

# CLYDE HILL ELEMENTARY



# SCIENCE PROJECT HANDBOOK

Young Scientist Week  
January 26-30<sup>th</sup>, 2009

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Welcome to Clyde Hill's newest annual PTSA sponsored event, Young Scientist Week! We are excited to start a new tradition at Clyde Hill and are looking forward to a fun and educational experience for all. There will be events scheduled throughout Young Scientist Week during the school day, and on the evening of Thursday, January 29<sup>th</sup> all families are invited to the 1st annual Clyde Hill Science Fair. We look forward to seeing the young scientists at Clyde Hill display the findings of their Science Fair Projects with students and their families.

## **SCHEDULE FOR YOUNG SCIENTIST WEEK, JANUARY 26-30**

**MONDAY, 1/26:** Pacific Science Center's "Physics on Wheels" exhibit for all students in the Gym. (Two classes at a time for 20 minute intervals).

**TUESDAY, 1/27:** A parent volunteer with a science background will speak in each classroom.

**WEDNESDAY, 1/28 :** Students present their Science Fair Project boards to their individual classrooms.

**THURSDAY, 1/29:** Pacific Science Center's "Radical Reactions" assembly 8:20am and 9:20am.  
**1<sup>st</sup> Annual Clyde Hill Science Fair 6-8pm** - Families and students will view all of the Science Project boards in the Gym and pizza dinner will be available for sale.

**FRIDAY, 1/30:** "Mad Scientist" dress up/crazy hair day.

### **OTHER IMPORTANT DATES:**

**12/18 and 1/8:** Project display boards (\$7) available for sale at the front entrance before school from **7:30-8:30am** and after school from **2-3pm**. Prepay is available - see attached order form. Due to their size (36"x 48") it is recommended that parents pick up the boards from school.

**1/8: 6:30-8pm FAMILY SCIENCE PROJECT TRAINING NIGHT** held with BSD's Director of Curriculum Development, Kathee Terry, in the Cafeteria. She will conduct an experiment for parents and students called "Milk Commotion" and describe the science inquiry process as she completes the experiment. She will be able to answer any questions you might have about student Science Projects and how they are executed. Childcare is available for preschool aged siblings. Please RSVP to Cindi Hawley by January 1<sup>st</sup> at [YSW@clydehillpta.org](mailto:YSW@clydehillpta.org) with the number of family members attending and the number of children needing childcare.

**1/12: SCIENCE PROJECT REGISTRATION FORMS DUE.** For planning purposes, **we are unable to accept late entries.** *For maximum participation, please encourage students to register their projects, even if they have not begun their investigations.*

**1/15: 2:30-4pm:** After-school Science Project assistance will be offered in the Cafeteria. Please use attached permission slip for each child attending, with contact info included.

**1/21: 12:10-1:30pm:** After-school Science Project assistance will be offered in the Cafeteria. Please use attached permission slip for each child attending, with contact info included.

## INFORMATION FOR PARENTS

Working on a science project and participating in Young Scientist Week is intended to be an enriching experience for Clyde Hill students and their families to share. We want to encourage all students to participate according to their ages, interests, and abilities. Our focus is on inquiry-based science projects in order to reflect the inquiry-based teaching method Clyde Hill Elementary School and Bellevue School District utilize in their science curriculum.

### What does “Inquiry-Based Science” mean?

In a full science inquiry, students begin with a question, design an investigation, gather evidence, formulate an answer to the original question and communicate the results. Students should approach science in ways that are within their developmental capabilities. Starting with a simple question and a simple investigation, students can observe results/collect data and come up with a reasonable explanation for the results.

### Guidelines

Parents should help the student choose a project that the student fully understands. There will be a special Science book cart set up in the school library. Parents may encourage students to choose books from this cart, or visit the public library with their child. There are also links in this handbook to websites that can help students decide on a topic. Parents may assist their child in brainstorming ideas, choosing and researching a topic, and gathering supplies and materials. The PTSA will be selling and distributing display boards for Science Fair Projects on December 18 and January 8<sup>th</sup> before and after school. There will also be two after-school sessions to help students with their questions, investigation design, etc.

