Science Fair

What's That?

How to have a successful science fair project

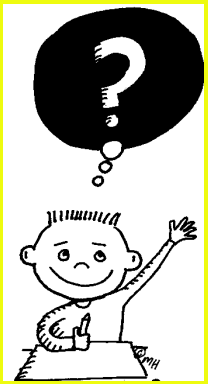
The science fair follows the scientific Method:

OBSERVATION

CONCLUSION

HYPOTHESIS

1) Make an observation
2) Ask a question
3) Form a hypothesis
4) Make a prediction
5) Do a test or experimentation
6) Analyze data
7) Form a conclusion



I predict...

EXPERIMENT

THE ENGINEERING DESIGN PROCESS

DEFINE
the problem

IDENTIFY
constraints on your solution (e.g. time, money, materials) and criteria for success

BRAINSTORM
multiple solutions for the problem

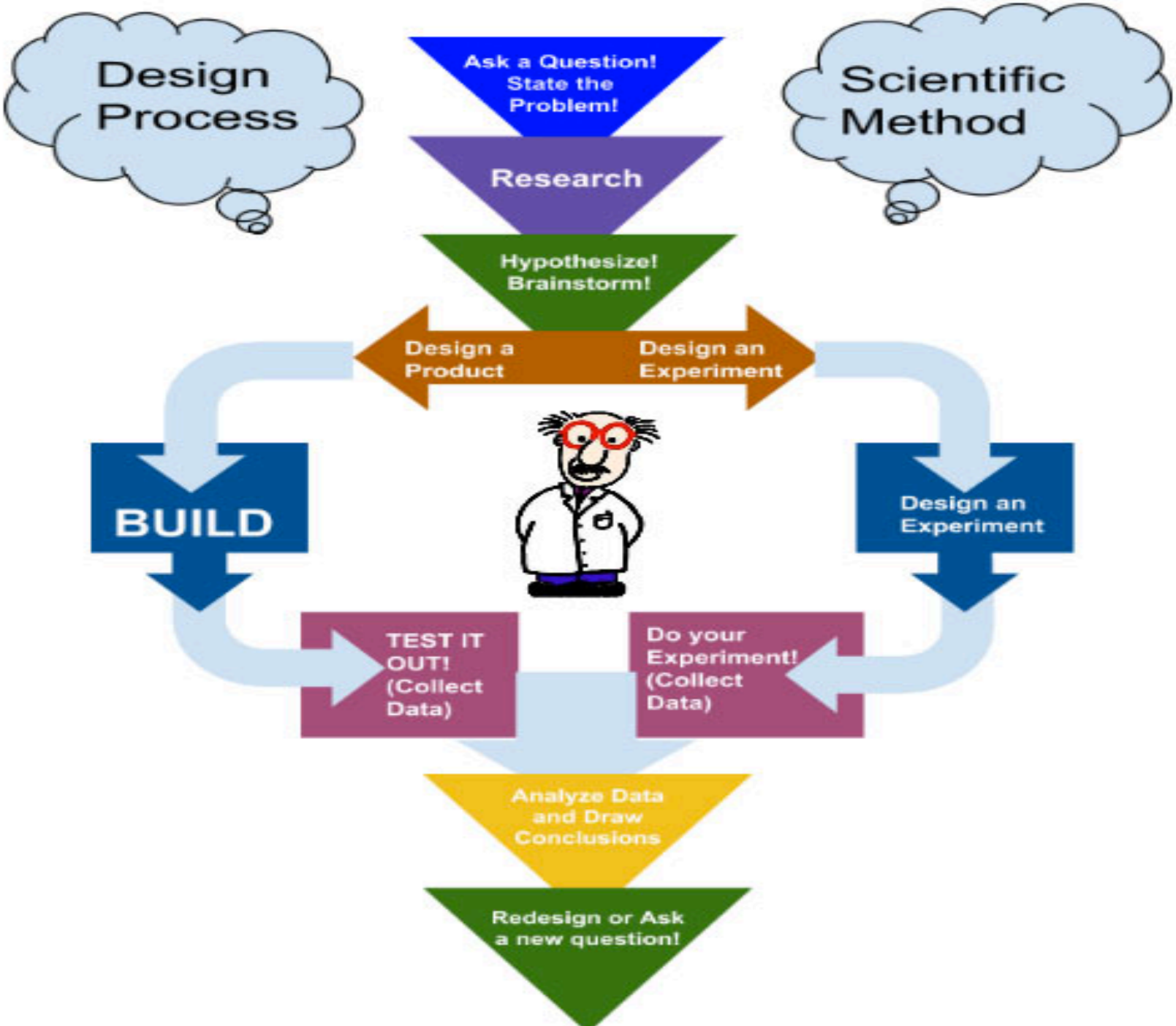
SELECT
the most promising solution

PROTOTYPE
your solution

TEST
and evaluate your prototype

ITERATE
to improve your prototype

COMMUNICATE
your solution


Design Process
Scientific Method
Ask a Question! State the Problem!
Research
Hypothesize! Brainstorm!
Design a Product
Design an Experiment
BUILD
Design an Experiment
TEST IT OUT! (Collect Data)
Do your Experiment! (Collect Data)
Analyze Data and Draw Conclusions
Redesign or Ask a new question!

Ask a Question:

When you think of a question remember to ask yourself, "Is it something I can test?"

For example: "Which brand of popcorn leaves the most kernels?"

Research:

It is important that you have a good understanding about what you are going to test.

You need to make sure you research using good scientific based websites, books, or even people. Wikipedia is NOT an okay website. sites that end in org and edu are great.

