



Using Science Notebooks in the Elementary Classroom

Jenny Gammill

NWAESC Science Specialist

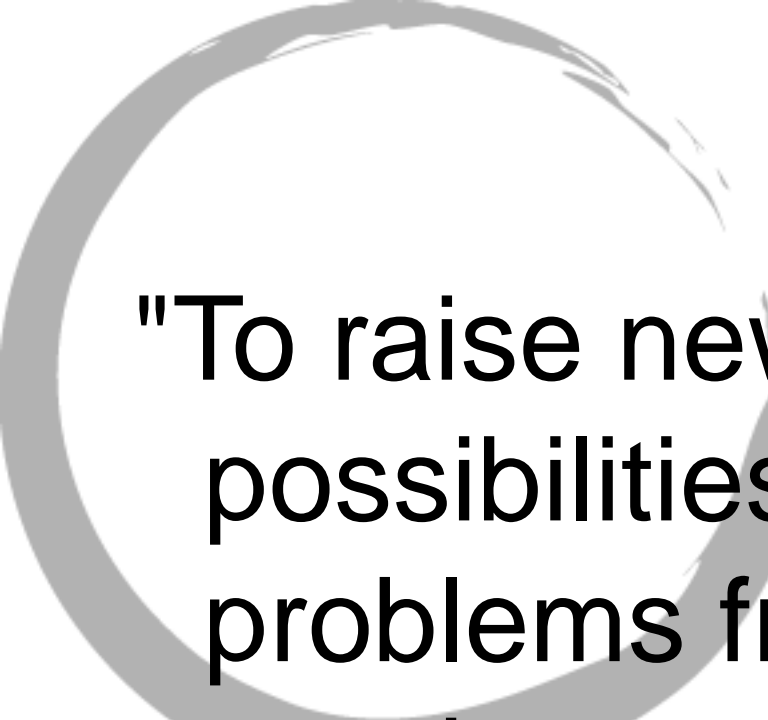
November 13, 2008

Arkansas Curriculum Conference



Today's Objectives

- Identify need for science notebooks
- Discuss reasons for using science notebooks
- Consider ways in which the teacher can provide structure to enhance student-centered science notebooks
- Examine examples of notebook entries

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"To raise new questions, new possibilities, to regard old problems from a new angle, requires creative imagination and marks real advance in science."

