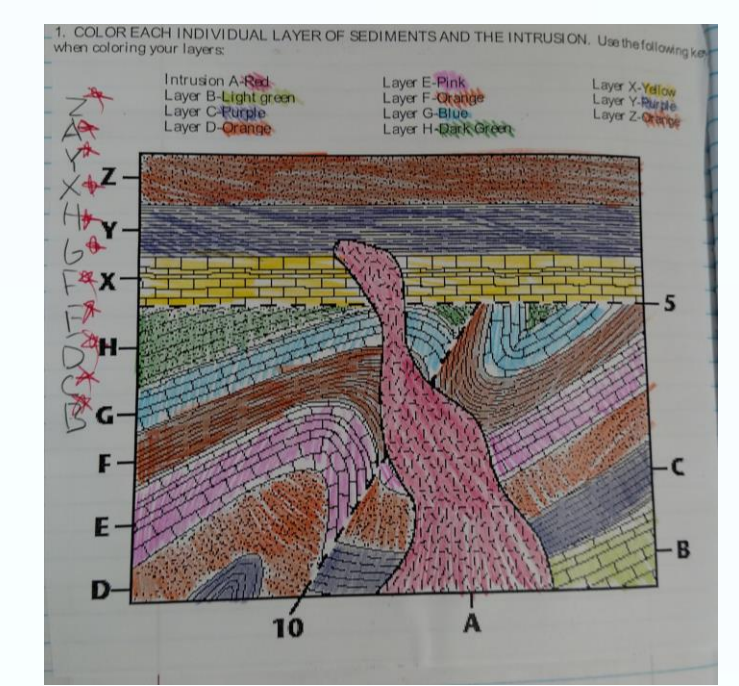
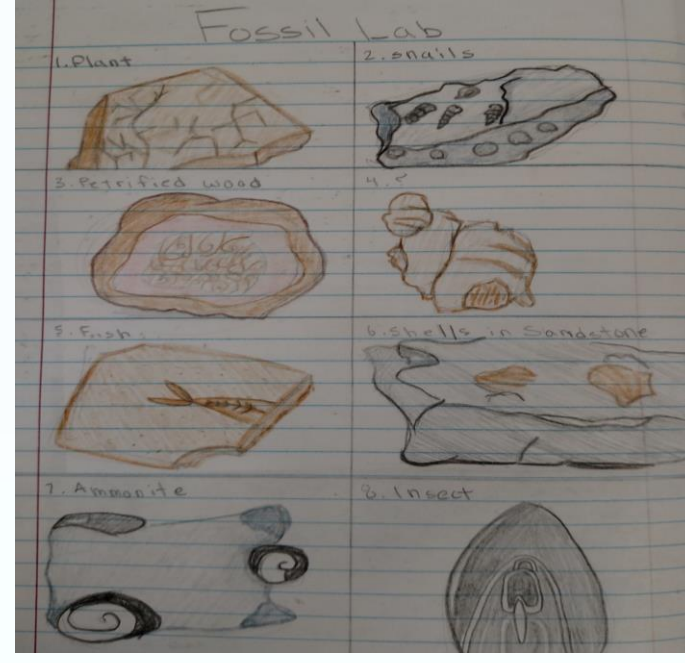


# INTERACTIVE SCIENCE NOTEBOOKS



## BACKGROUND

- For two years I have observed a disinterest in studying science outside the classroom, while teaching Earth Science at the Hmong American Peace Academy in Milwaukee, Wisconsin.
- My students struggle with learning English and applying it to different subject areas.
- The goal was to improve student thinking, learning, engagement, and communication through the use of interactive science notebooks.

## STUDENT SAMPLE

- The treatment class consisted of 21 students with 52% of them having received a C or lower in my science class.



## TREATMENT

- The treatment used in this research consisted of implementing science notebooks into one of my sixth grade Earth Science classrooms.
- This study was conducted with the dynamic earth unit, for eight weeks, during the second and third quarter.