Although the project should be the **student’s own work**, parents, grandparents, mentors, etc. are welcome to assist the student as necessary. It is understood that some students will need more assistance than others, depending on the age of the child, complexity of the project and so on. It is up to the parent or other adult assisting to determine how much and what kind of assistance is appropriate. Please exercise good judgment and remember that your child will benefit much more from “owning” his or her project than from exhibiting a nifty display that Mom or Dad built.

### Family Science Project Training Night

On January 8 Kathee Terry, Bellevue School District’s Director of Curriculum Development and Science Curriculum head will host a Science Project Parent Information Night. She will conduct an experiment called “Milk Commotion” and describe the science inquiry process as she completes the experiment. She will be able to answer any questions you might have about student science projects and how they are executed. This is a wonderful opportunity to become acquainted with Science Fair Projects for our first annual Science Fair. Please join us on this evening from 6:30-8pm in the Cafeteria. Students are welcome and encouraged to attend (childcare is available for preschool aged children).

## **GUIDELINES FOR YOUR SCIENCE FAIR PROJECT**

1. You will need a free-standing, three sided display board for your project. The PTSA will be selling boards for \$7 on December 18<sup>th</sup> and January 8<sup>th</sup> at the front entrance before school from 7:30-8:30am and after school from 2:00-3:00pm, as well as at Parent Information Night on January 8th. They can also be purchased at most office supply stores.
2. Students will need to be able to set up their own projects. No “hands on” activities should be included, as no one will be available during tours to demonstrate it and students will be asked not to touch the projects.
3. No glass containers, explosives, open liquid containers, bubbles, active volcanoes, flames or dangerous chemicals. If your project requires any of these, do the experiment at home and prepare an exhibit of the results with photos.
4. No experiments with pets or animals.
5. You may partner with another student at Clyde Hill to work on a project.
6. You are responsible for anything fragile or valuable. Due to this, think carefully about including fragile or valuable items in or on your display.
7. **Label your display board on the upper left front corner with the “SCIENCE FAIR PROJECT IDENTIFICATION LABEL” found on the last page of this handbook. This will allow the YSW committee, teachers, and Science Fair Attendants to know to whom the science project belongs.**

## **SCIENTIFIC INQUIRY GUIDE FOR K-3**

### **Ask a Question about Objects, Organisms, or Events in the Environment**

The emphasis should be on asking questions that students can answer with scientific knowledge, combined with their own observations. Students should answer their questions by seeking information from reliable sources of scientific information and from their own observations and investigations.

### **Plan and Conduct a Simple Investigation**

Investigations for K-3 are largely based on systematic observations. As students develop, they may design and conduct simple experiments to answer questions.

### **Employ Simple Equipment and Tools to Gather Data and Extend the Senses**

Students have developed basic skills to observe, measure, cut, connect, turn switches on and off, pour, hold, tie, and hook. Beginning with simple instruments, students can use rulers to measure the length, height, and depth of objects and materials, thermometers to measure temperature, watches to measure time, scales to measure weight, magnifiers to observe objects and organisms such as finer details of plants, animals, rocks, and other materials. Children can also develop skills in the use of computers and calculators for conducting investigations.

### **Use Data to Construct a Reasonable Explanation**

Emphasis should be on the students’ thought process as they use data to formulate explanations. Even at the earliest grade levels, students should learn what constitutes evidence and judge the merits or

strengths of data and information that will be used to make explanations. After students propose an explanation, they will appeal to the knowledge and evidence they obtained to support their explanations. Students should check their explanations against scientific knowledge, experiences, and observations of others.

### **Communicate the Investigation and Offer Explanations**

Students should begin developing the abilities to communicate, critique, and analyze their work and the work of other students. This communication might be spoken or drawn as well as written.

