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# An Interactive Science Notebook: An Effective Student Resource Tool

Barbara J. Zuber  
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## **Abstract**

This study aims at determining if an interactive science notebook provides evidence for and facilitates the application of new knowledge. In Science classrooms, notebooks are used in a variety of ways. Even with all the different notebook formats and functions, they are often used ineffectively. Many notebooks are missing evidence of student higher order thinking instead they are repositories of information. Interactive notebooks are one format specifically designed with the function of capturing higher order thinking. An 8th grade accelerated science class will use an interactive notebook, modeled after the History Alive interactive notebook. Students will be surveyed before, during and after the notebook use to determine what they were thinking and how they used the notebook. Audio and videotape as well as interviews will also be conducted during the notebook use to evaluate conversations and body language while working in the notebook.

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Thesis

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MS in Mathematics, Science, and Technology Education

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Running head: INTERACTIVE NOTEBOOK AS A RESOURCE TOOL

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An Effective Student Resource Tool**

**Barbara J. Zuber (Odenbach)**

**St. John Fisher College**

**2003**

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*Abstract*

This study aims at determining if an interactive science notebook provides evidence for and facilitates the application of new knowledge. In Science classrooms, notebooks are used in a variety of ways. Even with all the different notebook formats and functions, they are often used ineffectively. Many notebooks are missing evidence of student higher order thinking instead they are repositories of information. Interactive notebooks are one format specifically designed with the function of capturing higher order thinking. An 8<sup>th</sup> grade accelerated science class will use an interactive notebook, modeled after the History Alive interactive notebook. Students will be surveyed before, during and after the notebook use to determine what they were thinking and how they used the notebook. Audio and videotape as well as interviews will also be conducted during the notebook use to evaluate conversations and body language while working in the notebook.

### *Introduction*

Over the past four years of teaching science I have struggled with finding an effective method for students to organize class information. This challenge began around the middle of my first year and has grown in complexity since then. I have spent each school year observing students notebooks, modifying and assessing these modifications. Through this reflective process the role of the notebook in my classroom has changed as well as what exactly a notebook is. Even though some modifications allowed temporary success, I still struggle with finding an effective way to help students use the notebook as a resource tool.

First starting out, I had students keep a spiral notebook and a folder. Around midyear I observed several problems with the notebooks. Students who were absent or forgot their notebooks had missing pages. Even if students skipped pages for missed information they often ended up with too much or not enough space for the missed work. The problem that struck me the most was the observation that students did not know how to effectively use their notebooks. When it came time to complete homework, give evidence for their thinking or review, the notebook was not used as a reference. The notebook was not a natural reference tool for students. By the end of the year, I felt that the student notebooks were more like busy work than an effective resource tool. I ended the year reflecting on how could this change.

As a result of my reflections I changed the emphasis I placed on the notebook as well as the design, in an attempt to turn the notebook into an important resource tool. To tackle the problem of missing work and not having enough space I had the students switch from a spiral notebook to a three ring binder. To increase the importance, clear

notebook guidelines and expectations were explained to the students. Then these guidelines were used to establish grading criteria. Students were aware from the beginning what was expected and how the notebooks were to be graded. The changes thus far tackled the small problems yet they did not help the students to use the notebook as a reference tool. To encourage referring back to the notebook, review reference sheets were used. When discussing information on test and quizzes, direct references were made to the student notebooks. Students were directed to specific spots or information in their notebooks to use as a study guide. With all these changes I felt more confidence with the use of the notebook. Students were able to keep their notebooks more organized, valued them and referred back to them when directed. Although this eased my notebook struggle I still did not see students naturally (not teacher directed) using the notebooks as a reference tool. Any value placed on the notebook was for the grade, not because it was an important reference tool. Even though I felt some success, I ended my second year of teaching asking myself how can I change the role of a notebook in my classroom? How can it be used more effectively? How can I help turn it into a natural resource tool for students?

The opportunity arose my third year for me to take this notebook struggle to a more global, school wide level. Collaboration became a main focus in my school building. The building principal recommended that colleagues collaboratively plan at least one unit. As the other two 8<sup>th</sup> grade teachers and I planned, an inconsistency with how student notebooks were used was noticed. This inconsistency prompted a conversation on how each of us uses the notebook in the classroom. Through this conversation I found that both teachers had their students keep binders. One teacher had

students clip each activity, information sheet into the binder in a particular order. The activities were numbered as a way of finding them. There was no formal method of grading the notebooks; however periodically the teacher would do spot checks to be sure students are keeping them organized. The other teacher had students keep a spiral notebook clipped into the binder. The notebook was used for notes and graphic organizers while the rest of the notebook was divided up into different sections. The notebook was collected and graded once a marking period to confirm students were keeping it up to date and organized.

