

Experiment 1

Scientific Observation & Description

Name _____

Per. _____

You will need to bring a candle to class and a box of matches. (A used candle is just fine. It and the matches will be used in several labs to come).

Purpose: To collect reliable data by observation.

Read this:

Everyone thinks of herself as a good observer. Yet there is much more to observation than meets the eye. It takes concentration, alertness to detail, ingenuity, and often just plain patience. It even takes practice. Try it yourself. See how complete a description you can write about a familiar object--say, a burning candle. Be "scientific" about this and start with an experiment. This means you should observe a burning candle in a laboratory, that is, a place where conditions can be controlled. But how do we know what conditions need be controlled? Be ready for surprises here!

The experiment is done on the second floor.

The experiment is done in the daytime.

The room lights are on.

Here are some conditions that might be important in your experiment.

The lab bench is near the door.

The windows are open.

You are standing close enough to the candle to breathe on it.

Why are these conditions important? Do they have something in common? Yes. there is the common factor that a candle does not operate well in a draft. Important conditions are often not as easily recognized as these. A good experimentalist pays much attention to the discovery and control of conditions that are important.

PROCEDURE:

First examine the candle carefully. Then light it and record on the back of this paper any observations as you can during a short period (15 minutes).

On the back of this paper, diagram the candle and write a description of a burning candle, based upon your list of observations and upon any additional observations of burning candles suggested below:

PART 2:

As you investigated the burning candle, no doubt many unanswered questions came to mind. Perhaps there are other questions for which you have been able to find satisfactory answers. The purpose of this experiment is to help you to find clues that will enable you to postulate answers to some of the unanswered questions. As you perform the experiments outlined below, keep thinking about possible answers to the following questions:

Why is the flame blue at the base, dark in the center, and yellow elsewhere?

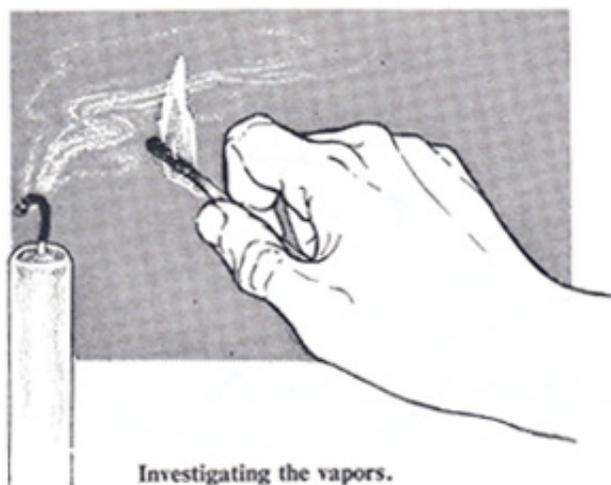
What is the purpose of the wick in a candle?

Why is it possible to extinguish a candle flame by blowing on it?

Why is the flame shaped as it is?

PROCEDURES 2:

1. Light the candle and allow it to burn about a half a minute. With a lighted match in hand, quickly blow out the candle and hold the match about a centimeter from the wick in the column of "smoke" emanating from the wick. See Figure below.



2. Record your observations.

3. Hold the flame of a lighted candle **against** a can lid or wire gauze. Note what happens when the lid or screen is brought into contact with the wick.

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4. Slowly bring a wire screen or can lid **down** upon a burning candle and note what happens.

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5. Finally slowly drip water onto the wick and make note of the results.

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6. Write an hypotheses explaining the above observations.

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