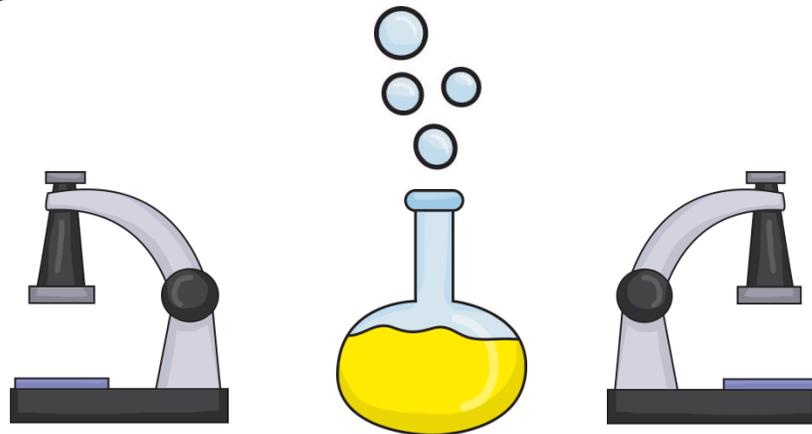


# My Science Fair Book



This book belongs to: \_\_\_\_\_

Dear Parents,

Your student will be participating in the science fair this year! Please encourage your student to work on this project independently. I know as a parent it is very difficult to sit back and watch the mistakes happen. But that is the magic of science! It is all about learning from the mistakes!

This packet is designed to help your child to understand the process of a science or engineering experiment. I encourage you as a parent to read through this packet with your child, to get excited, even assist your junior scientist with the experiment. But please, let the scientific explanation be your students. Allow your child to develop their own way of explaining what happened. I am looking for your child's effort and ability to execute the scientific or engineering process when I grade. I am not grading their ability to explain the principals of flight in correct mathematical terms.

It is important that you and your student agree on a project. You can easily choose a project that has little to no cost. This packet has a page full of suggestions! The only thing you will need to purchase is a tri-fold display board that can easily be purchased at any of the following stores: Target, Wal-Mart, The Dollar Tree, Staples, Office Max, or any craft store.

Please encourage your student to begin this project right away. It will be a fun and educational experience! Please fill out the Parent Student and Teacher Agreement and return by the deadline set on the due dates page.

Thank you for all that you do!

Science Fair Coordinator-



# Parent, Student, and teacher Project agreement



My Student and I have reviewed the Science Fair Packet

My Student and I have chosen and agreed on a project together.

We have chosen the following science question to investigate:

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Parent:

I approve the above scientific or engineering experiment and have reviewed the packet and deadlines with my child.

Parent Signature: \_\_\_\_\_

Student:

I agree to follow the guidelines in this packet and turn in work that I am proud of by the due date.

Student Signature: \_\_\_\_\_

Teacher:

The Topic is approved.

Teacher Signature: \_\_\_\_\_

# Science Fair Due Dates:

Due Date:	Title:	Description:	Completed?
	The Scientific method Sheet	This sheet is to make sure that you understand <i>all</i> of the steps of the scientific method before you begin.	<input type="checkbox"/>
	Step 1: Ask a question Sheet	This sheet will help you brainstorm ideas for your science question.	<input type="checkbox"/>
	Parent, Student, and Teacher Project Agreement form	You must have your question chosen and approved by your parent and teacher. Please bring in the signed sheet by the due date.	<input type="checkbox"/>
	Step 2a: Research Step 2b: Giving Credit	Use the road map to help you become an expert on your chosen topic! The more you know the better your hypothesis and conclusion!	<input type="checkbox"/>
	Step 3: State your Hypothesis	Re-state your question and create you educated guess!	<input type="checkbox"/>
	Step 4: Test your Hypothesis	Write out what materials you need and all the steps you have to follow in detail!	<input type="checkbox"/>
	Step 5: Analyze your Results	Explain everything that happened and explain if you were correct with your hypothesis.	<input type="checkbox"/>
	Step 6: Share your Results	This is a checklist to make sure you put everything on your presentation board!	<input type="checkbox"/>
	THE SCIENCE FAIR!!!!!!!!!!	This is the day your poster board needs to be at school!	<input type="checkbox"/>

# The Scientific Method

We can thank the father of experimental science, Sir Francis Bacon (1561-1626), for giving us the scientific method. The Scientific method is a method to explore a topic using an experiment. Each step is listed and explained below.