The discrepancy between the 8<sup>th</sup> grade science teachers lead me on a search to discover if this notebook use discrepancy is evident across different disciplines in my building. I found that several factors affected notebook use in different disciplines. First through conversations, I found that each discipline had its own unique need for a notebook, a specialized focus. Language Arts used theirs more for writing while math was more focused on notes. This focus seemed to drive the role of the notebook in the classroom. As far as consistency among grade level disciplines, the results varied greatly. For disciplines where the curriculum followed a specific program the use of the notebook was similar. Although there were variations found in the importance and grading of the notebook. For those disciplines not following a specific program the notebook styles, importance and grading varied greatly. A wide array of importance was being placed on student notebooks. Some teachers placed a high emphasis on the importance of a notebook, collecting and assessing them often; while others used them as a holding tank of information and activities, and only possibly as an assessment tool. Baxter, Bass and Glaser (2001) studied how some fifth-grade teachers used a science

notebook as a record of the student inquiry process. It was also concluded that “notebook writing in science is an important tool for recording observations, generalizing, hypothesizing, and theorizing-in general, for assisting thinking, reasoning, and problem solving during the conduct of science inquiry” (Baxter, Bass and Glaser 2001). Pendley (1997) uses a notebook as a means for students to record observations during laboratory experiments. The high degree of emphasis placed on this notebook by Pendley (1997) can be seen in the lesson he uses to teach students how to use the notebook. According to Ruiz-Primo, Li and Shavelson (2002) in notebooks “the intellectual demands of the tasks required by teachers were, in general, low.” They also found that keeping a notebook in science is a widespread practice even though entries were mainly mechanical (Ruiz-Primo, Li and Shevelson 2002).

The results of the search on notebook use in different disciplines was very valuable to me. For starters I realized that there were many different needs for keeping notebooks in a classroom. There were also many different formats and functions for the notebooks. Most notebooks are “neither effective nor efficient” and teachers need to be careful and thoughtful when planning how they intend on using a notebook (Ruiz-Primo, Li and Shevelson 2002). By asking different teachers what their student notebooks were I learned that there are many different understandings of what a notebook was. The outcomes of these reflections lead me to several questions. I questioned why do teachers have students keep notebooks? Why am I personally having students keep these notebooks? What role do I want these notebooks to have in my classroom? How much importance and emphasis should be placed on them? Finally, how do I know if students are using the notebooks in the intended manor?

Through conversations with my fellow colleagues, I decided to define the notebook as a resource tool where students keep the activities and information learned during class for further reference and study. This focused my interest and desire to discover a strategy where students are effectively using the notebook as a resource tool instead of a holding tank of information. From notebook discussions with some social studies teachers a specific type stood out, the interactive notebook. The interactive notebook is part of the History Alive Program. It is a double-sided notebook where concrete, testable information goes on the right side of the notebook, while assignments that show student processing and application of this new knowledge goes on the left side (History Alive, 2002). I wondered if this type of notebook could be modified and applied to a science classroom. If so, would it allow students to use the notebook as a resource tool to obtain information but also as a place to demonstrate that they can apply this information to a new situation.

Through this struggle of finding an effective method of organizing class information my ideas of the role and function of a notebook has changed. This research aims at finding a more effective strategy for student notebook usage. My interest lies in determining if an interactive science notebook will help students use their notebook as a resource tool and to aid them in demonstrating the application of new knowledge. The question that arose from this is:

**How does an interactive science notebook provide evidence for and facilitate the application of new knowledge?**

## Review of the Research Literature

### *Introduction*

To increase students' ability to learn and understand, science teachers need to look at more effective strategies for higher cognitive levels of understanding. Having students keep a science notebook is a common practice in many classrooms. However what is kept in the notebook, how it is used and if it aids students in meaningful learning are issues related to effective notebook use. Understanding how students learn, process new information and connect new information to old are critical aspects in evaluating meaningful learning.