— Albert Einstein

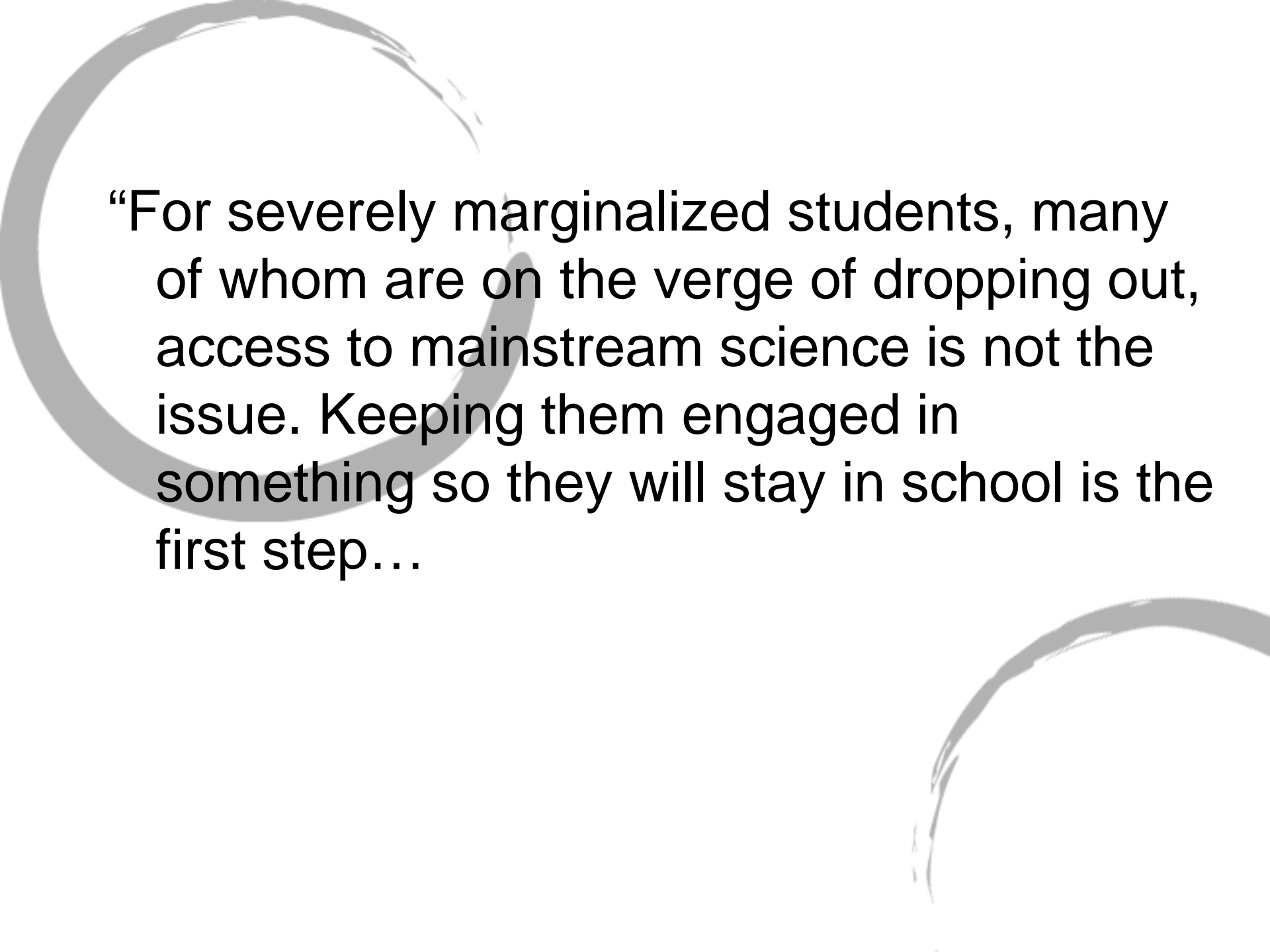
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Ted Talk: Sir Ken Robinson

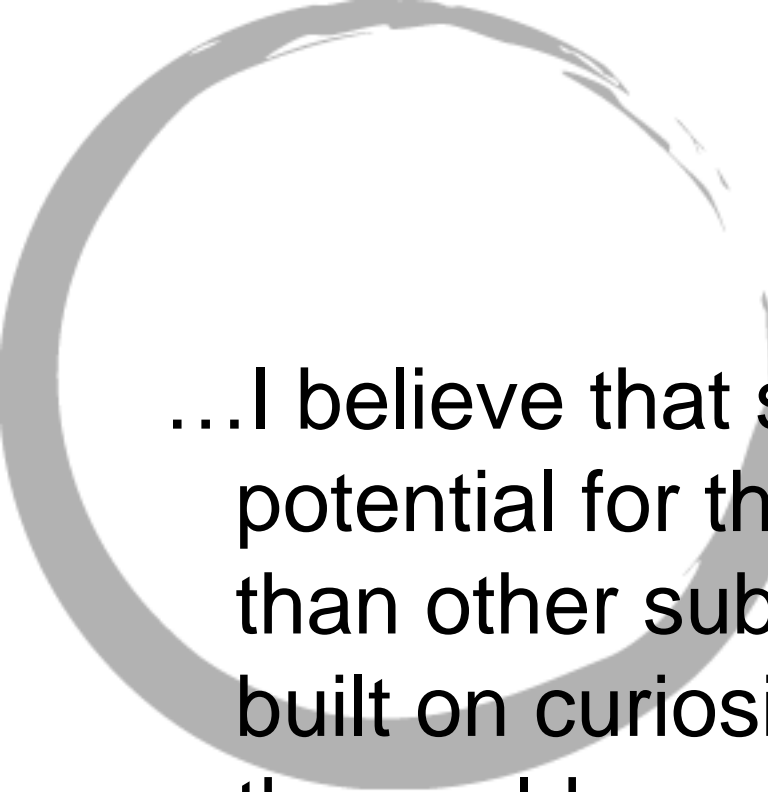


Zach Hill Comic Strip





“For severely marginalized students, many of whom are on the verge of dropping out, access to mainstream science is not the issue. Keeping them engaged in something so they will stay in school is the first step...