### **Use this simplified version of the Inquiry Process to help younger students plan and communicate their project:**

- 1. MY QUESTION**
- 2. MY PREDICTION (OR HYPOTHESIS)**
- 3. WHAT I DID**
- 4. WHAT I LEARNED**

## **SCIENTIFIC INQUIRY GUIDE FOR GRADES 4-5**

### **Identify Questions That Can Be Answered Through Scientific Investigations**

Students should develop the ability to refine and refocus broad questions. An important aspect of this ability is to clarify questions or problems and direct them towards objects or phenomena that can be described, explained, or predicted by scientific investigations. Students should be able to develop the ability to identify their questions with scientific ideas, concepts, and quantitative relationships that guide investigation.

### **Design and Conduct a Scientific Investigation**

Students should develop general abilities, such as systematic observation, making accurate measurements, and identifying and controlling variables. They should develop the ability to clarify their ideas that are influencing and guiding the inquiry, and to understand how those ideas compare with current scientific knowledge. Students can learn to formulate questions, design investigations, execute investigations, interpret data, use evidence to generate explanations, propose alternative explanations, and critique explanations and procedures.

### **Use Appropriate Tools and Techniques to Gather, Analyze, and Interpret Data**

The use of tools and techniques, including mathematics, will be guided by the question asked and the investigations that students design. The use of computers for the collection, summary, and display of evidence is encouraged for students.

## **Develop Descriptions, Explanations, Predictions, and Models Using Evidence**

Students should base their explanation on what they observed, and as they develop skills, they should be able to differentiate explanation from description – providing causes for effects and establishing relationships based on evidence and logical argument.

## **Think Critically and Logically to Make the Relationship Between Evidence and Explanations**

Thinking critically about evidence includes deciding what evidence should be used and accounting for anomalous data. Specifically, students should be able to review data from a simple experiment, summarize the data, and form a logical argument about the cause-and-effect relationships in the experiment.

## **Recognize and Analyze Explanations and Predictions**

Students should develop the ability to listen to and respect the explanations proposed by other students. They should remain open to and acknowledge different ideas and explanations, be able to accept the skepticism of others, and consider alternative explanations.

## **Communicate the Investigation and Explanations**

Students should be able to communicate, critique, and analyze their work and the work of other students. This communication should be able to be spoken as well as written.

## **Use this version of the Inquiry Process to help older students plan and communicate their project:**

### **1. STATE THE QUESTION OR PROBLEM**

What interests you? Brainstorm by yourself or with parents, friends or teachers. Check books and magazines for ideas.

### **2. PERFORM RESEARCH**

Check the Science book cart in the school Library. Visit the public library or other places like the zoo and the Pacific Science Center. Look on the Internet via sites found in this guide.

### **3. STATE YOUR PREDICTION (OR HYPOTHESIS)**

This is your guess. What do you think is the answer to your question? What did you think would happen if....?

### **4. CONDUCT THE EXPERIMENT**

Make up an experiment to test your prediction. How did you gather data to see if your guess was right? What equipment or materials did you use?

### **5. RESULTS**

What happened? Write down your observations at each step.

**6. CONCLUSION** Compare the results of your experiment with your prediction. Use your research to help explain the results.

## HELPFUL INTERNET SITES

The Ultimate Science Fair Project Resource: <http://www.scifair.org/>  
Pacific Science Center: <http://www.pacsci.org>  
Bill Nye the Science Guy: <http://www.billney.com>  
Exploratorium Teacher: <http://www.exploratorium.edu/educate/index.html>  
Science Projects for Primary Grades: <http://www.geocities.com/webeme76/sciencefair.html>  
Discovery for Kids Science Fair Central: <http://school.discovery.com/sciencefaircentral/>  
Science Made Simple: <http://sciencemadesimple.com>  
Science Buddies: <http://sciencebuddies.org>

## POSSIBLE IDEAS FOR SCIENCE PROJECTS

Here are some suggested examples from the science units you have been working on in class:

### **Kindergarten:**

#### Wood and Paper

- Does the type of paper affect how far a paper airplane flies?
- Which wood absorbs pain the best?
- Are more expensive paper towels better at absorbing water?

#### Animals 2x2

- Do goldfish like certain types of fish food more?
- Can you encourage an isopod to move faster?
- Which is stronger – land or water snails?

