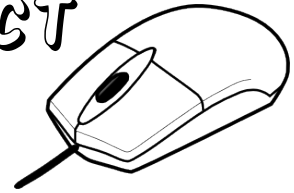




# SCIENCE FAIR PROJECT

## PACKET # 2 OF 4



### Science Fair Topic Research

Directions: Must use complete sentences for full credit.

**a. My Topic:** Rewrite your APPROVED question below.

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**b. Prior Knowledge:** What do I already know?

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**c. New Ideas to Explore:** What else do I need to know about my topic? What possible new ideas could I explore about the topic?

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### RESEARCH REFERENCES (SOURCES)

Using the ideas from **c.** above research your topic using the library, internet or other sources. While researching your topic make sure to keep a record of your resources on the following page.

**REQUIRED RESOURCES:** 3 sources minimum; 5 recommended

- At least **1 print source** (book, encyclopedia, newspaper, magazine)
- At least **1 electronic source** (website: must be pre-approved or a .gov or .edu)
- Student's choice** for final source (print, electronic(.com ok) or interview)

**d. Research Findings**

Possible Sources: Book/Encyclopedia, Newspaper/Magazine, Website, Professional Expert

1. Source Type: \_\_\_\_\_ Title: \_\_\_\_\_

Author(s): (Last, First) \_\_\_\_\_

Date Published: \_\_\_\_\_ Pages numbers used: \_\_\_\_\_

Website (if used): \_\_\_\_\_

**Information Learned:** \_\_\_\_\_

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2. Source Type: \_\_\_\_\_ Title: \_\_\_\_\_

Author(s): (Last, First) \_\_\_\_\_

Date Published: \_\_\_\_\_ Pages numbers used: \_\_\_\_\_

Website (if used): \_\_\_\_\_

**Information Learned:** \_\_\_\_\_

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3. Source Type: \_\_\_\_\_ Title: \_\_\_\_\_

Author(s): (Last, First) \_\_\_\_\_

Date Published: \_\_\_\_\_ Pages numbers used: \_\_\_\_\_

Website (if used): \_\_\_\_\_

**Information Learned:** \_\_\_\_\_

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*\*\*If you have additional references or need more space write them in your log book.\*\**

# Hypothesis

The **HYPOTHESIS** is another name for **an educated guess**. When you are writing the hypothesis you are trying to predict the **ANSWER** to your question. You should always give a **reason for your hypothesis** either from your own experiences or from the research you have done. For full credit you should also **provide the scientific background** for how you arrived at your hypothesis and **refer to your research**.

## FOR EXAMPLE:

### **Question:**

*Does soaking the bean seed before planting it effects how fast it will grow?*

### **Possible Hypothesis:**

*I think that bean plants that have their seeds soaked before planting will grow faster because it will make the hard seed covering soft. Also my research shows that seeds require water for them to sprout.*

Rewrite your APPROVED question in PEN below:

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## **Hypothesis & Research** (3-5 sentences with background research referenced)

### **Sentence Starters**

#### **Hypothesis** (1 long sentence)

*I think...because...*

*I predict that... because...*

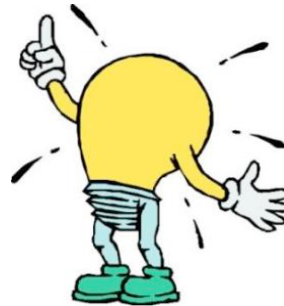
*Based on my observations... I infer...*

#### **Research** (2-4 sentences)

*In my research I learned...*

*According to (reference here)...*

*Using different resources such as... I found...*



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# Variables

Take time to identify your variables before you start your experiment. This will help you to write your procedures. A variable is something that you can change or be changed. **There are three kinds of variables called, independent, dependent, and controlled variables.**

In a well designed investigation there should be only **one** thing changed on purpose, called the **independent variable** (or manipulated variable).

*Example Question: Does the amount of sunlight a plant receives effect how fast it will grow?*

*In the example the thing I am changing on purpose how much sunlight the plant gets, full sunlight or shade. Therefore, the **amount of sunlight** is the **independent variable**.*

Whatever will be changed during the experiment due to the changing independent variable (or what you are hoping to change) is called the **dependent variable** (or responding variable). This variable is "dependent" on the one you change.

*In this example the thing that hopefully will change during the experiment is how fast the plant grows. Therefore, the **plants growth** is the **dependent variable** (responding variable).*

To make sure that your experiment is not influenced by anything else it is important to keep ALL other things that might be changed **the same** throughout the experiment. The things that are **kept the same** are called the **controlled variables**.

*In the above experiment the **control variables** would be the amount of water, the soil, the type and size of plant, the temperature, etc. Everything except the amount of sunlight and the growth of the plant*

## What Makes for Good Variables?

*For Good Variables, You Should Answer "Yes" to Every Question to the Right*

|   | YES                      | NO                       |
|---|--------------------------|--------------------------|
| Is the independent variable measurable?   | <input type="checkbox"/> | <input type="checkbox"/> |
| Can you change the independent variable during the experiment?  | <input type="checkbox"/> | <input type="checkbox"/> |
| Have you identified all relevant dependent variables, and are they all caused by and dependent on the independent variable? | <input type="checkbox"/> | <input type="checkbox"/> |
| Are all dependent variable(s) measurable?   | <input type="checkbox"/> | <input type="checkbox"/> |
| Have you identified all relevant controlled variables?  | <input type="checkbox"/> | <input type="checkbox"/> |
| Can all controlled variables be held at a steady value during the experiment?   | <input type="checkbox"/> | <input type="checkbox"/> |

## Identifying Variables

Independent Variable (What I will change on purpose): \_\_\_\_\_

Dependent Variable (What I think will change during the experiment): \_\_\_\_\_

Controlled Variable (What I will keep the same): \_\_\_\_\_