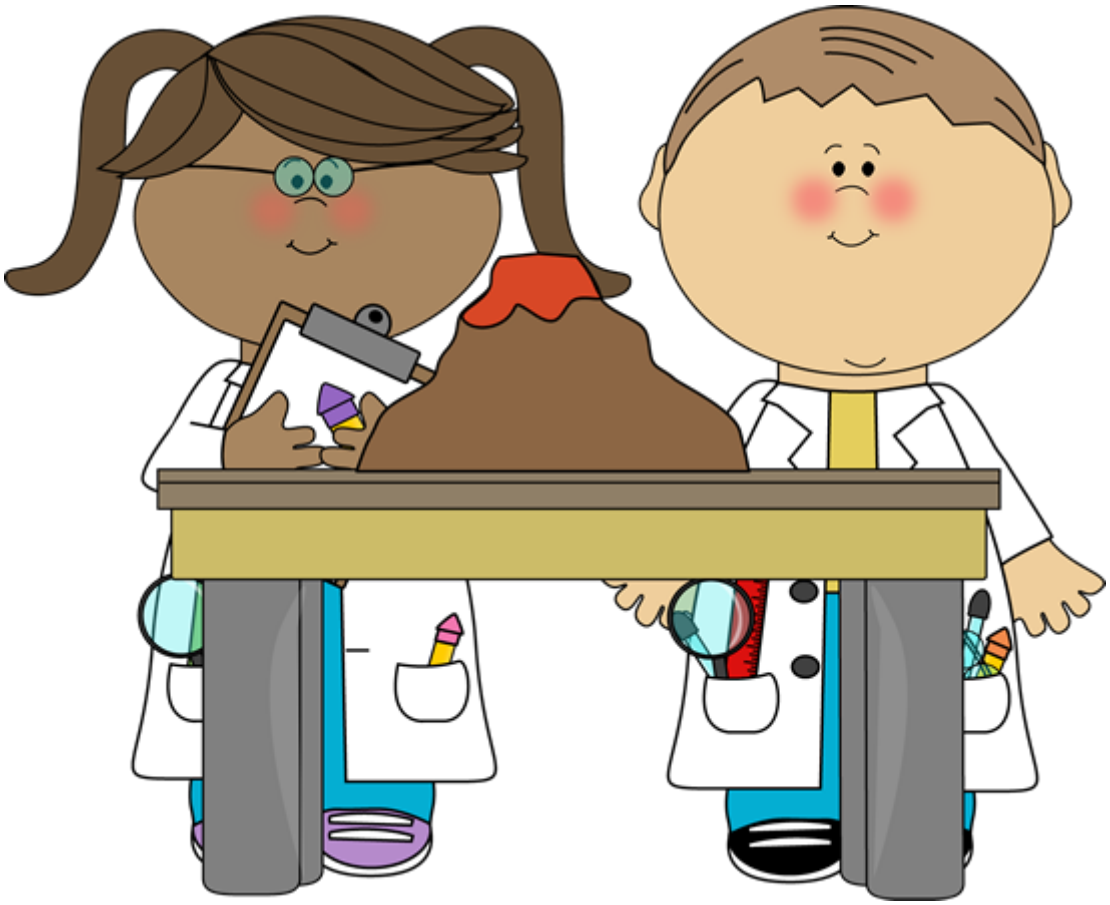
Broadmor PTA Science Fair Handbook



Fourth & Fifth Grades

Research Notebook for the Broadmor PTA Science Fair 2019

Any questions regarding this year's science fair packet, please direct them to **Stephanie Milam-Edwards,** smilam@tempeunion.org or **Erin Kirkpatrick,** kirkpatrickerin@hotmail.com.

This packet and enrollment information plus updates on the science fair will be posted on the *www.broadmorpta.org/science* website for your convenience.

FOR IMPORTANT SCIENCE FAIR DATES, TURN TO THE END OF THE PACKET INCLUDING DATES OF EXCITING ACTIVITES LEADING UP TO THE FAIR!

Name:_____

Dear Family Members,

Science Fair Week starts February 19th! The PTA's goal is to provide an opportunity for students to explore their world through science and for them to share their resulting discoveries. This may be the first time that your child has been given the opportunity to participate in a science fair. Things you should know:

- Students will present to a guest evaluator or team of judges;
- Every child is encouraged to participate; and,
- Each participant will receive a ribbon/certificate and prize.

Please consider letting your child do a project. Science is all about asking questions, and no one asks better questions than an elementary school child does.

Animals (zoology), people (human behavior), sports (physics), food (chemistry), Mars (astronomy) are just some of the topics your child can explore. There's science in just about everything we do. If your child can't think of a topic immediately, take a look at the suggestions on the websites below:

http://school.discoveryeducation.com/sciencefaircentral
http://bit.ly/IDdLQZ
http://www.sciencebuddies.org

Keep it simple! Help your child choose a topic that:

- Is interesting to them and relates to their own experiences;
- Suits the child's level of understanding and ability;
- Is realistic for the time available;
- Allows your child can be a BIG participant; and
- Is creative and original.