**Step 1: Question:** The scientific method starts when you ask a question about something you are curious about. A few questions you might ask:

- ✿ How come?
- ✿ What happens when?
- ✿ I wonder why?



Make sure your science question is specific and measurable! Do not ask “why do plants grow?” ask “Do bean plants grow better in sand or dirt?”

The bean plant is specific and you can measure which plant grew better by measuring the height! 😊

**Step 2: Research:** The research step is important! A Scientist researches their science question to find the best way to do their experiment *without* repeating mistakes other scientists have made. Scientist also research their topics in order to become experts and to better explain their experiment!

**Step 3: Hypothesis:** Once you research your question you can create your hypothesis! A hypothesis is an educated guess. You will guess the answer to your question using your research (another reason why we research!)

**Use this formula to state your hypotheses:** I think that \_\_\_\_\_ because according to my research \_\_\_\_\_.

For example: I think that the bean plant that gets watered with sugar water will grow the tallest because according to my research plants need sugar in order to live. Without enough sugar the plant cannot grow as tall. I don't think salt will grow a tall plant because it might make the plant thirstier. Salt usually makes me thirsty.

Feel free to use one or more sentences to fully explain your hypothesis! The more you explain the better your experiment!



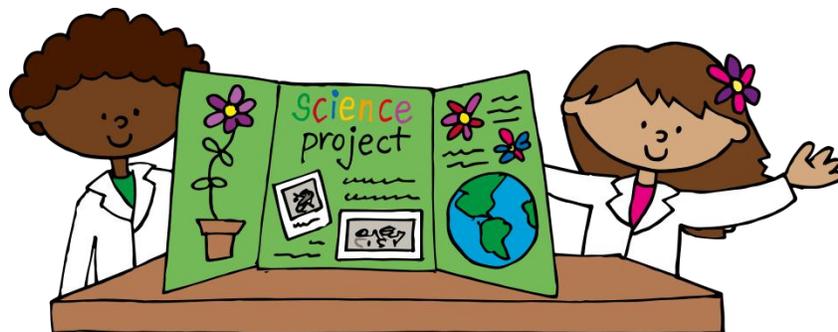
**Step 4: Test your hypothesis:** In this step you will need to explain the difference steps you took to test your hypothesis. This is your experiment. You will need to explain the following:

- ✿ List *all* of the materials a scientist would need in order to complete your experiment.
- ✿ Explain what your **control** is: The thing that you will not change in the experiment; in the case of the bean plant the amount of each liquid would be the same. (each plant gets one cup of liquid a day)
- ✿ Explain what your **dependent variable** is: The thing that you will measure, in the case of the bean plant experiment it would be how tall each plant is.
- ✿ Explain what the **independent variable** is: the thing that will be changed, in the case of the bean plant it is the liquid it is being watered with.
- ✿ List every single little step you took in order to complete the experiment
- ✿ Include pictures of yourself doing a few of the steps so that other scientists know what a professional scientist looks like when doing your experiment.

**Step 5: Analyze your results:** here is a list of things you will need to do to analyze your results like a super scientist:

- ✿ Create a bar graph, pie chart, or any sort of chart that can visually compare the measurements you took for your experiment.
- ✿ Explain what happened during your experiment in great detail! Explain *everything* that happened! If the bean plant grew only one inch or didn't grow at all state that in a complete sentence! When I say explain everything that happened I mean explain everything! If your cat knocked the sugar water plant over by accident explain it! Maybe the cat knocking over the plant made your results different? The analysis section is *your* area to write out **everything** that happened and for you to explain **why** you think you got the results you did.
- ✿ Be sure to conclude your analysis by answering this question: Was your hypothesis correct why or why not? What would you do differently next time?
- ✿ **Use the following formula for your concluding sentence:** My hypothesis was/was not correct because of \_\_\_\_\_. I think that the next time I try this experiment I will \_\_\_\_\_.

**Step 6: Share your results!** This is where you display all your hard work on a tri-fold board and explain your experiment to a judge! Yay!



# The Scientific Method

Directions Make sure that before begin your experiment that you have completed this page and your teacher has checked off the completed box at the bottom.

**Step 1: Question-** In your own words describe what a science question is.

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**Step 2: Research-** What are at least two reasons why research is an important step in the scientific method?

