



## SCIENCE FIRSTHAND – PARTNERS IN DISCOVERY

### Science Firsthand Mentor Resource Pages

\*this brochure is online at [www.firsthandlearning.org/sciencefirsthand.html](http://www.firsthandlearning.org/sciencefirsthand.html)

### Science discovery

#### *What is Science at Science Firsthand?*

Science is not just a collection of facts and information. Facts are part of science.

But science is more...

- Observing what is happening around you
- Predicting what might happen
- Testing predictions under controlled & natural conditions
- Making sense from our observations

Science is also trial and error – trying and failing and trying again.

Science does not provide final answers, only tentative ones.

We remain skeptical, so that our conclusions can be changed as we make new discoveries.

Children have their own ideas. They develop their own ideas about the physical world, ideas that reflect their own special perspectives.

“Fossils are bones that animals are through wearing”.

“A blizzard is when it snows sideways”.

Children’s experiences help them form ideas, and these often don’t match current scientific beliefs. Our children must be “allowed” to ask questions and make mistakes without feeling “stupid”. So can you!

#### *Why Hands – on?*

Children learn science best and understand scientific ideas better if they are able to investigate and experiment. Hands – on science helps children to think critically and gain confidence in their own ability to solve problems. Your students do this kind of science in the BPS, so be sure to ask them about their science activities in school. These can be great jumping off points for your investigations.

#### Finding the right activities for your mentees:

- Encourage activities that are neither too hard nor too easy. If in doubt, err on the easy side since something too difficult may give the idea that science itself is too hard.
- Consider a child’s personality or social habits. Some activities are best done alone, others in a group; some require more help; others require little or no supervision. Solitary activities may bore some, while group projects may intimidate others.
- Select activities that are make use of the environment around the center or clubhouse.
- Allow children to select the activity.

#### Links and list other resources:

<http://www.mcrel.org/whelmers/index.asp>

<http://www.mcrel.org/whelmers/wheintro.asp>

Good activities and the introduction is worth reading.

[http://www.exploratorium.edu/science\\_explorer/index.html](http://www.exploratorium.edu/science_explorer/index.html)

Some of the best physical science and sensory perception activities are at this site. They are also available in book form from the Exploratorium’s online store.

<http://www.californiasciencecenter.org/FunLab/DoltYourself/DoltYourself.php>

A short list of activities that may help you get started. Most of these are available in books (with better illustrations). The best thing about a book of experiments is that you and your student can page through it until you find something that catches your interest.

<http://www.reachoutmichigan.org/funexperiments/quick/quick.html>

This site is a portal for many other sites of varying quality and often the result is a “Not Found” message instead of an activity.

<http://www.discoverlife.org/pa/pr/anthunt.html>

Ant Hunt! is a citizen science project first conceptualized in the fall of 2004. Ant Hunt! participants will learn to collect, sort, identify, study, and map ants.

## Mentoring Skills and Guidelines

### Mentoring Tips

#### *Please do:*

- Allow kids to make choices.
- Let children feel that they are in control – Assist children without taking control (i.e., don't do the science experiment for them).
- Build trusting relationships – treat children with respect and listen to what they say. Talk eye to eye. Be an attentive listener.
- Be affectionate – Be sure to praise a child, when you believe what you are saying. Praise should be for something specific that they have shared, such as helping someone with an experiment.
- Help them explore their interests.
- Foster enthusiasm about science and learning – enthusiasm about science is catching. Let students see your excitement about their projects, experiments and discoveries.
- Reinforce the process of the scientific method- You're teaching a process, not facts. Give students time to explore, observe, handle materials, test ideas, and talk about what they are exploring and learning. Don't worry about the results so much.
- Be patient – Recognize the range of children's abilities. Some work more slowly than others.
- Share your life stories.
- Ask questions – Ask questions that encourage children to think for themselves. Avoid probing for the "right answer". Science is about asking questions and searching for answers. Model that it is okay, in fact necessary, to not have all the answers.
- Research lessons if you don't understand.
- Feel free to bring additional materials to enhance the lessons.
- Write letters or notes to children.

#### *Please do NOT:*

- Embarrass kids or make them feel ashamed for "not knowing."
- Tell them what they should do with their lives.

## Communication

Effective communication is absolutely essential for building relationships. As a mentor, your ability to listen and interact with your mentee is key to the quality of your and your mentee's experience. But it's not always easy to communicate with adolescents and children. How do we improve this skill? We need to communicate, verbally and nonverbally to share:

- Information
- Feelings
- Meanings
- Ideas

We need to "listen" and "hear".

### Three processes of communication:

#### **1. Mirroring**

(children often state that they feel misunderstood or unheard)

- Setting aside what you know, think or feel about something in order to focus on what the other person is saying
- Paraphrasing – saying back to the other person what you understand their message to be
- Be careful not to interrupt what is said or to interpret it; just paraphrase it.

#### **2. Validation**

- Communicate to the other person that you have heard
- See their point of view; put aside, at least for a moment your own viewpoint and judgements.
- Use phrases like: "I can see that." "I can understand that."
- You do not have to agree, but you do acknowledge their point and accept that two individuals will have different points of view.
- Adults are not always right.

#### **3. Empathy**

- Reflect on the feelings of the other person.