All this researching will help you form your hypothesis, and help you conduct your experiment.

Identifying Variables:

Independent variable- always changes

Dependent Variable- Relies on it

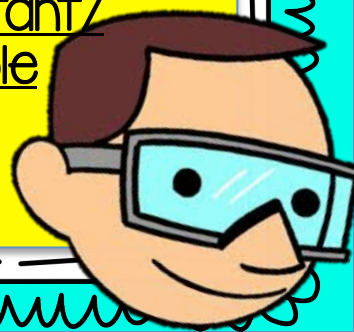
Constant/ Controlled Variable- stays the same- never changes

Example:

PopSecret popcorn, Orville Redenbacher popcorn, and Publix brand popcorn- **Independent variable**

The number of kernels left - **dependent variable**

size bag of popcorn, microwave, amount of time popped- **constant/ controlled variable**



HYPOTHESIS

The purpose of a hypothesis is to identify what you think will happen based on your research. We use a specific formula for constructing a hypothesis.

IF..... THEN.....

BECAUSE.....

EXAMPLE:

If I put Orville Redenbacher popcorn in the microwave for 3 minuets, then I think it will pop most of the kernels because it is the most popular name brand popcorn there is.

Materials:

Scientists create a detailed list of materials that they used. The goal of the Science Fair project is that anyone should be able to pick up your experiment and conduct it based on the materials and the procedures written.

Materials:

1) 1 bag of Orville Redenbacher pop corn
2) bag of Pop Secret Popcorn
3) 1 bag of Publix brand pop corn
4) Microwave
5) Bowl
6) Napkin

Procedures:

Make sure when writing procedures that you have a VERY detailed list. Remember, anyone should be able to pick up your experiment and conduct it themselves.