It is the family member's role to be:

- Lab Assistant – help gather materials, assist with construction, and supervise activities;
- Consultant – ask questions, give advice, make suggestions, ask student to explain his or her reasoning, help with understanding the requirements, keep on track; and,
- Chair of the board – approves project based on cost and materials available, determines project safety.

Team Projects are allowed. Be sure to allow each student to have an active role in the project.

Get Started!

- Read the handbook as a team (scientist and assistants).
- Create a plan of attack using the deadlines from the schedule provided in the handbook.
- Within the first week after the science fair booklet is received, submit an enrollment form to the child's teacher. This is appreciated, but not required to help us plan for the correct number of volunteers.
- Conduct your research, create your tri-fold display, and practice your interview.
- Bring your project before or after school on Tuesday, the first day of the Science Fair.

Please read this aloud with your child(ren):

4th & 5th graders,

We are happy that you will be working on a project for the science fair!

What is science? It is the study of the world around us. Your science fair project will answer questions and help you learn more about the world.

You will be a scientist for the next few weeks. As a scientist, you will need to ask questions, make a plan, do science work, write down things you learn, and make a display to show your project.

Please have your parents help you with all of the steps—they are your lab assistants. This is your project, but you will need your parents' help to pick a project, do the work and complete your display. You may need them to help you write things down. That's ok!

Take your time with your project and make sure that you have all the parts you need. Ask many questions, write down everything you learn, and take pictures.

Okay, now get to work on your project!

What's that? You still need help getting started?

All you need to do is follow these easy steps and you too can create a wonderful award winning science project, thought up entirely by you!

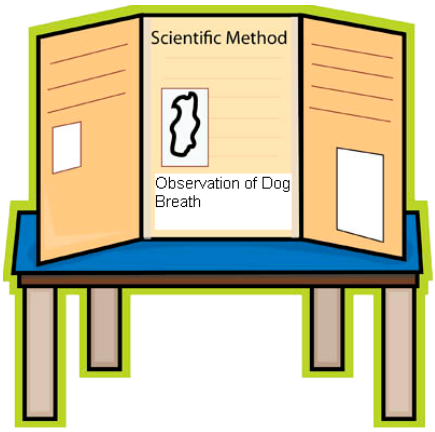
As part of your finished project and display…

- ☐ Include this completed planner (do only the sections appropriate to your project).
- ☐ Include your scientific notebook (composition, school notebook, or folder) to keep and record your information and for people to see your hard work.
- ☐ Use a tri-fold board to display your all that you learned.

From this point forward you are now… A SCIENTIST!

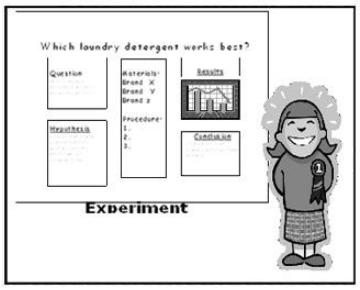
Types of Science Projects

There are four types of science projects for 4th and 5th graders: Observation, Collection, Experiment and Inventions. Here is the difference between them:



An Observation or Collection:

Shows how something works in the real world, but doesn't really test anything.
Examples of collection projects can be: "The Solar System," "Types of Dinosaurs," "Types of Rocks," "My gum collection."
Examples of observations might be: "How much water does my dog drink in a day?," "How Clouds Look Each Day?," or "What Does a Plant Look Like When It Grows?"



An Experiment or Survey:
Lots of information is given, but it also has a project that shows testing being done and the gathering of data. Examples of experiments can be: "The Effects of Detergent on the Growth of Plants", "Which Paper Towel is more Absorbent?" or "What Structure can Withstand the Most Amount of Weight." You can tell you have an experiment if you are testing something several times and changing a variable to see what will happens. We'll talk about variables later….

An experiment can also take the form of a scientific survey:
Students ask a question and create a survey of questions to gain information from the input of their subjects. This information is used to determine a mindset of a group of people. For example, "How many people recycle? What color makes you feel happiest? Information is arranged in a graphical way to report on public perception, behavior, or opinion.

An Invention:
An invention solves a problem for people in the real world. Are you interested in creating something new that actually works? Fourth and fifth graders can design an invention (a newly created item) or develop an innovation (an addition or improvement to an item that already exists). Which ever you choose to do, you should be able to make a working model, though it does not have to be perfect. Examples of inventions might be: a poncho to wear on a bicycle, clothing tags to keep track of what goes together, a new type of ice cream scoop, or a computer program that helps people keep track of their medications.

So What Type of Project Should You Do? (Any of the four categories in any discipline)

Life science: All animal, plant and human body questions that you might have. ***Remember that it is against Science Fair Rules to intentionally hurt an animal during an experiment.***

Physical Science: Topics about matter and structure, electricity, magnetism, sound, light or anything else that you might question, "How does it work and what if I do this to it, will it still work?"

Earth and Space Sciences: Covers all sorts of topics that deal with the Earth or objects in space, including weather, oceanography, and geology.

Social science: Topics about human behavior, interaction, and emotions based on perception of the environment around them.

ALWAYS CONDUCT YOUR RESEARCH WITH PARENTAL PERMISSION AND SUPERVISION!!!

