

Real Science-4-Kids

PHYSICS

Level I

Laboratory Worksheets

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Printed in Hong Kong



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Real Science-4-Kids: Physics Level I-Laboratory Manual

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Laboratory Safety

Most of these experiments use household items. However, some items, such as iodine, are extremely poisonous. Extra care should be taken while working with all chemicals in this series of experiments. Outlined below are some general laboratory precautions that should be applied to the home laboratory:

Never put things in your mouth without explicit instructions to do so. This means that food items should not be eaten unless it is part of the experiment.

Use safety glasses while using glass objects or strong chemicals such as bleach.

Wash hands after handling chemicals.

Use adult supervision while working with iodine and any step requiring a stove.

Keeping a Laboratory Notebook

A laboratory notebook is essential for the experimental scientist. In this notebook, the results for all of the experiment are kept together with comments and any additional information. For this curriculum, you should record your experimental observations and conclusions directly on these pages, which are designated as the laboratory notebook -- just like real scientists.

The experimental section for each chapter is pre-written. The exact format of a notebook may vary among scientists, but all experiments written in a laboratory notebook have certain essential parts. For each experiment, a descriptive but short *Title* is written at the top of the page together with the *Date* the experiment is performed. Below the title, an *Objective* and *Hypothesis* are written. The objective is a short statement that tells something about why you are doing the experiment, and the hypothesis tells what is the predicted outcome. Next, a *Materials List* should be written. The materials should be gathered before the experiment is started. Following the materials list, the *Experiment* is written. The sequence of steps for the experiment is written beforehand and any changes should be noted during the experiment. All of the details of the experiment are written in this section. All information that might be of some importance is included. For example, if you are to measure out 1 cup of water for an experiment, but you actually measured 1 and $\frac{1}{4}$ cup, this should be recorded. It is hard sometimes to predict how small variations in an experiment will affect the outcome and it is easier to track a problem if all of the information is recorded.

The next section is the *Results* section. Here you will record your experimental observations. It is extremely important that you be honest about what is observed. For example if the experimental instructions say that a solution will turn yellow, but your solution turned blue -- record blue. You may have done the experiment incorrectly or you might have discovered a new and interesting result, but either way it is very important that your observations be honestly recorded.

Finally, the *Conclusions* should be written. Here you will explain what the observations may mean. You should try to write only valid conclusions. It is important to learn to think about what the data actually show and what cannot be concluded from the experiment.

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Experiment 1: It's the Law!!

Date: _____

Objective: In this experiment we will use the scientific method to determine Newton's First Law of Motion

Materials:

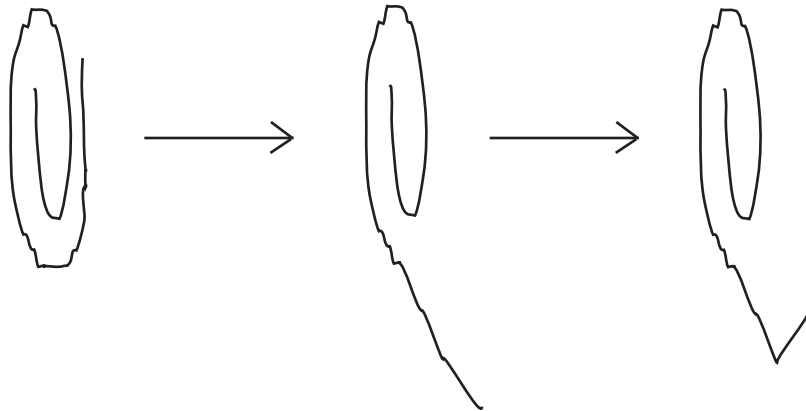
- tennis ball
- yarn or string (10 ft)
- paper clip
- marble

Experiment:

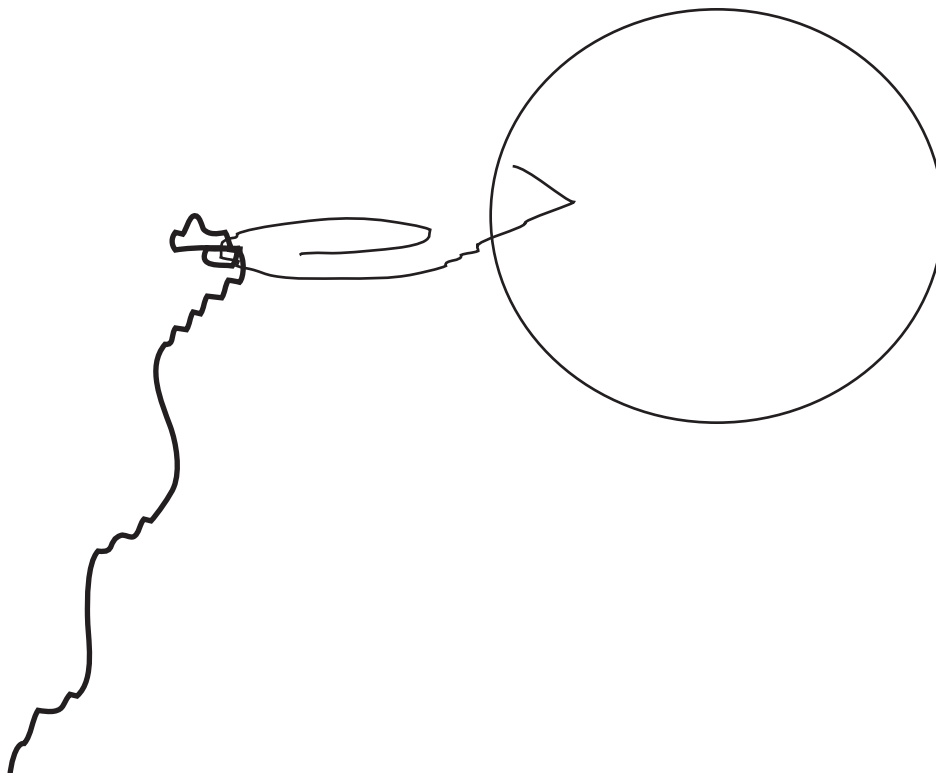
Part I

1. Take the tennis ball and throw it as far as you can. Observe how the ball travels through the air. Record what you see in the space below.


2. Now, take the string or yarn and attach it to the tennis ball using the paper clip. To do this, open the paper clip up on one side and slightly curve the end:



3. Put the extended curved end of the paper clip into the tennis ball by gently pushing and twisting.
4. Next, tie the string to the end of the paper clip.

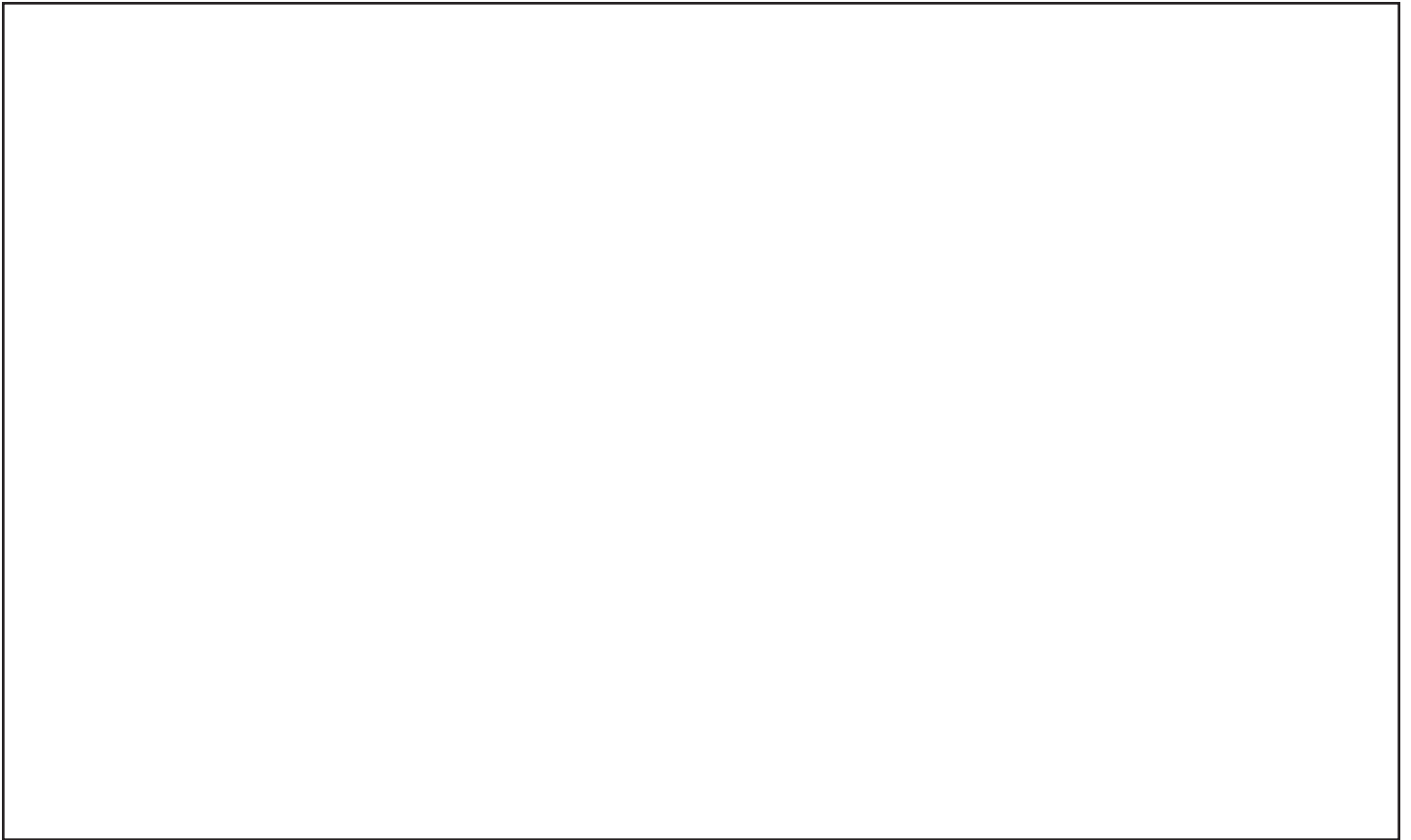


5. Holding onto one end of the string, throw the ball again into the air as far as you can. Note how the ball travels, and record what you see in the space below. Do this several times.



Part II

1. Take the marble and find a straight clear path on the floor or outdoors. Roll the marble on the floor and record how it travels. Note where and how it stops or changes direction. Do this several times and record your observations below.



Conclusions:

Review

Define the following:

physics

law

List the 5 steps of the scientific method:
