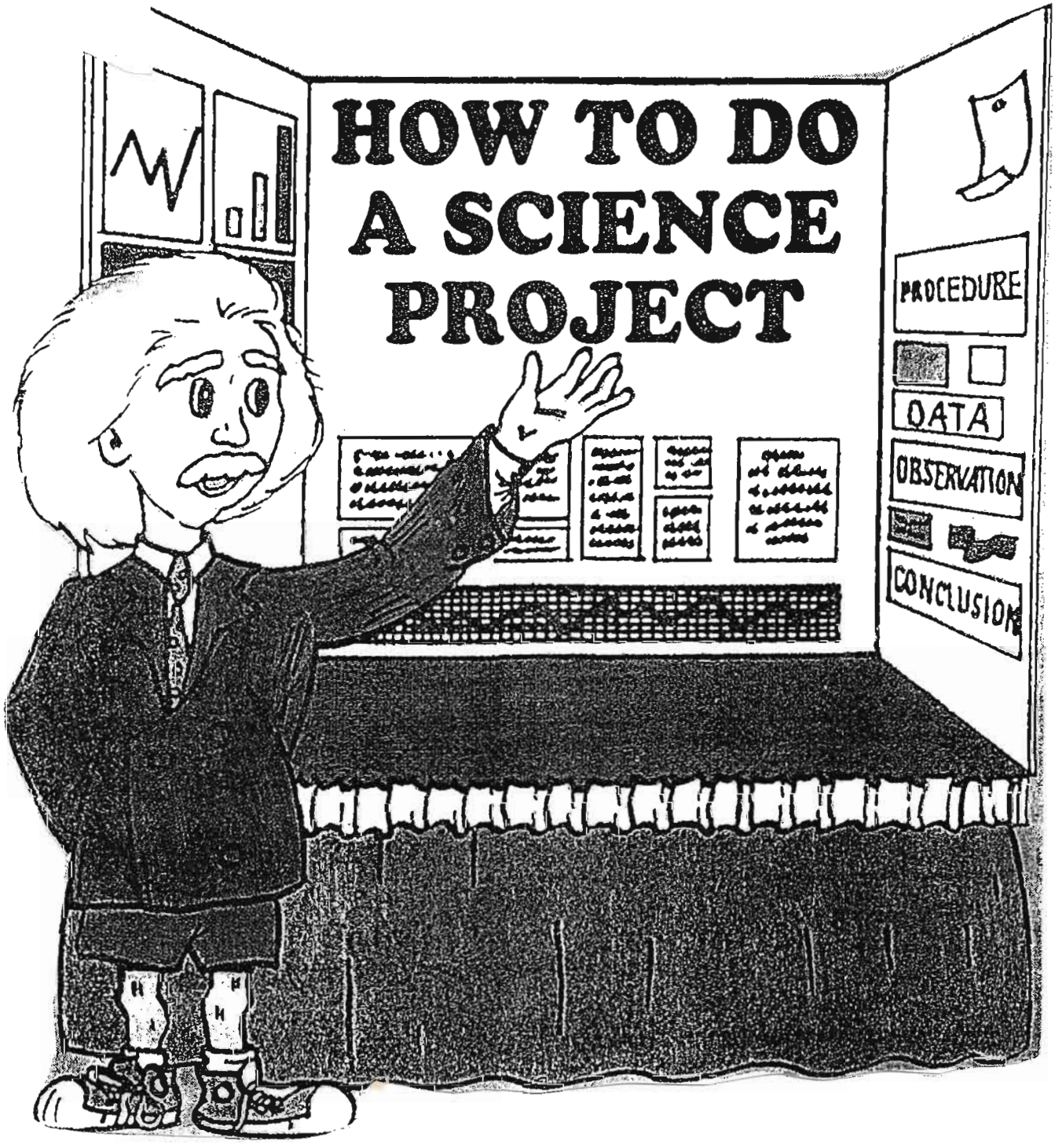
Kendale Lakes Elementary

Science Fair Packet



Dear Parents,

We are so excited to begin with the 2016 - 2017 Science Fair. Science is a very important part of our school curriculum, because it offers children experiences in exploring beyond the classroom in order to understand more about their world. It provides an opportunity to inquire, explore, be creative, and experience the hands-on use of the scientific method.

We invite you to work along with your child as he/she selects, investigates, and reports an appropriate area of science. With your interest, support, and encouragement, your child can develop skills and attitudes he/she needs to make this project a valuable experience.

To help you in assisting your child to prepare for his/her project, the Science Fair packet is available online on our school website. All you need to do is go to **http://kle.dadeschools.net** click on the left hand side on Kids Corner or Parents and click on Science Fair Packet. This packet offers instructions and suggestions to help you understand what the process entails. These guidelines will give you and your child some ideas on how to create an effective project.

ALL PROJECTS WILL BE DUE ON WEDNESDAY, NOVEMBER 30TH!

Cut on the line above and return bottom portion to your child's teacher.

I understand that the Science Fair packet is available online and that the project is due on **MONDAY, NOVEMBER 30TH.**

Student's Name _____

Parent's Name _____

Parent's Signature _____

Dear Fifth Grade Parents,

Your son and daughter will soon begin working on their Science Fair project. Please be advised that in fifth grade, all students are **required** to do a Science Fair project as part of the fifth grade curriculum. We encourage you to support your child's efforts at every step – guiding and encouraging whenever necessary. Please know that this is a long term assignment; therefore, it will be a major part of their Science grade for the second nine week grading period. Also, please keep in mind that your child **must** turn in his/her Science Fair project by the due date of **Wednesday, November 30th!**

Your child will not be able to participate in any of the fifth grade field trips and end of the year activities if he/she does not turn in a Science Fair project. If you have any questions or concerns, please do not hesitate to contact your child's teacher. We appreciate your support and cooperation.

Fifth Grade Teachers

---- --- ----------

Please read, complete bottom portion, sign, and return to your child's teacher.

I understand that my child will not be able to participate in any of the fifth grade field trips and end of the year activities if he/she does not turn in a Science Fair project by **Wednesday, November 30th!**

Student's Name _____

Parent's Name _____

Parent's Signature _____

Science Fair Rules and Guidelines

1. Only individual projects are allowed.
2. The type of project that must be done is a scientific investigation.
3. Projects must fit in one of the 11 science fair project category criteria listed in this handbook.
4. **No mold growth, or bacteria projects are allowed.**
5. **No use of vertebrate animals is allowed except for human observational projects.**
6. **No use of prescription drugs, harmful, or illegal substances are allowed.** Grocery items (i.e., baking soda, vinegar, salt, lemon juice, etc.) are appropriate.
7. Project display boards must follow safety guidelines listed in this handbook.
8. Projects must be approved by the classroom teacher.

Science Fair Categories

Physical Science: Projects that study the nature and properties of nonliving matter, energy and/or force and motion.

Behavioral Science: Projects that observe the behavior of invertebrate animals. **The use of vertebrate animals** is not allowed except for human observational projects (example: Do boys have a faster reaction time than girls?).

Botany: Projects that use subjects such as plants (mosses, seed plants), agriculture, conservation, and forestry. **No live plants** may be displayed. **Experiments using mold or fungi are NOT allowed**.

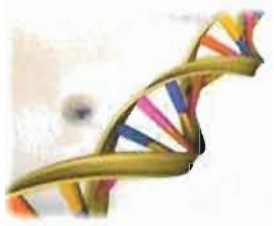
Chemistry: Projects that examine chemical reactions, the chemistry of living things, photosynthesis, solubility, heat capacity, etc. **No prescription drugs, dangerous or illegal substances should be used** in the experiments.

Earth and Space Science: These are projects investigating principles of geology (for example, weathering and erosion), geography, astronomy, meteorology, and related fields.

Engineering: Projects can develop technological devices, which are useful to the global society within an engineering-related field, such as electricity, mechanical, chemical, aeronautical, and geological.

Environmental Science: Projects that deal with global change, issues related to Earth, such as water, air, climate, waste and pollution, green living, human health, ecosystems and related fields.

Medicine and Health: The project's emphasis will be on human health. (STUDIES ARE LIMITED TO OBSERVATIONAL PROJECTS ONLY.)



Zoology: Projects that observe and record the growth or behavior of animals **(INVERTEBRATES).** VERTEBRATE STUDIES ARE LIMITED TO OBSERVATIONAL PROJECTS ONLY.

Please Note:

Failure to meet the category criteria and safety guidelines will be grounds for exclusion from the school and/or District Science Fair.

In addition it will also affect the final project grade.

Types of Project

1. **SCIENTIFIC INVESTIGATION**: In this type of experimental project you ask a question, construct a hypothesis, **test your hypothesis using an experiment** and draw conclusions from your experiment. It involves using the scientific method. It must follow an experimental design.

   A. **Experiment:** In this kind of investigation, your purpose is to change something (test or independent/manipulated variable) and record the outcome of this change (outcome or dependent/responding variable). EXAMPLE: Which material, aluminum foil or plastic wrap, will insulate cold water better?

   B. **Experiment with a Control Group**: This kind of investigation involves a more complex investigation that is designed to test the effects of a single condition or factor on a system. For example, you might have a group of plants as an experimental group and another group of the same type of plants as a control group. The test or independent variable in this experiment is the amount of chemical fertilizer added only to the experimental plant group. No fertilizer would be added to the control group. Both the control group and the experimental group would have the same constants (the normal conditions) such as amount of water and sunlight. The outcome or dependent variable is the difference observed in the growth of the plants.

Scientific Investigation Project Guidelines

THE SCIENTIFIC METHOD:

1. Asking a question.
2. Forming a hypothesis.
3. Designing an experiment.
   a. Identifying variables
   b. Developing procedures
   c. Gathering materials and equipment
4. Collecting data.
5. Analyzing the data.
6. Forming a conclusion.

Step 1 – Choose a Topic and Problem Statement

Begin by exploring a scientific concept that you are interested in. This can be something that was read about or were introduced in the classroom. Go to the library or internet to learn more about your topic. Write a brief summary of the background information you gather for your science fair topic. Keep a record of where the background information came from. This information will be listed in your bibliography in Step 12.

- At this point, your brain will start asking "What **if**...." questions. One of these questions is what you will use to design your experiment. It is called the "**TESTABLE QUESTION**". This will become your problem statement. Make sure that this has been approved by your teacher.

Step 2 – Form a Hypothesis

Once you have a problem statement (testable question) you have some decisions to make that should be recorded in your lab notebook.

- Think about what might happen in your experiment. This is called a **HYPOTHESIS**. Write down what you think will happen BEFORE actually doing the experiment.
- Write down your Hypothesis: "**If / Then**" statement. **If** (this is done), **then** (this will happen). Be specific.
- **Example: If** three plants are watered with tap water and three plants are watered with apple juice, **then** the plants watered with tap water will grow faster than the plants watered with apple juice.

Step 3 – Experimental Design

The experimental design is a plan to test your hypothesis. This is not a specific item on your display board; but it is determined by what your hypothesis is, the variables (test or independent, outcome or dependent, and control) and the materials that you need and the procedures that you will carry out.

Step 4 – Materials/Equipment

Now that you have planned your experiment, gather all the materials you will need to do the experiment. As you begin the experiment, make detailed observations of what is happening. Take your measurements carefully. Keep written notes about what you do and how you do it.

- Display a list of materials used in column form with metric units identified.
  Example:

  50 mL of apple juice
  3 teaspoons of sugar
  1 plastic spoon

Step 5 – Procedure

Write a detailed description of how to do your experiment. As you work through it, you may find that you have to change it. Make notes and change your procedure afterwards, to show the changes. Remember, any scientist should be able to take your procedure and repeat your experiment following your instructions.

- Use a numbered list to write each step.
- Start each sentence with an action verb. Example: mix, stir, get, measure, etc.
- Include quantities or amounts that you will measure using metric units.

Example:

1. Place the meterstick at the end of the ramp.
2. Put the toy car at the top of the ramp.
3. Let go of the toy car and observe.
4. Measure the distance the toy car traveled on the surface tested.

Step 6 – Variables and Control Group

- Identify the **test variable** (**independent/manipulated**). This is the variable that you are changing on purpose in your experiment to observe what will happen. For example; the temperature of the water or the battery strength.
- Identify the **outcome variable** (dependent/responding variable), this is the one that reacts or changes in response to the **test** or independent/manipulated variable, i.e., amount of salt that dissolves or number of paper clips held by a magnet.
- Identify the **constant variables** in your experiment. These are the variables in your experiment that you **do not change** so that you can compare the effects from only one **test** (independent/manipulated) **variable**. Constant variables are quantities that a scientist wants to **remain the same** or be held constant. Most experiments have more than one constant variable. Some people refer to controlled variables as "constant variables."
- Use a **control group** if applicable in your experiment. A control group is the group that does not receive the experimental variable. Both it and the experimental group have what is usually considered normal conditions, i.e., room temperature, normal amount of water, normal amount of sunlight (constants). A control group helps you to be sure that what YOU DO in your experiment is affecting the test results.

Step 7 – Experiment Data

- Design a data table to keep track of your results.
- Carry out your experiment following your written procedures.
- Observe and record the results in a data table using metric units i.e., centimeters (cm); grams (g); or degrees Celsius (°C).
- If qualitative observations are made, a numbered scale must be developed to quantify the observations.
- Use photographs whenever possible to record observations. **(NO FACES IN PHOTOS).** These can be shown on the display board.

Then, ***REPEAT THE EXPERIMENT*** at least two more times. Record your results as carefully as you did the first time. ALL scientists repeat their experiments; we **INSIST** you repeat yours as well. **All experiments must have a minimum of three trials.**

Step 8 – Results

- When you have all of your results, you need to design the way that you will report the data.
- Display all your data in **charts, graphs, and/or pictures** under the heading Data on the display board.
- Explain your results in a written summary and display this narrative under the heading Results on the display board.

Step 9 – Compare your results with your Hypothesis

Look again at your **HYPOTHESIS** and at the results of your experiment. Think about what happened and why it happened that way. Determine if your hypothesis was supported or not supported. You will use your observations to help you write your Conclusion in the next step.

Step 10 – Draw Conclusions

Answer the following questions to summarize what you have learned from the experiment. You must answer all of the questions in paragraph form and must be included under the Conclusions heading of the display board.

- What was the purpose of the investigation? (State the purpose of the experiment by describing the problem statement).
- Was your hypothesis supported by the data? (Indicate evidence and reasoning that supports your conclusion. This is called Conclusion Evidence Reasoning (CER).
- What were the major findings? (Explain your results)
- What are possible reasons for the results?

Step 11 – Applications

Answer the following questions to complete the Application.

- How can you use the findings from this investigation in your day-to-day life?
- How can the investigation be improved?
- What new question(s) has your experiment lead you to ask that could be tested in a new investigation.

Step 12 – Abstract and Bibliography

The abstract is a complete summary of the investigation and must consist of three to five paragraphs with a total of approximately 250 words that includes the following.

- Describe your purpose and hypothesis.
- Briefly describe your procedure.
- Describe and explain your results and state if your hypothesis was supported or not by the results. Suggest a reason why it was or was not supported.
- Explain your conclusion and application(s).

It's important to cite your sources for a science fair project. Put your bibliography of at least 3 different sources on the same page. Here are some examples of how to cite books, online references, and conversations.

