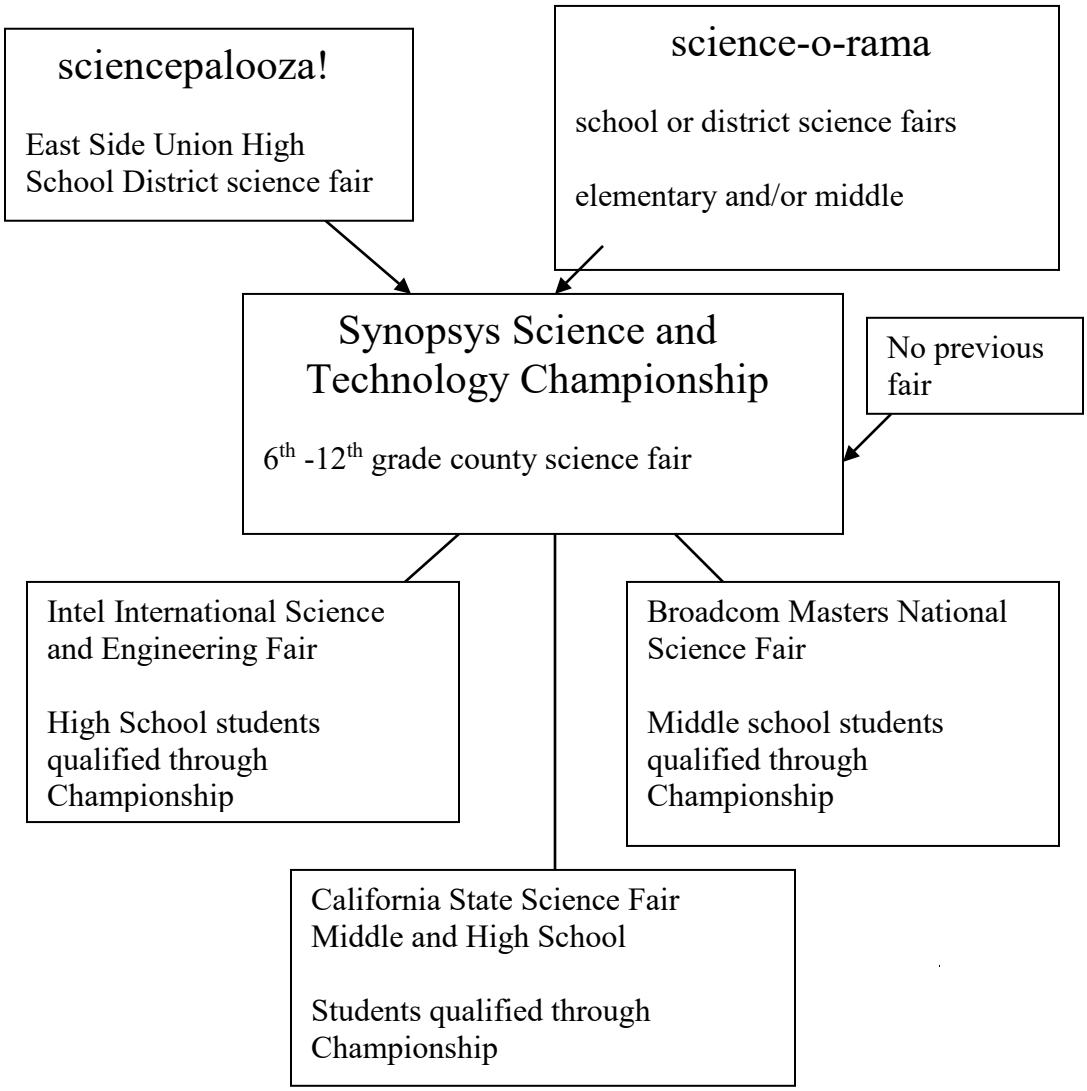
- Here is some information to help you become acquainted with the differences between sciencepalooza! (district fair) and the Synopsys Championship (county fair). (Insert PPT)
- Here is a schematic to show how all of the fairs are related to each other.

Science Fair Organization in Santa Clara County



- Below is a suggested timeline. These can be modified but the applications should be submitted by Dec 1.
- It is suggested that points for the project are distributed throughout the 2 semesters and not given all at once.
- Projects vary; you may need to be flexible with certain projects depending on material availability, etc.

Timeline	Suggested Due Date	Points
Topic Selection	20-Sept	
Research	1-Oct	
bibliography		
Variables-dependent, independent, and control	10-Oct	
Problem Statement	20-Oct	
Hypothesis	29-Oct	
Experimental Design	5-Nov	
Submit application and get approval	Nov 16	
Material List	19-Nov	
Log Book		
data tables	15-Dec	
graphs	20-Dec	
results	5-Jan	
Conclusion	10-Jan	
Powerpoint/oral presentation	20-Jan	
Board	30-Jan	
Abstract	5-Feb	

*Design Cycle includes: design, build, analyze (DBA)

See PowerPoint on Engineering Design online at www.science-fair.org/pdfs/WebPublishedWorkshop.ppt

- Here are two lists of tasks, one for the class and one for you, which might help in planning.