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**Step3: Form a Hypothesis-** What is a hypothesis and why is it important to explain why we predicted what we did?

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**Step 4: test your hypothesis-** What is a control?

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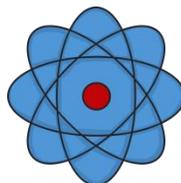
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What is an independent variable?

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What is a dependent variable?

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**Step 5: Analyze your results-** Why would a scientist want to explain everything that happened in the results part of the experiment?

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**Step 6: Share your results-** What are you most looking forward to about science fair?

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What are you least looking forward to about the science fair?

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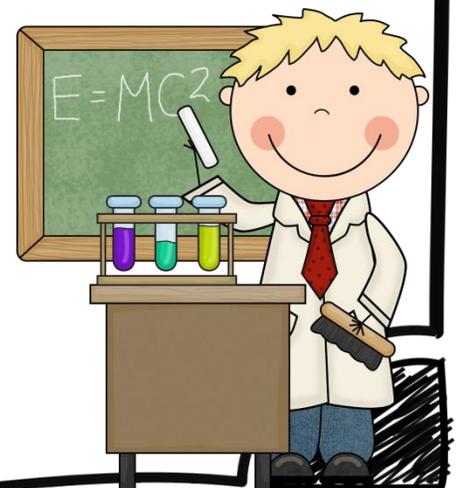
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**Good luck!**

Teacher Initials box



# Step 1: Ask a Question

Directions: Use this page to help you write your science question.

Look around you and think about the following questions:

- What interests you?
- What are you curious about?
- What is something you have always wondered about?



Brain storm *at least* ideas in the box below



2. Look at your ideas in the above box and Circle the ideas that can be measured using numbers and can actually be done with your own two hands.

(Example of measurements: height, weight, time, volume, or distance)

3. List your top three ideas that are circled here:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. Look at your top three ideas and decide which one will be the most interesting to explore!

My final question that I want to submit for approval is:

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Teacher approved →

# Step 2a: Research

Directions: use this road map organizer to help you with your research. You can use the internet or the library to help you.

The Goal is to become an expert in your topic!

**START**

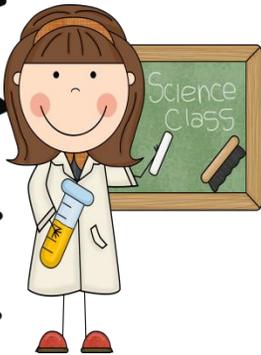
- 1) Identify Key words in your science question.
- 2) (Example: Does a bean plant grow better with sugar water, salt water or plain water? Key words would be, sugar, grow, bean plants, salt, and water)

Science Question: \_\_\_\_\_

\_\_\_\_\_

Key Words: \_\_\_\_\_

\_\_\_\_\_



- 3) Use the key words to create questions for you to research. The following examples are all questions I would need to answer in order to make a great hypothesis.
- 4) Example: How tall can a bean plant grow? What helps a plant grow? What is salt made out of? What is sugar made out of?

List at least three research questions from your key words below.

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

\*Optional Bonus\*

\_\_\_\_\_

On the next page answer the research question given and write your research question from the above step on the line and answer it inside the box.

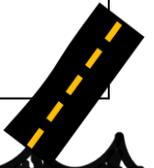
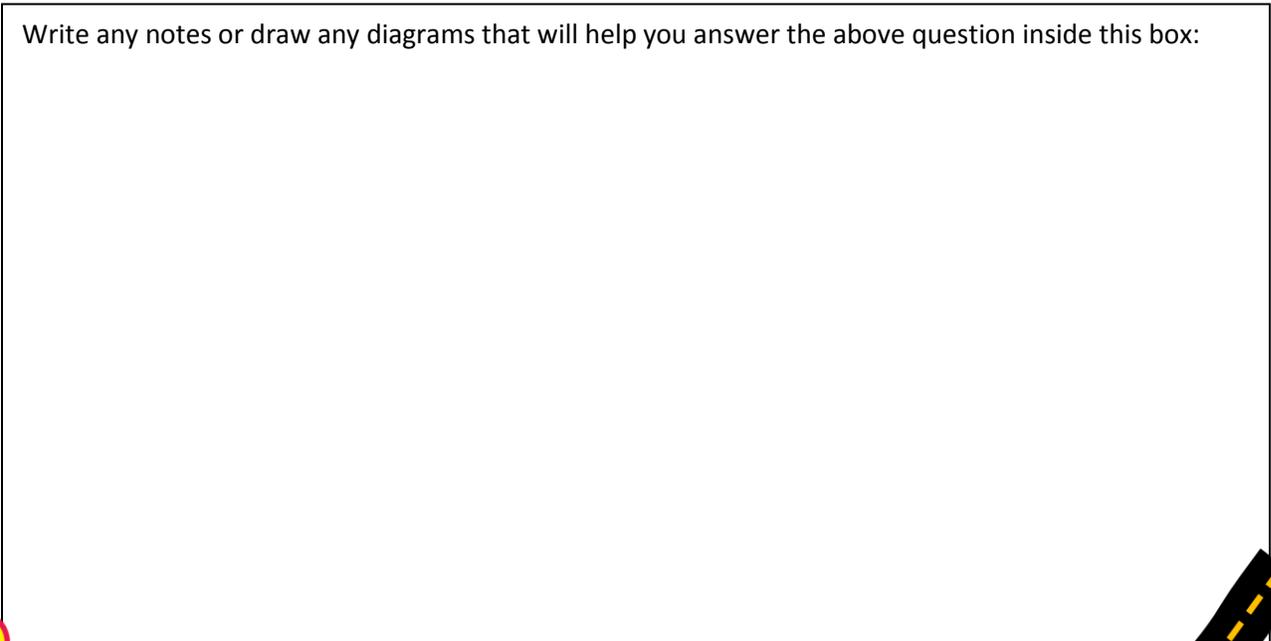
What steps will you need to complete in order to do this experiment?  
Summarize your findings in the box below:



Research Question 1: \_\_\_\_\_

\_\_\_\_\_

Write any notes or draw any diagrams that will help you answer the above question inside this box:



Research Question 2: \_\_\_\_\_

Write any notes or draw any diagrams that will help you answer the above question inside this box:

Research Question 3: \_\_\_\_\_

Write any notes or draw any diagrams that will help you answer the above question inside this box:

Now that you are an expert it is time to write your hypothesis after your teacher approves your research! → Teacher approved:

**STOP**



## Step 2b: Giving credit to those you learned from

Directions: Use this page to help you create a references section for your science board. Write down each and every source you actually used to help you.

You have to give credit to the sources you use! For example if I go to [www.beanplants.org](http://www.beanplants.org) to learn about bean plants for my experiment then I need to give the site credit for helping me with my project by having a references section!

Reference #1: Book title or Web Page Title:

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Book Author's Name or Web Address:

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Reference #2: Book title or Web Page Title:

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Book Author's Name or Web Address:

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Reference #3: Book title or Web Page Title:

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Book Author's Name or Web Address:

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# Step 3: State Your Hypothesis

Restate your Science Question so that it is specific and measurable:



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Use this formula to state your hypotheses: I think that \_\_\_\_\_ because according to my research \_\_\_\_\_.

For example: I think that the bean plant that gets watered with sugar water will grow the tallest because according to my research plants need sugar in order to live. Without enough sugar the plant cannot grow as tall. I don't think salt will grow a tall plant because it might make the plant thirstier. Salt usually makes me thirsty.

Feel free to use one or more sentences to fully explain your hypothesis! The more you explain the better your experiment!

State your hypothesis:

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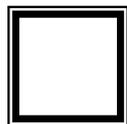
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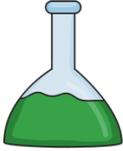
Teachers Approved:



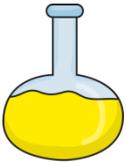
# Step 4: Test Your Hypothesis

Directions: Answer the following questions then follow the steps that you listed to complete your experiment.

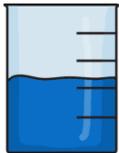
1. What is your control? (what stays the same?)



2. What is your dependent variable? (What you will measure?)



3. What is your independent variable? (What will you change?)



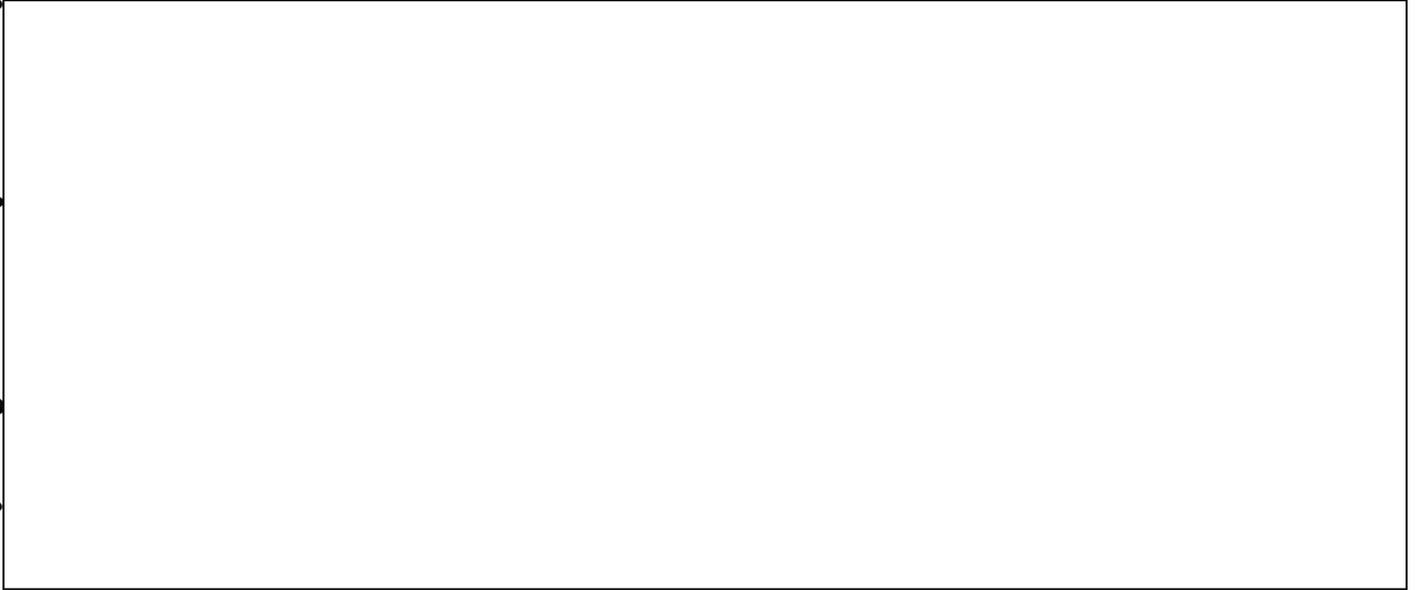
What Materials do you need to complete your experiment?





# Step 5: Analyze Your Results

Create a bar graph, pie chart, or any sort of chart that can visually compare the measurements you took for your experiment in the box below.



In the lines below explain what happened during your experiment in great detail! The analysis section is *your* area to write out **everything** that happened and for you to explain **why** you think you got the results you did.



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**Conclusion Statement:** Was your hypothesis correct? why or why not? What would you do differently next time? **Use the following formula for this sentence:** My hypothesis was/was not correct because of \_\_\_\_\_. I think that the next time I try this experiment I will \_\_\_\_\_.

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Teachers Approved:

# Step 6: Share Your Results

Directions: Use the checklist below to help you create a super science fair presentation board.

- I have a creative title on my board that tells the reader what my experiment is.
- I have my science question labeled and my question is visible.
- I have a section labeled for research
- In my research section I summarize the things I learned about my topic.
- My research is NOT copied from the internet and is in my OWN words.
- My Hypothesis is stated in a complete sentence and explains why I think I will get the results I predicted.
- My Hypothesis is clearly labeled
- My Materials are listed and clearly labeled
- My procedure (or steps) are listed in the correct order
- My Procedure is clearly labeled
- My results are shown using a graph or diagram
- My Graph or diagram is clearly labeled
- My results are explained in complete sentences.
- My results are clearly labeled
- My Conclusion statement is stated in a complete sentence and I explain why my hypothesis was correct or incorrect.
- My concluding statement is clearly labeled.
- I have a references section on my board where I list all of my references.
- My "References" Section is clearly labeled.
- I have pictures, drawings, or images that help illustrate my experiment or explain what I did.
- My board looks neat and does not have a lot of blank spaces.
- Everything on my board is typed and printed in a large enough fonts that someone can read it from 3 feet away.
- Everything on my board is written using correct grammar and spelling.
- My board is something I am VERY proud to display!