1. Here is an example for a book or magazine -- Jones, Jenny R., "Science Experiments to Try" *Science Time*, New York: Sterling Pub. Co., May 2004, Vol. 3:12-15.
2. Here is an example for a Web site -- Helmenstine, Anne, About Chemistry Website, http://chemistry.about.com, Oct. 4, 2005.
3. Here is an example for a conversation -- Smith, John, Telephone Conversation, Mar.5, 2013.

Investigation Project Abstract / Bibliography

SAMPLE

Student's Name: Jordan Webb

Project Title: Wrap It Up!

Abstract

The purpose of this project is to determine if increasing the number of wraps around an electromagnet will increase the magnet's strength. It is hypothesized that increasing the number of wraps around the nail will increase the strength of the electromagnet.

Wire, a nail, a D battery, and a battery holder were the materials used to build an electromagnet. The wire was cut 90 cm long so that 10, 20, and 30 wraps could be wrapped around the nail. An electromagnet with 10 wraps was used to pick up paper clips three times. Then using the same steps the electromagnet was built using 20 wraps of wire, tested three times, and then tested with 30 wraps. The number of paper clips collected was recorded in a data table for all the trials.

Results showed that in all three trials, the average number of paper clips picked up the electromagnet increased as the number of wraps increased from 10 wraps to 20 wraps to 30 wraps. The hypothesis was supported.

This experiment shows that the number of wraps of wire on an electromagnet affects its strength, so that in real life if a stronger electromagnet is needed to separate metal from nonmetal objects, its strength can increased by increasing the number of wraps.

The project may have been improved and had better data if a new battery was used for each trial.

Bibliography

Brain, Marshall. How Electromagnets Work. 2000. URL: http://science.howstuffworks.com/electromagnet.htm/printable

ScienceSaurus: A Student Handbook. United States of America: Great Source Education Group. 2005. p. 306

Van Cleave, Janice. *Help My Science Project is Due Tomorrow*. Scholastic. 2002

Investigation Project EXHIBIT and SAFETY DISPLAY GUIDELINES

1. Keep the exhibit neat, uncluttered and to the point.
2. All posters, charts, etc. must be attached to the science fair board.
3. No part of an exhibit may be attached to walls or tables.
4. The science fair board must be self-supporting (FREE STANDING).
5. Be sure to make everything sturdy so it can be safely transported. Fasten everything well.
6. The science fair board displays your project. Use attractive lettering.
7. Spell correctly. Your name and school name should go on the back of the board.
8. Main points should be large and simple. Details must be clear and legible from three feet away.
9. The abstract and bibliography must be placed on the board's lower left-hand corner (as you face the board).

Elementary Safety Display Guidelines

1. Anything which could be hazardous to the public, the exhibitor, or other exhibitors are **PROHIBITED.**
2. Nothing sharp or pointed.
3. Organisms: No invertebrate organisms live or dead or plants may be displayed, (Reminder: No vertebrates, fungi, mold, bacteria were allowed to be part of the experiment.)
4. No chemicals of any kind may be displayed. (No prescription drugs, dangerous and illegal substances were allowed as part of the experiment.) For example:
   - No acids, dilute or strong (i.e., vinegar, lemon juice)
   - No bases, dilute or strong (i.e., baking soda)
   - No salt solutions
5. No flammable substances may be displayed.

An alternative solution to displaying any of the above items that were allowed as part of the project is to take photographs of the substances that were used or use a digital camera and create large pictures with a computer printer for display on your board. No identifiable humans or their parts may be displayed in photos.

All projects will be inspected for adherence to Science Fair Safety Guidelines by the classroom teacher or the school Science Fair Committee. Failure to follow these guidelines will be grounds for exclusion from the school and/or District Science Fair. In addition it will also affect the final project grade.

Websites That May Be Helpful for Projects and Inventions:

http://www.sciencebob.com/sciencefair/index.php

http://www.invention-help.com/invention-help-books.htm

http://pbskids.org/designsquad/pdf/parentseducators/DS_Invent_Guide_Full.pdf (for teachers)

http://www.inventivekids.com/2010/10/05/step-by-step-guide-to-inventing/

http://www.sciencebuddies.org

http://www.showboard.com

http://science.dadeschools.net/

http://www.proteacher.com/110031.shtml

http://www.sciedunet.org

http://sciencepage.org/scifair.htm

http://my.integritynet.com.au/purdic/science-fair-projects-ideas.htm

http://www.ipl.org/div/kidspace/projectguide/

http://www.super-science-fair-projects.com/elementary-science-fair-projects.html

www.kidsinvent.org

www.howstuffworks.com

http://edweb.sdsu.edu/courses/EDTEC596/Project1/Inventors.html (teachers only)