In Class Tasks	completed
Introduce Science fair project expectations	
Offer extra credit for Championship	
Review scientific method	
Emphasize independent, dependent variables and control	
Establish timeline	
Reserve computers for topic research	
Set up dates for topic meetings	
Reserve computer lab for online applications	
Have students request materials	
Schedule after school work days	
Reserve computers for graphing, PowerPoint	
Schedule presentation days	
Field trip forms	
Boards due Monday before palooza	

Teacher Tasks	completed
Create Your Timeline	
Decide if students will participate as individuals/groups	
Apply for SOF Grant Online	
Set aside sciencepalooza! date to judge	
Send in W-9's	
Organize project submissions and acceptances (hard and soft copies advised)	
Order materials	
Save boxes boards arrive in	
Sign up for judging/get parking pass	
Invite principals, potential judges	
Make sure board stickers are properly filled out	
Duplicate field trip forms	
Arrange for transportation (busses can be provided)	
Distribute parent letter, student letters, permission slips	
Pack boards in boxes, place in office for pickup	
Post sciencepalooza! posters	
Present certificates	

- A brief description of the process.

sciencepalooza! What to expect…

1) Apply for a grant, maximum = **20 total** (1- 19 for palooza!, 1- 20 for Championship)
2) You will receive a materials fund **check** for $25 per project up to $500 for 20 projects. This will be addressed to your school to your attention. You should deposit it into a school account as soon as it is received. This usually arrives in November. This can be used to buy equipment, pay application fees for Championship, or even printer cartridges for printing out display board information.
3) Set aside the day of sciencepalooza! to accompany your students and to help judge.
4) Make sure to visit the Science Buddies website to find project ideas and well designed experiments. Students should not choose projects in less than the green level.
5) You will find a verification form on-line. You MUST return this form by April 15 or you will NOT be awarded your stipend of $100 per project. Projects must be completed on time and presented to receive this stipend.
6) When students submit their forms online, you will receive an **automatic email** containing important information such as the project control number. Make sure to have the student keep a hard copy of this. You should keep a soft copy as well. If possible, organize these on your computer for easy access. EXCEL works nicely.
7) Submit **only one application** for each group project.
8) Heidi Black will read over each submitted project and send you back an email stating whether the project was approved or not. If it was approved, again print out a copy and give it to the student. Keep a soft copy as well.
9) If it was not approved, Heidi will let you, and the student, know why. Have the student fix the problem and then use the "modify" option on the website. They need to use the control number and your email to do so. All this information is on the submission page.
10) In December you will receive **display boards** for each accepted project. DO NOT THROW AWAY the boxes they come in. These will be needed when the boards are picked up the week of sciencepalooza!
11) In January (or earlier), you will receive
    a. **Posters** to put up in your classroom or other placed around school.
    b. **Kudos bars** for each student.
    c. **Parent letters** to distribute with information on the science fair.
    d. **Student letters** to distribute
    e. **Stickers and colored dots** with which to label display boards (there will be a note included explaining what color dot to use for which projects)
    f. **Certificates** for the students
12) T-shirts will now be distributed at sciencepalooza!

- A task list for students going on to the County Science Fair.

Extra tasks for Championship	Completed
Look at website: http://www.science-fair.org	
Attend one teacher clinic (see student handbook for dates)	
Encourage students to attend one student clinic (See student handbook for dates)	
Print applications from website. One required for each project.	
Obtain student handbook (available online for download)	
Download extra forms as needed for projects	
Read through application and make sure everything is filled out correctly, sign where appropriate, make sure there is a student and parent signature for each student doing project	
Include application fee check for projects before sending	
Send projects to SCVSEFA, PO Box 307, Los Altos, CA, 94023-0307 by deadline	
Arrange for students to check in project day before science fair after school at the San Jose Convention Center. This can be any time between noon and 6:00 pm	
Arrange for a substitute for after lunch on the day of the science fair so you can escort your students.	
Arrange for transportation to the science fair. Students need to be at the convention center before 2:00 pm and will remain at the fair until 6:30 pm. They need to bring their boards home when they leave.	
Arrange for food for students while at fair. There is nothing to buy inside the science fair. Students can bring food or you can go outside and purchase food for them.	
Make sure all boards come back-students who win will need theirs for the California State Science Fair and/or Intel International Science and Engineering Fair. We would like to display all boards at the District Office.	

Don't assume students are familiar with the scientific method. Doing a "lab" is much different from designing your own experiment. Make sure they are comfortable with this terminology.

Definitions-

Variables: Something that can change in a project. Light, heat, and moisture are examples.

Independent Variable: Something the investigator changes on purpose (the "cause")

Dependent Variable: Something that changes as the result of a change the investigator made (the "effect")

Constants: These are variables that you try to keep from changing in the project to minimize their effect on the results. For example, if you are testing increased light levels, did you also end up increasing the temperature? If so, is the result due to temperature, light, or both. If you are adding compost as opposed to fertilizer, is the moisture content equal?

Control: This is an experimental group that does not experience a change in the independent variable. This is the "normal" group that can be used to compare the experimental results.

Sample Size: This is the number of times or individuals you are doing the test for each group in the experiment. Minimum sample size should never be less than 5. You might work with 10 plants or 100 people in each group. If you are testing something that naturally has a wide range of variation, then you need a larger sample size to see if your results were significant.

Qualitative Measurement: A measurement that does not use numbers such as healthier, greener. Ex: The leaves on the experimental group were less wilted than the control group.

Quantitative Measurements: Measurements that use numbers. Numbers ALWAYS need units. (cm, seconds, individual plants)

Definitions, cont.