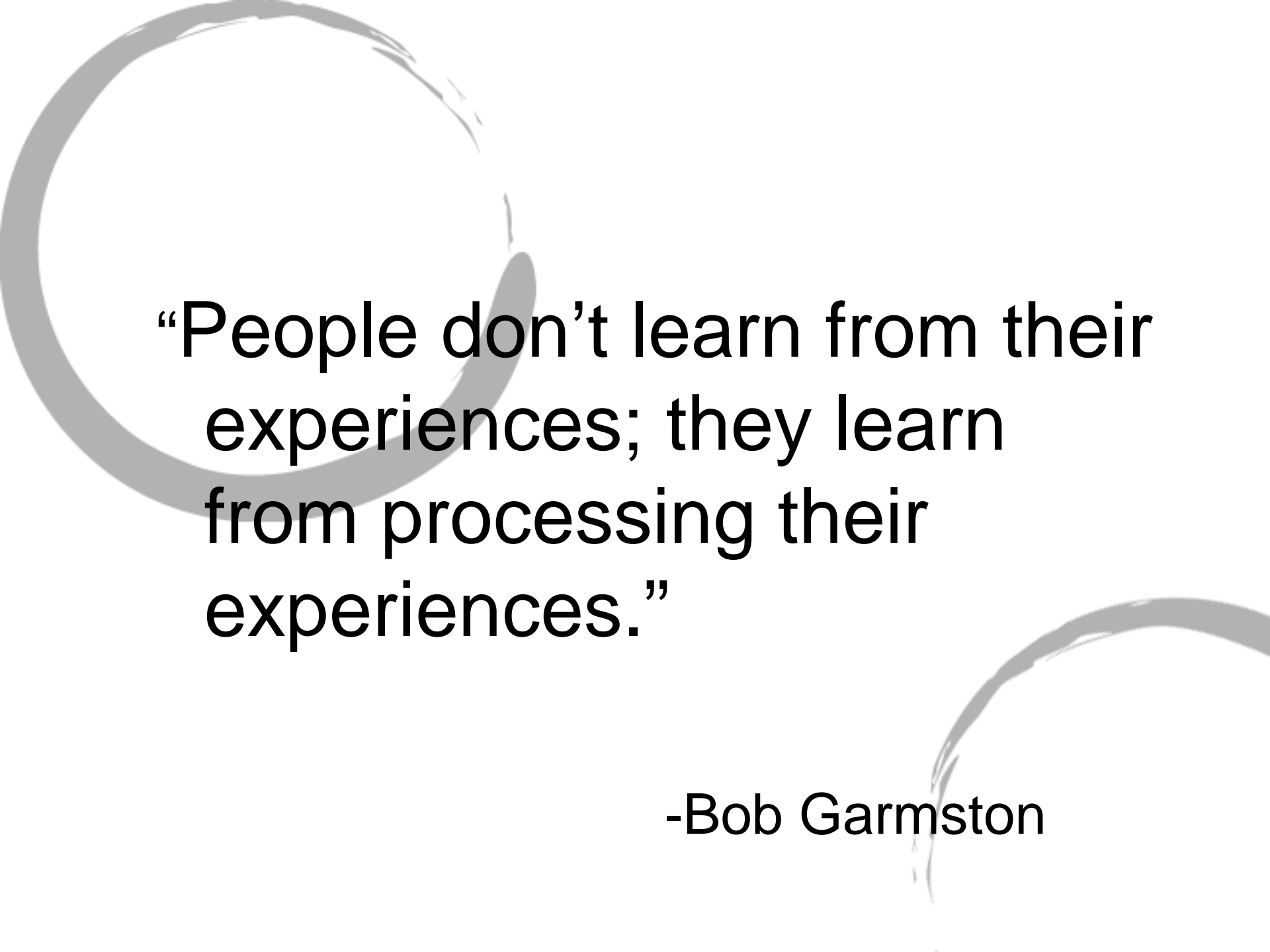
...I believe that science has a greater potential for this type of engagement than other subjects, due to its nature built on curiosity and understanding of the world around us. Ironically, it often is the discipline that serves as a gatekeeper instead of a motivator.”

-Gale Seiler





Why use science notebooks?