#### Fabric

- What type of fabric absorbs water the best?
- What type of fabric is most stain resistant?
- Which fabric has the most wrinkles after washing?

### **First Grade**

#### Air and Weather

- Is hot or cold air lighter?
- Will more air inside a basketball make it bounce higher?
- Which weather station gives the most accurate forecast

#### New Plants

- What type of soil is best for growing plants?
- Does more water help new plants grow faster?
- What is the effect of salt water on plant growth?

## Solids and Liquids

- What types of liquids evaporate fastest? (oil, milk, water, soda, etc.)
- What type of detergent removes grease or dirt the best?
- What solid can dissolve most in water – sugar, salt, or pepper?

## Second Grade

### Pebbles, Sand, and Silt

- What body clay is softest? What clay is hardest?
- Do expensive soil types have more ingredients?
- Does sand or dirt get warmer more quickly?

### Insects

- Does the color of its surroundings affect an insect's eating habits?
- Which insect can pull more of its body weight?
- Does heat or light attract insects?

### Balance and Motion

- Do tricycles or bicycles move faster?
- How do objects float or move in water?
- Does a pendulum swing more if it is heavier or longer?

## Third Grade

### Earth Materials

- What are the hardest types of rocks?
- Are salt or crystals heavier?
- Do crystals grow better in warmer temperatures?

### Human Body

- Do girls or boys have different resting pulse rates?
- Can your muscles lift or pull more weight when they are warmed up?
- Does age affect your lung capacity?

## Fourth Grade

### Structures of Life

- What foods do crayfish or land snails prefer?
- Do crayfish or land snails choose their habitat by location or randomly?
- Does the temperature of the water affect the growth of hydroponic plants?

### Water

- Do different amounts of salt or sugar affect how fast the water evaporates?
- Does an ice cube melt faster in water or air?
- What kind of filtration system yields the cleanest water?

### Magnetism and Electricity

- Does the number of turns of wire in an electromagnet affect its strength?
- Does temperature affect the strength of a magnet?
- What kind of material creates stronger temporary magnets?

## **Fifth Grade**

### Environments

Does fungus grow faster in a warm and wet environment or a cold and wet one?

Does more salt in the water affect the growth of plants?

What household cleaner is the least harmful to the environment?

### Landforms

What happens when the plates below the Earth move?

Does the slope angle affect the rate of erosion or the amount of eroded material?

How does elevation affect the weather?

### Mixtures and Solutions

Does the temperature affect how much salt/sugar dissolves in water?

How does density affect the solubility of substances?

Are certain brands of detergent more effective at removing dirt?

## Science Fair Project Planning Worksheet

Use these pages to take notes about your own Science Fair Project. First, brainstorm up to 10 questions that you might like to explore for your Science Fair Project and list them below.

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

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

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

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

7. \_\_\_\_\_

8. \_\_\_\_\_

9. \_\_\_\_\_

10. \_\_\_\_\_

Now, choose the question you would like to explore for your Science Fair Project and circle it.

## Science Fair Project Display Board Worksheet (Page 1)

**My Question:** (The one you circled on your planning worksheet):

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**My Prediction (or Hypothesis):** (What I think the answer to my question is):

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**Materials:** (List the materials you will use for your experiment):

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## Science Fair Project Display Board Worksheet (Page 2)

**My Experiment:** (What I did to test my prediction – include photos or drawings and explanations below each one):

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**My Observations:** (What I saw – include photos or drawings and explanations below each one):

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## Science Fair Project Display Board Worksheet (Page 3)