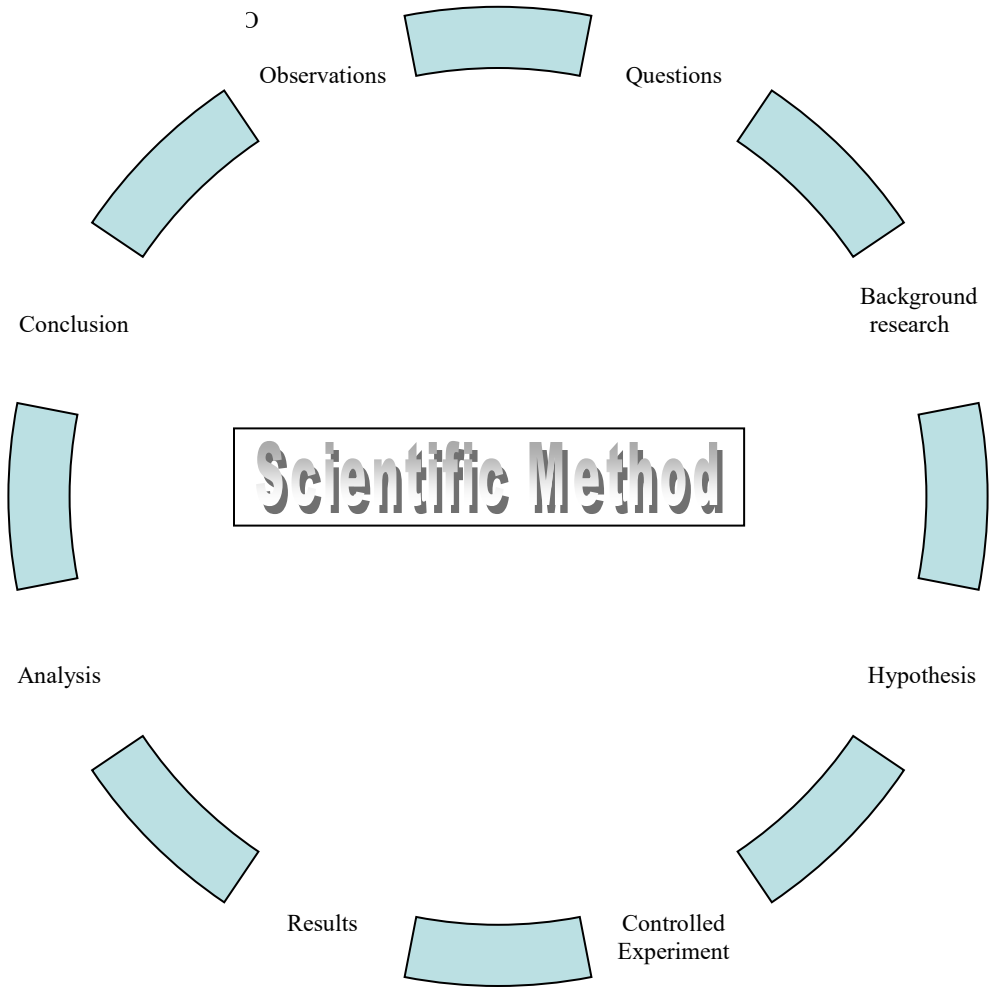
Significant Digits: The number of digits you report in your measurement that are significant, or important. If you take the average of 30.1cm and 30.0 cm, you get 30.05. Your ruler, however could not measure to that degree of precision, so you must round off the number you report to 30.1cm.

Accuracy: How close the measurement is to the actual measurement. If you know the plant is between 30.0 cm and 30.1 cm, then you have an accuracy of .1 cm

Measurement Error: The error introduced when using a measuring device such as a ruler or a scale. You might read the wrong number, but often error is just due to the limitations of the device. If you are using a stop watch, you need to think if the time to click it on and off as "error". It is important to identify sources of error in your project.

Schematic of Scientific Method:

The Scientific Method should start with an observation, which stimulates questions, which requires research, which can be used to develop a hypothesis, which suggests a controlled experiment, which produces results, which must be analyzed and lead to a conclusion. If the conclusion does not match the hypothesis (or even if it does) new observations should have been made, which should stimulate new questions….



This activity is included to help the students become familiar with the concept of dependent and independent variables.

Roto-Copter

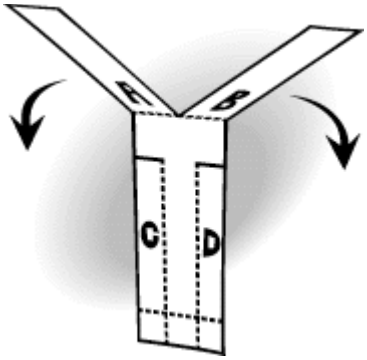
This simple paper toy spins through the air like a mini-helicopter

What do I need?

- print-out of the Roto-Copter pattern which you can click-on in Step 1
- pencil
- scissors
- paper clips
- crayons or markers
- newspaper
- cereal bowl

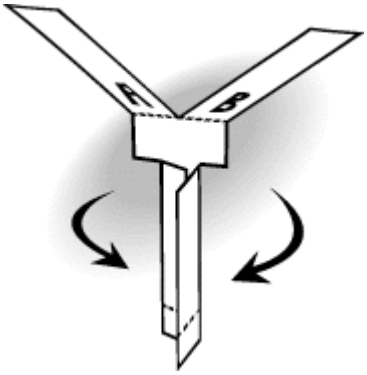
What do I do?

1 Print out the Roto-Copter pattern. Click here to go to pattern page. Cut along the solid lines only. Fold on the dotted lines.

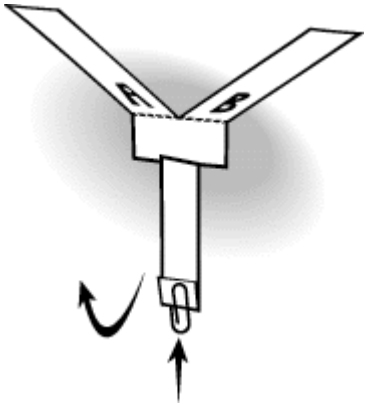


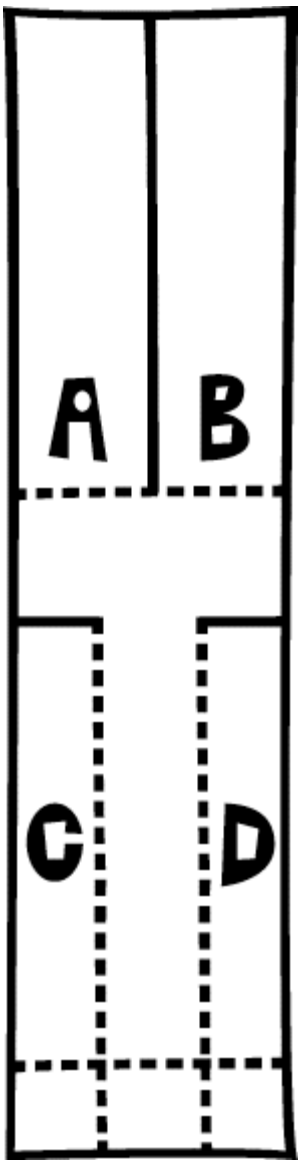
2 Fold A toward you. Fold B away from you.