Follow the steps on this page to use the Scientific Method as it applies to the project you'd like to do:

Collection

Ask a question	•What kind of things would you like to collect?
Do background research	•Read books, watch videos, or talk to people who know about your idea.
Collect	• Obtain materials needed to gather and sort your collection
Name and group	•Every item has a special name. Group like items together.
Collect your information	•Place collected items together. Label and organize them into one group.
Report your results	•Include your collection or photos of it as part of your tri-fold display.

Observation

Ask a question	•Ask a question that is easily answered as being true or false.
Do background research	•Read books, watch videos, or talk to people who know about your idea.
Create a plan	•Where, what, when and how will you make your observations?
Observe your subject(s)	•In a journal, record careful observations. Take pictures.
Collect your information	•Create a table or chart displaying what you learned from your data.
Report your results	•Was your question answered? Put answers on a tri-fold display.

SEE NEXT PAGE FOR THE SCIENTIFIC METHOD FLOW CHART FOR OTHER TYPES OF PROJECTS.

Experiment

Ask a question	•Ask a question that is easily answered as being true or false.
Do background research	•Read books, watch videos, or talk to people who know about your idea.
Construct a hypothesis	•Make a prediction about what might happen.
Test your hypothesis	•Conduct your experiment at least three times. Take pictures.
Analyze your data	•Was your prediction proved to be correct based on your data?
Report your results	•Make a tri-fold board that explains and displays your results clearly.

Invention

Choose a problem	•Choose a problem you want to solve by creating a solution or tool people can use
Consider the situation	•Read books, watch videos, or talk to people who know about your idea.
Research & Planning	•Make a prediction about what might happen.
Design & Development	•Conduct your experiment at least three times. Take pictures.
Testing & Revision	•Was your prediction proved to be correct based on your data?
Report your results	•Make a tri-fold board that explains and displays your invention clearly.

My project is this type: **Collection** **Observation** **Experiment** **Survey** **Invention**
(circle one)

My favorite Science Fair project discipline is: **(circle one)**

Life Science **Physical Science** **Earth/ Space Science** **Social Science**

I want to do a project involving (specific topic): _____

Collection: a project about collecting, identifying and grouping items from the environment around you.

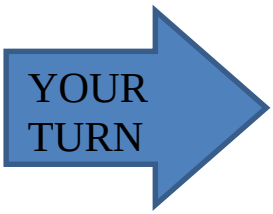
Step 1: Ask a question

Choose a topic that you are interested in learning more about. Ask a one sentence question that you will find the answer to by collecting something. You can get ideas of what you might want to collect and the question you want to answer by taking a walk, looking around your room, or thinking about what you like the most. *Write this question in your science notebook.*

Examples: What kinds of insects live in my backyard?
What kinds of leaves grow in my neighborhood?
What different twigs grow on trees in the park by my house?

Follow this format: What kinds of _____ _____ _____?

(item)	(verb)	(location)
birds	are	in my neighborhood
leaves	are	in the park
trains	are	in the world
dinosaurs	were	in the world



My Question: _____?

Step 2: Background Research

Now it is time to research your item as much as possible. Become an expert at your collected item.

How do you become an expert?

YOU READ!
READ about your topic. READ encyclopedias. READ magazine articles and books from the library. READ articles from the internet. Take *note of any new science words you learn in your notebook* and use them. Track of all the books and articles you read. You'll need that list for later.

YOU DISCUSS!
Talk about it with your parents. Talk about it with your teachers. Talk about it with experts like Veterinarians, Doctors, Weathermen or others who work with the things you are studying. ***Hint: take pictures of yourself interviewing people*

Sometimes websites will give you e-mail addresses to experts who can answer questions.

DO NOT WRITE TO ANYONE ON THE INTERNET WITHOUT PARENTAL PERMISSION & SUPERVISION!

Research: My items are: _____
(birds, trains, leaves, bark, insects, dinosaurs, minerals, liquids, etc.)

Write your sources in your science notebook

Books I found in the library on my topic are:

Title: Author:

Internet sites that I found on my topic are:

Website Title: URL:

People I talked to about my topic are:

Name: Title:

Some important facts that I learned about my topic are:

Step 3: Collect

Before you start, you'll need a plan. What materials will you need to collect and sort your items? Are you going to need to copy pictures instead of collecting actual items?

Example:

What types of birds are in my neighborhood?

1. I will collect between Rural and College and Broadway and Alameda.
2. I will take pictures of every bird I see.
3. I will print all my pictures with mom's help.
4. I will need a photo album.

After you've begun making your collection, you may find that your procedure needs changing. That's okay. Just be sure to record the changes you've made.

YOUR TURN

My Plan or Procedure:

Write a step-by-step plan here and record it in your scientific notebook.

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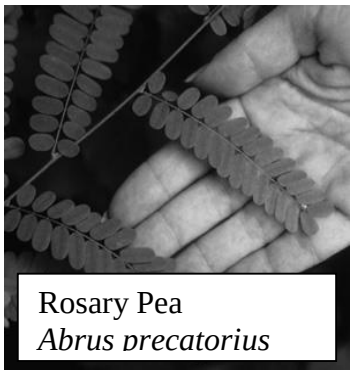


Rosary Pea
Abrus precatorius

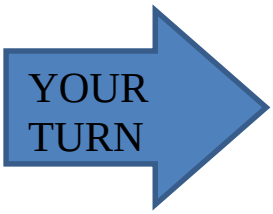
Step 4: Name and Group

Every item you've collected has a special name. For example, their names may come from the types of minerals they're made of or from the types of plants you collected them from. Once you have your collection, find the proper scientific name for each item using books or the internet for help. Create labels for each item to help you remember its name. *Record this info in your notebook.*

Look carefully at the items you've collected. Look at their colors, shapes, sizes, or at other things about them. How are some of the items a like? How are they different? Those items that are alike in some way, put them together in a group. Can the other items of your collection be put into similar groups for that same reason?

Example – A collection of rocks could be put into groups by color. There may be a group of red rocks, brown rocks, and green rocks. Every rock needs to be placed in one of the groups.

Of all the many different ways you could group the items of your collection, choose your favorite and present them grouped in that way at the science fair.

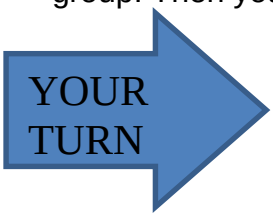


You will need to record your item names separately in your scientific notebook.

How did you group your objects?

Step 5: Collect Your Information

Put all of your collected items together. Make sure they are labeled Organize them into one type of group. Then you need to draw some conclusions.



Conclusions: Now tell us what you learned from this.

Did you answer your question? What did the results tell you?

Application:

(How does this apply to real life?)
It is important to know about this item because…...

Skip to **Step 6: Report Your Results** section.

Observation: a project about finding something in the natural world to watch closely and learn about.

Step 1: Ask a question

Think about what you want to observe and make a question that describes what you're hoping to learn. Choose a topic that you are interested in learning more about. Ask a one sentence question that you will find the answer to by making observations of the natural world. You can get ideas of what you might want to observe and the question you want to answer by taking a walk, looking around your room, or thinking about what you like the most. *Write this question in your science notebook.*

Examples: How much water does my dog drink each day?
What insects come to my back porch light at night?
How many birds visit my back yard?
What color is the sunset?

Use one of these formats to form your question:

The "How Much/Many" Question:

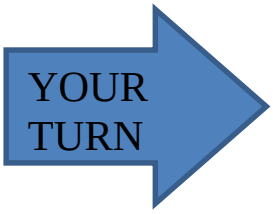
How much/many _____ _____ _____ ?

	(verb)	
food	does	my dog eat
birds	visit	my back yard
bugs	are	in the park

The "What" Question:

What _____ _____ _____ ?

	(verb)	(environment)
types of bird	visit	my yard
types of clouds	are in	the sky each day
color	is	the sunset
insects	come to	my back porch light at night



My Question: _____?

Step 2: Background Research

Now it is time to research your item as much as possible. Become an expert at your collected item.

How do you become an expert?

YOU READ!
READ about your topic. READ encyclopedias. READ magazine articles and books from the library. READ articles from the internet. Take *note of any new science words you learn in your notebook* and use them. Track of all the books and articles you read. You'll need that list for later.

YOU DISCUSS!
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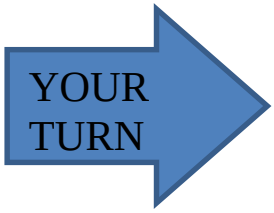


Research: My observation is mostly about this subject: _____

_____
(sample topics… magnetism, electricity, absorbency, taste, or plant growth.)

Write your sources in your science notebook

Books I found in the library on my topic are:
Title: Author:

Internet sites that I found on my topic are:
Website Title: URL:

People I talked to about my topic are:

Name: Title:

Some important facts that I learned about my topic are:

Step 3: Create a plan

Before you start, you'll need a plan. Where will you make your observations? When? How? What will you do? What will you be looking for? etc.

Example:

How much water does my dog drink each day?

1. Measure how much water it takes to fill my dog's water dish.

2. Choose one particular time of the day to measure how much water is left in the dish.

3. Each day during my observation and at the correct time, I need to:
   - measure how much water is left in my dog's dish
   - subtract that amount from how much was in it to start with
   - in the notebook, record the day and how much water was drunk for that day
   - refill the water dish and return it to where it belongs

4. If the water dish is ever empty, then I need to get a larger dish.

Be sure to write your plan or procedures in your scientific notebook before you start.

After you've begun making your observations, you may find that your procedure needs changing. That's okay. Just be sure to *record any changes you've made in your scientific notebook.*

YOUR TURN

My Plan or Procedure:

Write a step-by-step plan here and record it in your scientific notebook.

1

2

3

4

5

Step 4: Observe Your Subject(s)

Record everything that you observe about your subject. Watch carefully. Is there something that surprises you?

Draw sketches. Take photographs. Record information in your scientific journal.