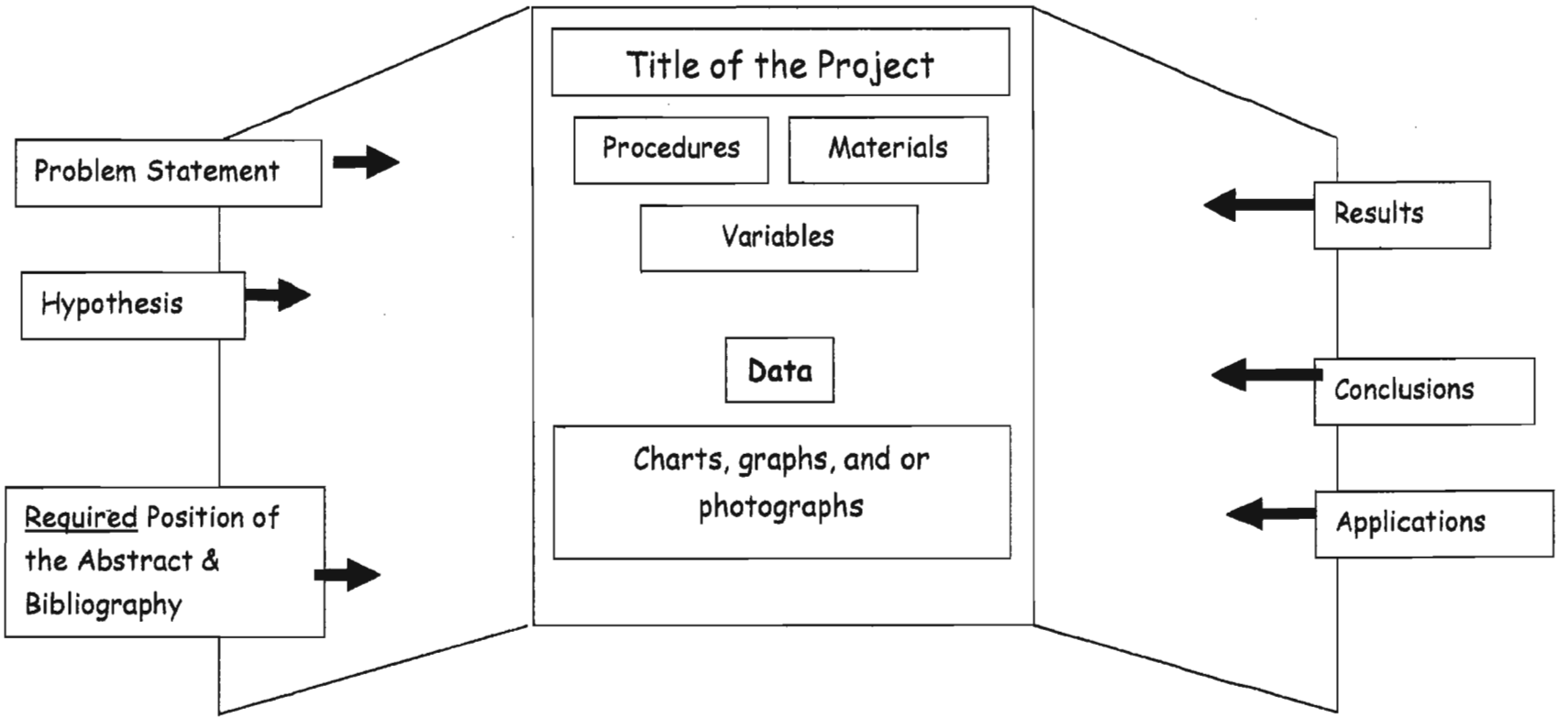
http://ctinventionconvention.org/

http://library.thinkquest.org/J002783/InvCon.htm

http://all-science-fair-projects.com/

Elementary Science, Mathematics, Engineering, and Invention Fair

Board Set-up for an Investigation Project



Display Board

This model is only an example of the layout which can be used to display a science project. According to NSF rules, the Abstract and Bibliography must be in the lower left corner, and the Data should be prominent in the center section. All other sections should reflect a logical organization of the experimental process.

Problem Statement

This is the question that the student will solve. The Problem Statement should include what the experimenter will do and what they will look for to measure results.

Hypothesis

This is the experimenter's educated guess as to the solution to the Problem Statement. It should be based on prior knowledge or research, and also reflect what the student will do and what they expect to see as a result. Use "If/Then" statement

Abstract

A paragraph or report that describes:

1. **The purpose of the experiment**
2. **The procedures used to solve the Problem Statement.**
3. **The results and conclusion of the experiment.**

Bibliography

Credit given to books, magazines, reference books, videos, T.V. programs, websites, etc., which are used to research the topic of the experiment. At least one non-reference book should be cited, and all should be written using proper bibliographical format.

Title

The title should reflect the topic of the experiment. It should be concise and interesting.

Materials

This section is numbered list of materials that the experimenter uses for the experiment. The list should be specific and include the types and amounts of materials in the list.

Procedures

A list of the steps the experimenter uses to solve the Problem Statement. The Procedures should be numbered as step-by-step directions. They should also include more than one trial to insure that the results of the experiment are reliable.

Variables

<u>Independent Variable</u> – This is what the experimenter does to cause a change in the tested item. This is actually what is being tested.

<u>Dependent Variable</u> – This is the change or reaction the experimenter is looking for by changing the Manipulated Variable.

<u>Controls</u> – This is a list of items which the experimenter must make sure does not change in order to insure that only the Manipulated Variable is being tested.

Data

Data is the information collected during the experiment.

Data includes:

- Written Observations & Data Log Book
- Charts & Tables
- Graphs
- Photographs
- Pictures drawn by the student
- Report

This is the most prominently displayed section of the experiment.

Results

This section describes what happens at the end of the experiment. The results should summarize and reflect the data collected during the experiment. Written summary

Conclusion

This section refers back to the hypothesis. Was the experimenter's hypothesis supported or not supported by the results of the experiment. The conclusions should also contain an analysis of the reasons the experiment did or did not turn out as expected.