## THE SCIENCE BEHIND INTERACTIVE SCIENCE NOTEBOOKS

- Interactive Science Notebooks have been found to promote learning, communication, and make student's thinking more visible (Crippen, 2009).
- The right side of the notebook contains notes from labs, activities, videos, and readings.
- The left side has drawings, graphic organizers, concept maps, pictures, and summaries.
- Notebooks are thinking tools because they allow students to construct their own conceptual understandings (Gilber & Kotelman, 2005).
- When used daily, these notebooks can promote learning and have been found to be successful because they use both left and right hemispheres of the brain to categorize, sort, and implement new knowledge in a creative manner (Young, 2003).

## FOCUS QUESTION

- What does the effect of implementing Interactive Science Notebooks (ISN) have on student learning in middle school science classes?

## SECONDARY QUESTIONS

- How is engagement in science affected by ISN?
- What is the effect of using ISN on students' thinking?
- What impact does the ISN make on improving the way students communicate?

## METHODS

- Teacher Checklists and Interviews for Student Engagement and Communication
- Student Opinion, Communication, Engagement Surveys
- Pre and Post Unit Assessment Scores
- Summative Assessment Scores and ISN Scores

## DATA AND ANALYSIS

- This study provides evidence that the implementation of Interactive Science Notebooks into a middle school science classroom can positively impact student performance.
- The data collected indicated improvements in students' engagement in science, academic achievement, and communication skills.

## ENGAGEMENT INTERVIEW RESPONSES

Engagement Questions	No	Yes
1) Do interactive science notebooks help make lectures from teachers more interesting?	20%	80%
2) Do interactive science notebooks help you get more involved in class discussions?	40%	60%
3) Do interactive science notebooks help you become more interested in reading science material?	40%	60%
4) Do interactive science notebooks help you stay engaged and on task during teamwork time?	40%	60%
5) Do interactive science notebooks help to make taking notes more enjoyable?	20%	80%
6) Do interactive science notebooks help you complete lab work and make you more excited for a science lesson.	0%	100%
7) Do interactive science notebooks help you become more engaged when you work alone and/or with a partner?	40%	60%

## REFERENCES

- Crippen. C.W. (2009). Integrating Interactive Notebooks. *The Science Teacher*, 51-55.
- Gilbert, J., & Kotelman, M. (2005, November). Five Good Reasons to Use Science Notebooks. *Science and Children*, 28-32.
- Young, J. (2003). Science interactive notebooks in the classroom. *Science scope*. 26(4), 44.

## NORMALIZED AVERAGE GAINS IN QUIZ AND TEST SCORES

Non-Treatment Average Normalized Test Gain	Non-Treatment Average Normalized Quiz Gain	Treatment Average Normalized Test Gain	Treatment Average Normalized Quiz Gain
-0.087	-0.372	0.136	0.022

## AVERAGES FOR TEACHER CHECKLIST OF STUDENT COMMUNICATION

AVG	Question 1: Asks questions using appropriate scientific terms	Question 2: Responds to questions using appropriate scientific terms	Question 3: Clearly expresses their understanding of the material in their speech	Question 4: Clearly expresses their understanding of the material in their written work	Question 5: Clearly expresses their understanding of the material in their writing through assessments
Pre unit	1.8	2.6	2	2.2	2.2
Post unit	2.6	3.2	2.8	3	2.6

## STUDENT QUOTES ABOUT SCIENCE NOTEBOOKS

- "It helped me complete the lab easier."
- "We are more confident because we are writing in the notebook and this makes us more confident in speaking."
- "The ISN will make it easier for us to understand our homework."
- "The ISN helps taking notes more fun because we have fun activities along with it."



## VALUE

- I have had the opportunity to experience the benefits of implementing Interactive Science Notebooks in my Earth Science class and will continue to do so.
- I now understand the importance of collecting quantitative data on my students growth.
- I also learned how I can change and what I can do to improve as a professional, to increase the level of science education my students receive.



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