## Snapshot of the children we serve and their needs:

### Demographics-

Varying abilities, multiple intelligences, varied learning styles

Culturally diverse

Varied socio-economic backgrounds, but mostly working class families

Some labeled with behavior problems or learning disabilities such as

Attention Deficit Hyperactivity Disorder

### Personal Characteristics that you might notice:

Range from articulate to expressive

Can be blunt and candid, “streetwise” for their age

Can use “ebonics” or inappropriate language in routine conversation

Can be very personal and inquisitive

Hungry for physically demonstrated affection, like a touch, hug

Need someone to identify with, rely on

Need immediate recognition and reward for achievement

Need to be shown respect and made to believe that they “can”

Need to feel that they are worth someone’s time

Have short attention spans

Like to talk a lot, listen a little

Need two way conversations (most kids are talked at)

Easily take negative looks or words personally

Need to receive things one step at a time, are hands – on

Can usually express themselves better through speaking than writing

Thrive when they’re praised for good work

## Learning styles

You have probably noticed that when you try to learn something new that you prefer to learn by listening to someone talk to you about the information. Some people prefer to read about a concept to learn it; others need to see a demonstration of the concept. Learning style theory proposes that different people learn in different ways and that it is good to know what your own preferred learning style is. It is important in your role as mentor to understand your own style as it relates to how you share information with your mentee. You might need to try alternatives to your natural style in order to communicate effectively.

After you complete the quiz, and have identified your own learning style, look for clues when you are working with your mentee to identify theirs. Try to determine how they absorb information best. Experiment with your methods of presenting ideas and information to them, incorporating ideas from the handout.

### Active and Reflexive Learners

- Active learners retain and understand information best when they do something active with it – discussing it, applying it, or explaining it to others.

Reflexive learners prefer to think about it quietly first.

- “Let’s try it and see how it works” is an active learners approach.

“Let’s think it through first” is the reflexive learner’s response.

- Active learners like group work. Reflexive learners prefer to work alone.

- Sitting and taking notes is hard for both types.

### Sensing and Intuitive Learners

- Sensing learners like learning facts. Intuitive learners prefer discovering possibilities and relationships.

- Sensors like solving problems by using known methods and dislike complications. Sensors dislike being asked questions on material that has not been covered. Intuitors like innovations and dislike repetition.

- Sensors tend to be patient with details, good at memorizing facts and doing lab work. Intuitors are better at grasping new concepts and feel more comfortable with abstractions.

- Sensors are practical and careful. Intuitors work faster.

- Sensors don’t like studies that have no apparent connection to the real world. Intuitors don’t like studies that require a lot of memorization and routine activities.

### Visual and Verbal Learners

- Visual learners remember best what they see – pictures, diagrams, timelines, films and demonstrations.

- Verbal learners get more out of words – written and spoken explanations.

- Everyone learns more when information is presented both visually and verbally.

## Reporting Investigations

### **On – line journal:** <http://journal.firsthandlearning.org>

Students and mentors report on their investigations. This valuable aspect of SF allows all mentors and students to share ideas and experiences. Please encourage your mentee to use this tool, and model it's value by using it yourself. It also builds computer skills.

**Paper journal:** The paper journal tracks ideas, questions and observations from session to session, important . Some students prefer to write, some draw their entries and some will dictate to their mentor. Grammar, spelling and writing skills are less important than expressing their ideas. You may also want to keep a journal.

### **Evaluations:** [www.surveymonkey.com](http://www.surveymonkey.com)

Science Firsthand is a pilot program and utilizes information from evaluations to understand the program's impact on students and mentors. Your participation in the evaluation process is extremely important to the success of Science Firsthand. We ask each participant to complete the online survey prior to engaging with students and again at the end of their Science Firsthand experience.

### **Sources:**

[www.mentoring.org](http://www.mentoring.org)  
*Reach Out Michigan*  
[www.LdPride.net](http://www.LdPride.net)

## Science Firsthand Schedule Information

Science Firsthand follows the same schedule as the Buffalo Public Schools. When the schools are closed for holidays or snow days, the mentors will not be expected to come to the centers. From time to time, days off are added to the school calendar. This information will be posted on the Firsthand Learning website and the Science Firsthand on-line calendar at <http://calendar.yahoo.com/>. You can access this calendar with the User ID: Sciencefirsthand. Please check the calendar regularly for updated information. On snowy days, you can check our calendar, or listen to a radio station that reports school closings for Buffalo Public Schools or call the center!

### **Buffalo Public School Calendar –2006 – 2007**

Sept. 6, Wednesday – First day of school  
Oct. 9, Monday – Celebrate Columbus Day  
Nov. 7, Tuesday – Election Day  
Nov. 10, Friday – Celebrate Veteran's Day  
Dec. 21, Thursday – Jan. 1, Monday – Winter Break  
Feb. 19, Monday – President's Day  
April 5, Thursday – April 13, Friday – Spring Break  
May 28, Monday – Memorial Day

### **Center Contacts**

FLARE – 838 - 6740/ Hashim Moore – Youth Program Coordinator  
Valley Community Center – 832 - 4704 x4/ Liza Waters – After School Program Coordinator  
Polonia Hall – 855 - 2124/ Floyd Smith – Director  
Dulski Center – 847 - 2860/ Linda Hansen – Director Of Youth & Family Services  
Boys & Girls Clubs of Buffalo –  
Chris Payne, Babcock St. Clubhouse Director

### **To contact Science Firsthand:**

Bill Rogers – 831 - 9160/ [billroger@gmail.com](mailto:billroger@gmail.com)  
Marilyn Sozanski – 831 - 8722/ [marilyn.sozanski@gmail.com](mailto:marilyn.sozanski@gmail.com)