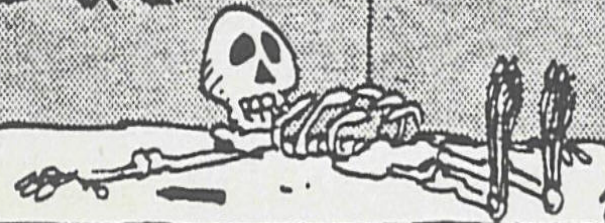
“People don’t learn from their experiences; they learn from processing their experiences.”

-Bob Garmston

Early Efforts to Keep a Science Notebook

B.C.

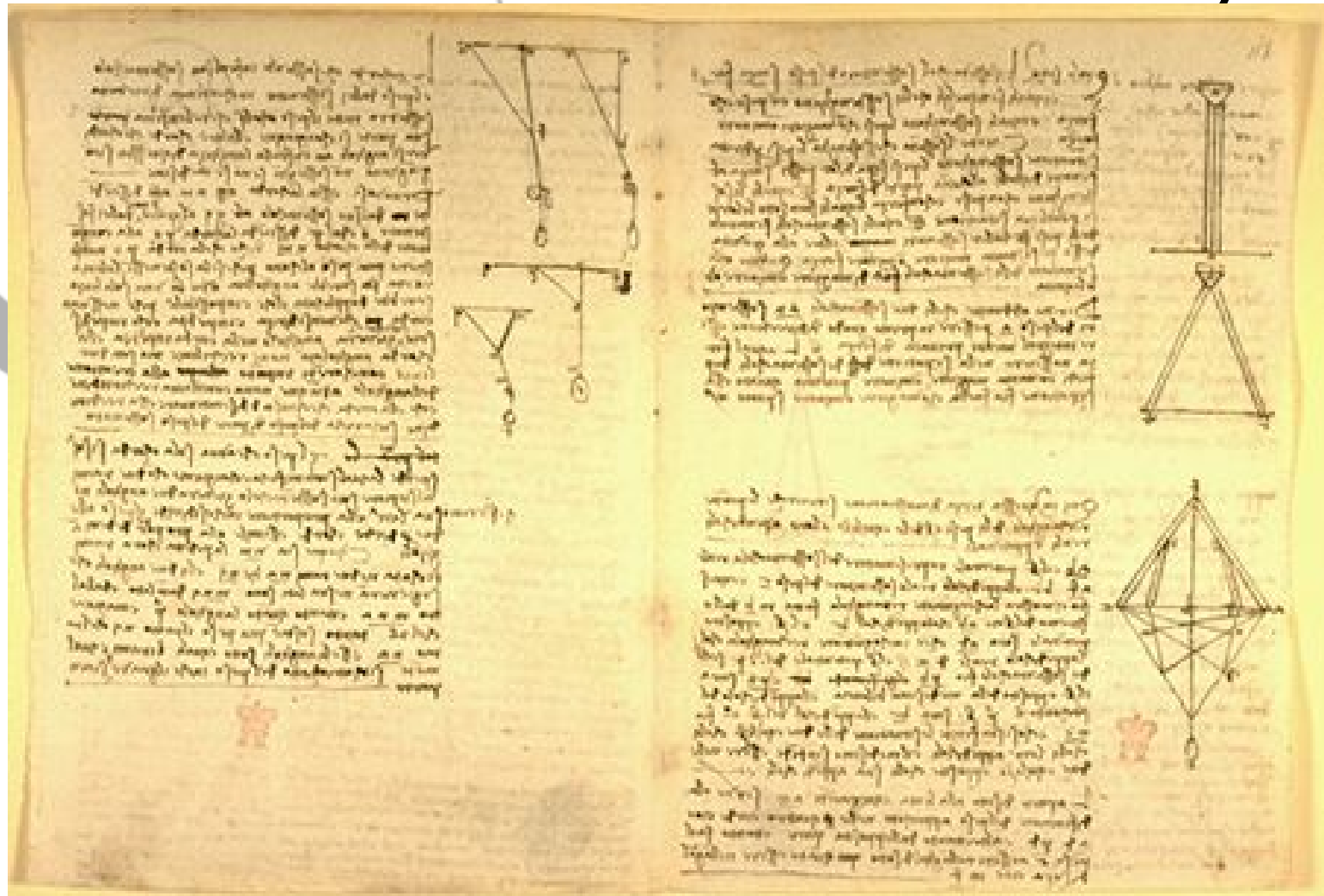
AS NEAR AS I CAN DETERMINE, HE WAS MAKING SOME SORT OF MUSHROOM CHART.