Example:

How much water does my dog drink each day?			
Day	How much water fills the dish?	How much was left at 6:00 each night?	How much water my dog drank?
Monday	2 cups	1 cup	1 cup
Tuesday	2	1 ½	½
Wednesday	2	½	1 ½
Thursday	2	1 ¼	¼
Friday	2	1	1
Saturday	2	1 ¼	¾

YOUR TURN

You will need to create a data table or chart and record your scientific notebook. Sketch a data table or chart to organizer your data. It's okay if you need to change it as you actually record your observations

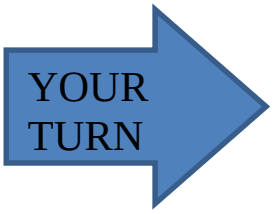
Step 5: Collect Your Information

Put data into a table or chart. Review all the information you have in your notebook.

Start by stating each observation. Do you have an answer to the question that you started with?

Next, try to brainstorm reasons why your subject did what it did. What did you learn from observing? What surprised you?

Example: Question - How much water does my dog drink each day?
Data statement - My pet drinks from ½ to 1 ½ cups of water each day.
Possible reasons –
1) The day she drank the 1 ½ cups was a really hot day.
2) We played a lot in the yard on the days she drank 1 ½ cups of water.
3) She slept a lot on the days she only drank ½ cup water.



My Question:

My Data statement: (How did the data answer my question?)

Possible reasons for the observations I saw:

Conclusion: Now tell us what you learned from this. Did you answer your question? What did the results tell you? Did you find a reason for your observations?

Application: (How does this apply to real life?) It is important to observe this because…...

Skip to **Step 6: Report Your Results** section.

Experiment/Survey: involves creating a hypothesis and testing that hypothesis through repeated experimentation.

Step 1: Ask a question

Now it's time write a question or identify a problem within that topic. Setup your question using one of the three formats below that work best for your topic. Record this question in your scientific notebook.

The "Effect" Question:

What is the effect of _____ on _____?

sunlight	the growth of plants
brands of soda	a piece of meat
temperature	the size of a balloon
oil	a ramp

The "How-Does-Affect" Question:

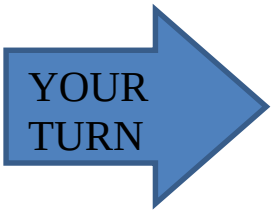
How does the _____ affect _____ ?

color of light	the growth of plants
humidity	the growth of fungi
color of a material	its absorption of heat

The Which/What and Verb Question:

Which/What _____ _____ _____?

	(Verb)	
paper towel	is	most absorbent
foods	do	meal worms prefer
detergent	makes	the most bubbles
paper towel	is	strongest
peanut butter	tastes	the best



My Question: _____?

Step 2: Background Research

Now it is time to research your item as much as possible. Become an expert at your collected item.

How do you become an expert?

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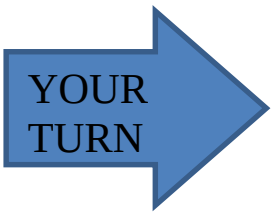


Research: My items are: _____
(birds, trains, leaves, bark, insects, dinosaurs, minerals, liquids, etc.)

Write your sources in your science notebook

Books I found in the library on my topic are:

Title: Author:

Internet sites that I found on my topic are:

Website Title: URL:

People I talked to about my topic are:

Name: Title:

Some important facts that I learned about my topic are:

Step 3: Construct a hypothesis

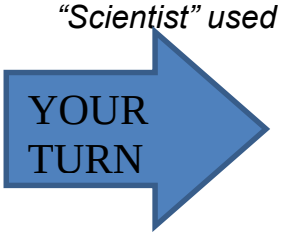
Now it is the time to PREDICT what you think will happen if you test your problem. This type of "SMART GUESS" or PREDICTION is what real scientists call A HYPOTHESIS.

Since you already have your question, now you just have to answer it BEFORE you do the experiment. In other words, what do you think will happen during your experiments. Remember you need to do your experiment at least three times.

Example Problem: Which brand of paper towel is more absorbent?

Example Hypothesis: I think Brand X will be more absorbent because it's a more popular brand, it is thicker and the people I interviewed said that the more expensive brands would work better

(This hypothesis not only predicts what will happen in the experiment, but also shows that the "Scientist" used research to back up his prediction.)



Hypothesis: Create a Hypothesis based on what you have researched.

I think that (will happen) because (my research shows…)

Step 4: Doing the Experiment to Test Your Hypothesis

Now we've come to the good part…. the EXPERIMENT! **Take lots of pictures!!!!!**

Designing an experiment is really cool because you get to use your imagination to come up with a test for your problem, and most of all, you get to prove (or disprove) your Hypothesis. Now **Science Fair Rules state that you cannot perform your experiment live**, so you'll have to take plenty of pictures as you go through these seven very simple steps.

First: Gather up your materials: What will you need to perform your experiment? The safest way to do this is get that adult you recruited to help you get the stuff you need. Take pictures or draw pictures of your materials. This will come in handy when you are making your board display.

Second: Write a PROCEDURE. A procedure is a list of steps that you did to perform an experiment. Why do you need to write it down? Well it's like giving someone a recipe to your favorite dish. If they want to try it, they can follow your steps to test if it's true. Scientists do this so that people will believe that they did the experiment and also to let other people test what they found out.

Third: Identify your variables. The variables are any factors that can change in an experiment. Remember that when you are testing your experiment you should only test one variable at a time in order to get accurate results. In other words, if you want to test the affect that water has on plant growth, then all the plants you test should be in the same conditions, these are called controlled

variables: same type of dirt, same type of plant, same type of location, same amount of sunlight, etc. The only variable you would change from plant to plant would be the amount of water it received. This is called the independent or manipulated variable. The independent variable is the factor you are testing. The results of the test that you do are called the dependent or responding variables. The responding variable is what happens as a result of your test. Knowing what your variables are is very important because if you don't know them you won't be able to collect your data or read your results.

Fourth: TEST, TEST, TEST. Remember, your results should be consistent in order to be a good experiment. In other words, when you cook from a recipe you expect the outcomes to be the same if you followed the directions (or procedure) step by step. So that means you need to do the experiment more than once in order to test it properly. We recommend three times or more. More is better! Don't forget to take pictures of the science project being done and the results.

Fifth: Collect your DATA. This means write down or record the results of the experiment every time you test it. Be sure you also organize it in a way that it is easy to read the results. Most scientists use tables, graphs and other organizers to show their results. Organizing makes the results easy to read, and much easier to recognize patterns that might be occurring in your results. But don't make a graph or table because we asked you to, use it to benefit your project and to help you make sense of the results. There is nothing worse than having graphs and tables that have nothing to do with answering the question of a science project.

How Do You Collect Data?!!?

• Keep data in a scientific notebook. Draw diagram and pictures and jot down any additional observations or questions you have as you do the experiment. Be sure to include what things are being measured in as well. Are your temperatures in Fahrenheit or Celsius? Are your lengths in inches, centimeters, meters? The recommended standard of measurement in science is metric so if you can keep your measurements in meters, liters, Celsius, grams, etc, you are doing great!

• Be accurate and neat!

Materials: (take pictures!)
List the Materials that you will need for your science experiment here:

Variables:

List the variables that you will control or keep the same and the variable that you will change to test your hypothesis.

Example: I will control the amount of water I use, where I pour it, how I pour it and how I put the paper towel on the spill. I will change the type of paper towel I use to see which is better.

My controlled variables are (the stuff that will always stay the same):

My experimental variable (the ONE thing that changes from one experiment to the next, what you are testing):

Procedure: (Don't forget to take pictures and write this in your scientific notebook)

List the steps that you have to do in order to perform the experiment here (use more if needed):

1

2

3

4

5

Data Chart(s): Create a data chart to record data in your scientific notebook.

Step 5: Analyze Your Data and Draw a Conclusion

Write a Conclusion. Tell us what happened. Was your hypothesis right or wrong or neither? Were you successful, did it turn out okay? Would you change anything about the experiment or are you curious about something else now that you've completed your experiment. And most of all, TELL WHAT YOU LEARNED FROM DOING THIS.

Understand its Application. Write about how this experiment can be used in a real life situation. Why was it important to know about it?

Conclusion: Now tell us what you learned from this and if you were able to prove your hypothesis. Did it work? Why did it work or why didn't it work? What did the results tell you? Sometimes not being able to prove a hypothesis is important because you still proved something. What did you prove?

Application:

(How does this apply to real life?)
It is important to know about this experiment because…...

Go to **Step 6: Report Your Results**

Invention: involves creating a new and improved version of an existing tool or an entirely new tool based on perceived need.

Step 1: Choose a problem:

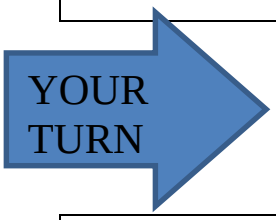
Finding the right problem to solve is often the most difficult part of the process. Focus on problems that you may have noticed during your daily life, i.e., opening a can of dog food, hanging a picture.

- Look for problems that need an invention or innovation to solve.
- Look in books, magazines and on the internet for ideas.
- Talk to parents and teachers for their suggestions.

SCAMPER is another way to generate ideas and to modify ideas is the SCAMPER technique.

EXAMPLE: A paper lunch bag

Substitute	What if you make the bag from a different material?
Combine	What if you combine it with another common object?
Adapt	How can you adapt the bag to another situation? Is it similar to other objects?
Magnify, Minify, Modify	What if I make it bigger, smaller, or change it in some way (tear it, change form, texture, shape, color)?
Put it to other uses	Put it to other uses What else can you use the bag for?
Eliminate	Eliminate What could you take away?
Rearrange/Reverse	Rearrange/Reverse Can you rearrange the parts? Can you turn it upside down, backwards, inside out?



My Idea / Item: _____

Substitute	
Combine	
Adapt	
Magnify, Minify, Modify	
Put it to other uses	
Eliminate	
Rearrange/Reverse	

Step 2: Consider the situation

What do you already know? Focus on originality. If an inventor has an idea, it is important to know what already exists so that the inventor does not waste time "reinventing the wheel." Do research in catalogs or online to find out if the invention already exists. Be sure to record all this information in your scientific notebook.

YOUR TURN

What do I already know about the problem I am trying to solve?

Step 3: Research and planning

Before an invention can be successful, you have to make a plan. Your plan should include all the steps you can think of, from beginning to end. Do not be surprised if you have to change your plans along the way. Sometimes a plan will not work as well as you first thought it would. So keep an open mind for change. You may even discover a better way of completing a certain step.

YOUR TURN

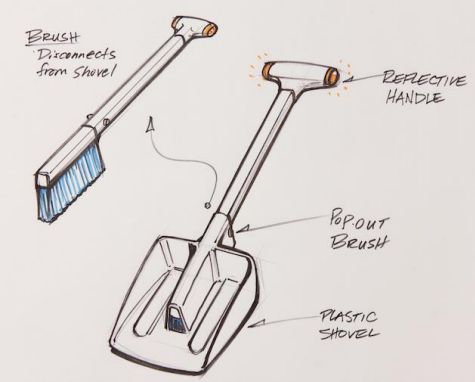
Answer the following questions about your proposed idea…

- What can I read about that will help me with my invention?
- Who can I talk to about solving problems and planning properly?
- What materials will I need? • How can I control the cost of my invention?
- What steps should I follow?
- How much time should I allow for each step?
- How can I test my invention?

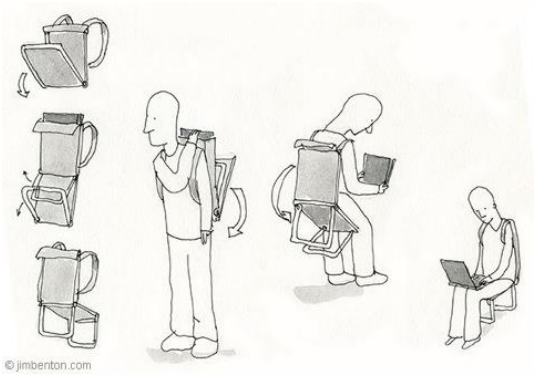
Step 4: Design and Development / Naming

Now the work begins. Follow your plan step-by-step. If you have difficulty with a certain part of your invention, find an expert to ask questions. Try different things until you overcome the difficulty. Most of all, do not give up! As Henry Ford, one of the inventors of the automobile assembly line, once said, "Failure is only an opportunity to start again more intelligently." Sketch your invention as you build it in your scientific notebook. *Label its parts and record any changes you make as you make them.*

Example: Combined broom and dustpan



Example: Backpack chair



YOUR TURN

My sketches of _____

Naming

Develop a name for your product using the following guidelines:

Do not make your brand name too similar to others.
Do not make your brand name too descriptive. You want your name to be a unique eye-catcher.
Be creative. Brand names that use rhyming or alliteration will grab people's attention.
For example; Kit-Kat® or Cap'n Crunch®.
Remember when you are brainstorming to go for a bunch of ideas.

YOUR TURN

Brainstorm names for your invention below:

Step 5: Testing and revision

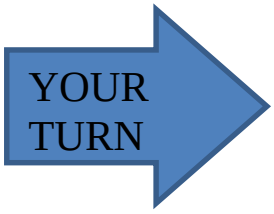
To show that your idea works, you should test it. The results of your test should be written into your scientific notebook. If your test fails, record the failure and what you did to overcome the problem. You may need to revise your design and made new versions until you come up with a final working model, going through steps 3 through 5 again and again.

Just remember to sketch and record everything you do in your scientific notebook. You want others to be able to make your inventions to give to lots of people to use.

Be sure to record what you tested, what the result was, and what modification was needed, if any. Take lots of pictures and/or sketches to show your process in your scientific notebook.

Use the sample cart below to collect data or create your own.

Test #	Description	Result	Modification Needed
1			
2			
3			



Create a sample chart below that lists some tests you may need to complete to make sure your invention works. Record this table and results in your scientific notebook.

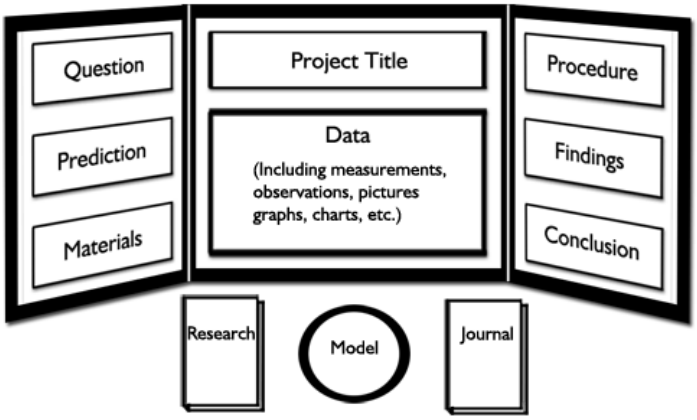
Go to Step 6: Report your results

Report Your Results: Make a display to showcase your project.

Step 6: Reporting Results or Why You Needed All Those Pictures

Your display board is kind of like an advertisement for all your hard work. So take our advice: BE NEAT! The judges like to see a nice, easy to read display, that has neat writing, easy to read graphs and tables and you guessed it…. lots and lots of pictures!!

This is an example of a neat looking Science Fair display board. It is just an example. Depending on your information and the amount pictures, tables and graphs, you may have a different layout. Just make sure it is neat.



Display Beauty Secrets:

- Use a computer to type out your information, but if you can't, write out your information in your best writing. Printing the titles is usually best. If you are using a computer, make sure the fonts are readable and only use one or two type faces. Your Lab Assistant should help you with this.
- Use spray adhesive or glue stick to paste up your papers. It is less messy
- Mount white paper, pictures, graphs and tables on colored papers (making sure the colored paper is larger so it creates a border for the white paper.

Bring items to show what you did.

- Bring in items to show what you did. For an observation, this might be photos, drawings or another representation of your work. For a collection, you can bring the items themselves or photographs that show the items labeled and classified. For an experiment, you can bring in models, experiment hardware or photos.
- This completed handbook should be with your project.
- Limit your total display to 36" wide by 15" deep (there is no height restriction).
- No liquids. This includes volcanoes—no eruptions. Take pictures instead.
- No insects or animals.
- Nothing that needs to be plugged into an outlet.

If you completed everything in this packet you probably have a terrific science fair project, and you are now a real scientist! Good Job!

Doing the Interview: Time to tell people what you learned from your project.

Look sharp, feel sharp and you will be sharp. Dress nice that day and you will show the evaluators that you have confidence.

Stand to the side of the display so that the guest evaluator can see it

The guest evaluators will ask you some questions about your project. They might ask:

Why did you choose this project?
What was your question?
What research did you do?
Can you tell me about what you did?
What did you learn about your topic?
What was your favorite part of the project?

The evaluators are just there to talk to you about your project. If you get lost or forget where you are, look at your display and find the answer. If you want to talk about something the evaluator didn't ask about, go ahead! When you are done, shake hands with the evaluators and thank them for their time, remember that they are volunteers who care about you!

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General Guidelines

1. Be sure your project is no larger than 36" wide and 15" deep (there is no height restriction). A standard pre-made display back is a good choice. Projects must be freestanding. Wall space is not available to hang or lean posters.

2. You will be most successful if you follow all of the steps from this handbook.

3. Fill out **ALL** of the needed sections of this packet. Also, be sure to include your scientific notebook with your display. **Fill out an entry form when you drop off your project.**

4. Any work with animals must follow humane procedures. No live animals, including mammals, birds, reptiles, amphibians, fish, insects or invertebrates, may be displayed because we cannot care for them.

5. High-voltage electricity, such as 110 volt current, may not be used. Instead, rely on low-voltage, battery powered circuits. There are no electrical outlets available for demonstrations. Please don't bring items that need to be plugged in to an outlet.

6. Do not use dangerous chemicals, highly flammable materials or other dangerous objects. Do not use any glass in the display. Use plastic instead. Please no liquids in your display.

7. Any project that breaks district rules or state/federal laws is not permitted.

8. Please always have adult help and supervision.

9. Firmly attach all small parts of your project to the backboard to prevent pieces from being lost or taken. **Please do not display anything valuable**.

10. Please print material clearly for your backboard. Our younger students have not yet learned to read cursive writing.
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Science Fair Schedule:

Friday, January 11th , 2019	**Handbooks delivered to students** *There are three levels: K-1st, 2nd – 3rd, and 4th – 5th* *They will also be posted on www.broadmorpta.org/science*
Monday, January 14th – Friday, 18th, 2019	**SCIENCE, WOW! Week** *Look for fun science activities on the playground before school from 8:30 to 9am and displays in the office to start off the excitement!*
January 30th, 2019 – 6:00 – 7:00 pm	**Bobcats' Night at the Planetarium** *Join us for a special night on the ASU campus at the Marston Gallery of Scientific Exploration* *781 E. Terrace Road* *Tempe, AZ 85281*
Friday, February 9th – 19th, 2019	**Science Fair Registration Open** **Registration will be online this year on the PTA website: www.broadmorpta.org/science** *Registering is very helpful to the Science Fair Planning Committee, even if your child's topic changes.*
Tuesday, February 20th, 2019	**Deliver projects to gym** Before school from 8:00 – 8:55 a.m. OR After school is dismissed from 3:30 – 4:00 p.m. **Choose which round of interviews your child will attend.**
Tuesday, February 19th, 2019	**1st round of student interviews** 5:30 p.m. – 7:30 p.m.
Wednesday, February 20th, 2019	**2nd round of student interviews** 5:30 p.m. – 7:30 p.m.
Tuesday – Thursday, February 19th – 21st	**Class tours throughout the day**
Thursday, February 21st	**STEM NIGHT – Open house** 6:00 p.m. – 7:00 p.m. *Join us in celebrating our student's achievements while engaging with scientific partners and organizations from around the valley.*
Friday, February 22nd	Any remaining projects will be bagged and given to students in their classroom. We are not responsible for damage. If possible, parents should pick up projects at the Open House.

REMINDER: PLEASE NO VALUABLES OR LIQUIDS ON YOUR DISPLAY!