Notebooks are used in the classroom in a variety of ways. The articles I investigated on the different formats or types of notebooks and the type of entries within the notebooks, seemed to be a focus on science journals, laboratory notebooks and lecture notebooks. Some other types of notebooks discovered in this investigation included learning logs, journals, lecture interactive notebooks and History Alive interactive notebooks. The research on science journals and lab notebooks showed a connection. Many of the articles addressed the type of entry students wrote and how teachers assessed the entries. With lecture notebooks the research focused on how students take poor notes and ways to improve them. The connection between the notebooks and effectively using them to increase the cognitive level of student understanding was difficult to find. Many of the research articles revealed the ineffective use of notebooks. A methodology for notebook keeping that claims to integrate concrete information with student processing activities is called an interactive notebook. I found very little research on the use of interactive notebooks in a science classroom. Numerous amounts of information were

found on the use of History Alive Interactive notebooks. In order to assess whether or not student understanding is being affected, research on higher order thinking and the application of new knowledge was investigated.

Since my research revealed that most notebooks are being used ineffectively, teachers need to take a closer look at effectively using notebooks in their class. In this paper, I will review a number of articles related to the use of notebooks, their effectiveness, History Alive interactive notebooks, and strategies to assess higher order thinking.

### ***Notebook Format and Function***

Current research shows a variety of notebook formats and functions. The formats include journals, science journals, learning logs, lecture notebooks, lab notebooks and interactive notebooks. The purpose or function of the notebook often dictates the notebook format. The quantity and quality of students' notebook entries is greatly influenced by the purpose of writing conveyed by the teacher (Baxter, Bass and Glaser, 2001). A widespread teaching practice in science is keeping a science notebook (Baxter, Glaser and Raghaven, 1994). In science notebooks, writing can be an "important tool for recording observation, generalizing, hypothesizing, and theorizing – in general, for assisting thinking, reasoning, and problem solving during the conduct of science inquiry" (Baxter et al., 2001). Research showed that notebooks typically began with an introduction to a unit followed by scientific investigations. Students carried out a sequence of investigations and used their notebooks as a means of documenting the outcome or results by recording data or observations (Baxter et al., 2001; Ruiz-Primo et al., 2002). One challenge Pendley (1997) found was encouraging or motivating students

to immediately record experimental observations in their notebooks instead of waiting and thinking back. Most notebook entries that zeroed in on conceptual understanding were comprised primarily of definitions and rarely provided examples and explanations, applied the concept or had students reword concepts or definitions (Ruiz-Primo, Li, Shavelson, 2002). In a study conducted by Ruiz-Primo et al. (2002) it was found that almost 70% of definitions in student notebooks were copied directly from a dictionary or a science textbook. To summarize, common notebook functions include students recording scientific investigations, observations, data and results, as well as recording scientific definitions and concepts. For teachers notebooks can be a tool for monitoring what students are doing, and when prompted by teachers, students can use notebooks to remind them of what they have done (Baxter et al., 2001). No matter the format or function, notebooks are viewed “mainly as a written account, in more or less detail and with diverse quality, of what students do and, hopefully, learn in their science classroom” (Ruiz-Primo et al., 2002).

### *Notebook Effectiveness*

Research reveals that many notebooks are being used ineffectively in the classroom. “Many student notebooks are drab repositories of information filled with uninspired, unconnected and poorly understood ideas” (History Alive, 2002). Most notebooks are “neither effective nor efficient” in how they are used by students (Ruiz-Primo et al., 2002). In many instances students are asked to record information but rarely elaborate on it. “The intellectual demands of the tasks required by the teachers were, in general, low” (Ruiz-Primo et al., 2002). Baxter et al. (2001) noted that in conclusions students simply responded to teacher questions, wrote the teacher question with no

answer, and listed relevant terms and definitions (Baxter et al., 2001). Similar results were found with Baxter et al. (1994) and Ruiz-Primo et al. (2002), where notebook writing was mostly mechanical in nature. Students were asked to record observations, experimental data or copy definitions (Baxter et al., 1994; Ruiz-Primo et al., 2002). When students were asked to take notes in the notebook, notes were often inaccurate and not thorough (Stencel, 1998). The types of activities teachers had students do in their notebooks were low in procedural and conceptual understanding, thus barely helping students improve their understanding of science concepts. In many notebooks students reflections on what they learned were missing or the notebook lacked in giving evidence of the level or quality of student thinking or understanding (Baxter et al., 2001). Ruiz-Primo et al. (2002) found “few entries show that they (students) are required to apply those concepts (e.g., relating, contrasting, comparing, justifying, or explaining the concepts)” thus missing the opportunity to assess whether students are understanding the concept (Ruiz-Primo et al., 2002). Even though many entries had supplemental pictures or graphs, they were not necessarily useful in adding any information to help students better understand the topic (Ruiz-Primo et al., 2002). Although the information contained within the pages of the notebooks were pertinent and appropriate for science, the entries often lacked in effectively capturing students learning or application of knowledge.

