STEM Experiment #3

The Beauty of Perfume

Background Information

Research Activity

Great scientists like to know as much information as they can about their topic before they start their experiments. Use the questions below to guide your research on the art of making perfume. This will help you to understand the science behind your product. You can use sources such as trusted websites on the Internet (with your teacher's permission, of course) and books from the library.

? *Define the word "volatility".*

? *Why would volatility be important when creating a perfume?*

? *Question 3: What is an essential oil?*

Pre-Lab Activity: The Beauty of Fragrance

The secret to making perfume lies in the percentage of fragrance contained in the entire mixture. Different percentages of fragrance create different products. Analyze the chart below and answer the questions that follow.

PRODUCT	PERCENTAGE OF FRAGRANCE	AMOUNT
Eau de Toilette	15 - 18 %	5.3 - 6.6 mL (1 - 1.3 tsp)
Eau de Parfum	19 - 22 %	7.0 - 8.5 mL (1.4 - 1.7 tsp)
Perfume	23 - 28 %	9.0 - 11.7 mL (1.8 - 2.4 tsp)

☑ ***Infer: Based on your definition of "volatility", which fragrance is the most volatile and why?***

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_____

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☑ ***Choose the amount of fragrance oil you will be adding to your perfume mixture using the reference chart above.***

I will use _____% of the fragrance oil, which is equivalent to _____mL or _____tsp.

Hypothesis

A **hypothesis** is a prediction that scientists make based on their research and prior knowledge. Based on the background information and research you have completed, write a hypothesis about changing the formulation for the fragrance oil.

! To write like a GPS scientist, use the following format to guide you:

__If__ I add more __fragrance oil__ to my perfume, __then__ my perfume will be _____, __because__ _____.

! ***Hypothesize: Write your own hypothesis for changing the volatility of your perfume.***

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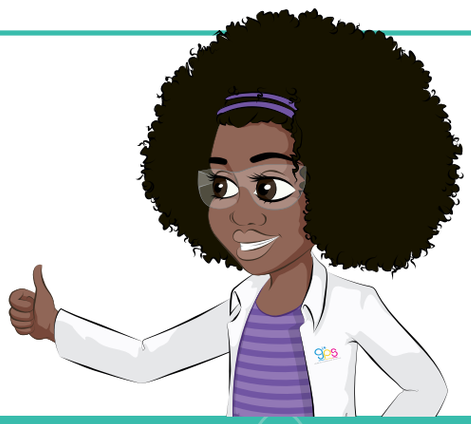

Let's Make Perfume!

Materials

EQUIPMENT IN YOUR KIT	QUANTITY	CLASSROOM EQUIPMENT	QUANTITY
Safety Glasses	1	GPS Lab Jacket	1
Pipette	1	Paper Towels	As needed
30 mL (1 oz) Mist Spray Bottle OR	3	Gloves	2
5ml Spray Bottles	6	Beaker	1

INGREDIENTS IN YOUR KIT	FORMULATION	CLASSROOM INGREDIENTS	FORMULATION
Perfumers Base	.25 to 30 mL (		
Fragrance Oil	15% - 28%		
Colorant	Tiny drop		

NOTE!

The materials list and formulation is for each person. If you are working in a group, multiply the quantity by the number of girls in your group!

Procedure

Step 1: Read the entire procedure, all 8 steps, before you begin.

NOTE!

Use caution when using the ingredients in your kit.
DO NOT INGEST ANY OF THE INGREDIENTS!

Step 2: Clean off your work surface and put on your safety glasses and your GPS Lab Jacket to protect your face and clothing.

Step 3: Gather all of your **ingredients** and **materials** (see list above) and arrange them in the order that they will be used.

NOTE!

Do not start making your product before you have all ingredients, supplies, and equipment in front of you!

Step 4: Waft all of the fragrance oils towards you in order to get an idea of which scent you would like for your perfume.

Step 5: Choose which fragrance oil you will use. Choices include:

- Strawberry
- Japanese Cherry Blossom
- Pink Sugar

Step 6: Pour 1 oz of the perfume base into a beaker. Add your chosen amount of fragrance oil (one pipette drop at a time). Refer to the table in the pre-lab activity for the quantity of fragrance oil for your product.

Step 7: Add a tiny drop of gel colorant if desired. Start with one drop. You will add more gradually until you get the color you want.

Step 8: **Slowly** pour the mixture into the mist sprayer, screw on your fine mist sprayer and shake well to mix.

ENJOY!

Analysis and Conclusion

After completing an experiment, scientists ask themselves questions in order to see what they have learned about their topic. Answer the following questions about your experiment in creating your perfume.

? ***Question 1: Did your perfume product turn out the way you wanted it to? Why or why not?***

? ***Question 2: Perfume is usually made with an essential oil, water, and alcohol. What do you think is the purpose of the alcohol in the mixture?***

? ***Question 3: Based on what you know about chemical reactions, explain why perfumes smell differently on each person.***