2-25

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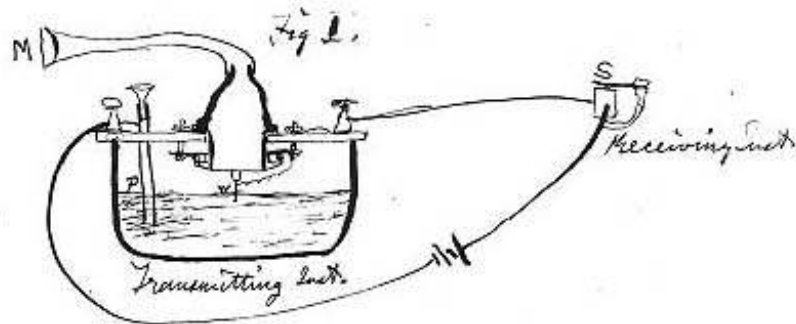
Da Vinci's Notebook Entry



Alexander Graham Bell's Notebook Entries

40

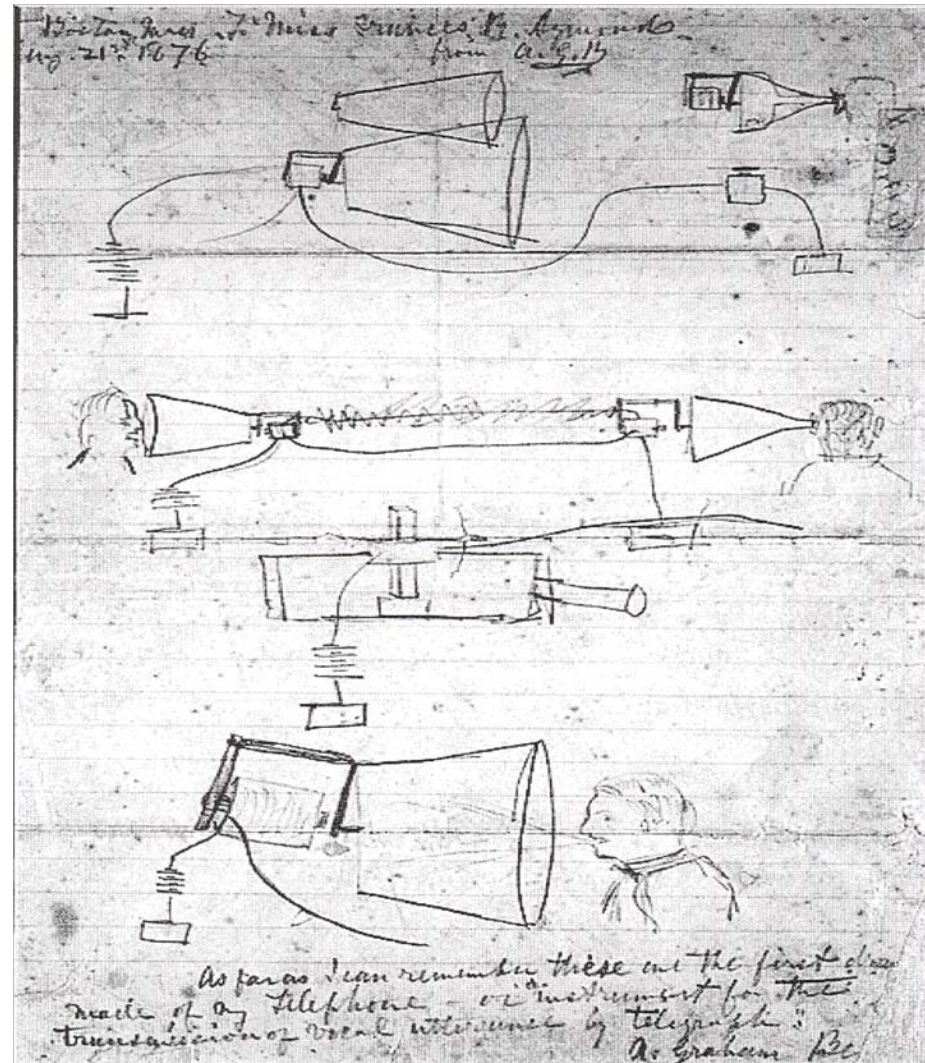
March 10th 1876



1. The improved instrument shown in Fig. 1 was constructed this morning and tried this evening. P is a brass pipe and W the platinum wire M the mouth piece - and S the armature of the Receiving Instrument.

