anaScience Fair Tasks for Middle School

Title _____

Purpose

What is the purpose of your experiment?

Example: To understand how light intensity affects plant growth.

_____

_____

Question

Find a question that interests you

Example: How does light wattage affect the height a plant can grow?

_____

_____

Background Research

What have you read about your topic? Write down a couple of paragraphs summarizing what you've read including details, but be sure to include an introduction and a conclusion.

Example:

(Introduction)

Plants are amazing organisms because they get energy in a unique way compared to other organisms. Unlike animals, most plants do not need to eat other organisms to get energy. Instead they need the sun.

(Summary):

Light energy is used in photosynthesis. Photosynthesis is a process in which plants change sunlight into energy. This is why plants do not need to eat food like we do. Instead, plants soak up water from their roots and absorb the sunlight in their leaves. But this is not all, they also "breath" in carbon dioxide through their leaves instead of oxygen like us. carbon dioxide is the same gas that we breathe out.

Photosynthesis is a very special process because by using their leaves, plants basically make oxygen, food for themselves and sugar for us. There are special parts in the leaves that allow plants to do this. There are tiny little holes in their leaves called "stomata". Here is where they take in carbon dioxide and breathe out oxygen. Chlorophyll in leaves absorb the sunlight that gives energy to create this process. Chlorophyll is what makes leaves green.

(Conclusion)

Plants use photosynthesis to get energy from the sun. With special parts of their leaves, called Chlorophyll, plants can convert water, sunlight and carbon dioxide into energy for themselves and oxygen for us! They are pretty amazing.

Introduction:_____

_____

_____

Summary (Include details)

_____

_____

_____

_____

Conclusion:_____

_____

_____

_____

_____

Bibliography

Be sure to write down your sources (where you got your information): title, author, date it was written and URL if it's a website. Organize it by: Author's Last name(s). Year. Title. URL (if applicable)

Example:

- Title: The Magic School Bus Gets Planted: A Book about Photosynthesis
  Author: Joanna Cole, Lenore Notkin, and Nancy E. Krulik
  Year: 1997

Write it like:

Cole, Notkin & Krulik. 1997. The Magic School Bus Gets Planted: A Book about Photosynthesis.

Example:

Title: Photosynthesis
Authors: James Alan Bassham and Hans Lambers
Year: 2018
URL: https://www.britannica.com/science/photosynthesis

Write it Like:

Bassham & Lambers. 2018. Photosynthesis.
https://www.britannica.com/science/photosynthesis

Sources:

Title _____
Author_____
Date was written _____
URL:

Title _____
Author_____
Date was written _____
URL:

Title _____
Author_____
Date was written _____
URL:

Title _____

Author_____
Date was written _____
URL:

Hypothesis

Write down what you predict could happen in an "If, then statement".

Example: If plants are placed in under a light bulb with high wattage, then the plant will grow taller than those that are not.

If I_____**, then**

_____

.

Variables

Identify your "independent variable": The part of your experiment that you are changing. Hint: it's in the "If" part of your hypothesis.

Example: If plants are placed under a light bulb with high wattage...

Independent Variable= Light Bulb Wattage

Independent Variable:_____

Identify your "dependent variable": The part of your experiment that should be effected by the change. Hint: it's in the "then" part of your hypothesis.

Example: ...then the plants will grow taller than those that are not.

____Dependent Variable: Plant Height

Dependent Variable: _____

Identify your "control group": The part of your experiment that should is not having any changes because this is what you're going to compare to in order to make sure that your experiment actually worked and it wasn't something else that changed things.

Example: Since I want to see how light affects plant growth, then my control group would be: plants that don't get any light.

Control group: Group C (plants with no light)

Control Group: _____

Materials

List the materials you're using and how much of each.

Example:

- Six tomato plants (all less than 1 inch tall)
- One desk lamp with a 60 watt LED light bulb
- One desk lamp with a 30 watt LED light bulb

_____

_____

_____

_____

Procedure

Plan an experiment to see if you are right, test it, and write down your results.What did you do and what things did you use? Write the exact steps of what you did and a list of things you used.

Example:

1. First, place three bean plants under each of the two lamps. The three last ones will not get any light
2. Second, label plants under the 60 Watt light bulb as Group A, plants under the 30 watt light bulb as Group B and plants with no light access as group C.
3. Third, water each plant with 1 tbsp of water each day
4. Fourth, each day measure how tall each plant is and record it

1. First,_____

2. Second,_____

3. **Third,** _____

4. **Fourth,**_____

_____

_____

Results

What did you observe?

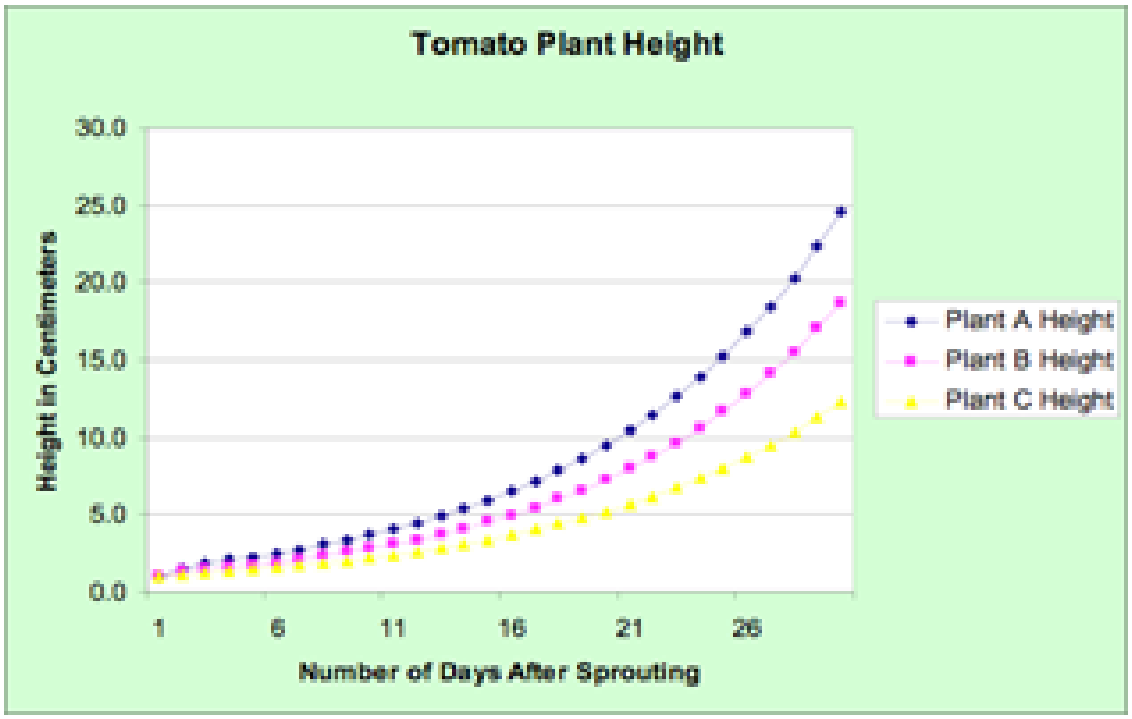
Write down what you measured, saw, heard, smelled or felt (touch). You can also take pictures or draw it. Be sure to keep a journal of your observations with the date of when you observed it. Create a scatter plot from the measurements you took. Hint: your independent variable goes on the x axis and your Dependent variable goes on the y axis.

Be sure to include your units and titles!

Example

Date	Observations	Measurement of Plants
September 3, 2018	Plants under the 60 watt light bulb are growing are growing leaves	60 Watt: 13 cm, 12 cm, 15 cm 30 Watt: 10 cm, 11 cm, 9 cm No Lightbulbs: 10 cm, 5

		cm,6 cm
September 10, 2018	No changes	60 Watt: 13 cm, 14 cm, 16 cm 30 Watt: 10 cm, 11 cm, 9 cm No Lightbulbs: 10 cm, 5 cm,6 cm
September 17, 2018	Plants under 30 watt light bulbs are kind of light green	60 Watt: 14 cm, 14 cm, 18 cm 30 Watt: 10 cm, 11 cm, 9 cm No Lightbulbs: 10 cm, dead,6 cm
September 24, 2018	Plants with no light are starting to turn yellow	60 Watt: 15 cm, 15 cm, 20 cm 30 Watt: 10 cm, 11 cm, 9 cm No Lightbulbs: 11 cm, dead,dead



Discussion

Explain what your results and data mean. Are there patterns? How is your dependent variable changing compared to the independent variable? Be sure to mention what part you're describing: your graph, chart, tables, pictures...etc.

Example: In my observations I noticed that plants grew unequal amounts each week. As shown in my graph, plant A grew the most, a total of 25 cm. I also noticed, as recorded in my chart, that around week 4 plants under light bulbs with less wattage started to turn yellow or died.

In my observations, I noticed _____.

My graph shows that_____.

My charts show that_____.

Conclusion

What did you figure out? Were you right (hypothesis)? How does this connect with what you researched? What new questions do you have? What will you do with your new information? What's next?

In my experiment, I saw that_____.

My hypothesis was (correct / Incorrect) _____ because _____.

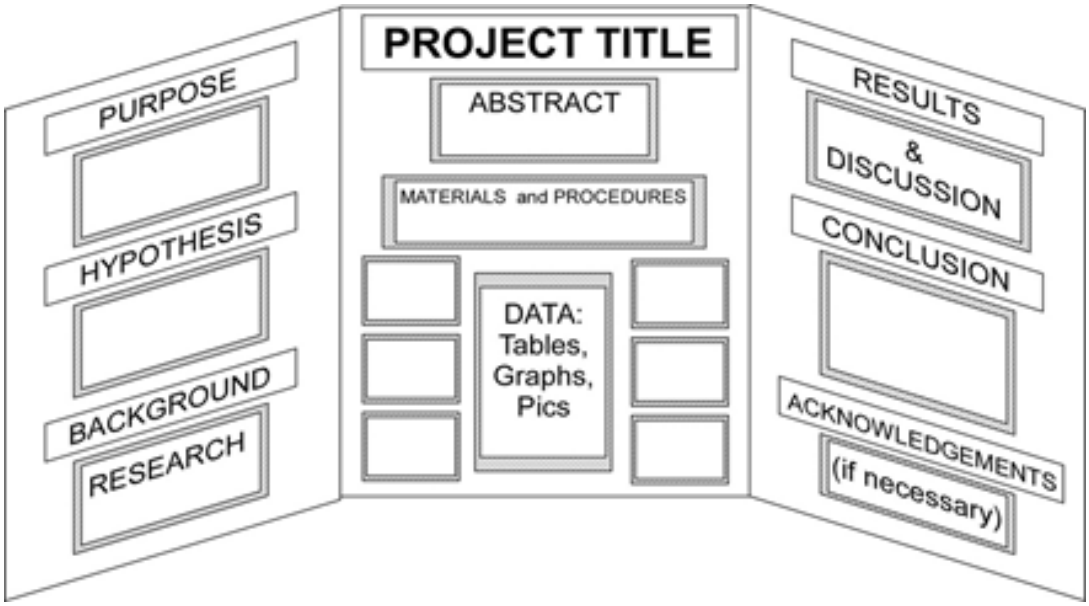
This agrees with what I learned in my research because_____.

Now I wonder if_____.

Abstract:
This is basically a one to two paragraph summary about your whole project. This is usually what you should write:
One sentence about your background research. One sentence about your hypothesis and variables. Two -three sentences about your procedure. Three to four sentences about your results and discussion. Two-three sentences about your conclusion.

Board: (You can buy one at the front office!)

36" tall by 48" wide and 30" deep



Deadline to turn in to the Classroom: _____

Science Fair Date: _____