3 Fold C and D over each other so they overlap.



4 Fold the bottom up and put a paper clip on it.





6 If you want, you can use crayons or markers to color your Roto-Copter before you fold it. The colors will blur together when it spins.

ROTO-TARGET

Make three Roto-Copters for each person. Use a marker to draw a 1-foot circle on a piece of newspaper. Put a cereal bowl in the middle of the circle. The circle is the target area and the bowl is the bull's-eye. Take turns standing on a chair at the edge of the newspaper and dropping your Roto-Copters. At the Exploratorium, we get 3 points for a bull's-eye, 2 points for a copter inside the circle, and one point for just hitting the newspaper-but you can make up any rules you want.

Wow! I Didn't Know That!

Igor Sikorsky designed the first successful helicopter in the late 1930s. His inspiration came from drawings of an aircraft with a spinning wing, drawn by Leonardo da Vinci nearly five hundred years before.

Places to Visit

Igor I. Sikorsky Historical Archives -Lots of photographs and information about helicopters and the man who invented them.

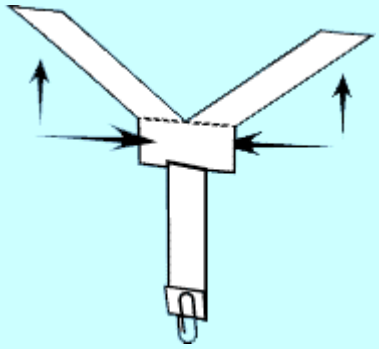
Leonardo da Vinci Museum
-This online gallery displays images and other information related to Leonardo da Vinci. The "West Wing" of the gallery has images of helicopters

What's Going On?

Why does the Roto-Copter spin?

When the Roto-Copter falls, air pushes up against the blades, bending them up just a little. When air pushes upward on the slanted blade, some of that thrust becomes a sideways, or horizontal, push.

Why doesn't the copter simply move sideways through the air? That's because there are two blades, each getting the same push, but in opposite directions. The two opposing thrusts work together to cause the toy to spin.



Next time you drop your copter, notice which direction it spins as it falls. Is it clockwise or counterclockwise? Now bend the blades in opposite directions-if blade A was bent toward you and blade B was bent away, bend B toward you and A away. Drop the copter again. Now

and other flying machines.

This and dozens of other cool activities are included in the Exploratorium's Science Explorer books, available for purchase from our online store.

We would like to hear about your results and discoveries. Please send an email message to Ken Finn.

which way does it spin?

In the Spinning Blimp, air pushes up on the flat sides of the strip of paper. When the flat side of the paper strip is parallel to the ground, the blimp drifts down like a flat piece of paper. But if the blimp tilts so that the flat side of the strip is at an angle to the ground, the paper strip gets a sideways push, just like the blade of the copter, sending the blimp spinning. Each time the flat strip comes around, it gets another push and goes for another spin.

This activity helps the students understand the importance of defining variables, using controls, and exploring the many options that may be used in designing a procedure.

Tape Activity

Purpose: to create a situation where students determine on their own the necessity of variable definition and experimental controls.

Materials: 3 types of tape (masking, duct or packing, etc) Ruler
Sandwich bag Pencil
A bucket or other container Pennies (~ 100 /group)

Procedure:

1) instruct the groups to devise their own experiment using only the materials provided to determine which type of tape is the "stickiest"---do not define sticky for them
2) once the students have completed the task ask them
    a. what was the first problem you encountered? (usually what "sticky" means)
    b. have each group describe the procedure they developed to the other groups
    c. which group came up with the most "fair" test? What makes it fair? Is it repeatable.

Examples: a. a group may decide that sticky has to do with how many times the tape can be stuck to the carpet and still cling to a penny
b. a group may see how many pennies they can stick to one piece of tape
c. a group may stick the bag to the tape and see how many pennies can be placed in the bag before the tape releases the bag

3) the groups should explain some of the ways they tried to make the test more fair (controls implemented)
    a. cutting all pieces of tape to the same length and width
    b. sticking equal amounts of tape on the bag
    c. using equal amounts of pressure to apply the tape
    d. making sure the adhesive wasn't touched before being applied
    e. considering the amount of dirt on the pennies
    f. dropping the pennies from an equal height into the bag

Discussion: Should lead the students to understand that

a) there are many ways to design the same experiment
b) it is important to start with solid definitions
c) there are many possible variables, besides the dependent and independent, that need controlling
d) if we considered this an experiment, what would be the dependent and independent variables? (for example c, independent is type of tape, and dependent is number of pennies)
e) Is this a true experiment? (No, there is no hypothesis based on scientific reasoning. This is more like product testing.)

Topic selection is the most time consuming and important part of doing a science fair project. Below is a list of activities that may help the student choose a topic. Choose those that suit you, but it will help to do as many as you can fit in. Try to get parent or mentor help to guide the students at this point-it will save a great deal of time later on. The more limits you put on topic selection the easier it will be for students to choose a topic. Consider having students select projects that reinforce the California State Science Standards.