Applications

This section is a paragraph or report which describes how the information learned from the experiment can be applied to real-life situations.

Español

Problem Statement

(Problema o Pregunta)

Esta es la pregunta que el estudiante va a investigar. Incluye lo que el estudiante va a hacer y como van a medir los resultados.

Title (Titulo)

El titulo refleja el tópico de el experimento. Debe ser simple e interesante.

Results (Resultados)

Esta sección describe que pasó al final del experimento. Los resultados deben resumir y reflejar los datos y observaciones que se vieron en el experimento (cantidades y calidades)

Hypothesis (Hipótesis)

Esto es lo que el estudiante piensa que es la solución del Problema o la Pregunta. Es una conjetura educada basada en conocimientos previo o investigaciones. Tambien explica lo que el estudiante va hacer y lo que esperan observar como resultado. Se usan las palabras "**If**" y "**Then**". "Si hago esto...**entonces** pasa esto."

Materials

(Materiales)

Esta sección es una lista numerada que indica todos los materiales y los instrumentos que el estudiate va a usar. La lista incluye tipos y cantidades de los materiales que se van a usar. La lista es detallada y especifica.

Procedures

(Procedimiento)

Esta seccion es una lista de los pasos que hay que seguir para el experimento. Los pasos son numerados y bien detallados. Haga una lista de las cantidades especificas, tiempos de espera, etc. y todos los detalles de lo que hay que hacer. El experimento se repite un mínimo de 3 veces

Conclusion

(Conclusiones)

En esta sección, el estudiante tiene que referirse a la hipótesis de nuevo y explicar si la hipótesis tiene validez o no basado en los resultados del experimento. Tambien debe contener un análisis de las razones por las cuales el experimento resulto o no resultó como se esperaba

Abstract (Resumen)

Esta sección es un párrafo que describe:

1. El propósito del experimento
2. Los pasos que se usaron para resolver el Problema o la Pregunta
3. Los resultados y la conclusión de el experimento

Variables (Variables)

Variables : Un evento, condicion o factor que se cambia o controla para estudiar una hipótesis.

Dependiente: La variable que se observa y que es causada por la variable independiente

Independiente : La variable que se ~~cambia~~ escoje para el experimento

Constantes: Todas las otras variables que affectan el experimento, por lo que tienen que mantenerse iguales todo el tiempo.

Application (Aplicacion)

Esta sección es un párrafo o reporte que describe como la información aprendida del experimento puede ser aplicada a situaciones reales sea en la industria o en la vida cotidiana en forma generalizada.

Bibliography (Bibliografia)

Listas en orden alfabético de todos los libros, revistas, videos, enciclopedias, documentales, paginas del Internet, etc. Estudiantes tienen que usar un formato bibliográfico correcto

Data (Datos)

Esta es la información que se acumuló durante el experimento:

* Notas de observaciones
*Tablas y Gráficas
*Fotografias
*Dibujos hechos por el estudiante
*Reporte

Toda la información acumulada y relevante se muestra en ésta sección. Esta es el área mas prominente de el experimento.

SIMPLE SCIENCE PROJECT IDEAS

PLANTS

- Which type of liquid (tap water, salt water, sugar water, fish tank water, rain water, canal water, pool water, ocean water, polluted water, tea, surge, coffee, etc.) makes plants grow the tallest? have more flowers? flower quicker? produce fruit quicker? produce more fruit?
- Which amount of water makes a plant grow the tallest? have more flowers? flower quicker? produce fruit quicker? produce more fruit?
- Which type of soil (sand, clay, dirt, potting soil) makes a plant grow the tallest?
- Which type of plant can grow through a maze the quickest?
- Which type of plant has the most sugar in it's leaves? (use glucose test tape)
- Which color light (red, blue, green, white) will make a plant grow the tallest? have more flowers? flower quicker? produce fruit quicker? produce more fruit?
- Which temperature water will make a plant grow the tallest? have more flowers? flower quicker? produce fruit quicker? produce more fruit?
- Which amount of vitamins makes a plant grow taller? have more flowers? flower quicker? produce fruit quicker? produce more fruit?
- Which kind of vitamin makes a plant grow taller? have more flowers? flower quicker? produce fruit quicker? produce more fruit?
- Which brand of pesticide makes a plant grow slower? have fewer flowers? flower slower? produce fruit slower? produce less fruit?
- Which amount of pesticide makes a plant grow slower? have fewer flowers? flower slower? produce fruit slower? produce less fruit?
- Which type of grass (Bahai, Floratam, etc) can grow with the least amount of water?
- Which type of grass (Bahai, Floratam, etc) can grow with the highest concentration of salt?
- Which type of grass plug (Bahai, Floratam, etc) can cover a patch of sand (or other type of soil) in the least amount of time?
- What is the lowest pH rain water (vinegar water) in which a plant can live?
- Which companies brand of seed will produce the tallest plant? have more flowers? flower quicker?

produce fruit quicker? produce more fruit?