**My Conclusion:** (What I learned from my observations):

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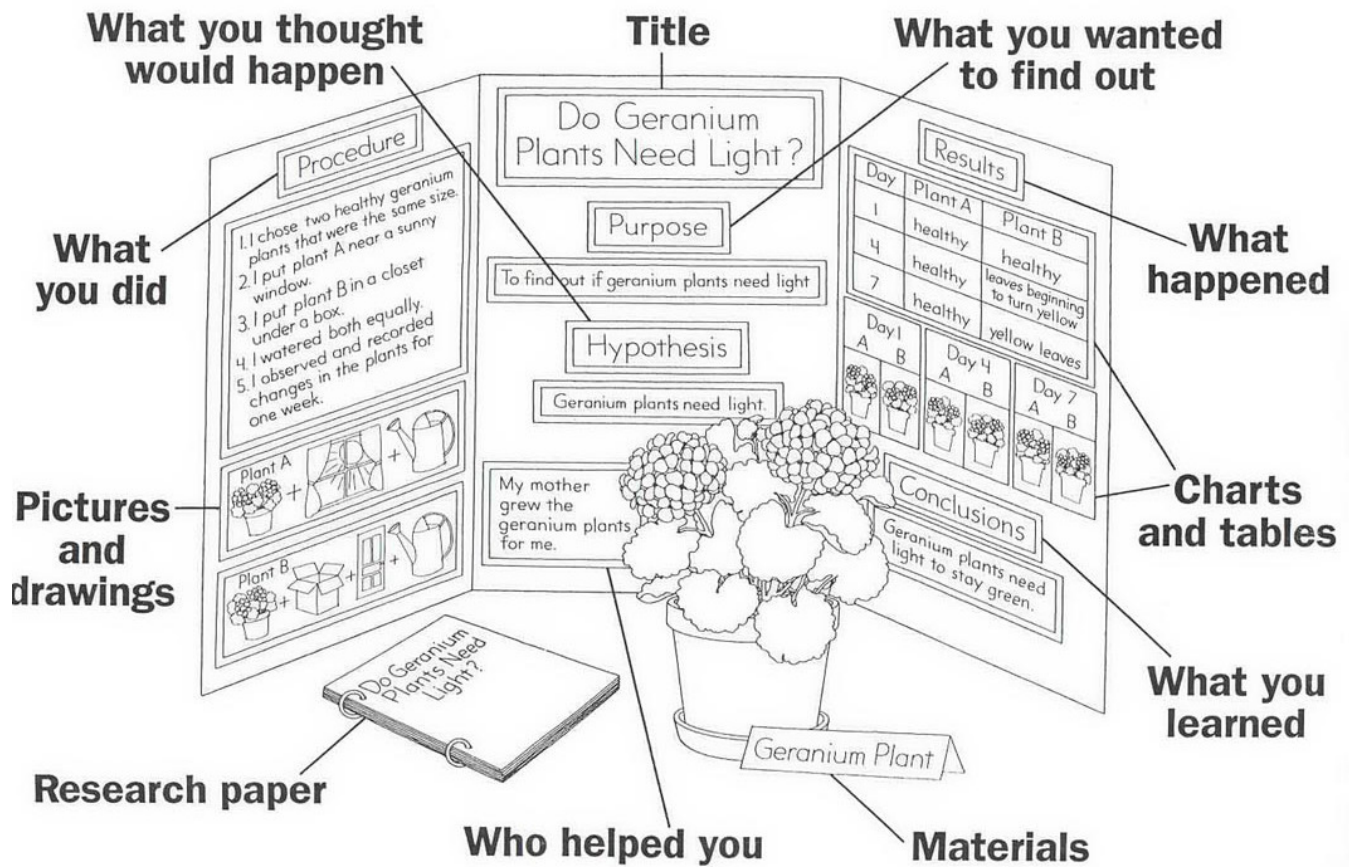
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**Put all of the steps of the scientific inquiry method on your display board (question, prediction, materials, experiment, observations and conclusion). Type everything (or write very neatly) so it is easy to read. Items must be glued onto your board – no tape please. The title of your Science Fair Project should stand out on the board. Use the largest letters for the title and medium letters for the headings. Display photos or drawings that show some of the steps in your procedure and the results. Display models if appropriate.**

Here is an example of what your display board might look like when you are finished:

## Displaying a Science Fair Project



## Young Scientist Week – Workshop Permission Slip

Parent/Guardian Permission – to attend YSW activity

To help students with any questions about their science projects for the Science Fair the Clyde Hill Elementary PTSA is going to offer hands-on workshops for students who are creating display boards. The workshops will take place on [Thursday, January 15<sup>th</sup>, 2009](#) between 2:30 and 4:00pm and [Wednesday, January 21<sup>st</sup>](#) from 12:10 until 1:30pm in the Cafeteria.

