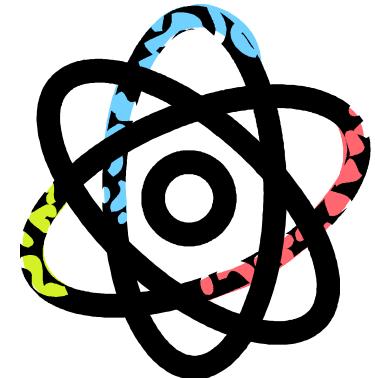


# **Myra Linn Elementary Family Education Night**

**Science Fair Projects  
From start to finish  
November 16, 2022**

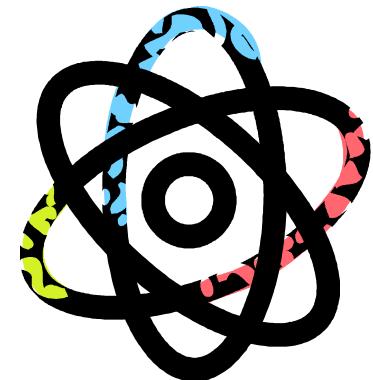


# **Escuela Primaria Myra Linn**

# **Noche de Educación**

# **Familiar**

**Proyectos para la Feria de  
Ciencias De principio a fin  
16 de noviembre, 2022**



# Videos:

- <https://www.youtube.com/watch?v=qAJ8IF4HI20>
- <https://www.youtube.com/watch?v=kKsGonHI0GE>
- <https://www.youtube.com/watch?v=tUP8rFWzVt4&t=137s>
- <https://www.youtube.com/watch?v=aLesk8fujH8>

***Step One: Pick a Problem***

***1er Paso: Escoger un Problema***

**Choose something of  
interest**

**Busque algo de  
interés**

**State the problem as  
a question**

**Declare el problema  
en forma de una  
pregunta**

## **Step 2: Research the Topic**

## ***2do Paso: Tópico de la Investigación***

**Go to the library for books and articles as well as search the internet and encyclopedia for information on your subject. This information will be put into your research report.**

**Record this information in your own words in your journal/notebook.**

***Vaya a la biblioteca por libros y artículos, y también al Internet y enciclopedias que tengan información sobre su tema.***

***Escriba esta información en sus propias palabras en un cuaderno diario.***



# **Reliable Websites for Research:**

- National Geographic
- Scientific organizations
  - NASA
  - NOAA
- Science museums
  - National Air and Space Museum
  - California Science Center
- Zoos
- Botanical Gardens

# Variables:

- Think about the **VARIABLES** that will be part of your experiment.
  - **Independent Variables**
    - These are the materials that you can manipulate by changing something.
    - Only one variable can be changed at a time.
  - **Controlled Variables**
    - These are the materials that will not change.
  - **Dependent Variables**
    - These are the variables that will change and can be measured or observed.

## Step 3: Form a Hypotheses

## 3er Paso: Forme una Hipótesis

- The hypothesis is your trial answer.
  - Use the information you gathered from your research or background knowledge to make an informed guess to your problem.
  - Must be written in the following format:  
If \_\_\_\_\_ then \_\_\_\_\_.
- *La hipótesis es su respuesta a lo que usted cree que sucederá.*
  - *Use la información que haya obtenido de su investigación y conocimiento para formular la hipótesis que conteste su problema.*
  - *Debe escribirse en la siguiente forma:*
  - *Si \_\_\_\_\_ entonces \_\_\_\_\_.*

## Step 4: Plan the Experiment

### 4to Paso: Planear el Experimento

- The experiment must test your hypothesis.
- Make a list of materials you will need.
- Plan the method or procedure you will take.
- *El experimento debe probar su hipótesis.*
- *Haga una lista de los materiales que va a necesitar.*
- *Planee el proceso o método que va a seguir.*

# Step 5: Do the Experiment

## 5to Paso: Haga el Experimento

- Carry out your experiment according to your plan.
- Keep careful notes and records of all observations (daily log) and information.
- *Haga el experimento de acuerdo con su plan.*
- *Escriba todas sus notas con cuidado y datos de todas sus observaciones e información.*



## **Step 6: State your Conclusion**

### ***6to Paso: Declare su Conclusión***

- Tell what happened in the experiment and whether or not the results supported your hypothesis.
- The hypothesis was correct or incorrect.
- Diga lo que sucedió en su experimento y si los resultados apoyaron su hipótesis o no.
- La hipótesis es correcta o incorrecta

# **Experiment vs Demonstration**

# **Experimento vs Demostración**

- **Experiment**- a test or tentative procedure; an act or operation for the purpose of discovering something unknown.
- **Demonstration**- a description or explanation using examples
  - **Examples of demonstration projects:** make a volcano or the solar system.

