

Science Fair Project Packet



Name _____

Period _____

Teacher _____



The Scientific Method is a step by step process that scientists use to answer questions!

1. Ask a question
2. Gather information
3. Form a hypothesis
4. Design and experiment
5. Collect data
6. Analyze data and draw conclusions
7. Communicate the results

Steps of the Scientific Method

1. PURPOSE

- a. What problem do I want to solve? You should investigate ONE problem only.
- b. What question do I want to answer? The question is usually the title of the project.

2. HYPOTHESIS

- a. What do I predict will happen during my experiment?

3. PROCEDURE

- a. How will I test my hypothesis?
- b. Will the test be safe and follow the rules?
- c. What materials will I need for my experiment?
- d. What kind of data do I need to collect?
- e. What will I change on purpose (this will be your independent variable)?
- f. What will change as a result of my experiment (this will be your dependent variable)?
- g. What factors will I control?

4. RESULTS/DATA

- a. What happened in the experiment?
- b. Do I see any trends or patterns?
- c. Are my charts and graphs clear, accurate, and neat?

5. CONCLUSIONS

- a. What did I learn?
- b. Did I prove or disprove my hypothesis?

Science Fair Procedures

1. Read the science fair informational packet with your parents or guardian.
2. Choose a topic. You may select a topic that is not on the suggested list. Begin to get information about your topic from the public library and other resources, such as the school library or the Internet (with parental consent).
3. Complete the science fair application and turn in to your teacher by the due date.
4. Once your application is approved by your teacher, you may begin your science fair project.
5. Make notes as you complete each step of your project.
6. Take photographs, make diagrams, and/or collect pictures or illustrations for your display.
7. Draw a rough sketch of what your display board will look like.
8. 4th through 8th grade, written reports are **mandatory**! Write your rough draft.
9. Finalize your science fair project. Complete your display board. Have adults proofread your project for errors. Correct the errors!
10. Practice giving your presentation to family members or in front of a mirror.
11. Write your final copy of your written report and have your project judged.
12. Bring your display board, materials, and written report to school. Dress professionally for the judging!
13. Explain your project to the judges. Memorize your speech. (Minimal note cards allowed).

STEP 1



THINK OF AN IDEA

Think of an Idea

Name _____ Date _____

Teacher _____ Due Date _____

This is the first sheet to help you get started on your science fair project. A good science fair project has the following characteristics:

1. You must ask an original question.
2. That original question requires an experiment that collects data and provides an answer.

Your job is to think of three different questions that you want to ask and write them down in the spaces below. Some examples of questions that require experiments include:

1. Which brand of microwave popcorn pops the best?
2. Does the amount of sugar in a solution affect crystal size?
3. Which detergent gets stains out the best?

You are not writing a report (right now), you are thinking of an idea that you want to experiment with, write-up, and present to your classmates and teacher. When you are done with this sheet, turn it in on the due date. Your teacher will review it with you.

Idea #1:

Idea #2:

Idea #3:

Approved Project:

STEP 2



RESEARCH YOUR TOPIC

Research Your Topic

Name _____ Date _____

Teacher _____ Due Date _____

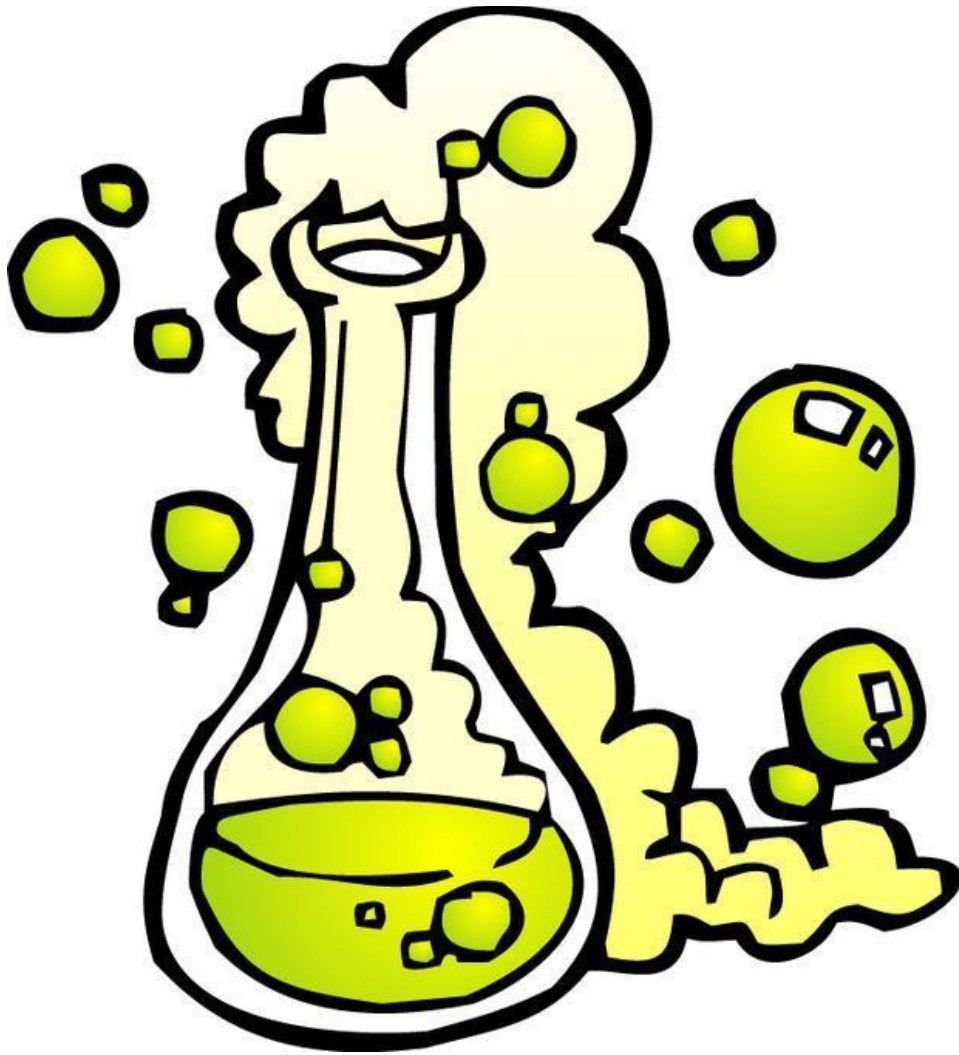
This sheet is designed to give you some ideas on where to look for information on your topic. When you prepare your lab report, you will want to include some background information about your topic. There are several sources of information that are available to you. Fill in as many of the blanks as you can. When you are done with this sheet, turn it in on the due date. Your teacher will review it with you and you can begin collecting data.

Books, Magazines, Newspapers

Encyclopedias, Internet Sources, Videos

Specialists, Professionals, Professors

STEP 3



PLAN YOUR EXPERIMENT



All participants must fill out an application. Once your project is approved, you will receive a science display board.

Applications due by: _____

Name _____ Grade _____

Teacher _____

- A. Question: What do you want to find out by doing your experiment? It cannot be answered by yes or no!

- B. Hypothesis: What do you predict will happen? (Begin with: I predict that...)

C. Purpose: Rewrite you question. (Begin with: The purpose of my project is to find out...)

D. Materials:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

7. _____
8. _____
9. _____
10. _____

E. My independent variable: The one thing that you can change on purpose in your experiment is:

My controlled variables: The things in your experiment that you keep the same are:

F. Research: List your sources. Include book titles, complete websites, magazines, or videos.

1. _____
2. _____
3. _____
4. _____
5. _____

G. Procedure: Write a detailed explanation of the steps you will take to complete your experiment.

Hint: It's like writing down a cake recipe so that others can follow it step by step to get the same results.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____

13. What is the result of the 1st experiment?

What is the result of the 2nd experiment?

What is the result of the 3rd experiment?

STEP 4



COLLECT &
RECORD DATA

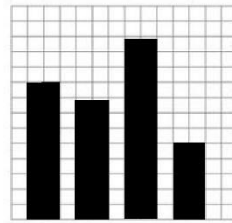
Research Your Topic

Name _____ Date _____

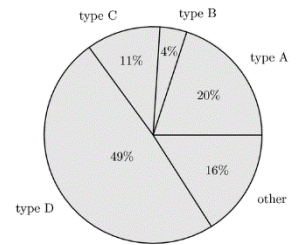
Teacher _____ Due Date _____

This sheet is designed to give you some ideas on how you can collect and record the information that you are going to collect. Check the methods that you are going to use and prepare a sample on the back of this page. When you are done with this sheet, turn it in on the due date. Your teacher will review it with you and you can begin collecting data.

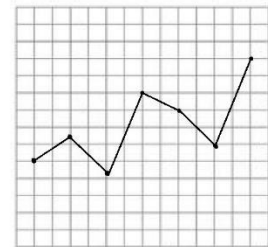
- ___ 1. Data tables
- ___ 2. Bar graphs
- ___ 3. Line graphs
- ___ 4. Pie graphs
- ___ 5. Best fit graphs
- ___ 6. Illustrations
- ___ 7. Photographs
- ___ 8. Written descriptions



Bar Graphs



Pie Graphs



Line Graphs

Name of cereal	Amount of elemental iron from least to greatest
Coco Puffs	3
Total	5
Corn Pops	1
Cheerios	4
Fruit Loops	2

Data Tables

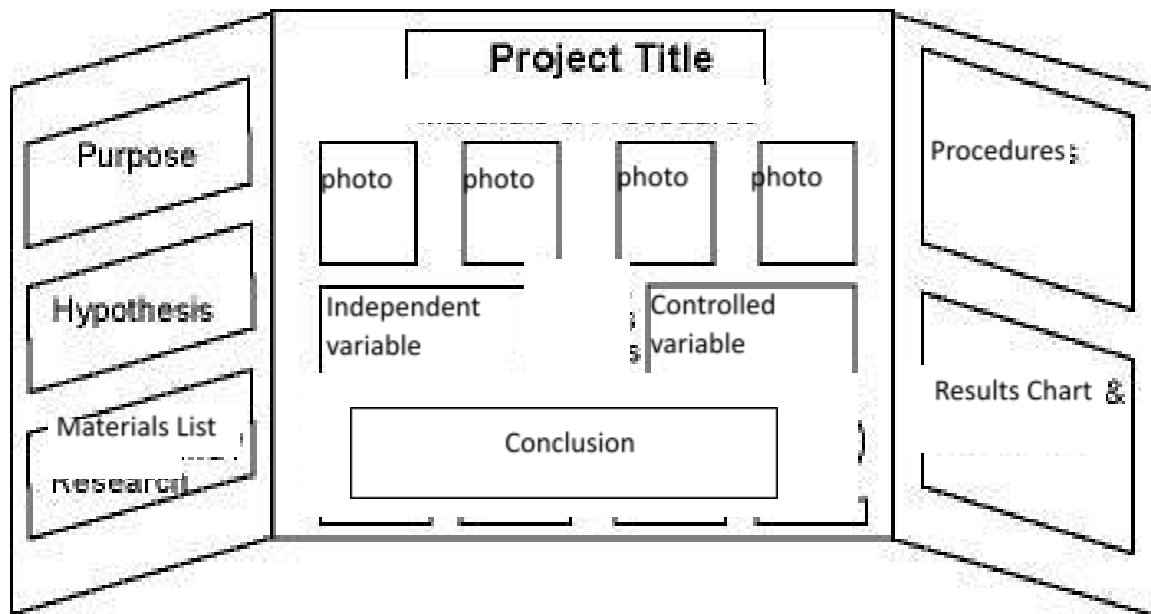
Rules

- 1.The following must be neatly displayed on the front of your board: title of project, student's name, school, teacher, and grade.
- 2.No hazardous chemicals, open flames, or burners.
- 3.Cultures of mold and bacteria **MUST** be thoroughly sealed.
- 4.Safety precautions when displaying electrical or mechanical equipment **MUST** be followed at all times.
5. You **MUST** complete an application to participate in the Science Fair. **Upon approval of your application**, the Science Fair Team will provide a free board to you-then you may begin your project.
- 6.You **MUST** use 3 different resources (i.e: books, magazines, Internet).
- 7.**NO HUMAN OR ANIMAL EXPERIMENTS ALLOWED.**
- 8.You **MUST** repeat your experiment 2 more times!
9. You **MUST** display and explain your controlled and independent variables on your board.
- 10.You **WILL** present your science project to a judge if you are chosen by the Science Committee.

DISPLAYING YOUR SCIENCE FAIR PROJECT

When complete, the science fair project should be neat and thorough. It should be displayed in an organized way so that judges can find needed information quickly and easily.