\_\_\_\_\_ has my permission to attend.  
Student's name

\_\_\_\_\_ Date

\_\_\_\_\_ Signature of parent of guardian

My child will be going home by:

Please check one -

\_\_\_ Will be picked up by \_\_\_\_\_  
Name/relationship/contact phone number

\_\_\_ Walking home

\_\_\_ Early Childcare Center

In the event of an emergency on this date, I may be reached at the following phone numbers:

\_\_\_\_\_ Home

\_\_\_\_\_ Other

Please note – if there are any students with medical issues that may require medication or treatment while at the workshop – please notify Carrie Tu at [chencarrie@gmail.com](mailto:chencarrie@gmail.com) or 206-972-4819.

Any questions, please contact Jill Follett, Cindi Hawley, or Carrie Tu at [YSW@clydehillpta.org](mailto:YSW@clydehillpta.org)

**Science Fair Project Registration Form**  
**Young Scientist Week – January 26<sup>th</sup> ~ 30<sup>th</sup>, 2009**

**Due on Monday, January 12<sup>th</sup>, 2009**

**(Sorry, no late entries allowed)**

Student's name: \_\_\_\_\_

Project Title: \_\_\_\_\_

Grade: \_\_\_\_\_ Teacher: \_\_\_\_\_

Parent name: \_\_\_\_\_

E-mail: \_\_\_\_\_

Home Phone # \_\_\_\_\_ Cell# \_\_\_\_\_

Emergency # \_\_\_\_\_

Partnering with (optional):

2<sup>nd</sup> Student's name: \_\_\_\_\_

Grade: \_\_\_\_\_ Teacher: \_\_\_\_\_

\_\_\_\_\_ I am interested in being a parent volunteer for Young Scientist Week.

\_\_\_\_\_ I am interested in visiting my child's classroom to talk about my scientific field or area of knowledge on Tuesday, January 27 (time to be decided by parent and teacher).

\_\_\_\_\_ I am applying for a full or partial scholarship (available for free and reduced lunch only). If ineligible for scholarship, but needing assistance, please contact one of the YSW chairs below.

Any questions, please contact Jill Follett, Cindi Hawley, or Carrie Tu at  
[YSW@clydehillpta.org](mailto:YSW@clydehillpta.org)

## Young Scientist Week - Order form

Student's name: \_\_\_\_\_

Grade: \_\_\_\_\_ Teacher's name: \_\_\_\_\_

Please indicate the number(s) and size(s) that you wish to order and make cash or check payment to **Clyde Hill PTSA**.

Item	Price/each	Quantity					Total
Display Board & YSW 2009 T-shirt	\$15.00 (SAVE \$2)						
Display Board	\$7.00						
YSW 2009 T-shirt	\$10.00	xs	s	m	l	xl	
Dinner at the Science Fair: Pizza slice, drink & cookie	\$5.00/person						
Sub total							

Distribution dates for the above items:

Display Board: December 18<sup>th</sup> 2008 and January 8<sup>th</sup> 2009

\*Pick up by at school front entrance at 7:30 ~ 8:30am & 2:00 ~ 3:00pm.

T-shirt: January 22<sup>nd</sup> 2009

\*delivered to student's classroom

Dinner ticket: January 29<sup>th</sup> 2009

\*picked up at Science Fair Night – doors open at 6pm.

Any questions, please contact Jill Follett, Cindi Hawley, or Carrie Tu at

[YSW@clydehillpta.org](mailto:YSW@clydehillpta.org)

**SCIENCE FAIR PROJECT IDENTIFICATION LABEL**  
**Detach and place on upper left corner of display board**

Teacher(s): \_\_\_\_\_

Names(s): \_\_\_\_\_

Grade(s): \_\_\_\_\_ Room(s): \_\_\_\_\_

Project Title: \_\_\_\_\_