- Seeds exposed to which temperature for 24 hours will then germinate the fastest? produce the tallest plant? have more flowers? flower quicker? produce fruit quicker? produce more fruit?
- Seeds soaked in which type of liquid (rain water, tap water, salt water, polluted water, soda, juice, coffee) will then germinate the fastest? produce the tallest plant? have more flowers? flower quicker? produce fruit quicker? produce more fruit?
- Which type of mulch (cypress, pine bark, eucalyptus) conserves the most water? (weigh watered pot of soil before and after)
- What is the smallest amount of mulch that will keep soil adequately wet? (weigh watered pot of soil before and after)
- Which type of mulch (cypress, pine bark, eucalyptus) allows the fewest weeds to grow?
- What is the smallest amount of mulch that prevents weeds from growing?
- Which brand of aspirin keeps cut flowers fresh for the longest period of time?
- What amount of aspirin keeps cut flowers fresh for the longest period of time?

ENVIRONMENT

- What environmental factor (water, sun, temperature, soil, etc.) makes a newspaper disintegrate the fastest?
- What type of garbage (banana peel, newspaper, bread, piece of meat, etc.) take the longest to decay buried in the ground?
- Which type of material (gravel, sand, water, clay, dirt, etc.) used to fill a liter bottle painted black collects the most solar energy? (measure the temperature)
- Which body of water in your area has the highest pH level?
- Which kind of plants stop the most dirt from being eroded away? (make a model to test)
- What is the lowest pH rain water that can visibly damage car paint?

HEAT

- What is the effect of different colored roof tiles on the temperature of a house? (make a model)
- Which color water solution absorbs the most heat?
- Which brand of 100 watt light bulb gives off the most heat?
- Which type of insulation keeps a house the coolest in the sun? (make a model)
- Which color paper can be burned the fastest using a magnifying glass?

FOOD

- What factor can effect how many kernels of popcorn will actually pop? (freezing, warming, soaking

SAMPLE IDEAS FOR SCIENCE FAIR PROJECTS

- What conditions cause iron nails to rust faster?
- What common substances prevent the rusting of iron nails?
- Which rocks best resist cracking from the impact of a weight?
- What are the effects of caffeine on the germination and growth of plant seeds?
- What brand or type of paper can best resist penetration by a pencil or pen point?
- What is the effect of color on the rate of evaporation?
- Which brand of tape holds the most weight?
- What common materials are able to block radio waves?
- What effects does crowding have on the growth rate of plants?
- What brand of eraser is most effective in removing pencil marks?
- What is the effect of colored cellophane on the growth of lima beans?
- How does temperature affect the height that a dropped ball bounces?
- What conditions affect the strength of adhesives?

Suggested Topics for Project:

- Which liquid freezes most quickly?
- Does color affect the rate at which an ice cube melts?
- Through which materials will magnetism pass?
- Does the shape of an ice cube affect its melting rate?
- What can you do to make a toy parachute fall more slowly?
- Which liquid evaporate more quickly?
- Which brand of popcorn makes the largest yield?
- Does color affect the evaporation rate of water?
- Do bigger seeds make bigger plants?
- Do bigger wheels roll faster?
- Does the type of soil affect plant growth?
- Which liquid dissolves pills faster?
- Does color affect heat absorption?
- Does the design of paper airplanes affect their flight patterns?
- Does the way food is stored affect its freshness?
- Which soil absorbs water most quickly?
- Does the color of a birdhouse affect feeding habits of birds?
- Do vitamins affect the germination of seeds?
- Does the kind of water absorbed by seeds affect germination?
- Does music affect plant growth?
- Do the moon's phases affect germination?
- Does magnetism affect plant growth?
- Which materials are effective insulators?

SAMPLE IDEAS FOR SCIENCE FAIR PROJECTS

- What conditions cause iron nails to rust faster?
- What common substances prevent the rusting of iron nails?
- What are toy commercials communicating to students of this grade level?

Topics for Science investigations (continued)

Plants:

- How can you keep algae from growing in the fish tank?
- Will this plant grow better in plain or salt water?
- How does fertilizer affect plant growth?
- Do you eat more roots, stems leaves, flowers, fruits or seeds?
- Do plants grow better under fluorescent light, sun light, or incandescent light?
- Do lima bean plants grow faster than green bean plants?
- Which part of the plant is needed to grow a new plant?
- Will plants grow better if they listen to music or are talked to?
- Which seeds germinate the fastest: radish, tomato or bean?
- Do all sweet potato plants grow to be the same size?
- How are different seeds alike or different?
- Will a leaf covered with petroleum jelly be any different than any other leaf on the plant?
- Does the color of light a plant receives affect its growth?
- Where do plants grow best?

Physical Science

Chemistry

- How can I tell which of these white substances is sugar, which is salt, which is soda, and which is flour?
- How can I find out which of these substances will dissolve in water and which will not?
- How does temperature affect the rate at which yeast grows to make bread rise?
- What do ice, water, and steam have in common?
- How can you change a liquid into a gas? A solid into a liquid?

Topics for Science investigations (continued)

- What substance works best to remove a food stain from material?
- Does ice lose weight when it melts?
- Why do metal objects rust?
- How can you get more sugar to dissolve in water?
- How can we separate salt from sand?
- Which detergent makes the most suds?
- What causes milk to sour?

Heat and Energy

- What is the effect of applying heat to different substances?
- How does the color of the material covering an ice cube affect its melting rate?
- Which melts fastest: butter, margarine, or shortening?
- What is the relationship between friction and heat?
- What is the effect of heat on air in a balloon?

Sound and Light

- How can the sound produced by a string on an instrument be changed?
- How can the sound produced by blowing through a straw be changed?

Machines and Movement

- Which of these things is most elastic?
- Do objects drop faster when traveling through air or water?
- Does a pulley make work easier than straight lifting?
- Which size marble/can will roll faster (farther)?
- What shape piece of paper will stay in the air the longest if dropped from five feet?
- What can you do to slow down the speed at which you travel down a slide?
- What kind of things will bounce when they are dropped?
- Which shape can you make a piece of paper into so that it is most resistant to the force of gravity?

Magnetism and Electricity

- Can different sizes of magnets pick up different numbers of paper clips?
- How can you magnetize an object?
- What things conduct electricity?

Earth Science

Weather and Seasons

- How can you predict the temperature tomorrow?
- Where do clouds come from?
- What is the best way to use the sun's heat to melt an ice cubs?
- On which day of the week does it rain most often?
- How does weather affect people's moods?

Air, Land and Water

- What is the most common way this class wastes water during the school day?
- At what time of the day is your shadow shortest?
- What is soil (ice, snow, clouds, fog) made of?
- What are the differences between pond water and tap water?
- How can soil erosion be prevented?
- What kind of soil (sand, clay, or potting soil) does water go through most easily?
- Will pond water and ocean water freeze at the same temperature?

SCIENCE PROJECT IDEAS

- What kind of juice cleans pennies best?
- Which dish soap makes the most bubbles?
- Do watches keep time the same?
- On which surface can a snail move faster-dirt or cement?
- What brand or raisin cereal has the most raisins?
- Do ants like cheese or sugar better?
- Can the design of a paper airplane make it fly farther?
- What foods do mealworms prefer?
- Does a bath take less water than a shower?
- Does warm water freeze faster than cool water?
- In my class who is taller- boys or girls?
- Do different types of apples have the same number of seeds?
- Do wheels reduce friction?
- Does holding a mirror in front of a fish change what a fish does?
- What color of birdseed do birds like best?
- What holds two boards together better- a nail or a screw?
- Will bananas brown faster on the counter or in the refrigerator?
- Do mint leaves repel ants?
- Does a ball roll farther on grass or dirt?
- Which travels faster- a snail or a worm?
- Which paper towel is the strongest?
- With which type of battery do toys run longest?
- Can the sun's energy be used to clean water?
- Which metal conducts heat best?
- What percentage of corn seeds in a package will germinate?
- Does an earthworm react to light and darkness?
- Can same – type balloons withstand the same amount of pressure?
- Does the viscosity of a liquid affect its boiling point?
- Does surrounding color affect an insect's eating habits?
- Do children's heart rates increase as they get older?
- What materials provide the best insulation?
- What keeps things colder- plastic wrap or aluminum foil?
- Does heart rate increase with increasing sound volume?
- Do boys or girls have a higher resting heart rate?
- Which way does the wind blow most frequently?
- Does the size of a light bulb affect its energy use?
- Which grows mold faster- moist bead or dry bread?
- Do sugar crystals grow faster in tap water or distilled water?
- What common liquids are acid, base, or neutral?
- Do taller people run faster than shorter people?
- Which dish soap makes the longest lasting suds?
- What are the effects of chlorine on plant growth?
- Which type of oil has the greatest density?

MORE SCIENCE FAIR PROJECTS

Do sugar crystals grow faster in tap water or distilled water ?

Do taller people run faster than shorter people?

Does the length of a vibrating object affect sound?

Who can balance better of the balls of their feet - boys or girls ?

Which dish soap makes the longest lasting suds ?

What are the effects of chlorine on plant growth?

Which type of oil has the greatest density ?

What type of soil filters water best?

What brand of cereal has the most raisins?

Can the design of a paper airplane make it fly farther?

How long will it take a drop of food dye to color a glass of still water ?

Does warm water freeze faster than cool water?

Do different types of apples have the same number of seeds ?

Do bigger seeds produce bigger plants ?

What color of birdseed do birds like best?

What holds two boards together better - a nail or a screw ?

Will bananas brown faster on the counter or in the refrigerator?

Does a ball roll farther on grass or dirt?

Which dissolves better in water - salt or baking soda ?

With which type of battery do toys run longest?

21. Are bar magnets stronger than horseshoe magnets?

22. Are Baggies as strong as Zip-Lock bags?

23. Do mealworms prefer a warm or cool surface?

24. Do plants grow more in plain water or in water with sugar?

25. Will the number of batteries used in an electromagnet affect its strength?

26. Will plain water evaporate more quickly than water colored with red food coloring?

27. Are all body temperatures the same?

28. Which variety of apples has the most seeds?

29. What slows down the oxidation process more - lemon juice, orange juice, or grapefruit juice?

30. What helps a string transmit sound better - water (a liquid) or wax (a solid)?

31. Does the number of wraps used in making an electromagnet affect its strength?

32. Can a paper towel absorb the same amount of water once it has already absorbed water, then dried?

33. Does a hard-boiled egg take the same amount of salt to float as a raw egg?

34. Does the shape of a water balloon affect the distance it can be tossed before it breaks?