The example below is a completed project set up for viewing by judges and others at the science fair. Most important, enjoy the science fair!



Your Science Fair board will represent all of the learning you have done for your project. The display should be eye-catching and creative, yet easy to read and organized.

- **NO** visible tape- use double-sided tape or glue stuck
- **NO** pencil allowed-type your pages if possible
- Draw a rough sketch of your board **FIRST** on a piece of paper
- Does your conclusion state if it proves or disproves your hypothesis?
- Paper or picture attachments **MUST** be **NEATLY** attached
- **SPELLING ERRORS ARE UNACCEPTABLE!**
- **SPELL CHECK** your work before attaching it to your board
- Lettering should be **neat and easy to read**
- Use brightly colored paper behind your headings
- Use photos, tables, and graphs when possible
- Do not write directly on your board
- **YOU MUST** include on the board your title, purpose, hypothesis, materials, procedure, variables, results, and conclusion
- **YOU MUST** practice and memorize your presentation if you are chosen to present to a science judge

Written Report Requirements/Guidelines

Page 1: Title page: Giving each its own line, write your project title, your name, your school name, your teacher's name, your grade, and 2018-19 Science Fair

Page 2: Table of Contents: List the parts of your report by page number. See example for what it should look like.

Page 3: Acknowledgements: Give credit to family members and teachers who helped you with this project.

Page 4: Introduction: The introduction is a paragraph (5 sentences) summarizing your project.

Page 5: Purpose and hypothesis: Giving each its own header, state your purpose and hypothesis as phrased in your science fair application.

Page 6: Materials and procedures: Giving each its own header, list your materials (without numbering them) and state all the steps in your experiment (written in paragraph form).

Page 7: Results/data: Describe what happened or what you observed in your experiment. Show data in charts or graphs.

Page 8: Conclusion: Describe what happened. Did you prove or disprove your hypothesis? What did you learn from the experiment? Do not be afraid to say that you made any mistakes along the way. Great discoveries can come from mistakes.

Page 9: Bibliography: Make a list of the books, magazine, websites, etc. that you used to get information for your Science Fair Project.

****Important Note** NOTHING should be printed off or copied directly from the Internet or a book and added to a Science Project. Students always need to read the information and rewrite it IN THEIR OWN WORDS!!!**

Sample

Written

Report

Table of Contents

Acknowledgements	Page 1
Purpose and Hypothesis	Page 2
Introduction	Page 3
Materials and Procedures	Page 4
Results	Page 5
Conclusion	Page 6
Bibliography	Page 7

Acknowledgements

I want to thank my mom for buying all the popcorn for my project. I want to thank Ms. Peebles for helping us with questions we had. Most importantly, I want to thank my family who had to eat all the popcorn I made.

Purpose

The purpose of this study is to see which brand of popcorn pops the most kernels.

Hypothesis

I predict that the space in the bag is too small. Therefore, there is not enough room for all the kernels to pop.

Introduction

Popcorn was first grown in Mexico and somehow made it to India and China before it came to North America. In 1950, ears of popcorn were found in a cave in New Mexico. The sizes of the ears ranged from $\frac{1}{2}$ inch to 2 inches long and are the oldest ears ever found. Popcorn was popped in the old days by throwing it on a hot stone in a fire. Like a game, the popcorn would pop and fly out of the fire and people would try to catch it (Gibbons, 1993).

Materials

Three different brands of popcorn

Five bags of each brand

Microwave

Fire extinguisher

Scale

Timer

Procedures

After buying the popcorn from the store, I weighed the first bag I was going to pop and recorded the weight and the name of the brand of popcorn. I set the microwave on high for four minutes. After the popcorn popped, I weighed the bag again to see if the mass had changed. I separated the popped kernels from the non-popped kernels. I counted the non-popped kernels and recorded the data. I repeated these steps every day until I popped five bags from each of the three brands of popcorn.

Results

	1 st Attempt	2 nd Attempt	3 rd Attempt	4 th Attempt	5 th Attempt
#1 Brand	21	24	19	23	21
Weight Before	16 oz.	Weight After	14 oz.		
#2 Brand	18	35	25	20	28
Weight Before	16.5 oz.	Weight After	15.5 oz.		
#3 Brand	23	25	23	20	26
Weight Before	15 oz.	Weight After	14 oz.		

