one or two sentences.

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1. **Conclusion**:
   1. **Discuss** the validity of your hypothesis based on the results. Write a statement discussing if your **hypothesis** was supported or contradicted (not supported), and **why**.

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* 1. **Discuss** the validity of your **method** based on the results. Write about the following:

(1) Problems or errors in your lab procedure;

(2) Suggestions for improving the lab for next time;

(3) How your findings compared to other students’;

(4) Other questions that you have now that you have finished the lab!

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