Topic Selection ideas	due date	points
1) List 20 things that interest you What kinds of things do you enjoy doing? What area of science interests you the most? If you could be a scientist, what would you like to do? What are your hobbies or free time activities? What do you like to do on rainy days? What kinds of books do you like to read? Which movies or TV shows might give you ideas or information? What are your special skills or talents?		
2) narrow 5 of these to a question that can be investigated		
make the question very specific-ex		
topic = electricity		
specific = electricity for Christmas tree lights		
more specific= Christmas tree lights wired in series and parallel		
even more specific= do lights wired in series use less electricity than lights wired in parallel		
3) make 20 observations		
4) change 5 of these into "what if?" or "I wonder?" question		
5) use the science standards for your course to identify possible topics		
6) Look at, print and summarize 3 websites other than science buddies		
7) do a google search using two science terms to see what other researchers are doing		
8) Go to science buddies (www.sciencebuddies.org/mentoring/index.htm) and fill out topic selection wizard		
-print out topic ideas		
9) meet with teacher/mentor to discuss possible topics		

Give students the chance to become familiar with science writing and the information that might be gained by reading. Choose and run off an article from *Discover, Science News, or Popular Science.*

Have students:

- Read the article, identifying the independent and dependent variables and controls described.
- List materials that were used in the experiment.
- Create a step by step description of the procedure.
- Use the controls or other information given in the article to develop alternative investigations the scientist might have explored.
- State the investigator's hypothesis and conclusion.

The more research the student does, the less time will be wasted setting up procedures that fail. The minimum number of resources should be 3, it is recommended that the student have between 5 and 10. Students should fill out this page, print out the resource, and type up a paragraph summary. You may want to have the students use easybib.com or http://citationmachine.net/.

Research Source _____

Title:

Author:

Web address or publisher:

Date:

Two things you learned from this source:
1)

2)

A hypothesis is not just a guess-it is the application of a scientific principle to an unknown situation. Here is an excellent lesson on building hypotheses: http://www.accessexcellence.org/LC/TL/filson/writhypo.html. Students should use the information from their research to develop their hypothesis in a format as shown below. Students should also be ready to fill out their project proposal.

Develop your hypothesis:

AFTER learning about the independent and dependent variables in your project, you must make an EDUCATED guess about how the experiment will turn out. The hypothesis is one sentence that states what you think the answer to the problem statement will be BASED ON WHAT YOU LEARNED IN THE RESEARCH. The sentence should indicate what you expect the dependent variable (effect) to be as a result of changing the independent variable (cause).

The hypothesis should not be written in 1st person (I, we, my, etc.) Try using one of the following formats:

1) It is hypothesized that there is a direct/inverse relationship between _____ and _____.
2) The hypothesis for this research project is that _____ will cause a significant change in _____.
3) It is hypothesized that _____ will result in _____.

Project Proposal page
Students should develop detailed procedural steps and walk through as much as possible to avoid unexpected problems. This may be a good time for peer review.

Experiment Science Fair Proposal Form (20 pts)
Due _____

Name	Period	Grade Level

1. Are you interested in entering this project in the championship? (2pts)
   _____ Yes _____ No _____ Not Sure _____ Convince me
2. Topic Choice (3 pts)
3. Description of possible lab experiment involving this topic (4 pts)
4. What will be your independent variable? (2 pts)

   _____
5. What will be your dependent variable? (2 pts)
6. State your hypothesis. (2pts)
7. What equipment will you be using? (2pts)
8. Bibliography – Minimum of three sources correctly sited about this topic (3 pts)
9. What safety considerations are associated with your project? How will these be addressed?

A form for engineering projects.

Science Fair Engineering Proposal Form (20 pts)
Due_____

Name:	Period	Grade Level

1. Are you interested in entering this project in the championship? (2pts)
_____Yes _____No _____Not Sure _____Convince me

2. Function or purpose of your project? (Your improvement for a target user) (3 pts)

3. Description of possible prototype involving this topic (4pts)

4. State your design criteria and constraints? (3 pts)

6. What equipment will you be using to construct your project? (2 pts)

7. Describe your basic test plan and the equipment you will need. (3 pts)

8. Bibliography – Minimum of three sources correctly sited about this topic? (3 pts)

9. Safety concerns addressed?

PreLab Rubric (you can make your own at http://rubistar.4teachers.org/index.php)

Lab Report: Experimental Design Rubric

Student Name: _____

CATEGORY	4	3	2	1
Title	The title includes all important key words about the experiment.	The title includes most of the important key words about the experiment.	The title includes some of the important key words about the experiment.	Title is absent or misleading.
Question/Purpose	The purpose of the experiment or the question to be answered is clearly identified and stated.	The purpose of the experiment or the question to be answered is identified, but is stated in a somewhat unclear manner.	The purpose of the experiment or the question to be answered is partially identified, and is stated in a somewhat unclear manner.	The purpose of the experiment or the question to be answered is erroneous or irrelevant.
Hypothesis	Hypothesized relationship between the variables and the predicted results is clear and reasonable based on what has been studied.	Hypothesized relationship between the variables and the predicted results is clear and reasonable based on general knowledge and observations.	Hypothesized relationship between the variables and the predicted results has been stated, but appears to based on flawed logic.	No hypothesis has been stated.

Materials	All materials and setup used in the experiment are clearly and accurately described.	Almost all materials and the setupu used in the experiment are clearly and accurately described.	Most of the materials and the setup used in the experiment are accurately described.	Many materials are described inaccurately OR are not described at all.
Procedures	Procedures are listed in clear steps. Each step is numbered and is a complete sentence. Safety concerns have been addressed.	Procedures are listed in a logical order, but steps are not numbered and/or are not in complete sentences. Safety concerns are incomplete.	Procedures are listed but are not in a logical order or are difficult to follow. Safety concerns are incomplete.	Procedures do not accurately list the steps of the experiment. Safety concerns have not been addressed.
Data	Data tables are labeled and titled. Units are indentified. Qualitative observations have been identified.	Data tables are labeled and titled. Units are missing. Qualitative observations have been identified.	Data tables are unlabeled or untitled. Units are missing. Qualitative observations have not been identified.	Data tables are not shown OR are inaccurate.
Variables	All variables and controls are clearly described with all relevant details.	All variables and controls are clearly described with most relevant details.	Most variables are clearly described with most relevant details. Controls may be missing.	Variables are not described OR the majority lack sufficient detail. Controls are absent.