Data:

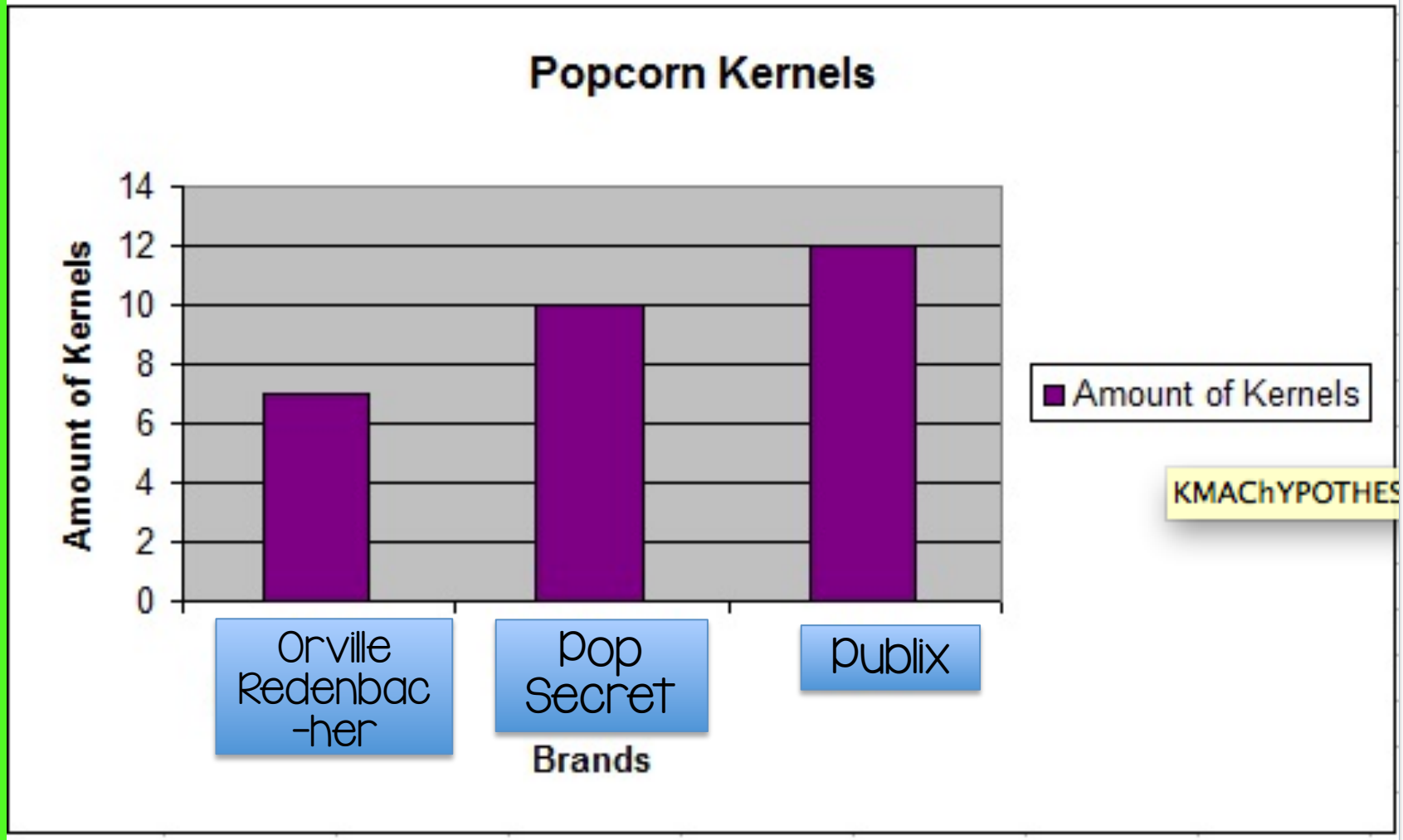
Throughout the experimentation process, you will be collecting data. This a data will help you create your graph or data collection chart.

You can choose between a chart, pie graph, line graph, bar graph, or tally chart. Choose the data table that will best fit your project.

It is important that your data is accurate, so you can figure out whether or not your hypothesis was correct.

Data:

If you Google: Create a graph you can find an online graph creating website that will help you.



Conclusion:

When creating a conclusion, you must look at all your data and figure out whether or not your hypothesis was correct. Why do you think it was or wasn't.