Mr. Watson was stationed in one room with the Receiving Instrument. He pressed one ear closely against S and closed his other ear with his hand. The Transmitting Instrument was placed in another room and the doors of both rooms were closed.

I then shouted into M the following sentence: "Mr. Watson - Come here - I want to



Science notebooks are...

- “...tools for STUDENTS to grapple with and make sense of THEIR understandings using recording and organizing strategies that are PERSONALLY meaningful.”

-Fulton and Campbell, 2004

- NOT strictly a journal
- NOT strictly a logbook

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“5 Good Reasons to Use Science Notebooks” by Gilbert and Kotelman

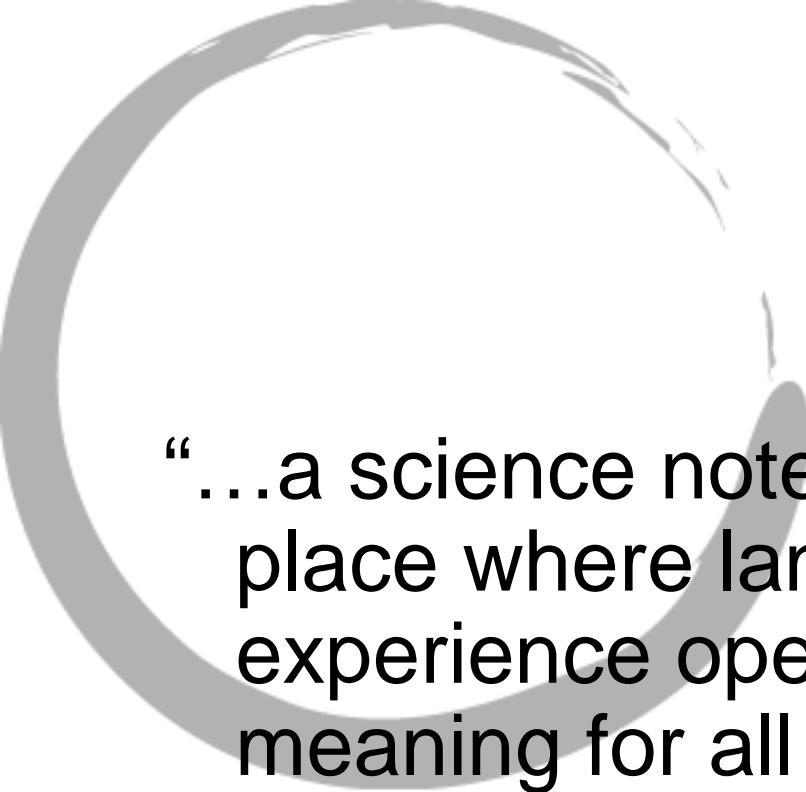


Purpose

- Build conceptual knowledge and understanding
- Enhance literacy skills
- Support differentiated learning
- Formative assessment
- Foster teacher collaboration

Science and Children, Nov/Dec 2005





“...a science notebook becomes a central place where language, data, and experience operate jointly to form meaning for all students.”

M. Klentschy, 2008



Formatting Notebooks*

- Useful elements: Date, Time, Subject
- “Codes”
 - (see handout- [“Science Notebooking Components”](#))
- Front/Back of each sheet
- Glossary
- Tabs for strands of science
- Remember...this is the student’s notebook!

*(see handout- [“Notebook Organization”](#))

Notebook Entry Types*

- Drawings
- Tables, Charts, Graphs
- Graphic Organizer
- Notes and Practice Problems
- Reflective and Analytical Entries
- Inserts
- Investigation
- Writing Frames

* (See handout-“[Notebook Entry Types](#)”)

Sentence Stems

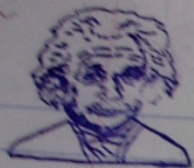
- My question: _____ (Question)
- Today I (or we) want to find out _____ (Problem)
- I think _____ will happen because (Prediction)
- I noticed (or observed) _____
(Observation)
- Today I learned _____ (Conclusion)
- I wonder _____ (Reflection)
- Questions I have now are _____ (Next Steps/New Questions)

Possible Questions

- How many...?
- How long...?
- How often...?
- How are ____ and ____ the same (different)?
- Which object is ____?
- What would happen if?
- What happens to ____ if we change ____?
- How can we ____?

Examine Notebook Entries

- What type of entry is it?
- When might students complete this type of entry?
- Why is this type of work meaningful?



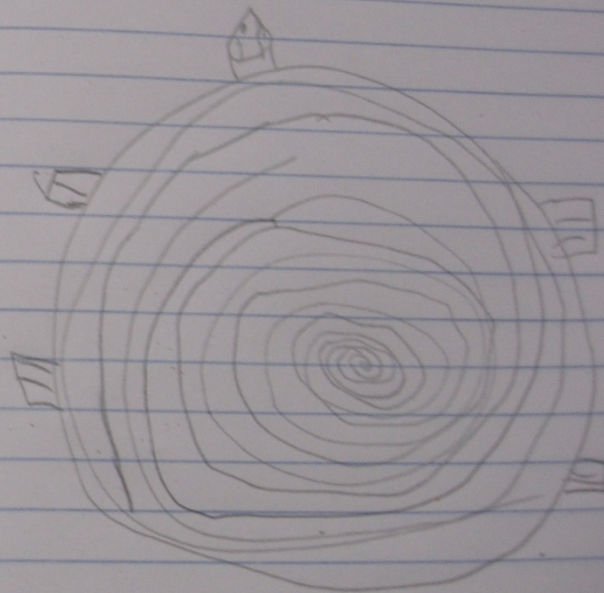
I AM A Scientist



Earth Science

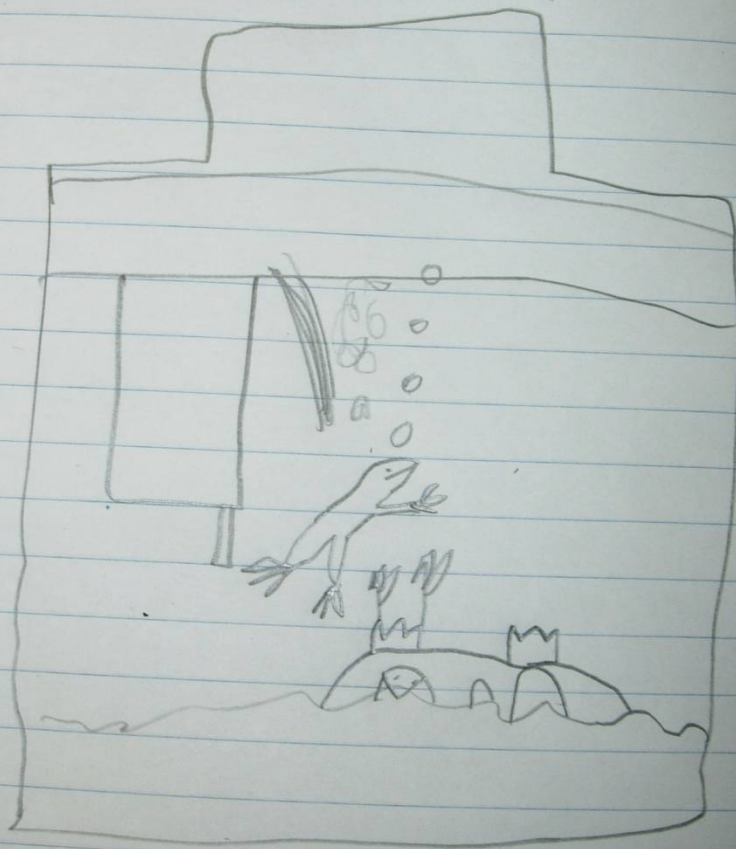


- the turtle
1. Turtle's names chirlie
 2. Has a shell to protect him
 3. lives in a turtle tank
 4. gets water in it
 5. Can live in Arkansas river



2:25.p.m 823-07

wet
skerd
fun
slimming
frushshrdid



a penny. Before				
Trials	# of drops			
1	22	high	low	<u>variable</u>
2	18	1.0	1.21	
3	23	2.1	2.18	H: I think mo
4	15	3.0	3.22	drops will be c
5	14	4.17	4.19	low.
6	14	5.1	5.22	C: In the exper
7	20			I found that w
8	12			held it low it
9	19			more drops tha
10	10			held it high.

8/21/07

Description	Predict the Flavor	Numbers Followed	Real Bean Flavor
ex. Lime Green	mint chocolate	1b, 11b, 20b, 22b,	Margarita
green and white spots	Blueberry	1b, 11a, 17b, 19b	Blueberry
1. dark blue with	Island Punch	1b, 11a, 17b, 19a,	Berry Blue
lite spots	Homemade Ice cream	1d, 29c	French Vanilla
2. baby Blue	Black Licorise	1c, 24a, 25a,	Licorice
3. white with	grape	1b, 11a, 17a, 18b,	Grape Jelly
gray spots	Pineapple	1a, 2a, 3a, 4a, 5b,	Lemon Drop
4. Black with white		10a,	
spots			
5. dark Purple			
6. light Yellow			

1. I predicted 2 jelly beans correct. 8/22/07
2. There was only 1 jelly bean that tasted like Bean Flavor. Nature of Science
3. Yes, the grape jelly wasn't what I expected
4. Color is important because if you eat a grape and you get a purple jelly bean you can probably predict it's grape.

Assessing Notebooks

- Acquiring knowledge related to student's level of understanding
- Sticky notes versus writing in student's notebook
- Use [rubric](#)
- Self-assessment

Figure 2.

Traditional P.O.E.T.R.Y scoring rubric. (See NSTA Connections for holistic and checklist versions of this rubric).

	Predict	Observe	Explain	Think	Reflect	Yearn
Advanced	The student provides a reasonable prediction that is related to the topic at hand and uses many details from her prior knowledge to support it.	The student provides a detailed description of many characteristics of an object or person.	The student evaluates her prediction and poses a reasonable explanation, using many details from her prior knowledge and observations.	The student poses a reasonable alternative explanation, using many details from her prior knowledge and observations.	The student evaluates how she gathered information and suggests many reasonable ideas for improvement.	The student poses many new questions to investigate that are related to the topic at hand and suggests reasonable methods of for investigating them.
Proficient	The student provides a reasonable prediction that is related to the topic at hand and uses a few details from her prior knowledge to support it.	The student provides a detailed description of a few of the characteristics of an object or person.	The student evaluates her prediction and poses a reasonable explanation, using many details from her observations.	The student poses a reasonable alternative explanation, using many details from her observations.	The student evaluates how she gathered information and suggests a few reasonable ideas for improvement.	The student poses a few new questions to investigate that are related to the topic at hand and suggests reasonable methods for investigating them.
Basic	The student provides a reasonable prediction that is related to the topic at hand and uses at least one detail from her prior knowledge to support it.	The student attempts to describe more than one characteristic of an object or person.	The student evaluates her prediction and poses a reasonable explanation, using at least one observation.	The student poses a reasonable alternative explanation, using a few details from her observations.	The student attempts to evaluate how she gathered information and provides at least one reasonable suggestion for improvement.	The student poses at least one new question to investigate that is related to the topic at hand and suggests a reasonable method for investigating it.
Developing	The student provides a reasonable prediction that is related to the topic.	The student attempts to describe at least one characteristic of an object or person.	The student evaluates her prediction or poses a reasonable explanation, using at least one observation.	The student poses a reasonable alternative explanation, using at least one observation.	The student attempts to evaluate how she gathered information or provides at least one reasonable suggestion for improvement.	The student poses at least one new question to investigate that is related to the topic at hand.

Circle One: Advanced Proficient Basic Developing

Pitfalls of Notebooks

- Brainstorm
- How can you avoid?



Reflect

- How will I use science notebooks in my classroom?
- 

Resources

- *Using Science Notebooks in the Elementary Classroom* by Michael Klentschy
- *Science Notebooks: Writing About Inquiry* by Brian Campbell & Lori Fulton
- <http://www.sciencenotebooks.org>
- *More Picture-Perfect Science Lessons* by Karen Ansberry & Emily Morgan

Contact Information

Jenny Gammill

Jenny@starfish.nwsc.k12.ar.us

479-267-7450