Research from both Baxter et al. (1994) and Ruiz-Primo et al. (2002), indicate that if notebooks are used appropriately they can assist students’ thinking, reasoning, and problem solving. Furthermore, “the ongoing accurate and systematic documentation of the development of ideas, concepts, and procedures is a powerful scientific tool”

especially “for developing scientific inquiry” (Ruiz-Primo et al., 2002). Baxter et al. (1994) also believe that “teachers need first to carefully select the type of entry to work on with students.” Through this research it can be concluded, “educators and researchers need to think carefully about how science notebooks can be conceptualized, implemented, and assessed in a form that most effectively reflects their main purpose” (Ruiz-Primo et al., 2002).

### *Interactive Notebooks*

An interactive notebook is a non-traditional notebook format that attempts to make notebooks a more effective tool. One particular notebook format used is an interactive lecture notebook. With this type of notebook students are given some of the notes in advance. It is shown that students achieve at higher levels if they have organized, complete and comprehensive notes (Stencel, 2001). The interactive notebook allows students the complete notes “rather than furiously scribbling notes and rushing to copy definitions” (Stencel, 2001). According to Stencel (1998), interactive notebooks have several advantages. First “the notes are interactive and thus involve student participation” (Stencel, 1998). Students need to answer questions, color code diagrams, circle important terms, concepts and ideas. Also, students can participate in the learning process by taking written information and transferring it into diagrams. Third, the interactive notebook serves as a study tool of the last class. Finally, it is “a creative personal accumulation of biological facts and concepts from books, journals, workshops, meetings, and experiences” (Stencel, 1998). Stencel (1998) found that “90 percent of the students in the courses where the interactive notebook was used wanted to use them in other courses.

History Alive is a comprehensive program for teaching history. Developed by Teachers' Curriculum Institute, this approach involves eight strategies. According to the History Alive web site (2002), the strategies involved in the program include Interactive slide lectures, social studies skill builders, experiential exercises, writing for understanding, response groups, problem solving group work, interactive notebooks and culminating projects (History Alive, 2002). This research is most focused on the History Alive interactive notebook. With this notebook, as students learn new ideas, "they use several types of writing and innovative graphic techniques to record and process them" (History Alive, 2002). Critical thinking skills are essential in organizing information and pondering question, which promotes creative independent thinking (History Alive 2002). Understanding the theories behind History Alive interactive and how the interactive notebook is designed is essential since this research will be attempting to model an interactive notebook in a science classroom. By constantly challenging students to apply knowledge to real world settings, History Alive helps students become life long learners (History Alive, 2002). As with the interactive lecture notebook, the History Alive interactive notebook strives at having student's record information in an active, engaging way (History Alive, 2002). Similar color-coding techniques, bulleting and indentations are used. History Alive interactive notebooks go one step further by using Venn diagrams to demonstrate relationships, cartoons for events, timelines to show chronology and arrows to point out cause-and-effect relationships (History Alive, 2002). The organization and usage of the History Alive interactive notebook differs from that of a traditional notebook and the interactive lecture notebook in many ways. The notebook is divided by the spiral into a left and right side. "The right side of the notebook is where

the teacher organizes a common set of information that all students must know” (History Alive, 2002). This right side or “input side” is similar to a traditional notebook in the sense that it is the “testable” information, a spot for students to record class notes and discussions (History Alive, 2002). It is here that teachers have the opportunity to “model how to think graphically by using illustrated outlines, flow charts, T-charts, and other graphic organizers” (History Alive, 2002). The information present on the left side of the notebooks spirals it where it stands out from all the other notebook formats. This side is set aside specifically as the “output side”, where students process new information (History Alive, 2002). To demonstrate their understanding of these new ideas, students produce “illustrations, diagrams, flow charts, poetry, colors, matrices, cartoons, support opinions with evidence and ask ‘what if’ questions” (History Alive, 2002). Students use the information they learned on the right side of the notebook as a reference as they produce the left side activity.