Brand one had an average of 21.6 unpopped kernels.

Brand two had an average of 25.2 unpopped kernels.

Brand three had an average of 23.4 unpopped kernels.

The weight of the first bag was 2 oz. less after cooking it.

The weight of the second bag was 1 oz. less after cooking it.

The weight of the third bag was 1 oz. less after cooking it.

Conclusions

In conclusion, the popcorn was popped at the same time and at the same temperature, and there was a difference between the brands. Brand one had an average less than the other two brands. Brand one also lost a total of 2 oz. after popping was completed. The 2 oz. can allow the extra room needed for the seeds to pop. Therefore, one can assume if there was more space, more kernels would pop.

Bibliography

Frank, Asch. (1979). Popcorn. Holiday House, New York.

Gibbons, Gail. (1993). From seed to plant. Parents magazine, press.

Smith, Andrew. (1991). Popped culture: A social history of popcorn in America.

United States Popcorn Board. (2002). Fun facts about popcorn.

<www.nal.usda.gov/speccoll/images1/popcorn.html>

Woods, Dave. (1980). What makes popcorn pop? Atheneum Publications, MI.

Name _____

Date of Presentation _____

Title _____

Science Classroom Presentation Rubric

Digital Presentation/Board

___ Organized in the steps of the scientific method (Purpose, Information, Hypothesis, Experiment, Results, Conclusion) (20 points)

___ Colorful and creative (10 points)

___ Neat (10 points)

___ Typed (20 points)

___ Pictures of project/experiment (10 points)

___ Graph or chart representing data gathered through the experiment (10 points)

___ Significant title-Title relates to project and is large enough for people to see (10 points)

___ Variables listed-Independent, dependent, and control (10 points)

Total: ___/100

Name _____ Date of Presentation _____

Title _____

Presentation

___ Notecards used during presentation or speech memorized (10 points)

___ Eye contact with audience (10 points)

___ Loud voice that the whole class can hear (10 points)

___ Presents in order of the scientific method (Purpose, Information, Hypothesis, Experiment, Results, Conclusion) (10 points)

___ Pacing moves smoothly, not too fast or too slow (10 points)

___ Asks the audience for questions at the end of presentation without prompting (10 points)

___ Knowledgeable of project and able to answer related questions (10 points)

___ Stance facing audience and avoiding excessive unnecessary movement (10 points)

___ Enthusiasm/Engaged with audience and speaking excitedly (10 points)

Total: ___/100

Name _____

Date of Completion _____

Title _____

Written Report

___ Typed in 12 pt. font/Times New Roman (10 points)

___ Reference List (10 points)

___ Grammar/Spelling (10 points)

___ Cover Page-Title, student name, school, teacher, grade (10 points)

___ Introduction (15 points)

___ Organized-refer to sample written report (15 points)

___ Hypothesis-phrased as in application (5 points)

___ Purpose-phrased as in application (5 points)

___ Results presented in graph or chart (10 points)

___ Explained conclusion-Whether hypothesis was proven or disproven and why (15 points)

Total: ___/100

Dear Parents and/or Guardians,

This quarter, our school will be doing our Science Fair Projects. Every student from 4th-8th grade will be required to do this **mandatory** project. We have sent home a packet outlining every portion of the project in depth, so please make sure that your student is working on each part of his or her Science Fair Project as outlined in the packet in order to meet the deadlines listed below:

___ Friday, November 16th: Science Fair topics are due (Think of an Idea page in packet)

___ Friday, December 7th: Resource lists are due (Research Your Topic page in packet)

___ Thursday, December 13th: Experiment plans are due (Science Fair Application for Scientific Method Experiments page in packet)

___ Friday, January 11th: Experiments completed, lab reports are due

___ Monday, January 14th: Students will sign up for presentation order, boards should be complete

___ Tuesday, January 15th – Friday, January 18th: Science Fair boards and presentation presented in class

Please keep the top portion and return the bottom portion signed to your student's teacher.

I, _____, parent or guardian of _____ have

received the Science Fair Project packet and list of deadlines for the Science Fair Projects. I understand that all deadlines are final, and if my student does not complete each of these portions of the Science Fair Project on the assigned dates, that he or she will not receive credit for that portion of the Science Fair Project and it will negatively impact my student's grade.

Student Signature _____ Date _____

Parent Signature _____ Date _____