Date Created: Jul 03, 2007 02:53 pm (CDT)

Having students fill out a form such as this will help you keep orders straight and get borrowed materials returned.

Log books should be kept from the very beginning; you may find it works better to begin the log book after a topic has been selected. Judges are very impressed by them-this is real science. All scientists and engineers have log books, they are legal documents. Everything-ideas, mistakes, phone calls, data- is kept in the book. Log books should be checked often.

Science Fair Equipment List (10 pts)
Due _____
Project Title _____

Name	Period	Grade Level

Material List

Student Provided	Available at school	Purchased by Teacher (fill out next table)

For each item to be purchased by teacher fill in this table.

Item	Catalog or website	Page	Item #	Quantity	Cost per each	Total cost

Logbooks:
Write all notes in ink.
Date all notes.
Initial and date any corrections (do not cross them out, only put a single line through them).
Use a bound notebook.

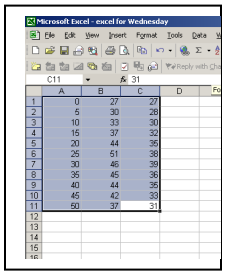
Log book Rubric- it is helpful to have students tape this to the inside cover of the log book.

Science Fair Log Book

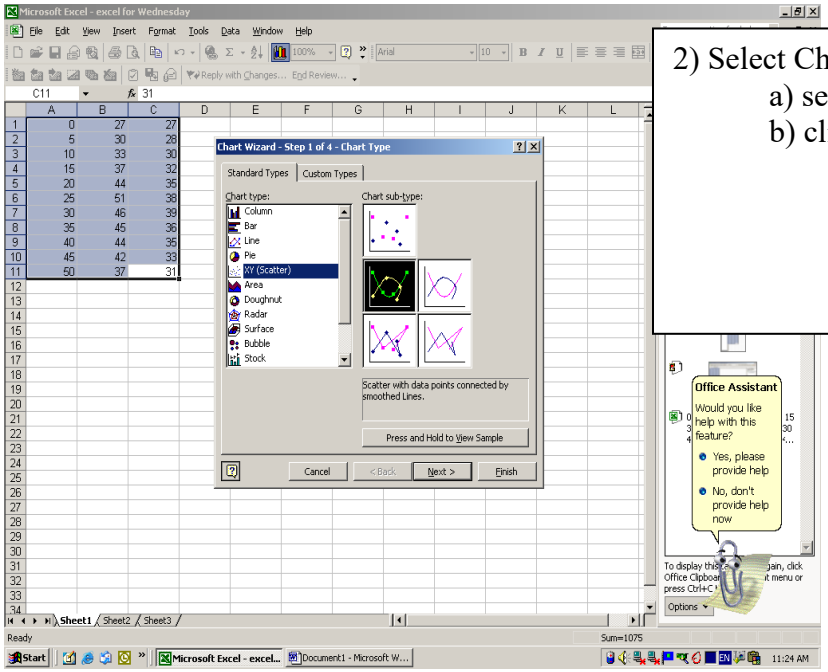
Item	Points	Points Received
Cover – Names/Period/Title	5	
Background Information	15	
Prelab – (acceptance page) - Purpose, hypothesis, materials, safety, procedures	15	
Data - Tables with labels and METRIC units, include date – week 1	10	
Data week 2	20	
Data week 3	20	
Pictures (min 4) – write caption under each	20	
Graph – title, labels, units, trendline and EQ(if needed)	20	
Discussion – conclusion – written in RERUN format	20	

Have students graph as much data as possible. Below are instructions for making graphs that don't start with zero on the "Y" axis.

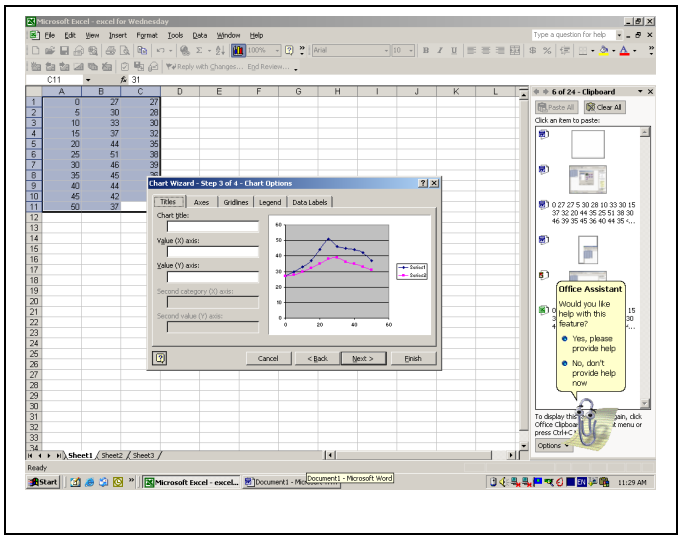
How to Make Excel Graph like a Scientist Heidi Strahm Black Page 227/26/2019



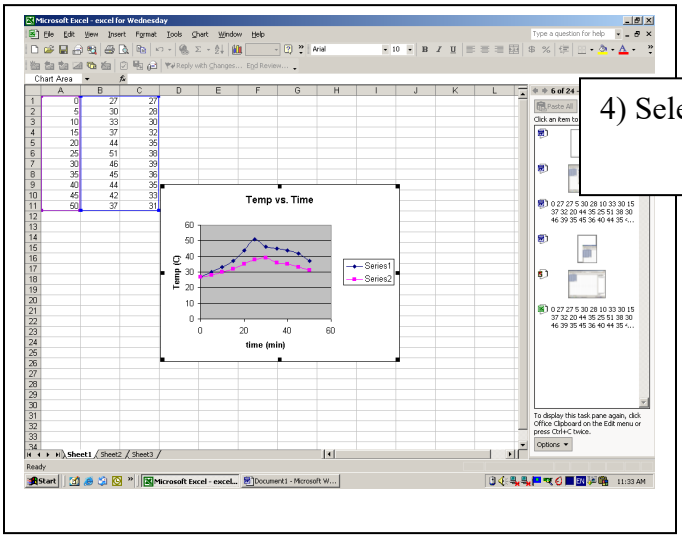
1) Create data table in Excel
   a. Dependent variable in first column
   b. Independent variable in subsequent columns
   c. Highlight data



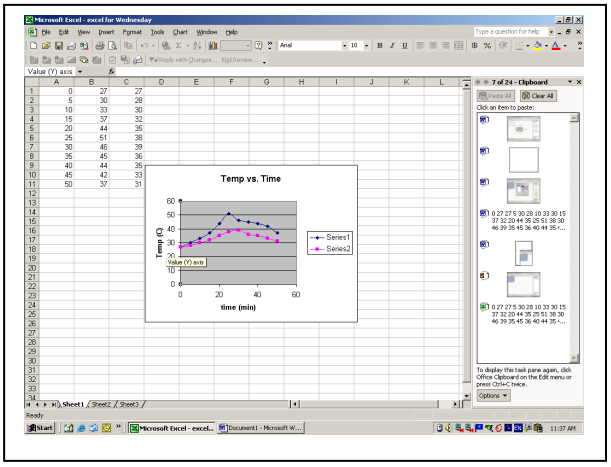
2) Select Chart Wizard
a) select Scatter
b) click "next"



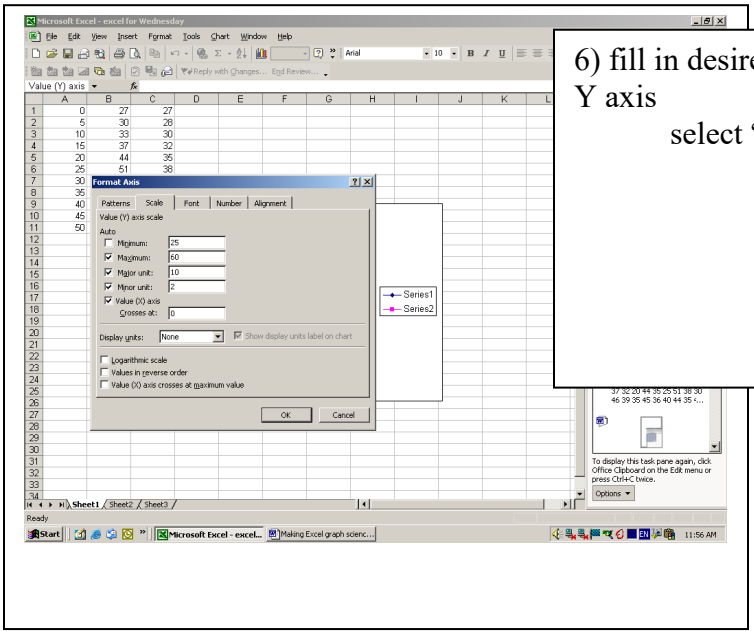
3) Click "next", then you can add Chart title, x and y axes.



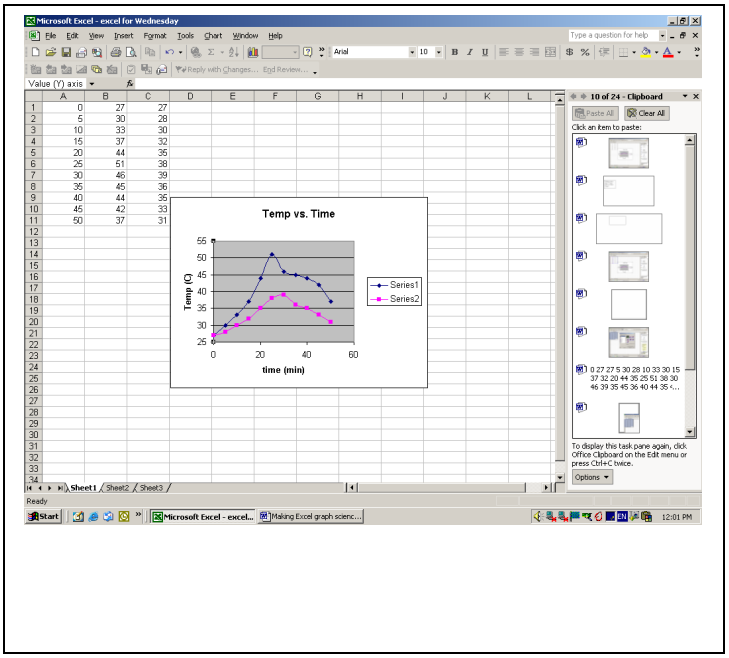
4) Select "finish"



5) Move cursor over “Y” axis right click on “value Y axis”, and select “format axis”



6) fill in desired lower limit of Y axis
select “OK”



Ta Da!!!!

Results and Conclusions

Students sometimes have a difficult time distinguishing between results and conclusions. The results are the data gathered and any representations of that data to make it clearer (i.e. graphs, tables, trends, mean, standard deviation). The conclusion is the interpretation of these results. It should defend whether or not the hypothesis was supported and what the results mean to the real world. What is the importance of the data? Here is where the student convinces the judges to care about this project.

Abstracts are not a reprint of the information on the student board. They should be written in paragraph form and limited to 500 words. While abstracts are not required for sciencepalooza!, they are for the Championship.

How to Write an Abstract

Title:
Researcher:

I. Problem Statement and Hypothesis: (What you wanted to find out, what you thought would happen, and why.)

Because research reports that chemical fertilizers can have a negative effect on nitrogen fixing in legumes, I wanted to find out if compost would have less of an effect. I thought the compost would not interfere with the nitrogen fixing abilities of bacteria in legume nodules because the compost adds nutrients in a balanced proportion.

II. Methodology: (How you ran your test, including important materials or techniques. This should not be step-by-step, but a general description.)

A comparison was made of the effects of compost vs nitrogen fertilizer on the nitrogen fixing nodules of pea plants. Five groups of 50 pea plants were grown from seeds in identical soils. One group received no fertilizer and the second the recommended dose of fertilizer. The third group was given a small amount of organic fertilizer, the fourth a medium amount and the fifth a large amount. At the end of 2 week intervals, 10 plants in each group were pulled out of the soil and the nodules were counted and diameters measured. The nitrogen content of the soil was measured.

III. Data analysis: (Include a summary of your results, including any important trends.)

Nodules of plants grown in the fertilized soil were significantly smaller than those grown in untreated soil, based on a T-test. Nodules in composted soil were larger and more numerous in the composted soil. This effect did not increase in the sample with the highest amount of compost. My tests of nitrogen content were inconclusive.

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IV Conclusions: (What did you find out and what does it mean? What is important about your results?)

Although the nodules were more numerous on the plants grown in compost, there does seem to be an upper limit to the benefit of adding compost. Since I was not able to measure the amount of nitrogen in the soil, I'm not sure if the plants or soil benefit from the increases in nodule number and size. Since the nodule were more numerous and larger in both the control group and experimental group than in the chemical fertilizer group, I believe the data supports the conjecture that chemical fertilizers have a negative effect on legumes.

V. Applications and future research: (Who should care about your work, how could it be of use?
What research would you do given more time or money?)
Legumes are a staple food source for much of the world. The nitrogen fixing bacteria in their nodules allow them to produce protein rich seeds (beans and peas). If chemical fertilizers are harming legume crops, alternatives need to be explored in order to feed an increasing world population. In order for this research to be of significant value further research needs to be completed: a) the nitrogen content of the soil must be accurately measured, b) the long-term effects on the overall health of plant needs to be evaluated, and c) the protein content of the fruit needs to be compared.

A PowerPoint presentation can easily be turned into the pages needed for the display board. Students should have the opportunity to present their project in class before judging.

SF Power Point Rubric

Student Names _____

CATEGORY	4	3	2	1
Text- Font Choice and Formatting	Font formats (e.g., color, bold, italic) have been carefully planned to enhance readability and content.	Font formats have been carefully planned to enhance readability.	Font formatting has been carefully planned to complement the content. It may be a little hard to read.	Font formatting makes it very difficult to read the material.
Slides	All graphics are attractive (size and colors) and support the theme/content of the presentation.	A few graphics are not attractive, but all support the theme/content of the presentation.	All graphics are attractive, but a few do not seem to support the theme/content of the presentation.	Several graphics are unattractive AND detract from the content of the presentation.
Content and Accuracy	All content throughout the presentation is accurate. There are no factual errors.	Most of the content is accurate but there is one piece of information that might be inaccurate.	The content is generally accurate, but one piece of information is clearly flawed or inaccurate.	Content is typically confusing or contains more than one factual error.
Questions	Group is able to answer all questions posed in detail.	Group is able to answer all questions simply or with some help.	Group is able to answer some question but require help and little details are given	Group is unable to most questions even with help.
Cooperation	All members speak equally.	All members speak, but some more than others.	One member never speaks.	Only one person speaks during the presentation.
Presentation	Group is able to maintain audience attention and speak loudly and with voice inflections.	Sometimes group is able to maintain audience attention OR voices are too soft OR voices are monotonous.	Sometimes group is able to maintain audience attention AND voices are too soft OR voices are monotonous.	Group is unable to maintain audience attention AND voices are too soft OR voices are monotonous.

There is no set-in stone way to set up the display board. Some projects emphasize procedure, some results. However, the sections should be in a logical order from left to right and top to bottom.

SF Board Rubric - Student Names: _____

CATEGORY	4	3	2	1
Attractiveness	The poster is exceptionally attractive in terms of design, layout, and neatness.	The poster is attractive in terms of design, layout and neatness.	The poster is acceptably attractive though it may be a bit messy.	The poster is distractingly messy or very poorly designed. It is not attractive.
Graphics - Relevance	All graphics are related to the topic and make it easier to understand. Graphics don't take away from presentation or make it too busy.	All graphics are related to the topic and most make it easier to understand. Graphics don't take away from presentation or make it too busy.	All graphics relate to the topic.	Graphics do not relate to the topic OR several borrowed graphics do not have a source citation.
Labels	All items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.	Almost all items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.	Several items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.	Labels are too small to view OR no important items were labeled.
Required Elements	The poster includes all required elements. Title Teacher name Student name and school Problem Hypothesis Materials Procedures Data Table Graph Conclusion Pictures Bibliography	1-2l required elements are missing on the poster. Title Teacher name Student name and school Problem Hypothesis Materials Procedures Data Table Graph Conclusion Pictures Bibliography	3-5 of the required elements are missing on the poster. Title Teacher name Student name and school Problem Hypothesis Materials Procedures Data Table Graph Conclusion Pictures Bibliography	Several required elements were missing. Title Teacher name Student name and school Problem Hypothesis Materials Procedures Data Table Graph Conclusion Pictures Bibliography

	Extensions	Extensions	Extensions	Extensions
Story Telling	All parts of experiment are evident from the poster and easy to follow without explanation.	Most parts of the experiment are evident from the poster and easy to follow without explanation	Some parts of the experiment are missing and poster is difficult to follow.	Many parts of the experiment are missing and the poster is difficult to follow.