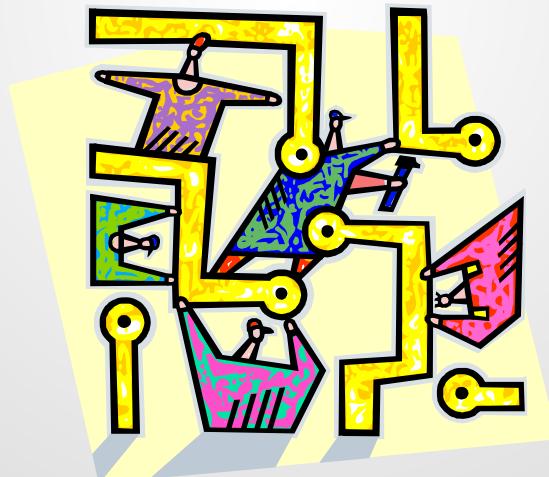
**Experimento**- un examén o procedimiento tentativo; un acto o operación con el proposito de descubrir algo nuevo.

**Demostración**- una descripción o explicación usando ejemplos

**Ejemplos de proyectos de demostración:** hacer un volcan o el sistema solar.

# Project Example

## *Ejemplo*



# Problem/*El Problema*

- What type of cup (glass, plastic, paper, styrofoam) is the best insulator to keep a drink the coldest?



- *Qué clase de vaso (vidrio, plástico, papel, styrofoam) es el mejor insulador para mantener una bebida lo más fría posible?*

# Hypothesis/Hipótesis

- From my research, I predict the glass cup will make the best insulator to keep the liquid coldest because glass has a silver coating that refracts heat.
- *De acuerdo a mi investigación, yo predigo que el vaso de vidrio será el mejor insulador para mantener el líquido más frío porque el vidrio tiene una capa de plata que refracta el calor.*

# Materials/Materiales

- Materials:
  - ❖ 20 oz. Paper, Plastic, Glass, and Styrofoam cup (1 each)
  - ❖ Pitcher
  - ❖ Water
  - ❖ Thermometer
  - ❖ Watch or clock
  - ❖ Ice Cubes (20 same size cubes, 5 per cup)
- Materiales
  - ❖ Vaso de 20 oz. de papel, plástico, vidrio, y styrofoam (1 de cada uno)
  - ❖ Jarra
  - ❖ Agua
  - ❖ Termómetro
  - ❖ Reloj
  - ❖ Cubos de hielo (20 de la misma medida, 5 por vaso).

# **Procedure/Procedimiento**

- Gather supplies necessary to conduct experiment.
- Fill pitcher with 6 quarts of water.
- Put the pitcher in the refrigerator.
- Leave the pitcher in the refrigerator for about 20 minutes until the water cools.
- Calibrate the thermometers by putting them in the same container of liquid to make sure they record the same temperatures.
- Pour 20oz. of water in the glass, paper, plastic, and styrofoam cups.
- *Colete todo lo que necesita para conducir el experimento.*
- *Llene la jarra con 6 cuartos de agua.*
- *Ponga la jarra en el refrigerador.*
- *Deje la jarra en el refrigerador por cerca de 20 minutos hasta que se enfíe el agua.*
- *Calibre los termómetros poniéndolos en el mismo recipiente de liquido para asegurarse que estén a la misma temperatura.*
- *Vacíe 20 onzas de agua en los vasos de vidrio, de papel, de plástico, y de styrofoam.*

# Procedure / Procedimiento

- For one hour, in 10 minute intervals, check the temperature in each cup and record findings in log.
- Record data from log onto a graph.
- Repeat the experiment by adding 5 ice cubes into each cup of 16oz. of water.
- *Por una hora, cada 10 minutos, chequee la temperatura de cada vaso y escríbala en su cuaderno.*
- *Pase la información del cuaderno a una gráfica.*
- *Repita el experimento añadiendo 5 cubos de hielo a cada vaso de 16 onzas de agua.*

# **Results/Resultados**

## **Without Ice**

- The styrofoam cup kept the liquid the coldest, with a temperature of 50 degrees Fahrenheit. The runner-ups were the plastic and paper cups, with a temperature of 56 degrees Fahrenheit. The cup with the highest temperature was the glass cup with a temperature of 57 degrees Fahrenheit.

## ***Sin Hielo***

- *El vaso de styrofoam mantuvo el líquido más frío, con una temperatura de 50 grados Fahrenheit. Los que siguieron fueron los vasos de plástico y de papel, con una temperatura de 56 grados Fahrenheit. El vaso con la temperatura de 57 grados Fahrenheit, fue el de vidrio.*

# Results/Resultados

## With Ice

- The styrofoam cup showed the same result of having the coldest temperature as in the experiment without ice. The runner-up was the paper cup with a temperature of 32 degrees Fahrenheit. The glass and plastic cups had the warmest temperatures. The ice completely melted in the glass cup after 2 hours 25 minutes. It took 3 hours 3 minutes for the ice to melt in the plastic cup and the ice took 3 hours 11 minutes to melt in the paper cup and finally 4 hours 43 minutes for the ice to dissolve in the Styrofoam cup.

## Con Hielo

- *El vaso de styrofoam mostró los mismos resultados con la temperatura más baja como con el experimento sin hielo. Los que siguieron fueron el vaso de papel con una temperatura de 32 grados Fahrenheit. Los vasos de vidrio y plástico con las temperaturas más altas. El hielo se derritió por completo en el vaso de vidrio después de 2 horas 25 minutos. Tomó 3 horas 3 minutos para que el hielo se derritiera en el vaso de plástico y 3 horas 11 minutos para que se derritiera en el vaso de papel y finalmente 4 horas 43 minutos para que el hielo se disolviera en el vaso de styrofoam.*

# Conclusion/Conclusión

- After analyzing the information, I concluded that my hypothesis was incorrect. I learned that a glass isn't the best insulator to keep a liquid coldest with or without ice cubes. The data indicated that the styrofoam cup was the best insulator to keep liquids cold with or without ice cubes. The glass cup actually allowed the water to get warmer quicker than the styrofoam cup.
- *Después de analizar la información, yo concuí que mi hipótesis estaba incorrecta,. Yo aprendí que un vaso de vidrio no es el mejor insulador para mantener un liquido mas frío con o sin cubos de hielo. Los datos indicaron que el vaso de styrofoam es el mejor insulador para mantener los líquidos fríos con o sin cubos de hielo. El vaso de vidrio permitió que el agua se calentara más rápidamente que el vaso de styrofoam.*

# **Conclusion/Conclusion**

- Without ice cubes in the cups there was a 7 degree change between the final temperatures of the styrofoam cup and the glass cup.
- Sin los cubos de hielo en los vasos hubo un cambio de 7 grados entre las últimas temperaturas de los vasos de styrofoam y de vidrio.*

# Conclusion / Conclusion

If I did this experiment again, I would change the following:

1. I would repeat the experiment with various sized cups.
2. I would place lids on some cups and not on others.
3. I would also do this experiment in different environments.
4. I would also test my project with different kinds of liquids.

*Si yo hiciera este experimento otra vez, haría los siguientes cambios:*

1. *Yo repetiría el experimento con vasos de diferentes medidas.*
2. *Yo le pondría tapas a unos vasos y otros no.*
3. *Yo haría este experimento en diferentes ambientes.*
4. *Yo también experimentaría con diferentes clases de líquidos.*

# The Notebook

## *El Cuaderno de Ciencia*

- Title Page
  - Table of Contents
  - Problem
  - Research
  - Hypothesis
  - Materials
  - Procedure
  - Observations
  - Results/Data
  - Conclusions
  - Acknowledgements
  - Resources Used
- *Página de título*
  - *Tabla del contenido*
  - *Problema*
  - *Investigación*
  - *Hipótesis*
  - *Materiales*
  - *Procedimientos*
  - *Observaciones*
  - *Resultados/Análisis*
  - *Conclusión*
  - *Reconocimiento*
  - *Bibliografía*



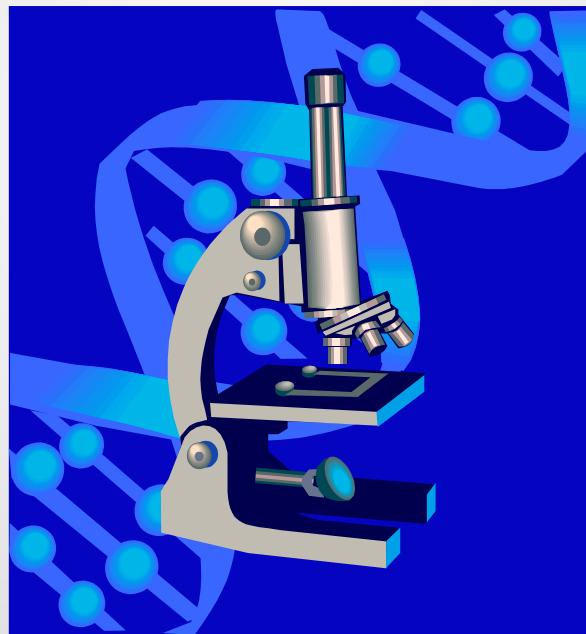
How to put the board together/Como terminar el proyecto

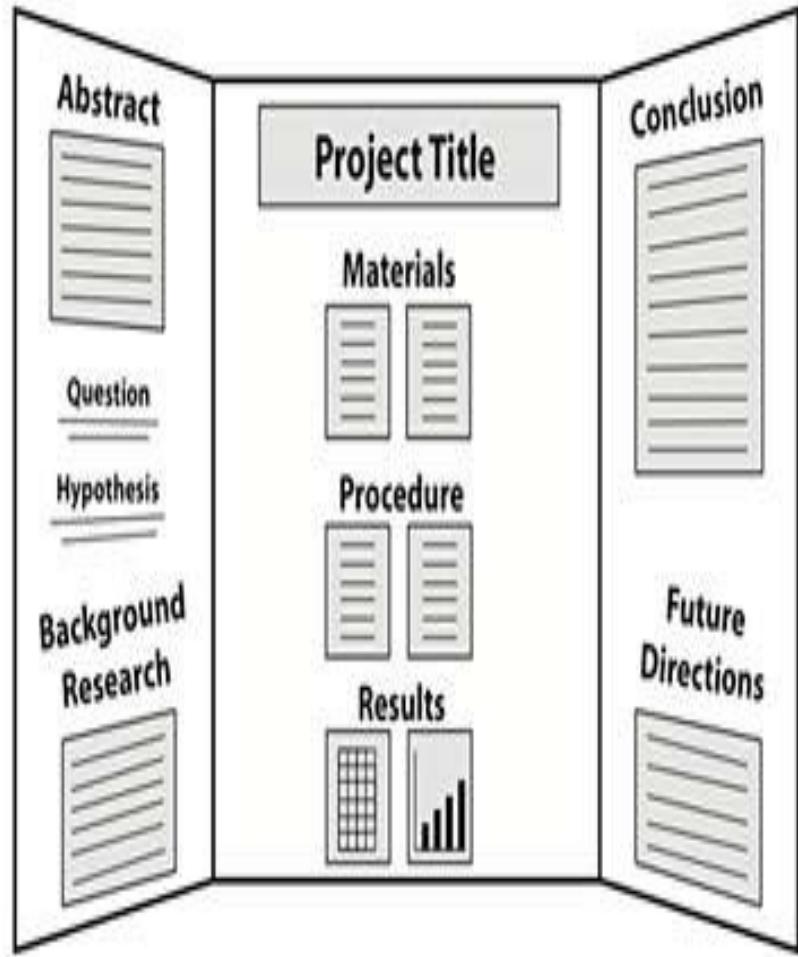
Check off list/Lista

Samples/Ejemplos

Questions/Preguntas

- Thank you for coming and supporting your son/daughter
- Gracias por venir y apoyar a su hijo/hija





# What Color of Light is Important for Photosynthesis?

**QUESTION**

I read a story about a gardener who wanted to plants grow better. So, he covered his greenhouse with green color. A month later, he found all the plants died. I wonder what color is important for photosynthesis?

**HYPOTHESIS**

My hypothesis is that leaves under red and blue will grow the best, under yellow and green light will grow the worst. This hypothesis is based on the absorbance spectrum of chlorophyll.

**MATERIALS**

- 7 Black poster board
- Sissors
- transparency tape
- LED lights (from white, blue, red, yellow, and green colors from Radio shack.)
- 5 D-cell batteries
- 6 thin coated wires (about 7ft)
- 10 disposable plastic drinking cup
- All purpose soil.
- A digital camera

**PROCEDURE**

- Make 5 cylinders and tops (height: 8", diameter: 4") with black poster boards.
- Connect all 5 LED lights to the batteries to make a close proximity to each other.
- Again wrap LED lights inside the top of cylinders.
- 3 days before the experiment, buy a bunch of fresh radish with leaves on them and store in the refrigerator.
- Cut off the old leaves, plant radishes into cups, and wait 3 days for new leaves to come out.
- Pick 5 healthy radishes with leaves in similar size.
- Put 5 of those plants under LED lights in the cylinder, no plant under no light, and leave another plant without any cylinder. Turn on the LED lights and keep them on for 72 hours.
- Remove cylinders from the plants and record growth differences in color and shape changes of the leaves.

**DATA**

Design	No Cover	White Light	Black Light	Red Light	Yellow Light	Blue Light	Green Light
Color	Light green	Dark green	Light green	Yellow green	Yellow green	Yellow green	Yellow
Size	Normal size, uncovered leaves	Same size, but leaves are not very green	Same size, but leaves are not very green	Same size, but leaves are not very green	Same size, but leaves are not very green	Same size, but leaves are not very green	Small size, small and normal leaves
Growth height	2 inches	2.5 inches	2.4 inches	2.3 inches	2.2 inches	2.1 inches	1.5 inches
Growth weight	0.5 oz	0.6 oz	0.55 oz	0.52 oz	0.51 oz	0.5 oz	0.45 oz

**Circuit Set up for LED Lights**

**RESULTS**

Plant in the dirt did not grow, leaves shriveled. Plant under white light grew normal with new leaves coming out, but not equally as much as uncovered leaves. Leaves under green light did not grow and turned to yellow after 72 hours. Yellow light affected leaves to grow slow. Blue and red are most essential to the photosynthesis of radish leaves. Red light gave stronger support of photosynthesis. Blue light made photosynthesis less efficient as to red light. The growth sequence of plants under different colors of light was: No cover > white > red > blue > yellow > green > green.

**QUESTION**

My experiments approved my hypothesis. Leaf has preferences for different color of light. My results showed that red and blue are most essential color of light for photosynthesis. Plants were green and grow well under these lights. Green light was the least effective color because most green plants are green. Yellow light was not green and blue light, which means yellow is needed but not essential. In my experiment, 72 hours continuously under light did affect the growth of plant, since plant uncovered grew better than the plant under white light. Overall, my results is supportive to that three set of experiments with different plants supported my hypothesis. This project can provide information to both farmers, gardeners, and house plant lovers. The finding could help plant grow by giving their color, or it could save plant by avoiding harmful/unnecessary color of light.

**CONCLUSION**

Photosynthesis is a process producing food for plants. Chlorophyll captures sunlight in a leaf for photosynthesis. The purpose of this project was to find out what color of light is essential for photosynthesis. Radishes were covered under different colors of LED lights (white, blue, red, yellow, green). Growth height and leaf color changes were recorded. As expected, radish in the dark without radio under white light grew well. The results showed that red and blue light were most essential for radish photosynthesis. Yellow light was useful, but the efficiency of photosynthesis was dramatically reduced. Green light was least essential.

**ABSTRACT**

My initial thought about this project was to use house plant, but the house plant I picked either grew too slow or were not sensitive to sunlight as I expected. And I was also winter time, most of the time was cloudy during my experiment. So, I decided to use radish. Radish is a color direct sunlight, and it's easy to take care of. While I was wrapping up the results from radish, the individual covered leaves showed similar results though it took about 20 days to show the expected results. If I repeat this project, I will try different species of plants and in different seasons.

**FUTURE CONSIDERATION**

Plant under white light grew normal with new leaves coming out, but not equally as much as uncovered leaves. Leaves under green light did not grow and turned to yellow after 72 hours. Yellow light affected leaves to grow slow. Blue and red are most essential to the photosynthesis of radish leaves. Red light gave stronger support of photosynthesis. Blue light made photosynthesis less efficient as to red light. The growth sequence of plants under different colors of light was: No cover > white > red > blue > yellow > green > green.

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# The Display/La Presentación