Many students that used the History Alive interactive notebook found it helped them with organization, had helpful visuals and became a great reference book of what was learned over the year (Madden, 2001). A negative point was seen when students forgot their notebooks or lost them, had difficulties and were at a great disadvantage (Madden, 2001). If used properly and interactive notebook can be a wonderful tool for teachers. “These notebooks organize students notes and responses, become the major method of test review, and ultimately become a key element for review for the Standards of Learning assessments” (Sparks Fly, 2002).

### *Higher Order Thinking / Application of Knowledge*

Demonstrating higher order thinking and the application of new knowledge to a different situation is an indication of how well students understand a concept or idea. Writing does not guarantee learning, learning requires an active role in making the writing process apparent, purposeful, and relevant to students and teachers (Baxter et al., 2001). By simply writing in notebooks, it is not a guarantee that learning is taking place. The research showed notebook entries contained textbook definitions, while lacking explanations and examples, and application of concepts making evidence of student learning and understanding difficult to find (Ruiz-Primo et al., 2002). Not only do these type of entries make determining students level of understanding difficult but they scarcely aid students in improving their understanding of a topic (Ruiz-Primo et al., 2002). Even students' personal reflections on what they had learned was absent from many of the notebooks entries (Baxter et al., 2001). To summarize, many of the entries students made in their notebooks required only a low level of thinking and did not clearly demonstrate the students actual understanding of the topic or concept. According to Ruiz-Primo et al. (2002), teachers need to have students represent more concepts verbally and pictorially, as well as interpret data and draw conclusions, if the notebook is going to effectively assess student understanding (Ruiz-Primo et al., 2002). In contrast to this, the interactive notebook is designed to aid students in higher order thinking. According to (Stencel, 1998) the interactive notebook could parallel an informational processing model. "This model involves the processes of selective attention, encoding (coding information into usable form), placement of information into short-term memory, storage in long-term memory, and retrieval from memory. A breakdown in any of these

processes usually leads to a loss of memory or no memory at all” (Stencel, 1998).

Written down information does not necessarily mean it has been learned and the left side activities of the interactive notebook emphasize this idea by having students actively use information to aid them in internalizing it (History Alive, 2002). “The active tasks that require students to solve a problem, to analyze a situation, to understand a perspective, or to evaluate alternatives involve higher order intellectual skills” (History Alive, 2002). The graphical thinking, poems, visual metaphors, are all examples of how the left side of the interactive notebook allows students different avenues to express high-levels of concept understanding (History Alive, 2002).

### ***Conclusion***

To increase students’ ability to demonstrate higher levels of cognitive understanding teachers need to look at a more effective format for science notebooks. Many of the current notebook formats and functions are basically a repository of definitions, scientific investigations, observations, data and results, as well as teacher directed questions and answers. In many classrooms notebooks are reminders of the activities students have done. Very rarely do notebooks aid students in concept development. This low level of concept development is due to the mechanical nature of student entries. Notebooks have the potential of aiding students in demonstrating understanding, except in many situations they are used ineffectively. Teachers really need to focus on the types of entries they have students complete. In contrast the interactive notebook is a format designed to provide feedback on students level of understanding. The notebook design encourages students to review information and notes then apply that information in a creative manor.

## ***Methodology***

### ***Participants***

The participants of this study are 27 eighth grade students taking accelerated science. Of these 27 students, 12 are males and 15 are females. These students are currently enrolled in a high school Regents Living Environmental Science course. This is my fourth year teaching eighth grade, but only the second year teaching the accelerated Living Environment course. Not all students accelerating in this course at the time of the study were in the accelerated program last year. Four of the student joined the accelerated program at the start of the school year. This class is part of a middle school comprising of 950 students with 382 of them being in eighth grade.

### ***Instruments and Material***

To measure how students are currently using their science notebook, a notebook survey (appendix A) was used at the start of this research. Spiral notebooks will be provided to each student along with the use of highlighters and color pencils. Students will use these materials in the actual production of the interactive notebook. Scissors and tape are provided for pages that will be photocopied and added to the interactive notebook. After the production of left side activities, activity notebook assessment surveys (appendix U) will be used in an attempt to determine how the students used the notebook to complete the assignment. Audio recorders will be distributed to groups of students to capture the dialogue as they work in the notebook. To look at body language while working on the notebook a video recorder will be used.

