Comparing Scented Inserts

Summary

The primary job of a scientist is to ask questions and try to answer them. One approach to solving problems often used by scientists is the ***scientific method***. The steps of this process are: having a question, forming a hypothesis, testing with an experiment, and making conclusions. A scientist can ask questions about almost anything. The only requirement is that the question be testable, so that an experiment can be used to answer it.

QUESTION ==> HYPOTHESIS ==> EXPERIMENT ==> CONCLUSIONS
testable *your guess* *testing* *correct hypothesis?*

A ***hypothesis*** is made before your experiment and is just a guess at what you think will happen. This is an important step because you have to know what to expect in order to make a good experiment. For example, let's say you want to know what is in a mixture and there are two possible choices, A and B. You must be sure that your experiment will allow you to tell if you have A or if it is B.

Your ***experiment*** is just a test to try to find the answer to your question. Scientists try to make the experiment as simple as possible, but they must eliminate all other aspects, not related to their hypothesis, that might affect the outcome. For example, let's say you want to know if dew is forming outside your house at night. You hypothesize that there is dew forming and are expecting your lawn will be wet in the morning. However, testing after a rainy night would be a poor experiment because the rain could be (and more likely is) causing your lawn to be wet.

The final step is to make a ***conclusion***, a decision on whether your hypothesis was correct or incorrect. If it was incorrect, you must think of a different hypothesis to test. If it was correct, you will want to think about why that was the case. Either way scientist rarely stop at answering just one question, starting the process all over again!

In this activity, you will be the scientist and will use the scientific method. The experiment has already been set up in the *Making Scented Inserts* activity. Your job is to compare these, so you will look for a certain difference (scent, ingredients, etc.) that might make one product better than the other.

In this activity:

- Use scientific methods to:
  - Compare different adhesives to see which holds in smells the longest.
  - Compare different kinds of scented products (scent, main ingredient, etc.) to see which maintains its smell the longest.

Materials needed

- Scented Inserts (from Making Scented Inserts activity)

Activity

A. Identifying the Question and Making a Hypothesis

1. There are two questions that you can answer with your scented inserts.
    a. Question 1 will concern the adhesives. What is this question?

The other question depends on what aspect of the scented products you would like to compare. This means your question is about how the samples are <u>different</u>. If you have two samples with the same scent, your question might be "Which type of product (Body Wash or Body Spray) will maintain its smell the longest on a scented insert?" Other possible questions are: Which scent of body wash, X or Y, will maintain its scent the longest? What main ingredient will make the product's scent last longer, alcohol or glycol? Which odor identifier will last the longest?

This question should be as specific as possible, and is completely your choice!

    b. Question 2 will be related to the products you want to compare. Write the question you want to answer here.

2. Now you need to make a prediction about what will happen. These are called hypotheses and will be an answer (that you guess) to your questions. Write your TWO hypotheses in the area below.

a. Hypothesis 1:

b. Hypothesis 2:

B. Opening Your Scented inserts

Test one scented product at a time. Wait for 1 day, open and smell the "tomorrow" samples. To open the *glue sample*, pull gently at the corner of the tab. To open the *tape sample*, grab the tab and pull *very slowly* to keep from ripping the bottom sheet.

Glue Sample

Tape Sample

C. Making Observations

TOMORROW (Day 1) *Sample A*

[Tip: Remember, if you have trouble smelling to compare, take a deep whiff of something relatively unscented like your shirt sleeve, a clean towel, etc. This should refresh your nose for more smelling!]

What strong "odor identifiers" do you smell?

How is the smell different from the previous day? (refer to Odor identifiers from the first day written on the *Tape Sample*.)

How do the glue and tape inserts compare? Is one stronger than the other?

Write down any other observations here.

TOMORROW (Day 1) *Sample B*

What strong "odor identifiers" do you smell?

How is the smell different from the previous day? (refer to Odor identifiers from the first day written on the *Tape Sample*.)

How do the glue and tape inserts compare? Is one stronger than the other?

Write down any other observations here.

3 DAYS *Sample A*

What strong “odor identifiers” do you smell?

How is the smell different from the previous test day (Day 1)?

How do the glue and tape inserts compare? Is one stronger than the other?

Write down any other observations here.

3 DAYS *Sample B*

What strong “odor identifiers” do you smell?

How is the smell different from the previous test day (Day 1)?

How do the glue and tape inserts compare? Is one stronger than the other?

Write down any other observations here.

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5 DAYS *Sample A*

What strong “odor identifiers” do you smell?

How is the smell different from the previous test day (Day 3)?

How do the glue and tape inserts compare? Is one stronger than the other?

Write down any other observations here.

5 DAYS *Sample B*

What strong “odor identifiers” do you smell?

How is the smell different from the previous test day (Day 3)?

How do the glue and tape inserts compare? Is one stronger than the other?

Write down any other observations here.

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1 WEEK *Sample A*

What strong “odor identifiers” do you smell?

How is the smell different from the previous test day (Day 5)?

How do the glue and tape inserts compare? Is one stronger than the other?

Write down any other observations here.

1 WEEK *Sample B*

What strong “odor identifiers” do you smell?

How is the smell different from the previous test day (Day 5)?

How do the glue and tape inserts compare? Is one stronger than the other?

Write down any other observations here.

Final Conclusions:

1. Compare the glue and tape samples for each sample. Which worked better for each sample?

a. Sample A - b. Sample B -

2. Compare the different scented products.

a. Which sample lasted the longest?

b. Did any of the samples change smells with time?

c. Could this be related to the main ingredients?

3. Compare the different strong smells.

a. Do certain types of smells last longer than others?

b. Do some scents change to others over time?

4. Go back and look at your hypotheses.

a. Was your hypothesis 1 correct?

b. Was your hypothesis 2 correct?

5. It was stated earlier that "scientists try to make the experiment as simple as possible, but they must eliminate all other aspects, not related to their hypothesis, that might affect the outcome."

a. Did your experiment "eliminate other aspects"?

b. How might your experiment be improved?

6. What might be another experiment/comparison you would want to complete?

Extensions: Test other products and run more experiments! Some ideas:

- Test different products that have the same scent, to see how much ingredients effect smell.
- Compare compare women's perfume to men's cologne? Which lasts longer? Are there major differences in primary odors/odor identifiers?