Write a paragraph on your observations and maybe what you could have done differently. This is the place where you reflect and put all your information together.

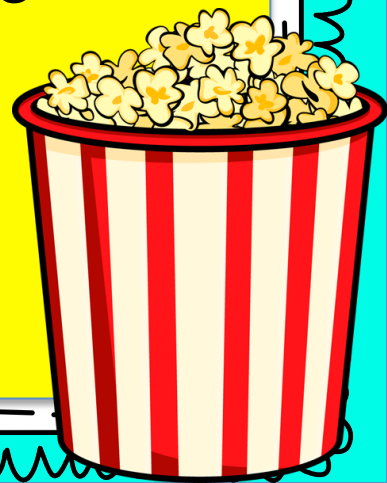
Conclusion:

FOR EXAMPLE:

The purpose of this experiment was to figure out which popcorn brand had the least amount of unpopped kernels. I did three trials for each brand then averaged them up. The results wound up being that Orville Redenbacher had the least amount of kernels unpopped with an average of 36 kernels. Pop Secret had the second least with 58 kernels and the Publix Brand had the most with 76 kernels.

Abstract:

The abstract is the part in your project log in which you summarize the entire investigation. Remember to include things such as the questions you were trying to answer or problem you were trying to solve, hypothesis, procedure, data/results, and conclusions based on evidence collected.



Present Your Project:

Whether you are required to make a backboard or a PowerPoint, you must put all your findings together and present it. On the next slide you will find an example of a backboard.

Present Your Project:

QUESTION or PROBLEM

HYPOTHESIS

ABSTRACT

The abstract is the part in your project log in which you summarize the entire investigation.

RESOURCES CITED

TITLE and AUTHORS

The title should describe the work to the reader. Include the variables that are manipulated.

TESTING and PLANNING

PROCEDURES, VARIABLES, MATERIALS

This section should include three sections in sufficient detail so that others can repeat your research.

DATA and RESULTS

Describe the results clearly. Use graphs, tables, charts, and pictures to prove or disprove your hypothesis to help clarify the results. Include a discussion on the statistics you use to describe or test your data. Save any conclusions for the discussion.

CONCLUSION

A summary of your results. State whether or not your investigation supported your hypothesis or if any modifications need to be made to improve your prototype.


PURPOSE
What brand of microwave popcorn pops the best?
HYPOTHESIS
PROCEDURE
DATA
GRAPH
VARIABLES
RESULT
CONCLU
33%
11%
10%
12%
11%
13%

5th GRADE SCIENCE RUBRIC

NAME:_____

PROJECT TITLE/TOPIC:_____

REQUIRED AREA	CRITERIA	POINTS
Problem (Project Question)	1. Stated as testable question. (5pts) 2. No obvious answer. (5pts) 10 total points	
Research	1. Relates to the problem statement. (5pts) 2. Any direct quotes or paraphrased materials are cited. Cites adequate research. (5pts) 10 total points	
Hypothesis	1. Clearly relates to the problem (Project Question.) 10 total points	
Procedures	1. Procedures produce necessary data. (10pts) 2. Procedures clearly written. (5pts) 3. Appropriate instrumentation used, if required. (5pts) 4. All materials used are listed. (5pts) 25 total points	
Presentation	1. Tri-fold board. (5pts) 2. Sections labeled. (5pts) 3. Neat/easy to read. (5pts) 4. Organization. (5pts) 5. Visual Aids. (5pts) 25 total points	
Conclusion	1. Supported by data. (5pts) 2. Limitations of results recognized (Examples- too few samples, errors in collection, variables not controlled too many variables.) (5pts) 10 total points	
Oral Presentation	1. Introduces self & project with enthusiasm. 2. Thorough. 3. Organized. 4. Easily heard and understood. 5. Makes eye contact. 10 total points	**Total Points:**

Comments: