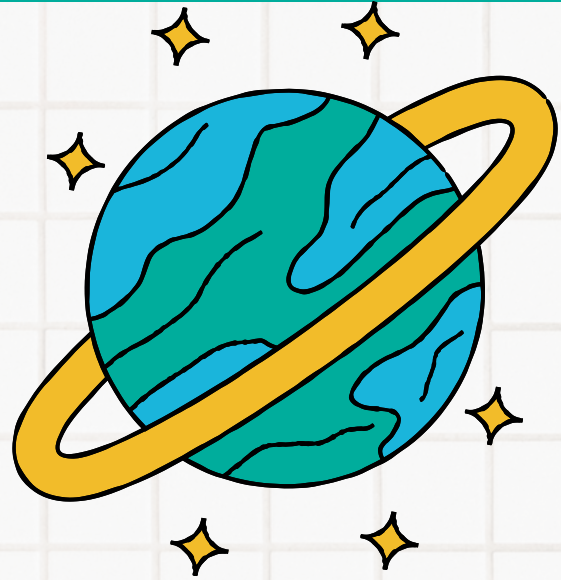


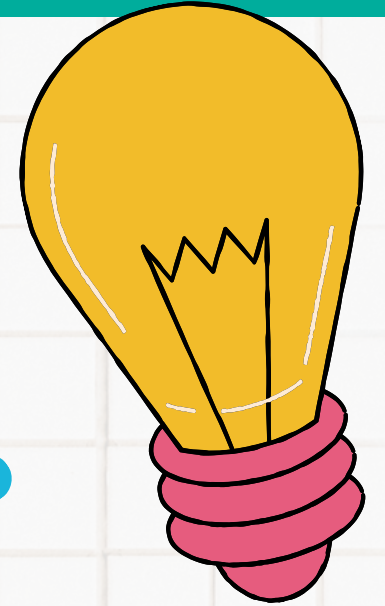


# GUADALUPE 1ST ANNUAL SCIENCE FAIR

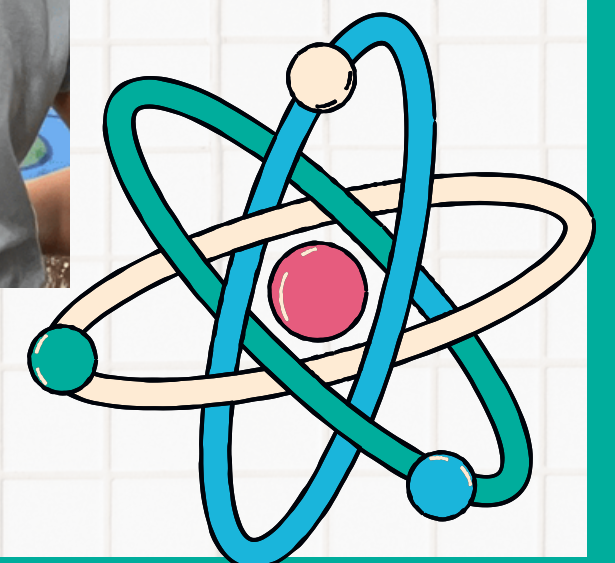
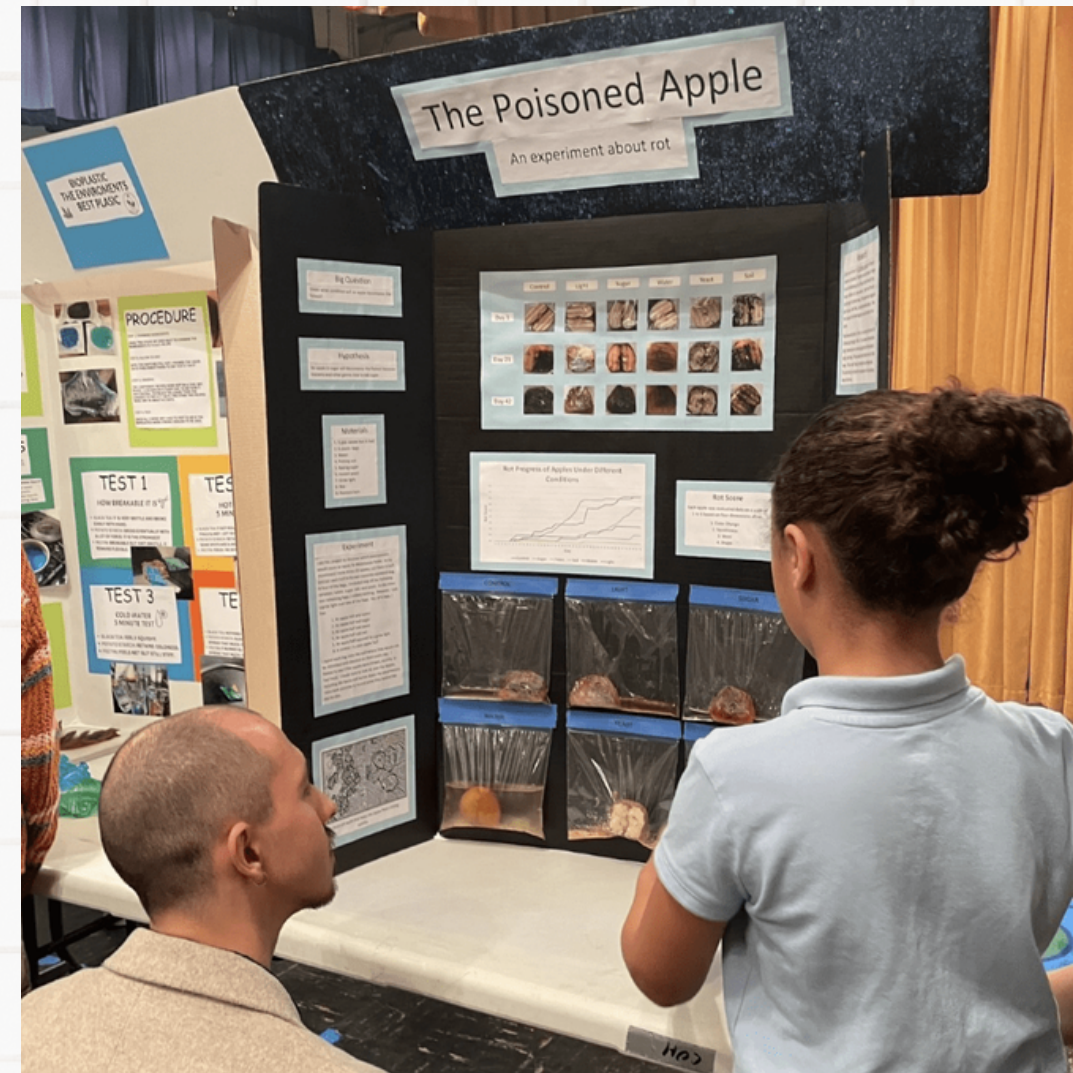
**THE SCIENTIFIC METHOD**



# WHAT IS A SCIENCE FAIR?

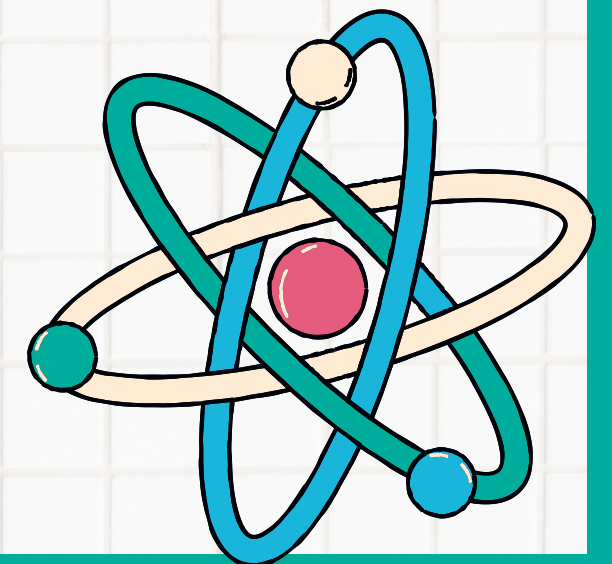
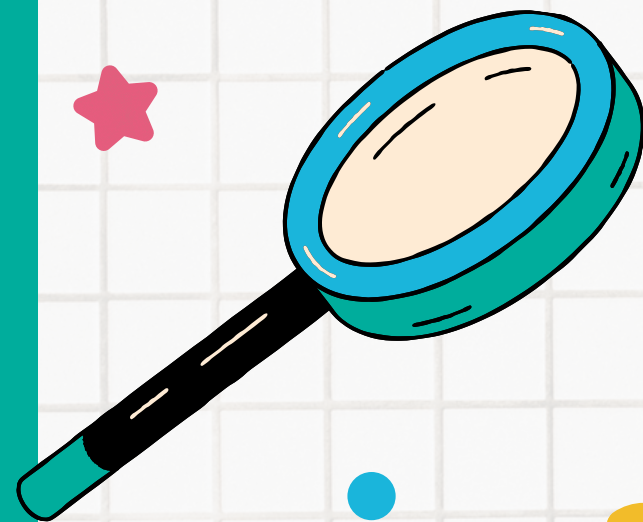
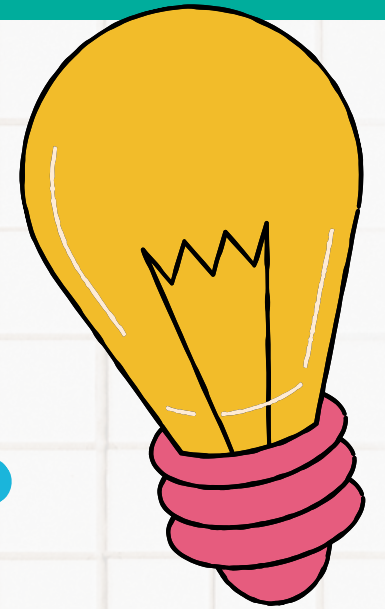
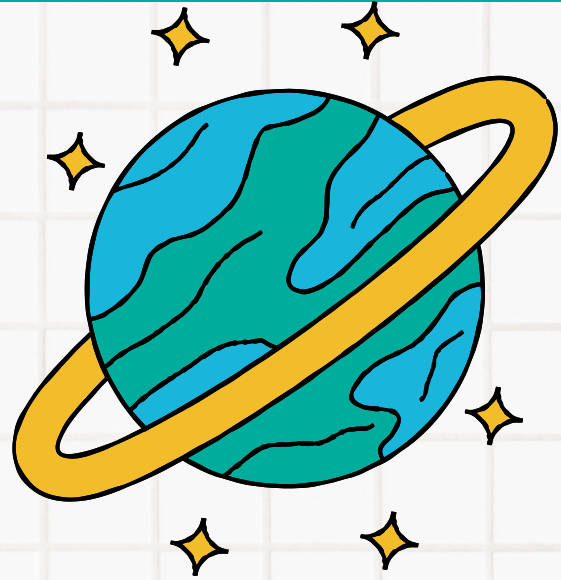


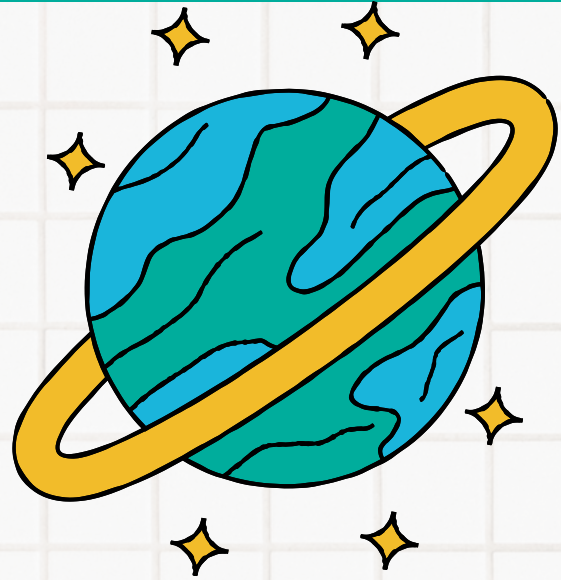
- Event to promote the scientific inquiry
- Students display boards documenting their experiment
- Attendance open to students, parents, teachers and Guadalupe community
- Volunteer run
- Goal: Have fun and promote science



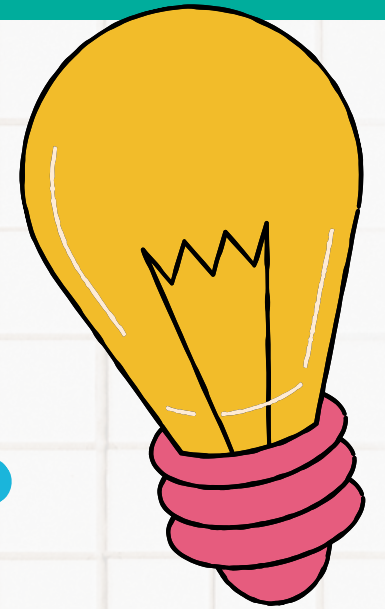
# IMPORTANT FACTS

- Open K-5 students
- No entrance fee
- Materials provided by parents
- Students work individually
- Students will have 6 weeks to choose a category/topic
- Students will have 7 weeks to work on their project
- Work done outside of school hours (not part of school curriculum)
- Parent help needed
- Notable projects will receive awards
- Participation not mandatory





# \* WHAT NEEDS TO BE TURNED IN? \*



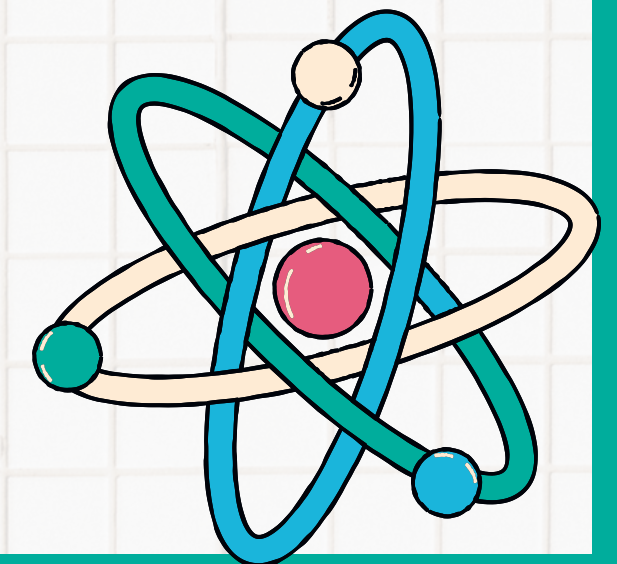
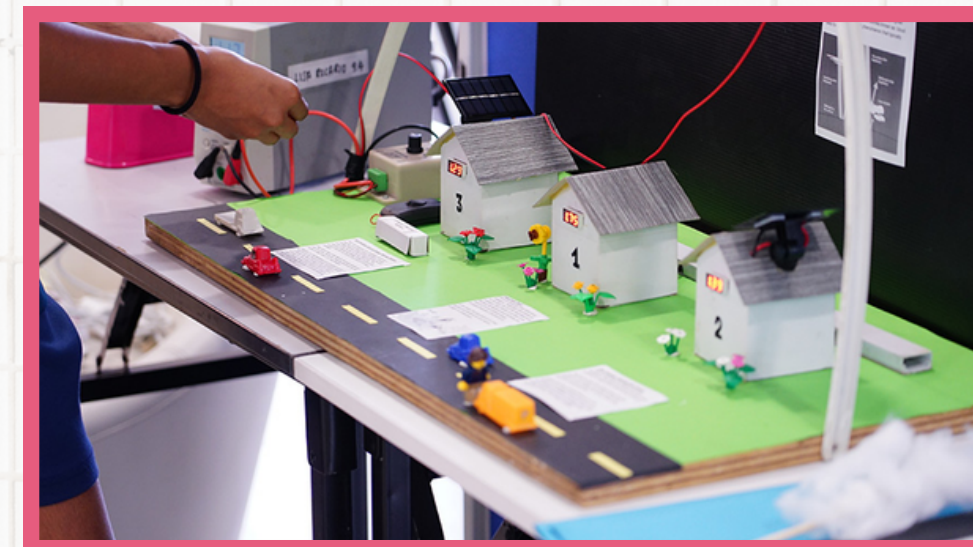
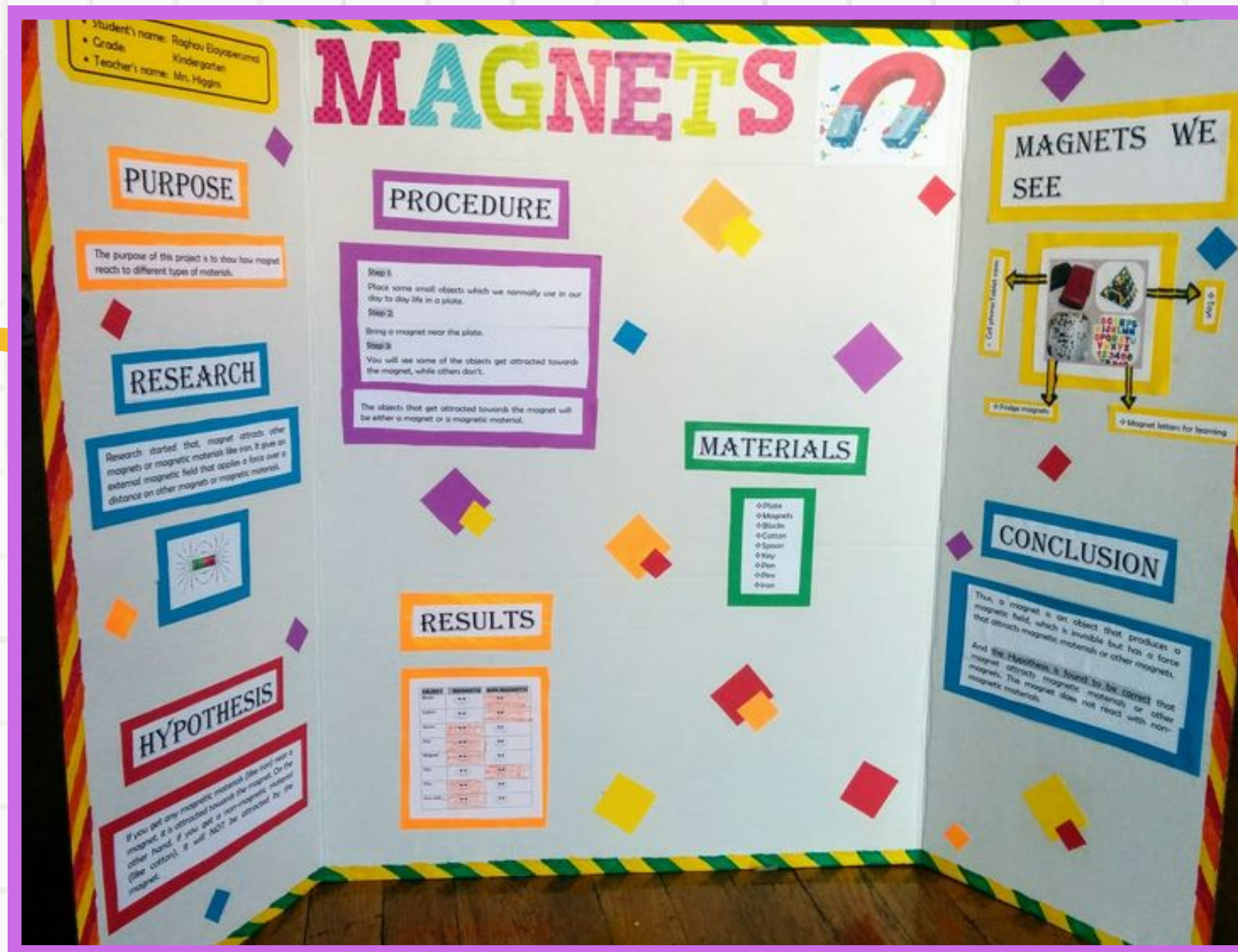
**YES**  
DISPLAY BOARD

**NO**

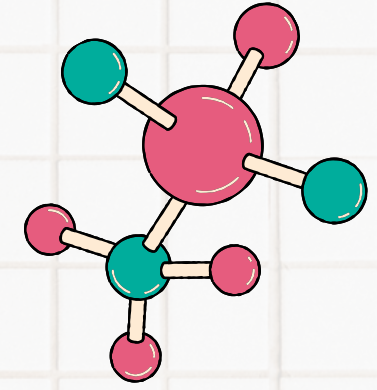
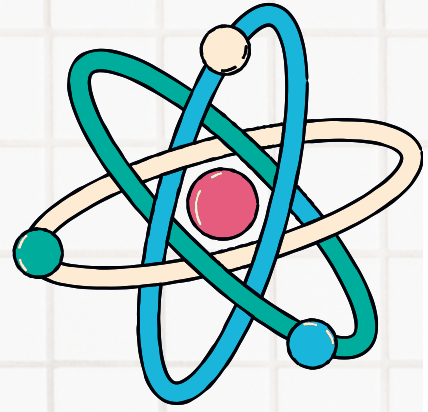
- NO LOG BOOK
- NO WRITTEN REPORT
- NO ORAL PRESENTATION TO JUDGE

**OPTIONAL**

- INTERACTIVE DEMO OR PROPS



# KEY DATES

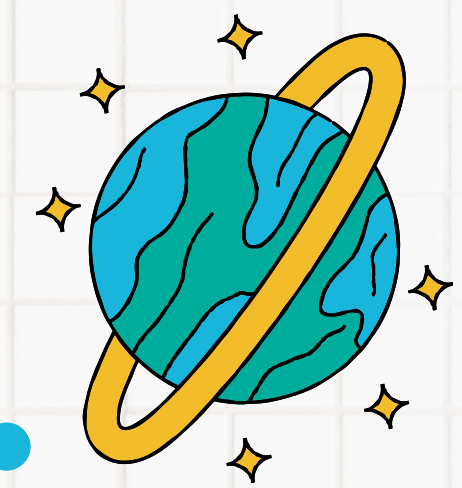


Nov 29	Submit <a href="#">Science Fair Participation Form</a>
Jan 15	Submit <a href="#">Science Fair Project Form</a>
Jan 22	Project Forms approved (students receive Scientist-in-training badges) <input type="checkbox"/>
Jan 23-Mar 12	Students work on science projects at home (see Suggested Timeline below)
March 13	Students turn in tri-fold display boards and set-up
March 14	Projects are judged
March 14	Science Fair (community viewing and awards ceremony)





# SUGGESTED TIMELINE



Nov 29

**Submit Entry Form**

Dec 1-Jan 14

**Brainstorm Topics**

Resources in Planning Guide

Jan. 15

**Submit Project Form**

Jan 22

**Project Approved**

Look out for email

**Week 3  
Feb 9-16**

**Gather Materials**

- Order materials
- including Tri-fold display

**Week 2  
Feb 1-8**

**Design Experiment**

- Identify Variables
- Review Safety

**Week 1  
Jan 22-30**

**Research**

- Need 3 references

**Week 4 &5  
Feb 16-Mar 1**

**Perform Experiment**

- at least 3 times
- collect data

**Week 6  
Mar 1-8**

**Analyze Data**

- make graphs
- looks at trends

**Week 7  
Mar 8-13**

**Display Board**

- review judging rubric
- include all steps of Scientific Method

**Mar 13**

**Delivery**

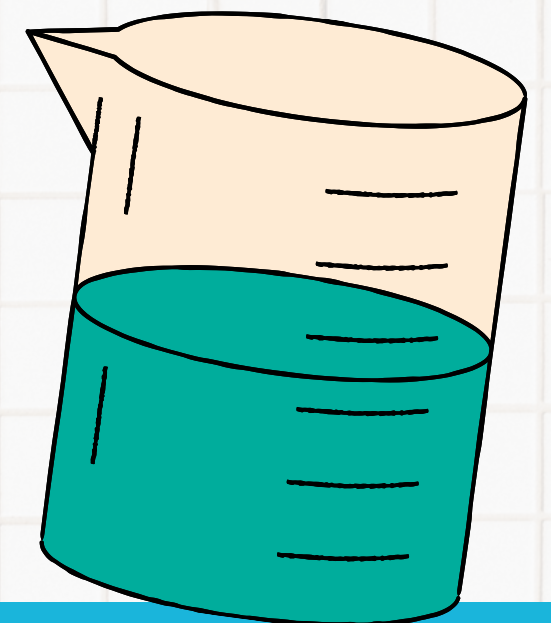
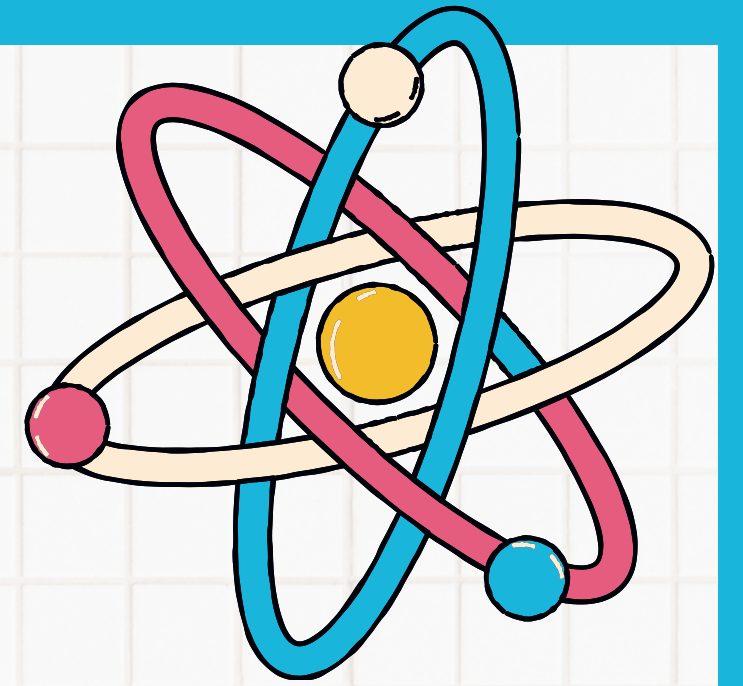
Set-up



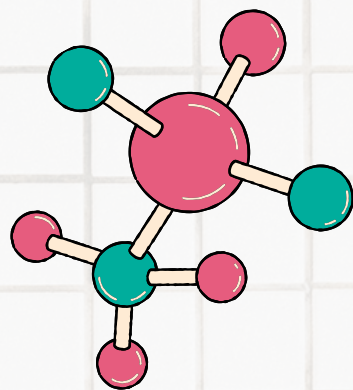
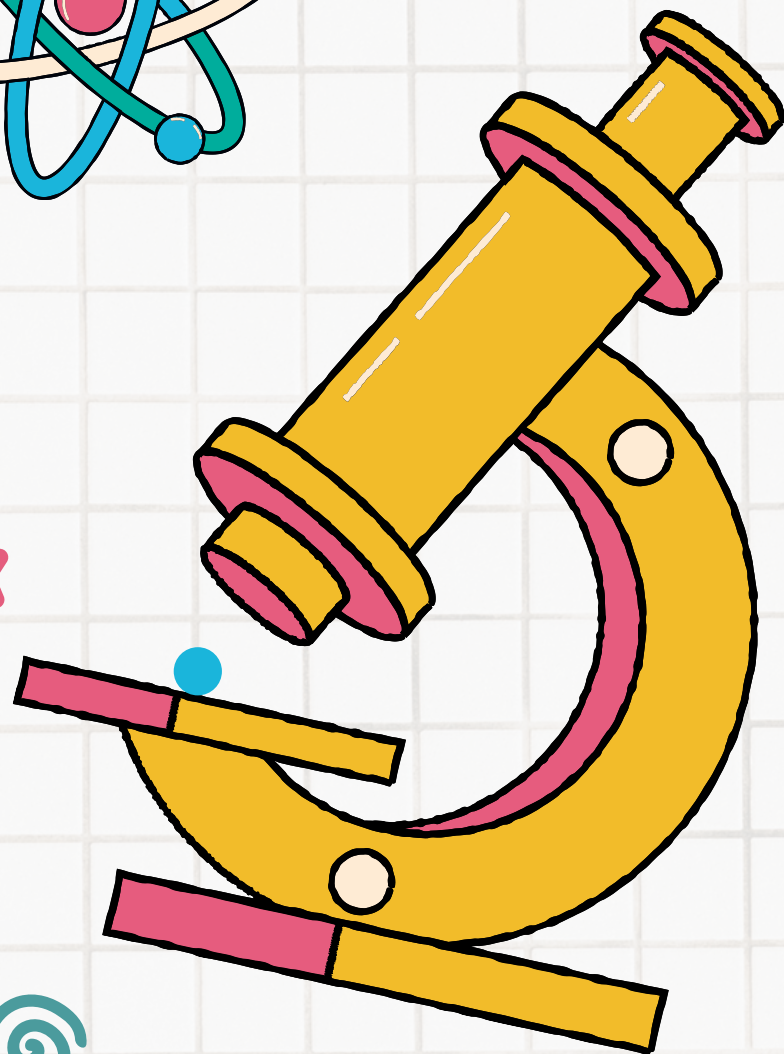
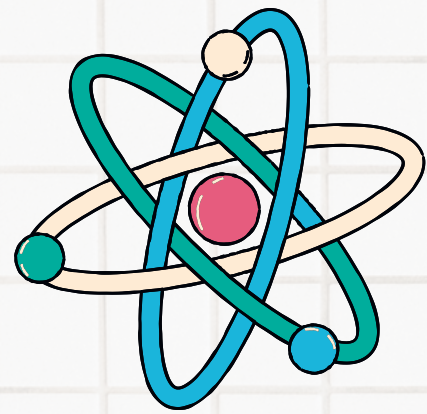
# PARENT RESPONSIBILITIES

1. SUBMISSION OF ENTRY AND PROJECT GOOGLE FORMS
2. ENSURE SAFETY RULES ARE FOLLOWED
3. GUIDANCE ON PICKING TOPIC
4. HELP WITH RESEARCH
5. HELP WITH CONDUCTING/DOCUMENTING EXPERIMENT(PHOTOS)
6. STAYING ON SCHEDULE
7. HELP WITH DISPLAY BOARD SET-UP AND DISASSEMBLY

**DO NOT DO THE PROJECT FOR YOUR CHILD**



# SIGN-UP



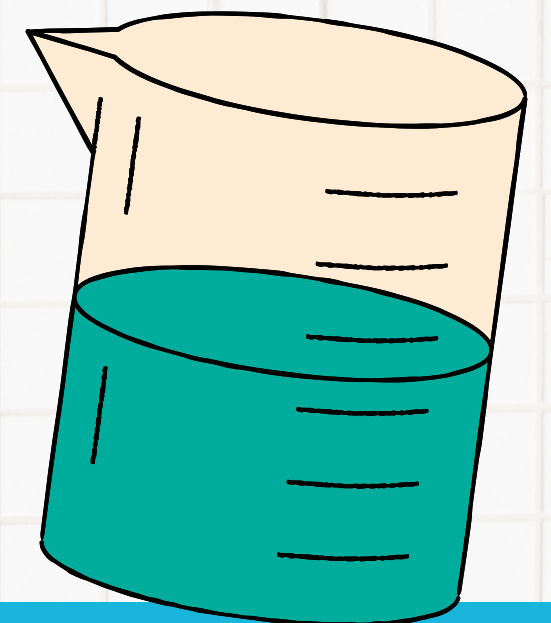
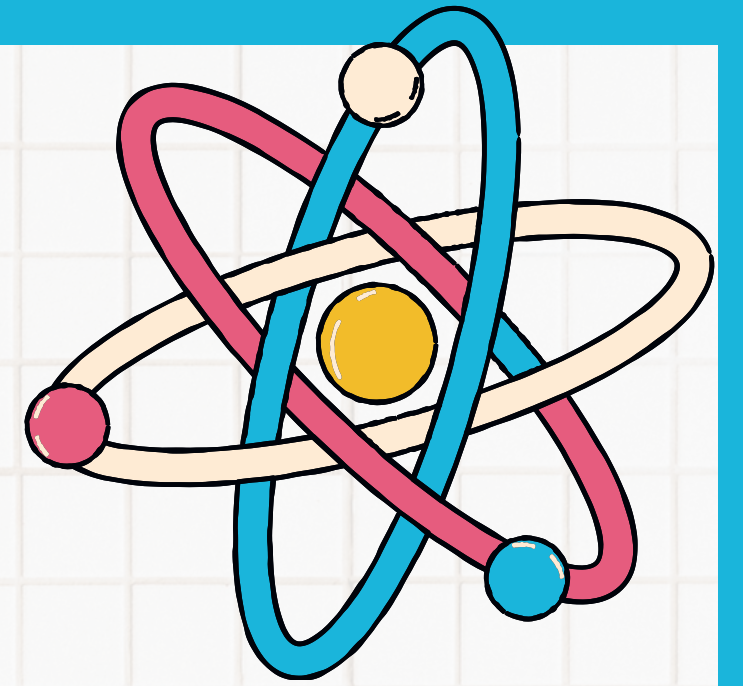
- Entry Deadline: **Nov. 29 by 5pm**  
**Science Fair Participation Form**
- Project Deadline: **Jan. 15 by 5pm**  
**Science Fair Project Form**
- Display boards due: **Mar. 13**
- Science Fair: **Mar. 14**



# WHAT'S IN THE PLANNING GUIDE?

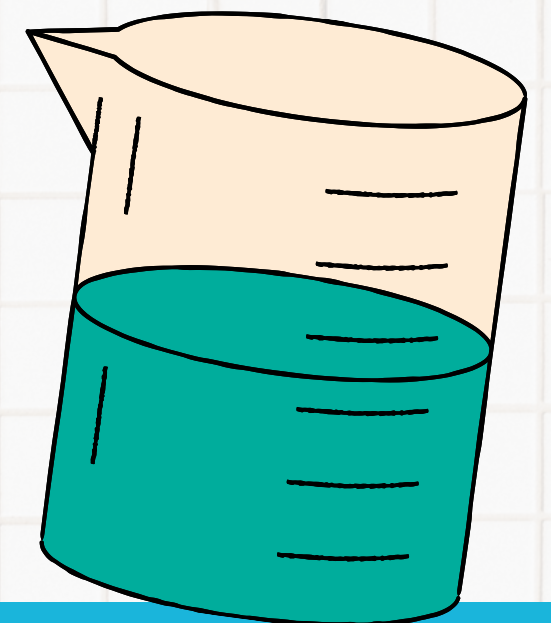
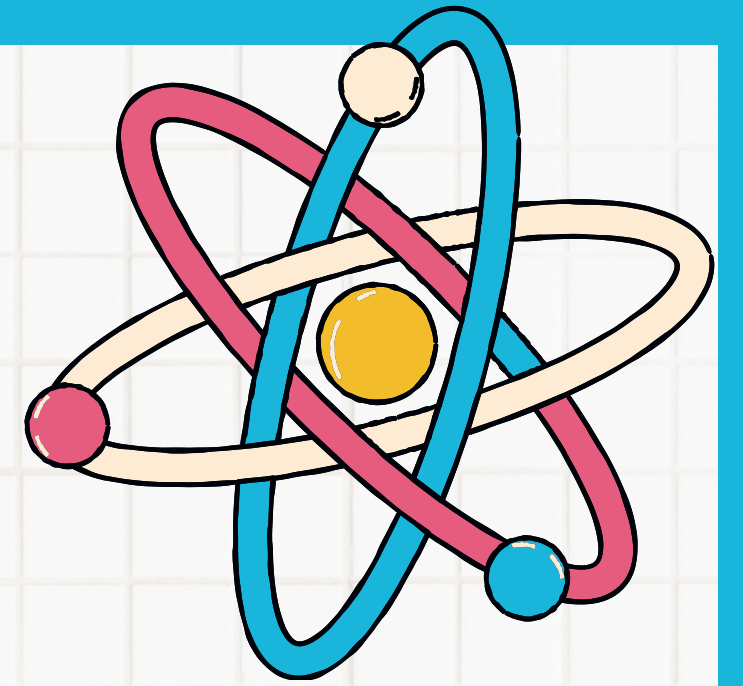
LINK: [SCIENCE FAIR PLANNING GUIDE](#)

- SCIENCE CATEGORIES: LIFE, PHYSICAL, EARTH
- SAFETY RULES
- HELP CHOOSING A TOPIC/QUESTION
- TYPES OF PROJECTS
- SCIENTIFIC METHOD WORKSHEET
- PROPOSED WORK TIMELINE
- DISPLAY BOARD GUIDELINES
- JUDGING RUBRIC
- LIST OF ONLINE RESOURCES



# SAFETY RULES

1. NO EXPERIMENTING ON ANIMALS OR ANIMAL TISSUE
2. ADULTS MUST SUPERVISE EXPERIMENT
3. NO EXPLOSIVES, DRUGS, OR ALCOHOL
4. DO NOT TOUCH/TASTE DANGEROUS CHEMICALS
5. WEAR EYE/EAR PROTECTION
6. NO CULTURING OF DANGEROUS MICRO-ORGANISMS
7. NO EATING/DRINKING DURING EXPERIMENT
8. DISPOSE OF WASTE PROPERLY
9. KNIVES OR OTHER SHARP OBJECTS MAY NOT BE DISPLAYED
10. USE INTERNET SAFELY AND WITH PARENTS' APPROVAL

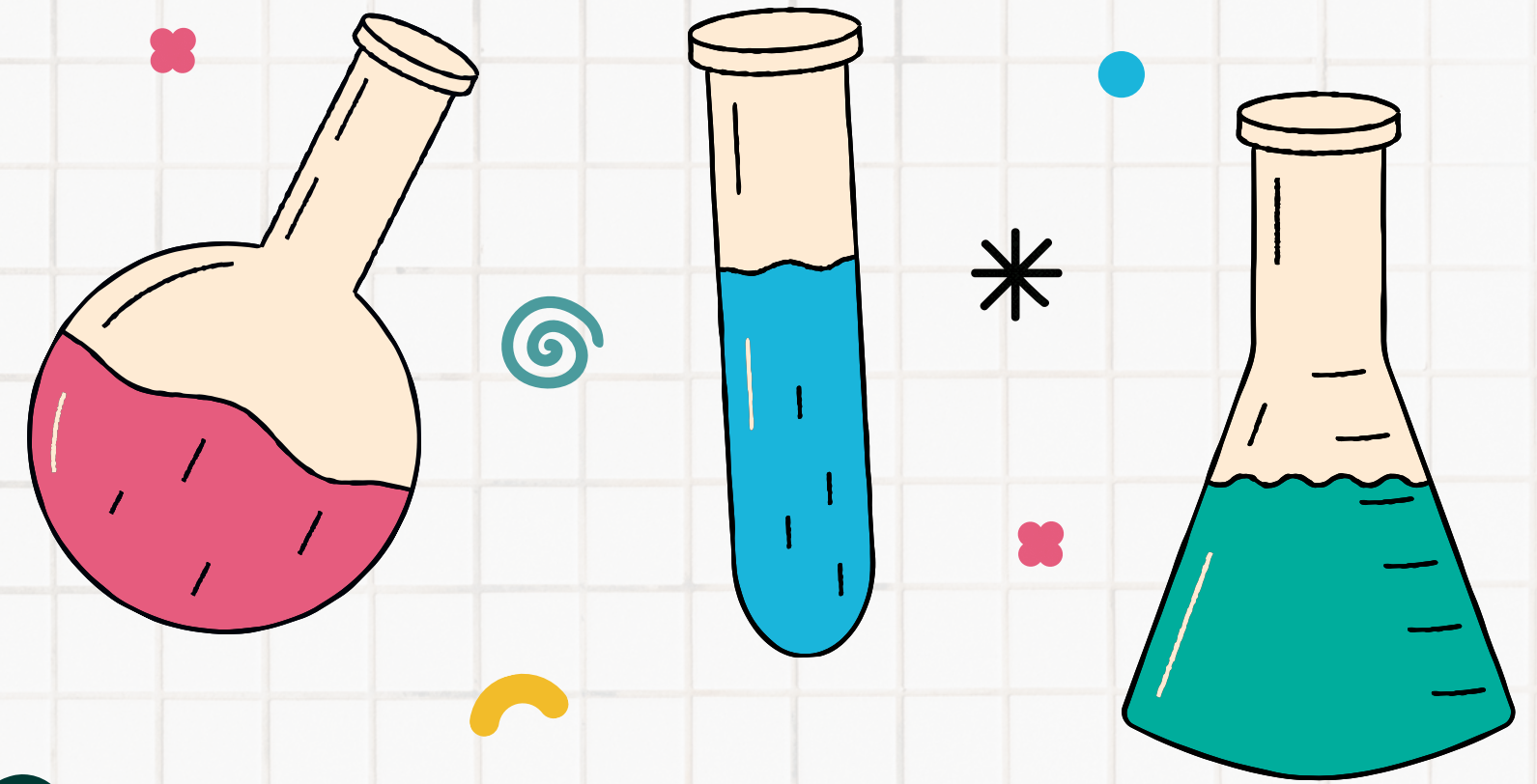
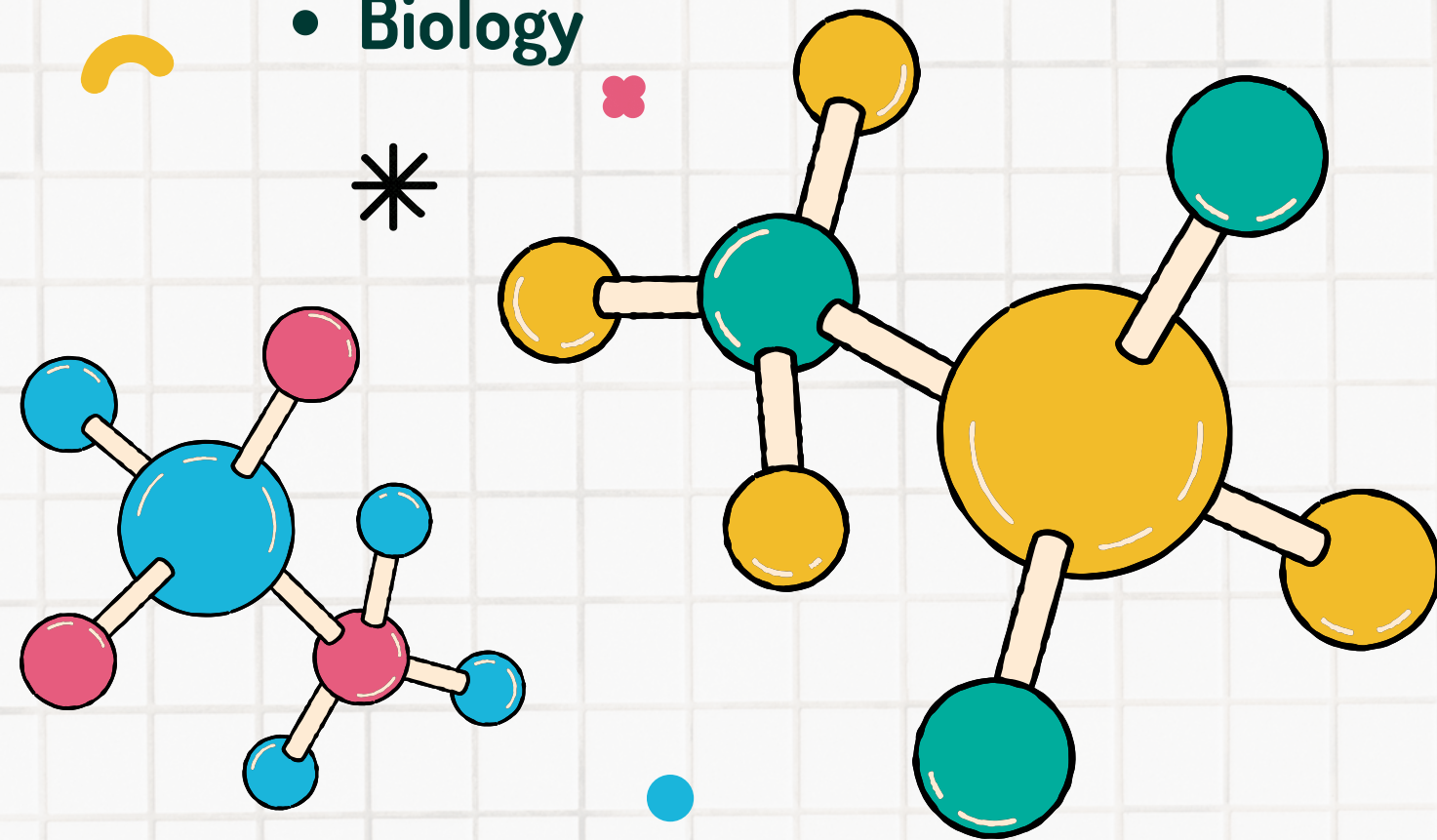


# 01 CATEGORIES

## LIFE SCIENCE

Examples:

- Botany
- Environmental Science
- Nutrition
- Zoology
- Biology



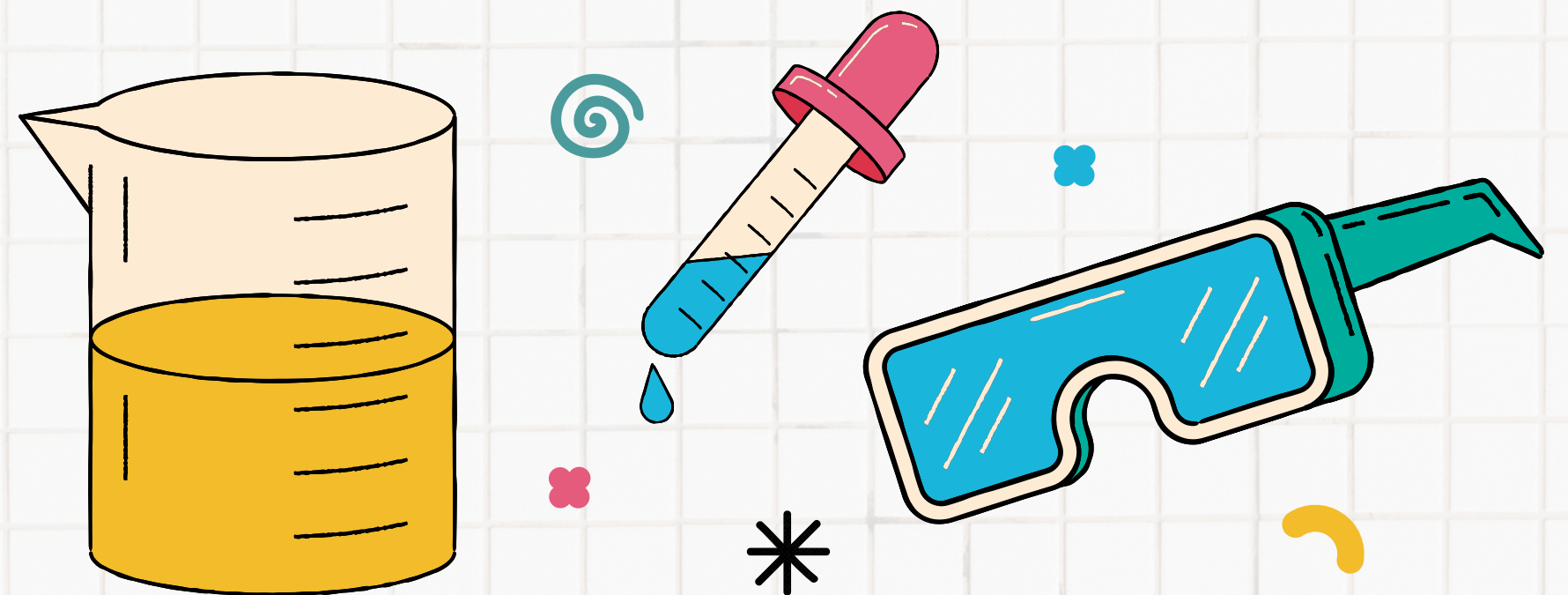
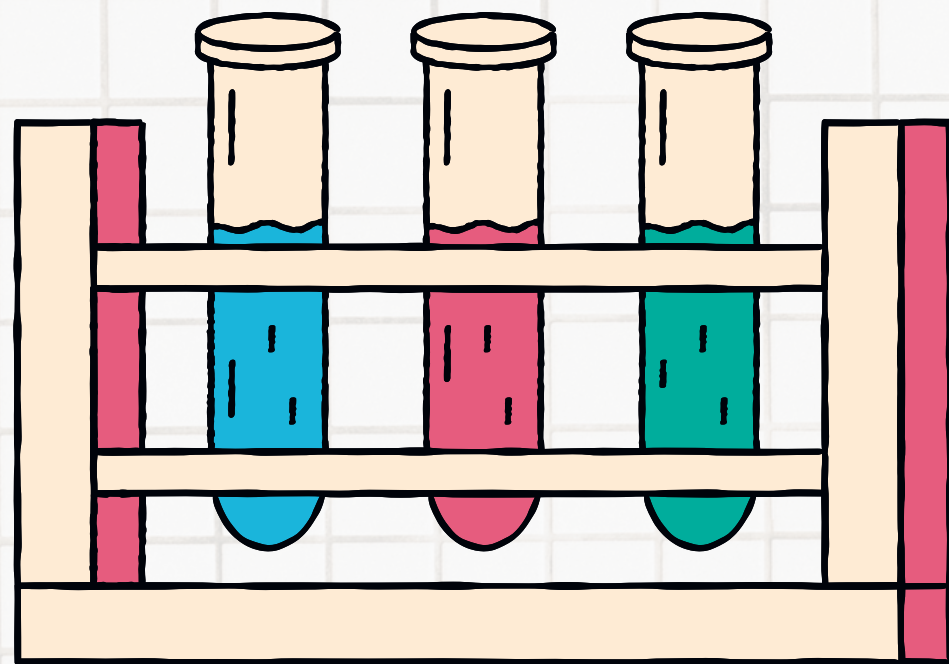
# 02 EARTH & SPACE SCIENCE

Examples:

- Geology
- Weather
- Rock Formations
- Layers of the Earth
- The atmosphere
- stars
- planets/moon

# 03 PHYSICAL SCIENCE

- **Chemistry:** states of matter, solubility, heat capacity, periodic table, solutions etc.
- **Physics:** magnetism, electricity, force/motion, properties of matter, sound, light etc.

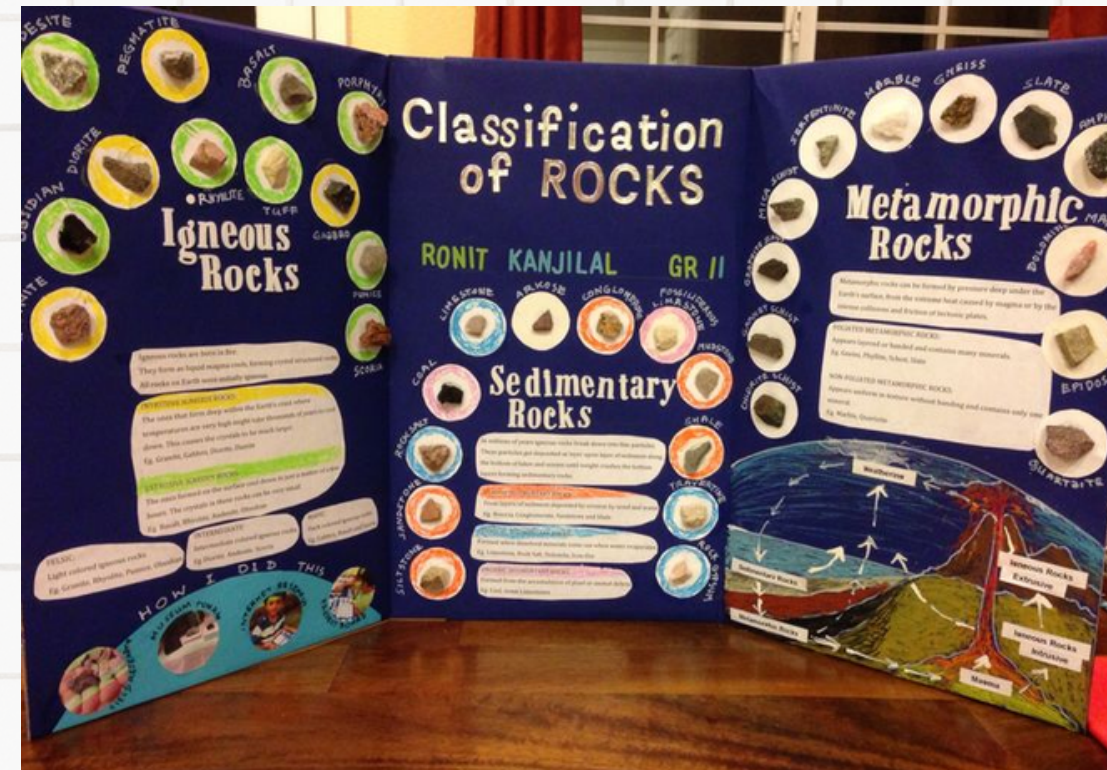
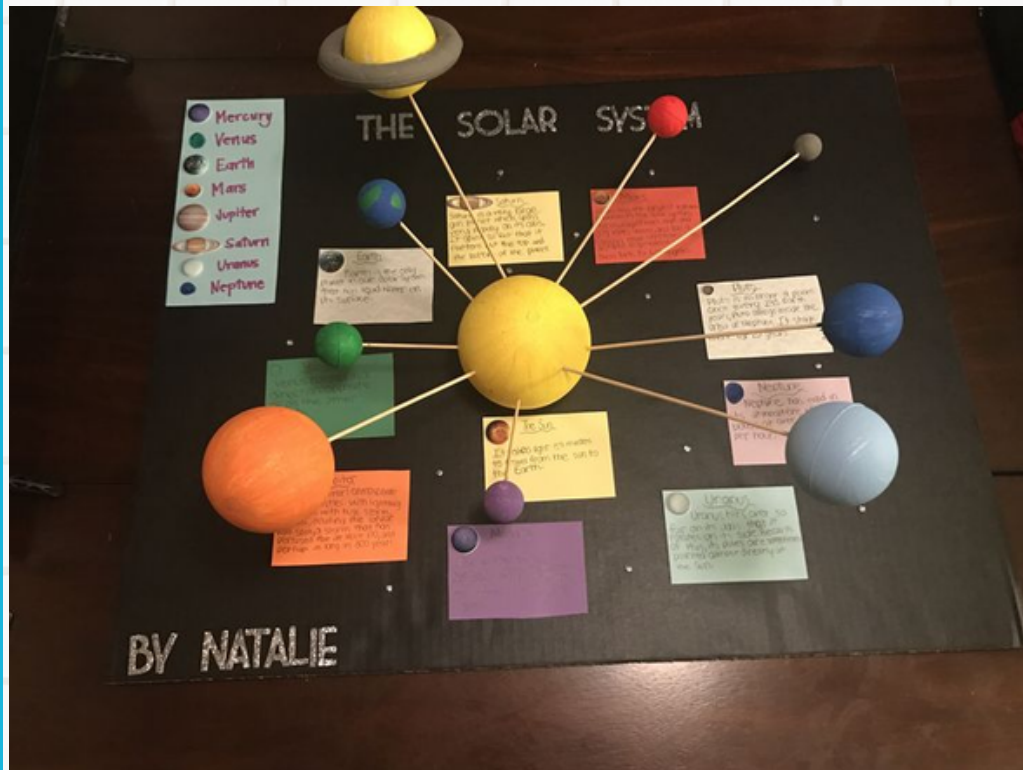
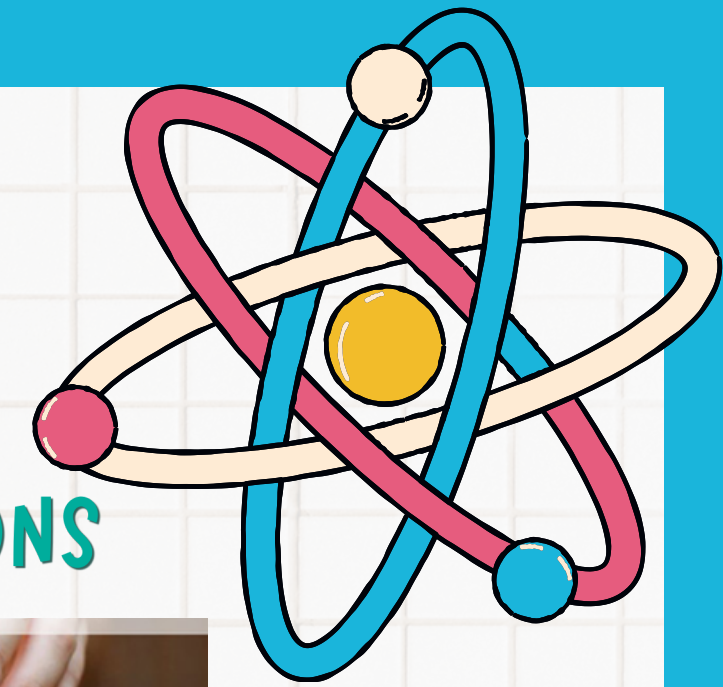


# TYPES OF PROJECTS NOT ALLOWED

MODELS

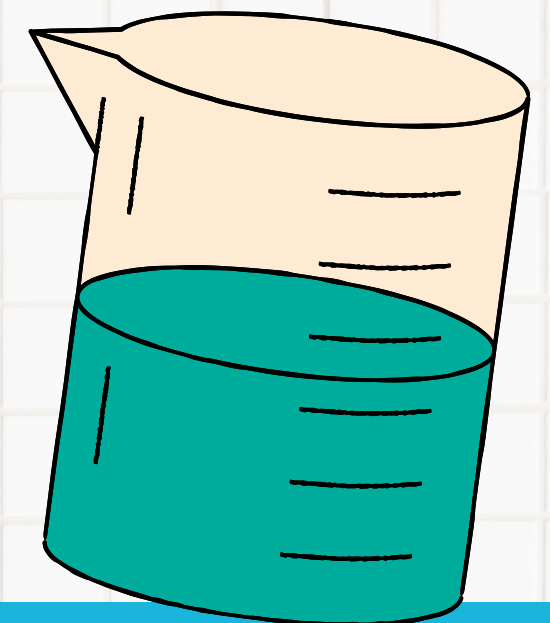
COLLECTIONS

DEMONSTRATIONS

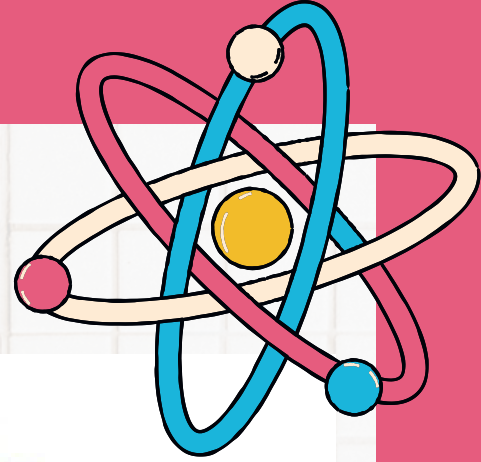


THESE PROJECTS DO NOT TEST ANYTHING

YOUR PROJECT SHOULD BE EXPERIMENT-BASED USING THE SCIENTIFIC METHOD



# SCIENTIFIC METHOD



**STEP 1**

**ASK A QUESTION**


What do you want to learn about?



**STEP 2**

**RESEARCH**

Learn as much as you can about your topic from books, experts and the internet.



**STEP 3**

**FORM A HYPOTHESIS**

Predict what you think will happen based on what you already know.



**STEP 4**

**EXPERIMENT**


Gather materials and follow your plan to test your hypothesis.



**STEP 5**

**ANALYZE THE RESULTS**

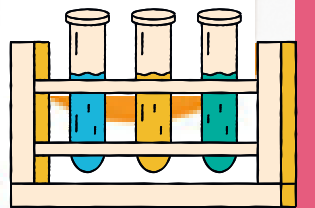
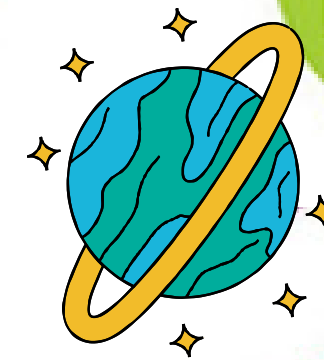
Write down what happened and record what you learned.



**STEP 6**

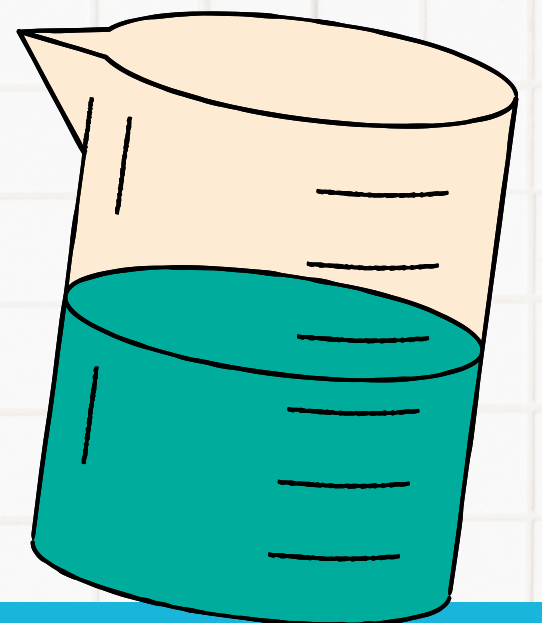
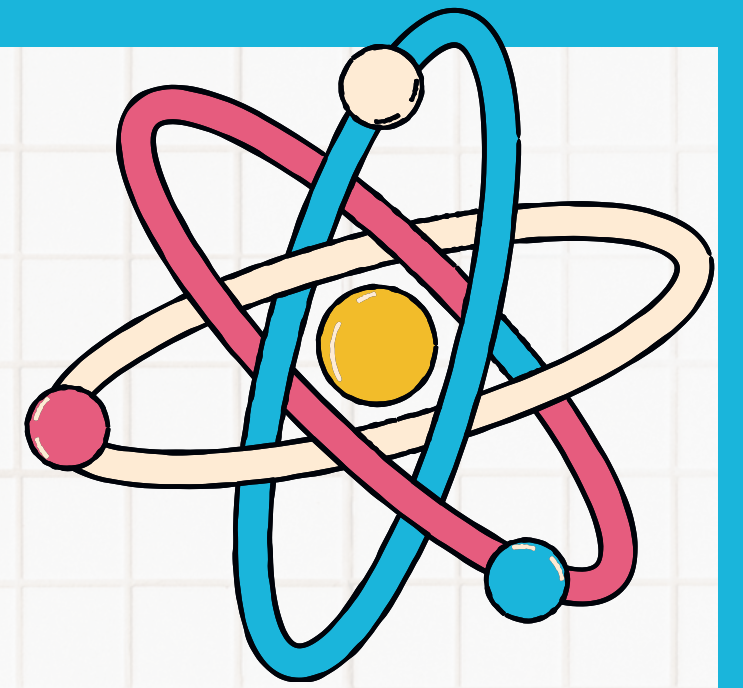
**CONCLUSION**

Share your results and if your hypothesis was correct or incorrect, and decide what to do next.

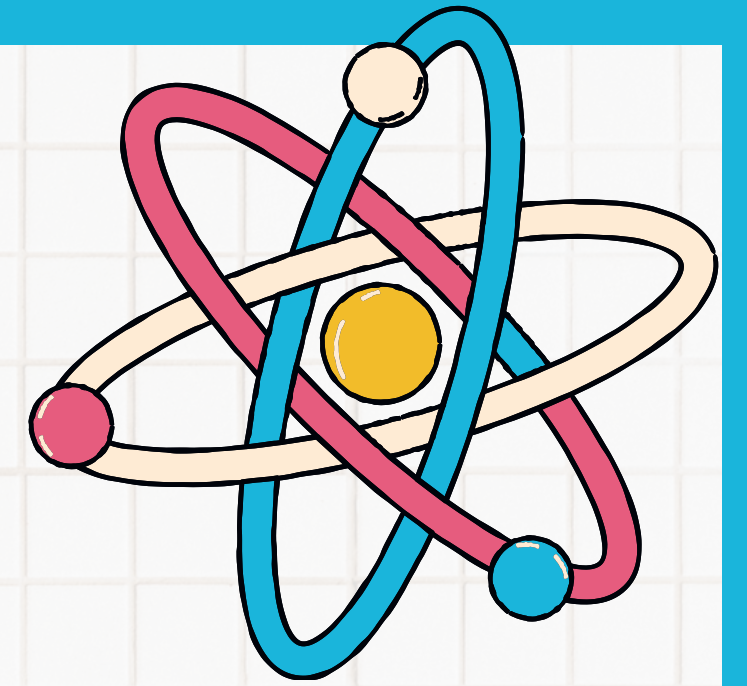


# TIPS ON CHOOSING A PROJECT

- ENCOURAGE CHILD TO PICK BASED ON THEIR INTEREST
- CHOOSE A PROJECT WITH A CLEARLY DEFINED, TESTABLE QUESTION THAT CAN BE ANSWERED BY AN EXPERIMENT
- CHOOSE A PROJECT THAT CAN BE RESEARCHED THOROUGHLY IN THE TIME AVAILABLE.
- CONSIDER WHAT MATERIALS ARE AVAILABLE WHEN CHOOSING A PROJECT.
- CHOOSE A PROJECT WITH AN APPROPRIATE DIFFICULTY LEVEL.

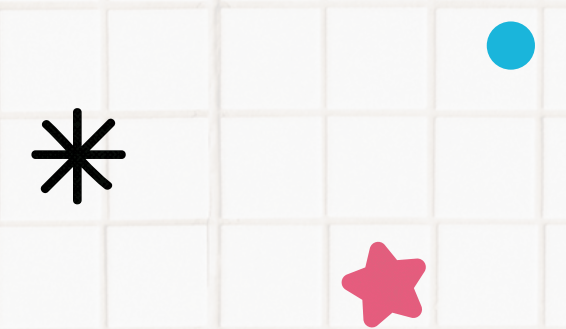


# TESTABLE VS UNTESTABLE QUESTIONS?



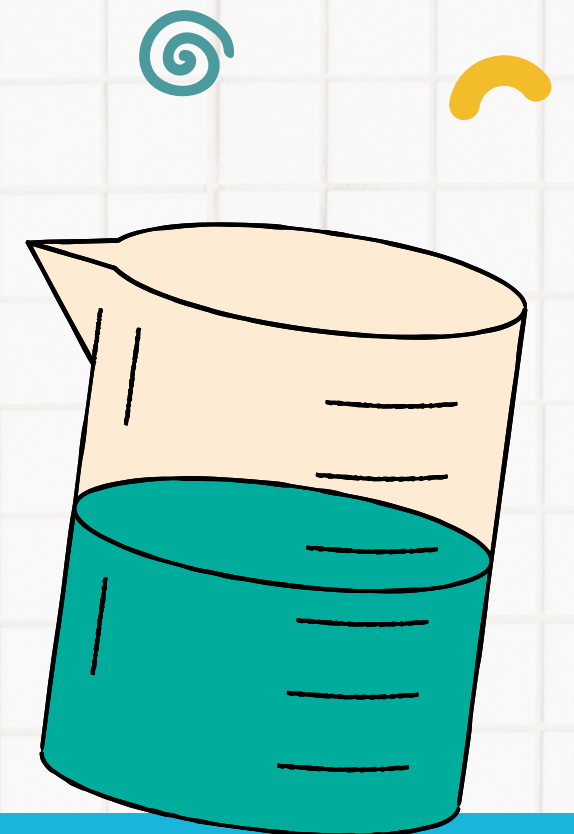
## TESTABLE

- How well do different materials sink or float in water?
- How does changing the shaped of a rocket's fins change its flight?
- Does temperature have any effect on a magnet's strength?



## UNTESTABLE

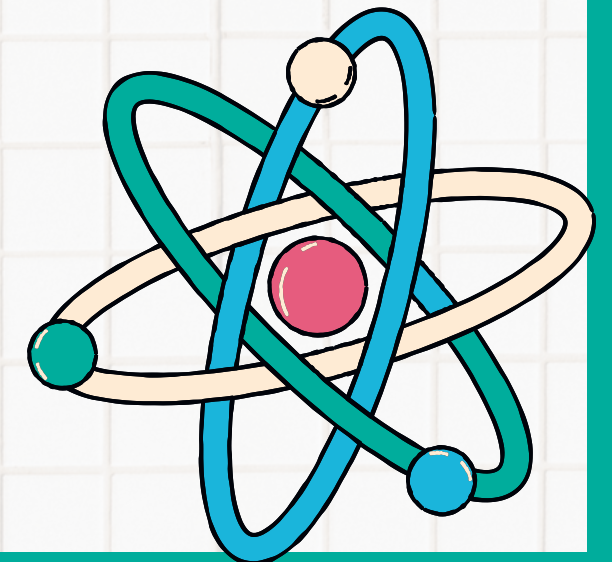
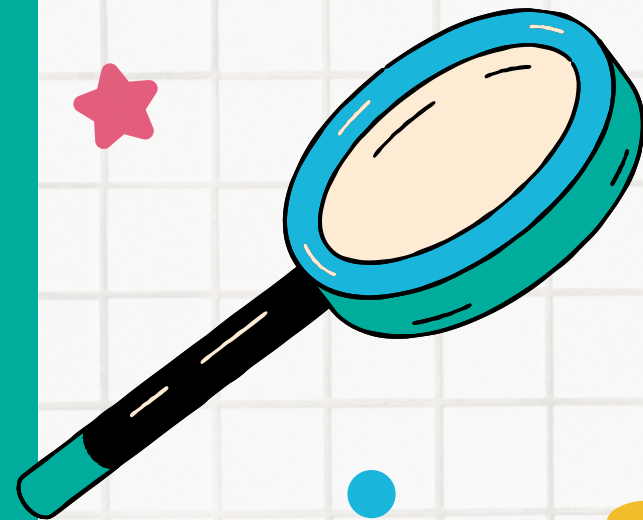
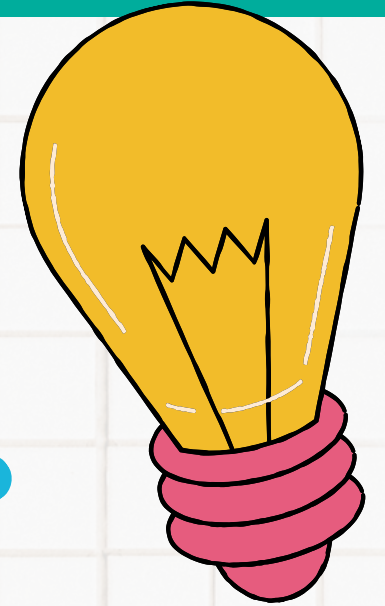
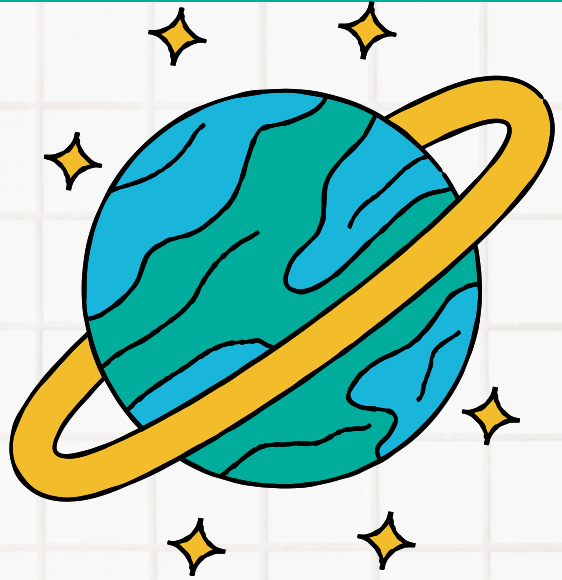
- What makes something sink or float?
- How do rockets work?
- What makes a magnet attract things?





# RESOURCES

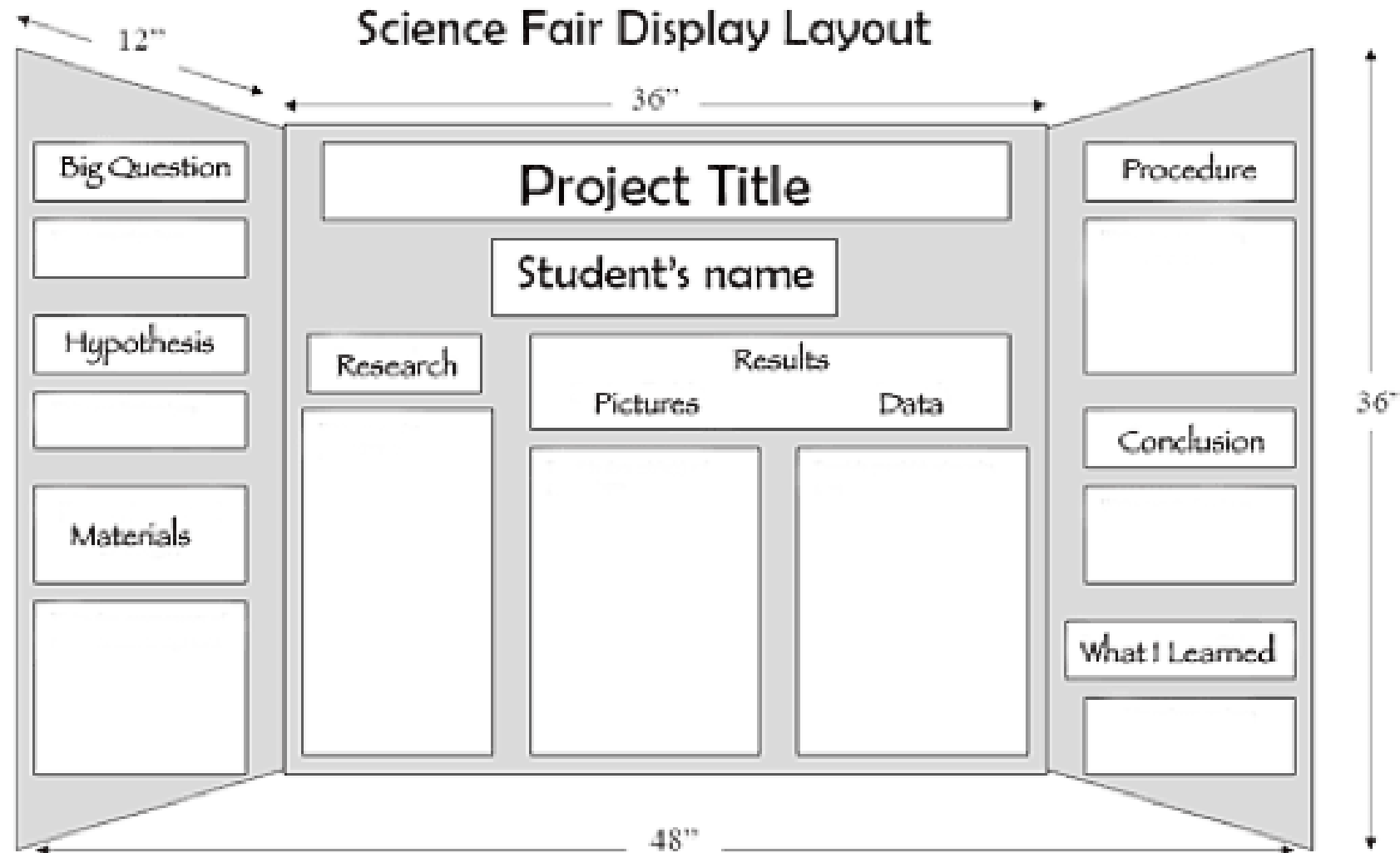
- [Steve Spangler Science](#)
- [Science Bob](#)
- [Science Buddies](#)
- [Mark Rober: Tips for great elementary science fair projects](#)
- [Education.com](#)
- Example project display boards:
- [Blossom Hill Elementary](#) (K-5 example projects)
- [Somers Intermediate School](#) (5th grade example projects)



# DISPLAY BOARD

## SCIENCE FAIR PROJECT BOARD

### Science Fair Display Layout



- Summarize Experiment
- Should be neat
- Legible from 3-ft away
- Eye-catching

- Dimensions (unfolded) 36" H x 48" W
- Display guidelines in Planning Guide

# © K-2 EXAMPLE PROJECTS ★

## HOW MANY SEEDS IN AN APPLE?

**Problem Statement**  
I want to know how many seeds are in an apple.

**Materials**  
1. Golden Delicious  
2. Fuji  
3. Red Delicious  
4. Granny Smith

**Procedures**  
1. Wash the apples.  
2. Cut the apples in half.  
3. Count the seeds in each half.  
4. Record the number of seeds.

**Conclusion**  
The Golden Delicious and Fuji apples have the most seeds, followed by the Red Delicious and then the Granny Smith.

**Hypothesis**  
I think the Golden Delicious and Fuji apples will have more seeds than the Red Delicious and Granny Smith.

**Results**

Apple Type	Seeds
Golden Delicious	5
Fuji	4
Red Delicious	9
Granny Smith	4

## M&M Count

Ms. Higgins - 1st Grade

**Problem**  
I want to know my chances of getting my favorite color in any bag of M&Ms. My favorite color is blue.

**Hypothesis**  
I think there are more orange M&Ms than other colors. I think my favorite color blue is less common than orange.

**Procedures & Materials**  
Step 1 - Get 3 bags of 4 types of M&Ms:  
• Fun size milk chocolate  
• Milk chocolate 1.49 Ounces (42.9 gram)  
• Peanut Butter 2.83 Ounces (80.2 gram)  
• Peanut 1.79 Ounces (50.3 gram)  
Step 2 - Count how many red, orange, yellow, green, blue and brown M&Ms come in each bag. Record numbers on chart.  
Step 3 - Add up how many M&Ms are in each color. Look at the total number for each kind of M&M and total number for all M&Ms.  
Step 4 - Calculate percentage of each color to figure out chance of getting favorite M&Ms.  
Step 5 - Eat the M&Ms!

**M&M Color Tracker - Milk Chocolate Fun Size**

Color	PS 1	PS 2	PS 3	Total	Total %
Red	1	2	3	6	12.5%
Orange	7	9	6	22	42.3%
Yellow	4	2	2	8	15.4%
Green	1	2	9	12	22.7%
Blue	3	4	2	9	17.3%
Brown	1	0	2	3	5.7%
Total	27	29	27	83	

13 of the 83 M&Ms in fun size bags were orange. There is a 15.7% chance that I would get an orange, more than other colors. Only 9 of the 83 M&Ms in fun size bags were blue. There is a 10.7% chance I would get my favorite color blue.

**M&M Color Tracker - Milk Chocolate 1.49 Ounces (42.9 gram)**

Color	Milk 1	Milk 2	Milk 3	Total	Total %
Red	8	3	7	18	33.3%
Orange	12	14	15	41	76.7%
Yellow	28	9	9	46	86.7%
Green	9	26	9	44	83.3%
Blue	9	10	13	32	60.0%
Brown	5	10	8	23	43.3%
Total	56	57	56	169	

40 of the 169 M&Ms in the regular size bags were orange. There is a 23.7% chance that I would get an orange, more than other colors. 32 of the 169 M&Ms in the regular size bags were blue. There is a 19.0% chance I would get my favorite color blue, about the same as the fun size bags.

**M&M Color Tracker - Peanut 1.79 Ounces (50.3 gram)**

Color	P 1	P 2	P 3	Total	Total %
Red	1	3	1	5	7.5%
Orange	6	7	9	22	33.0%
Yellow	9	6	5	20	30.0%
Green	1	9	7	17	25.5%
Blue	6	1	5	12	18.0%
Brown	3	2	0	5	7.5%
Total	23	28	22	73	

17 of the 73 M&Ms in the regular size peanut bags were orange. There is a 23.3% chance that I would get an orange, more than other colors. 12 of the 73 M&Ms in the regular size peanut bags were blue. There is a 16.4% chance I would get my favorite color blue, about the same as the fun size and regular milk chocolate bags.

**M&M Color Tracker - Peanut Butter 2.83 Ounces (80.2 gram)**

Color	PB 1	PB 2	PB 3	Total	Total %
Red	13	9	7	29	36.3%
Orange	6	6	6	18	22.5%
Yellow	7	7	13	27	33.8%
Green	8	11	6	25	31.3%
Blue	5	6	2	13	16.3%
Brown	6	6	10	22	27.5%
Total	45	45	49	139	

28 of the 139 M&Ms in the peanut butter bags were orange. There is a 20.1% chance that I would get an orange. But this time, red is the most popular color at 20.9% and 22.6%. 13 of the 139 M&Ms in the peanut butter bags were blue, less than any other peanut butter color. At 9.4%, there is a lower chance that I would get a blue peanut butter M&M than the other types of M&Ms.

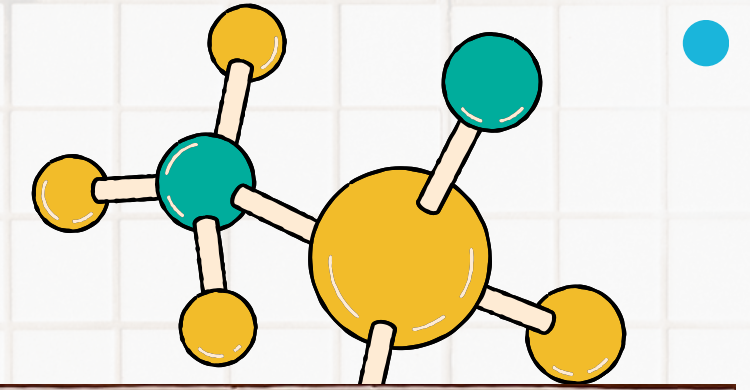
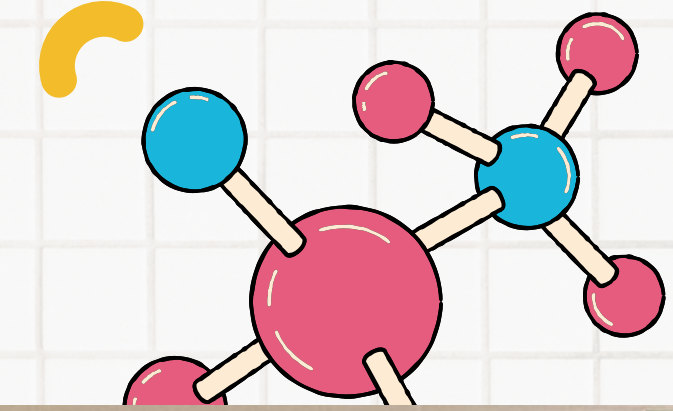
**M&M Color Tracker - All Kinds**

Color	Total Fun Size	Total Milk	Total Peanut	Total Peanut Butter	Total	Total %
Red	6	28	5	29	58	13.9%
Orange	25	90	17	28	160	35.9%
Yellow	8	22	25	27	82	18.8%
Green	7	34	12	25	78	17.7%
Blue	9	32	12	13	66	15.0%
Brown	3	23	5	22	53	12.0%
Total	61	224	66	139	490	

When I added all the M&Ms together, orange was still the most popular color. 90 of the 490 M&Ms were orange. There is a 22.5% chance that I would get an orange M&M. Blue was slightly less popular with 66 of the 490 M&Ms, or 13.5%. The average of blue M&Ms was lower because there were so few blue peanut butter M&Ms.

**Conclusion**  
Based on my experiment, it seems most likely I will get an orange candy when I open a bag of M&Ms. My experiment predicts a 22.5% chance that I will get an orange, followed by green (18.7%), yellow (17.2%), blue (13.5%), red (13.9%) and brown (12.7%).  
My tests of peanut butter M&Ms were unusual. The most popular peanut butter colors were red, yellow and brown. Red and brown were the least popular colors for all other tests. This makes me think I have a higher chance of getting my favorite color blue if I eat milk chocolate and peanut M&Ms. About 1 in 5 M&Ms would be blue.  
If I did the experiment again, I could use bigger bags of M&Ms to see if my chances of getting blue changes. I could also do this test on other candies like gum bears, conversation hearts or stickers because I like them too.

# GR. 3-5 EXAMPLE PROJECTS ★



## DOES SMELL AFFECT TASTE?

Connor Duke Noah Margolis

### PURPOSE

The purpose of this experiment was to test if the sense of smell influences the sense of taste. We wanted to see if taking away the sense of smell would alter the sense of taste and make it harder to determine which food the tester was eating.

### HYPOTHESIS

We believe that the sense of smell has a major impact of how we taste food.

### RESEARCH

Our taste buds can recognize five tastes: sweet, sour, salty, bitter and umami (Japanese term meaning "a pleasant/savory taste"). When we eat, the flavor comes from a combination of the taste and the smell. When you take away the smell, it makes it difficult to recognize the food. It becomes increasingly difficult when you also remove sight.

### MATERIALS

- Salt
- Sugar
- Cinnamon
- Smoked salt
- Kala Namak (tastes of sulfur/eggs)
- Lemon pepper Seasoning
- Small spoon
- Plastic cups
- Water for in-between foods
- Blindfold

### PROCEDURE

- The test was repeated with 11 people
- Each test had three rounds of tasting:
  - Round 1 - testers could see and smell the items
  - Round 2 - testers were blindfolded
  - Round 3 - testers were blindfolded with their nose plugged
- For each test and each round, testers were given a small spoonful of each of the six items
- After each spoonful they would guess what they believed they had just tasted
- After each taste, they could drink water help clear the taste from their mouth
- The results were recorded for each tester

### RESULTS

With the sense of smell, 9 of the 11 testers were able to accurately identify each item. Once we removed the sense of smell, all of the testers missed at least one of the items. Most inaccurately identified three items.

Items	With Smell	Without Smell
Salt	9	8
Smoked Salt	12	3
Kala Namak Salt	11	5
Lemon Pepper Seasoning	10	7
Cinnamon	11	10
Sugar	10	10

### CONCLUSION

As seen in our results, we feel that we were accurate in predicting that the sense of smell affects the way we taste things. We also saw that people were consistently better at correctly guessing common tastes like salt, cinnamon and sugar compared to more complex tastes like smoked salt and Kala Namak salt.

## SMASHING EGG EXPERIMENT

### Purpose

To test the breaking point of an egg under various weights. Also, to have the opportunity to walk over dozens of eggs for fun.

### Hypothesis

My hypothesis was that a vertical egg will break at 10 lbs. and a horizontal egg will break at 20 lbs. Eggs need to be strong enough for a chicken to sit on it, but weak enough for a baby chicken to break out.

### Materials

- 120 Eggs - 8 for test, remainder for walking
- 50 lbs. of Weights in 5lbs. increments
- A holder to steady the egg
- A holder to steady the weight
- Thin foam for between holders and egg

### Procedure

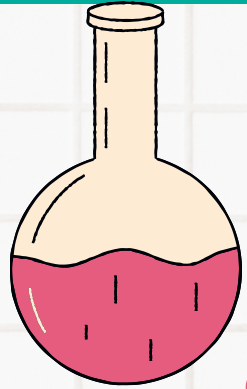
- Make an egg holder to steady the egg
- Make an egg holder to steady the weight
- First test vertically
  - Put the egg vertically in the egg holder with a layer of thin foam
  - Put the weight holder on top of the egg with a thin layer of foam
  - Put 5lb of weight on the egg
    - Record result (pass = didn't break, fail = break)
    - If the egg breaks, clean up and get another egg for the next test
    - If the egg doesn't break, add 5lbs. more and retest
    - Test until there a three of the same results
- Then test eggs horizontally
  - Put the egg horizontally in the egg holder with a layer of thin foam
  - Put the weight holder on top of the egg with a thin layer of foam
  - Put 5lb of weight on the egg
    - Record result (pass = didn't break, fail = break)
    - If the egg breaks, clean up and get another egg for the next test
    - If the egg doesn't break, add 5lbs. more and retest
    - Test until there a three of the same results
  - Clean up the mess

### Results

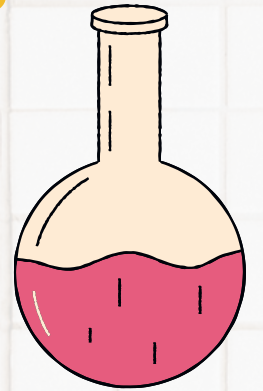
Test Weight (lbs)	Horizontal	Vertical
5	0	0
10	0	0
15	0	0
20	1	0
25	1	0

### Conclusion

In the vertical position, the egg was able to support 20lbs. of weight, 10 lbs. more weight than I thought it would. My guess of 20 lbs. for the horizontal position was correct. The horizontal and vertical position of the egg didn't make a difference in the amount of weight that an egg can support. Since the average chicken weighs 5-13 lbs. and most eggs supported 20 lbs. of weight, chickens sitting on eggs won't break them.



# SET-UP, JUDGING & VIEWING



## Set-up: March 13, morning

- Drop off and set up your displays in the cafeteria.
- Your project will have a designated space marked by your project form.

## Judging: March 14, morning

- The judging process is closed to spectators and is done before community viewing
- Some awards and ribbons will be attached to notable project displays.

All judging decisions are final. [Judging Rubric Google form](#) found in Planning Guide

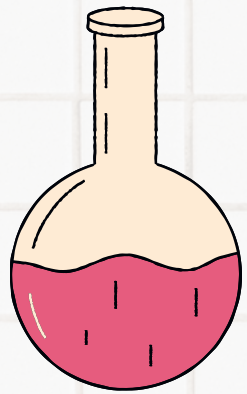
## Community Viewing & Awards Ceremony: March 14, evening

- Members of Guadalupe community are invited to view the projects

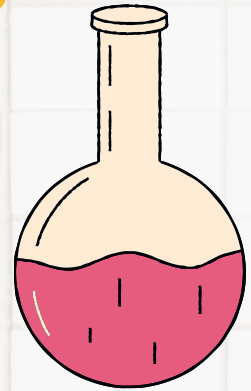


## Clean up and Take-Down: March 14 after Science Fair

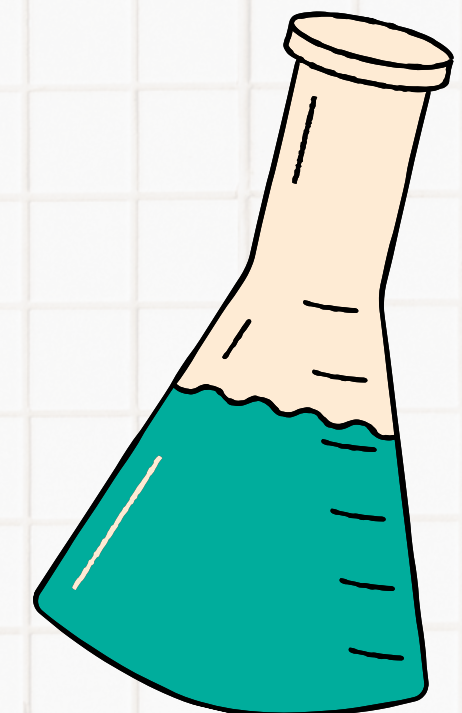
- Any projects that are not taken home the night of the fair will be discarded.

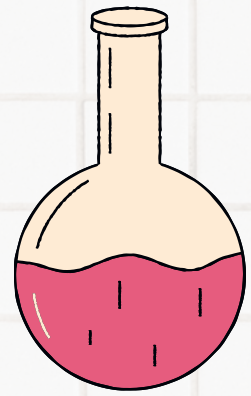


# AWARDS

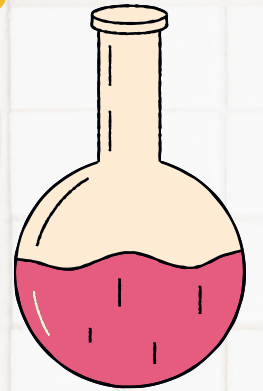


- All students will receive a certificate of participation
- Awards will be given for each grade level.
- The projects with the top three highest scores in each grade will be announced during the Science Fair on March 14.
- Awards and prizes will consist of gold, silver, and bronze medallions and award certificates.





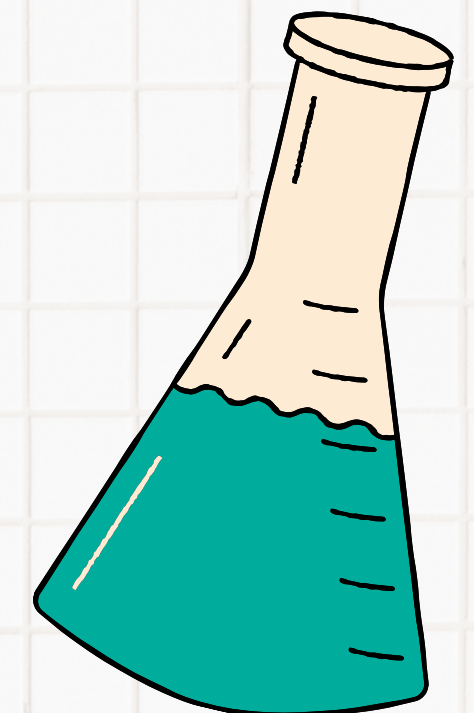
# WHY PARTICIPATE?



Students learn :



- practical application of science
- time/resource management skills
- communication skills
- early appreciation for STEM careers
- how to build community and have fun with science





**THANK YOU!**

Any questions? Don't hesitate to  
ask for our help

[ScienceFair.GHSC@gmail.com](mailto:ScienceFair.GHSC@gmail.com)  
[GHSC.net/ScienceFair](http://GHSC.net/ScienceFair)