***Data Collection***

For this study, the students will participate in using an interactive science notebook throughout two of the sections on the human body/homeostasis unit, the digestive system and the respiratory and circulatory pathway. The interactive notebook will be the main data source for this research. It will be collected and the student entries analyzed to determine the students level of understanding new information. Prior to the use of the interactive notebook, students will participate in a survey on how they currently use their science notebook.

Another source for this study would be audio and videotapes of students working in the notebooks. The student to student dialog, student to teacher dialog, as well as body language will be analyzed to try and determine what students are thinking while they are using the notebook. Students level of engagement while working in the notebook can also be observed. Student interviews and surveys will also be used as a data source for this study.

General surveys about students effort in using the notebook, what they were thinking while using it, as well as how they used it will be analyzed. Student interviews (appendix V) can help determine what students were thinking while making entries by having students explain entries in more detail and why they did entries in a certain manor.

***Procedures***

A notebook survey (appendix A) will be conducted at the start of this study. Students will then receive their spiral notebooks and be instructed on how to use this notebook (appendix B). The overall structure of the notebook will be discussed

(Appendix C), along with how it is organized and graded (Appendix D). Students will then have the opportunity to design their title page for the unit (Appendix G).

The first section of the unit is the digestive system. After learning about enzymes, what they are and how they work, students will look at the digestive pathway and the enzymes associated with it. The right side page will consist of a digestive diagram, as students go through the diagram they will disassemble a mock systems and determine how the function relates to the structure (Appendix H). On the top half of the left side student will create a flow chart showing the pathway, on the bottom half they will create a post card describing one of the digestive places they visited (Appendix I). Next, using a reading strategy students will fill out the Right side, enzyme function sheet (Appendix J) with a brief discussion of the reading after. The left side activity will be for students to create classified ads for at least 4 of the digestive enzymes (Appendix K). To learn about malfunctions of the systems students will complete a jigsaw learning and fill in an organizer on the right side of the notebook (Appendix L). To complete the left side students will divide the page in half and create 2 wanted posters for digestive pathway malfunctions (Appendix M).

The second section of the unit are the respiratory and circulatory pathways. After diagramming the respiratory pathway on the right side (Appendix N), students will create a travel ad about going to the lungs, what is happening there and returning home on the left side of the notebook (Appendix O). After dissecting a heart students will complete a right side heart diagram (Appendix P). On the left side, students will create a eulogy for the heart, summarizing the job it did and how the body will miss it (Appendix Q). As the respiratory pathways and circulatory pathways are put together on the right side

(Appendix R), the left side activity will be to describe the journey of an oxygen molecule as it enters the body to when it is used in a cell for respiration (Appendix S).

At the end of the study student notebooks will be collected for analysis. A rubric will be used to grade the left side activities (Appendix T). Also students will participate in a final notebook survey (Appendix W) to evaluate the use of the interactive notebook.

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## Appendix A

***Pre-notebook Survey***

Please answer the following questions as honestly as you can about how you currently use and view your notebook / binder for science.

1. How do you currently organize your material for science class?

(Check any that apply to you)

- Binder with dividers
- Spiral notebook
- Folder
- Journal
- Other \_\_\_\_\_

2. Do you feel that it is essential to have your materials everyday?

- Yes
- No

3. What type of information would be found most often in your notebook / binder / journal / folder?

- Class notes
- Class activities
- Labs
- Other \_\_\_\_\_

4. Once papers and information goes into your notebook / binder / journal / folder, how often do you refer back to it?

- Never
- When studying for test and quizzes
- When doing assignments or labs and need more help
- Almost every night to review information from that day
- Other \_\_\_\_\_

5. How often is your notebook / binder / journal / folder graded?

6. Do you keep a science journal? If yes, what type of information do you put into it?

## Appendix B

**INTERACTIVE NOTEBOOK REMINDERS SHEET!**

- 1 BRING THIS INTERACTIVE NOTEBOOK TO CLASS EVERY DAY!
- 2 PUT A HEADING ON EVERY PAGE (L/R, PAGE #, DATE, TOPIC)
- 3 FILL IN YOUR TABLE OF CONTENTS FOR EVERY PAGE YOU DO!
- 4 USE COLOR! - NOT JUST TO LOOK GOOD, BUT TO DISTINGUISH IMPORTANT INFORMATION!
- 5 KEEP YOUR NOTEBOOK ORGANIZED, NEAT, & COMPLETE! DO ALL INTERACTIVE HOMEWORKS ON TIME!

**Left Side**

Student Processing  
"Output"

- students process new ideas
- students use illustrations, diagrams, flow charts, poetry, colors, matrices, cartoons and the like to understand new content
- students explore opinions, clarify values, wonder "what if," and ask questions about new ideas
- students express feelings and reactions
- students review what they have learned and preview what they will be learning

**Right Side**

Teacher Directed  
"Input"

- students take notes during lectures or class discussions
- students record reading notes from their textbook, literature, or primary sources
- this information should be regarded as "testable" and should be structured so that key ideas and concepts are clear

## Appendix C

# Notebook Guidelines

## Notebook Structure:

- ✓ Must have a Title Page
- ✓ Must have an accurate Table of Contents
  - Color code by unit
- ✓ Title, date and have page number on all work in notebook
- ✓ Handouts should be securely taped or glued in
- ✓ Right side of spiral is testable
- ✓ Left side of spiral is student processing

## Grading:

- Spot check on the day the assignments are due
  - Note done = 0; Needs work =  -;
  - Average =  ; Excellent =  +
- At 4 weeks and 9 weeks of the marking period the notebook will be graded (Rubric Appendix D)
- Graded on
  - Structure and organization
  - Accuracy of Right side information
  - Demonstration of knowledge on Left side assignments
  - Use of color to help organize and enhance the notebook

Appendix D

Grading Rubric

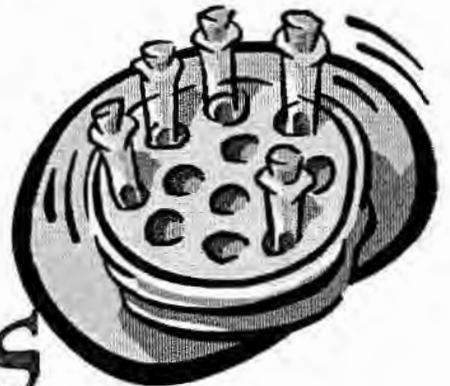
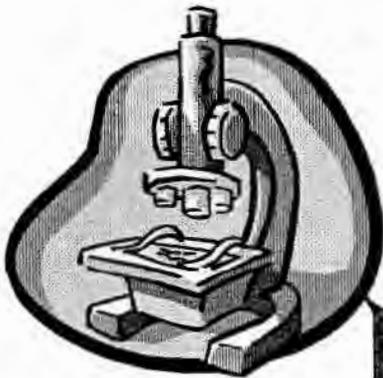
Appendix E

Sample Title Page

**Mrs. Odenbach**



**Science**



**Red Class**



Appendix G

Unit Title Page / Questions

<p>L-1      Homeostasis &amp; the Human Body Date</p>	<p>Homeostasis Questions      R-1</p> <p>Essential Question:</p> <p>Focus Questions:</p> <p>Standards:</p>
---	--

Appendix H

Digestive Diagram

R-2  
Date

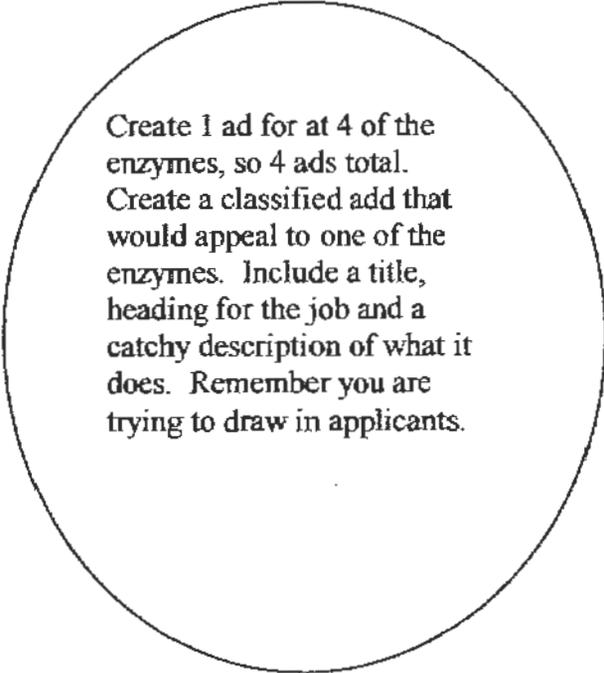
A large empty rectangular box with a black border, intended for drawing a digestive diagram. The box occupies most of the page below the header and title.

Appendix I

<p>L-2 Date</p>	<p>Digestive Pathway</p>	
<p>Flow chart</p>	<p>Create a flow chart demonstrating the path of the digestive system. Include all the major structures food would go through and structures that add or take away substances to/from the digestive pathway.</p>	
<p>Postcard</p>	<p>Descriptively and with color draw a picture of some "spot" you visited along the digestive pathway</p>	<p>Write on your postcard, describe what it looks like and the activities that are occurring around you. What type of things have you met. How your trip to this spot has been.</p>



Appendix K

L-3 Date	Enzyme Classified Ad
	 <p>Create 1 ad for at 4 of the enzymes, so 4 ads total. Create a classified add that would appeal to one of the enzymes. Include a title, heading for the job and a catchy description of what it does. Remember you are trying to draw in applicants.</p>

Appendix L

Digestive Malfunctions

R-4  
Date

## Appendix M

L-4  
Date

## Digestive Wanted Poster

## Wanted

DEAD or ALIVE

### “Constipation”

- Wanted for taking too much water from people's large intestines
- Last seen in the vicinity of Elizabeth's large intestines
- Approach with caution, can cause dehydration and slow bowel movements

Create a wanted poster for a malfunction. Design it like a traditional wanted poster and include the malfunction, description of where this usually occurs, what it does to the body, and what the malfunction is. Include a drawing if possible.

Appendix **N**

R-5  
Date

**Respiratory Pathway**

## Appendix O

## Respiratory Travel Ad

L-5  
Date

Create a page from a travel book that might be used by traveler seeking information about the respiratory pathway. The page should include a title, colorful visuals of what will be seen with descriptions of the different parts and what happens there. Make this attractive to visitors. You need to "sell" your pathway, your income (grade) depends on how many travelers this appeals to.

Appendix P

R-6  
Date

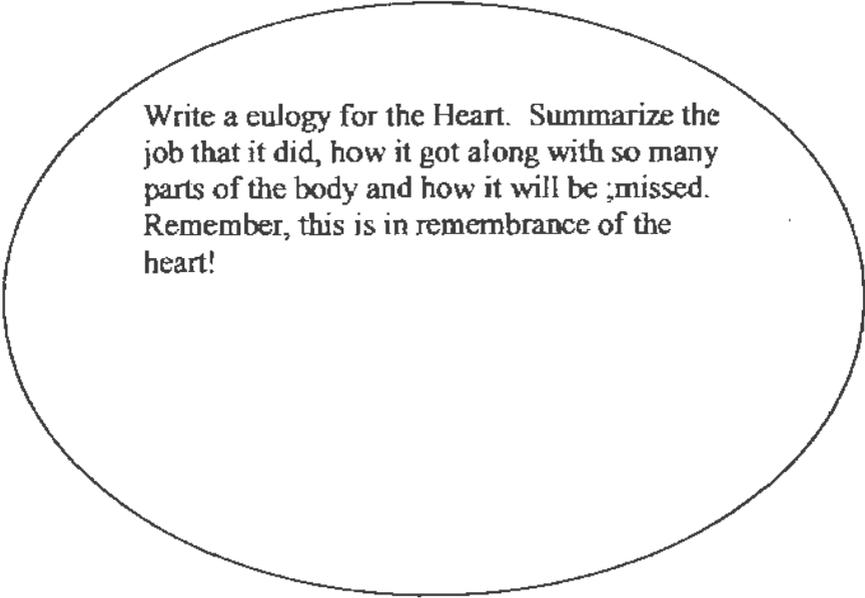
Heart Diagram

A large empty rectangular box with a thin black border, intended for drawing a heart diagram. The box occupies most of the page below the header and title.

Appendix Q

Heart Eulogy

L-6  
Date



Write a eulogy for the Heart. Summarize the job that it did, how it got along with so many parts of the body and how it will be missed. Remember, this is in remembrance of the heart!

Appendix R

R-7  
Date

Respiratory and Circulatory Pathways

## Appendix S

L-7

Date

Journey of an O<sub>2</sub> Molecule

You are an oxygen molecule hanging out in the air. You are suddenly "sucked in by Bob". Write a descriptive story about your experiences as you went from the air all the way to a cell for respiration. Share what things looked like, what was happening to you, who/what did you pass. The reader should be able to visualize what you are going through.

Appendix T

Left side grading rubric

Appendix U

Activity Notebook Assessment Survey

Appendix V

Interview questions and prompts

Appendix W

Final Notebook Survey