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NIGHT OF THE TWISTERS: A COMPREHENSIVE UNIT

A Project

Presented to the

Faculty of

California State University,

San Bernardino

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

in

Education:

Instructional Technology

---

by

Shawn Davis Brown

December 2004

NIGHT OF THE TWISTERS: A COMPREHENSIVE UNIT

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Shawn Davis Brown

December 2004

Approved by:

[redacted]

Brian Newberry, First Reader

Sept. 13, 2004

Date

[redacted]

Randall Wright, Second Reader

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ABSTRACT

This project serves to create a web-based literature unit for the Ivy Ruckman book, "Night of the Twisters." The essential problem prompting the creation of this unit is that the book alone does not create the level of learning that it could otherwise produce with allowances for teacher directed student investigation. Thus a comprehensive web based unit was developed that focuses on the (a) strategic reading of the book according to proven literature comprehension techniques, (b) applicable meteorological study, (c) study of grade level vocabulary, (d) integration of higher level thinking skills and questioning, and (e) California grade six English-language arts standards. The result is a comprehensive web-based unit that allows readers to live and experience the book.

ACKNOWLEDGMENTS

I would like to thank all of the students who had a hand in inspiring the creation of this unit and making it the success that it is.

I would also like to thank my wife for her patience during this process, as well as for her scrutinous eye whilst viewing the site repeatedly.

DEDICATION

This project/thesis is dedicated to anyone who has ever read or been required to read a book merely for the purpose of reading the printed word. In other words, this is dedicated to anyone who has not yet experienced the true joy and wonder of "living" a book.

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CHAPTER ONE

BACKGROUND

Introduction

In California sixth grade language arts programs there is an inherent focus on the comprehension of literature selections. Given the rigorous emphasis on the coverage of state standards and the great pressures that exist to advance student state test scores, limited time and ability for quality literature practices have emerged. As a result, literature selections are often being merely read instead of fully experienced. To achieve the fullest possible learning encompassed in any given literature selection, students must interact with the literature so as to experience it.

This project will provide a model for experiential literature practices through the creation of a web-based unit for a 6^{th} grade reading selection.

Statement of the Problem

The Ivy Ruckman book, Night of the Twisters, is a 6^{th} grade level literature selection. The story is a reality-based fictional story that integrates both fictional characters and events with some actual people and events within the setting of the actual 1980 Grand

Island, NE tornado outbreak. The book incorporates a multitude of references to weather phenomena. Since a 6th grader's knowledge of meteorology is typically limited, it is essential that the book be accompanied by the study of applicable weather topics.

Purpose of the Project

The purpose of the project was to develop a comprehensive literature unit that integrates essential meteorology study within the relevant chapters of the book. Since the development of such a unit needed to encompass much more than merely the reading of the book and the study of applicable meteorological material, a muli-faceted literature experience was designed. At the heart of this was the application of the California grade six English-language arts standards (see Appendix B). Secondary components were addressed in order to build a complete literature unit. Additional inclusions were (a) essential geography and mathematics knowledge, (b) essential vocabulary study, (c) higher level thinking tasks, and (d) appropriate questioning aimed to foster and assess levels of comprehension.

The goal of this project was to have a web-based comprehensive unit that would simultaneously integrate the

(a) strategic reading of the book according to proven literature comprehension techniques, (b) applicable meteorological study, (c) study of grade level vocabulary, and (d) integration of higher level thinking skills and questioning, and (e) cross-curricular infusion practices where applicable.

Significance of the Project

This project is significant for two reasons. The first significance lies in current computer technology practices. Hundreds of millions of dollars are spent on computer technology in U.S. schools each year with no real consideration as to how this technology will be best used or produce the greatest learning outcomes (Swain, Bridges, &, Hresko, 1996; Frear & Hirschbuhl, 2000). Thus, this project is significant in that it will serve to create a method and model for high impact student learning.

The second significance lies in the history of outcomes with the use of this book. This book has been used with sixth grade students for 5 years now. Without the use of this comprehensive web based unit, the results were adequate, but not what they could potentially be, as students had merely read for basic comprehension. With student use of this product, the unit will serve to

surpass basic comprehension, entering into significantly greater levels of understanding. Furthermore, this unit will require that students cross the curricular divides so as to utilize all of the academic spheres of knowledge.

Limitations

During the development of the project, a number of limitations were noted. These limitations are the following:

1. This unit was developed for use with students at one particular school site in California; therefore, it is not yet designed for global access. However, the materials are able to be generalized.
2. This site has been created for one book. More examples of such units will need to be created in order to fully understand how such units are most effective.
3. This site, as it presently exists, has not been extensively utilized with students. Therefore, more student use is needed in order to provide for adequate content and structure feedback, and to provide a clearer focus for future project development.

Definition of Terms

The following terms are defined as they apply to the project.

Ability Grouping - The grouping strategy whereby there is the intentional division of a mixed-ability group of students into more similar-ability groupings.

Instructional Design - The process of formulating instructional content and formatting the system for its delivery.

Meaning Construct - A person's notion of the value or meaning of something; what one believes to be true.

Meteorology - The study of the earth's atmosphere; the study of weather.

PDF - Portable Document Format; a computer information display format that allows for precise personal viewing of web-based content.

Reality-based fiction - A fictional (untrue) story that is either created because of realistic events or embedded within elements of reality.

CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

This chapter consists of a discussion of the relevant literature that guided and fostered the development of this project. Specifically, this literature review focuses on four key areas: (1) The need for constructing meaning in literature, (2) Technology's influence on higher level thinking & Multiple Intelligences within the curriculum, (3) The infusion of Internet computer technology and curriculum content, and (4) Constructivist implications for learning.

Constructing Meaning in Literature

The common thinking among teachers is that the goal of reading school-based literature is comprehension, and the secondary goal is that of enjoyment. In a recent study of experiential literature practices, Boyd (2003) identified the ultimate goal to be that of shared value. Furthermore, she states that it is the engagement or experiencing of literature that creates and often furthers a student's comprehension. Boyd's study was able to conclude that although experiential literature practices may not provide the same value (meaning constructs) for

everybody, these experiential practices also provide a more complex understanding of the material than mere reading would otherwise produce-even if not fully acknowledged by the reader.

Bransford (1996), states "Curriculum materials [literature included] should allow exploration by the learner" (p. 2). Bransford found that if curricula utilize "anchors" (p. 1), or central problems that foster the need for further investigation, a much higher level of understanding is achieved.

In yet another article aimed at the analysis of experiential reading practices, McManus (1998) determines that "reading is a performance" (p. 2), and in order to perform it, students must actively delve into all the unknowns of the reading. In other words, reading comprehension will only be as good as the level of investigation that a student initiates or is required to initiate. Furthermore, she finds that students have the choice of reading to understand the individual meanings within a book, or students can investigate the intertwined meanings within a book to understand the whole reading selection.

As the above studies indicate, the focus of school-based reading literature ought not be on the

reading of information; rather it should be on the meanings constructed given the interaction and investigation that take place within the reading of a selection. Furthermore, it is proposed by this author that the Internet can and does serve as a valuable medium for this to occur.

Technology's Influence on Higher Level Thinking and Multiple Intelligences within the Curriculum

The goal of this computerized literature unit is to successfully integrate the reader within the book. In order to facilitate this, it was important to gain an understanding of how technology could successfully produce learning experiences that would be rich and varied in terms of higher-level thinking and Multiple Intelleigences.

A study by Frear and Hirschbuhl (2000), examined the effects of computer-based multimedia infusion within the science curriculum. They were able to conclude that there was a significant difference in achievement, as students were found to have much more complex levels of understanding than would have otherwise been produced without the use of multimedia. Furthermore, they assert that since multimedia tends to foster high levels of

interest via the presentation of, and interaction with information that is in an rich video and/or audio format, infusion within any curriculum would likely produce greater levels of understanding than would otherwise be possible.

Howard Gardner, who is considered an eminent researcher of the study of higher-level thinking and more specifically, Multiple Intelligences, has always been concerned with the quality of education. So what would he have to say about the effects of technology on educational quality?

As discussed in Weiss (2000), Gardner is quite fond of technology; however, he is cautious to state that technology is there to foster, not dictate educational goals. Gardner states:

> Clearly a marriage of education and technology will be a happy marriage only if those charged with education remain clear on what they want to achieve and [remain] vigilant that technology serves those ends. (Weiss, 2000, p. 57)

In other words, technology is a great tool to further the educational goals, not create them. He states that everyone has certain modalities of learning (learning preferences or styles of learning), and often the use of computer multimedia can appeal to many different learning styles all at once. Gardner finds that computer based

multi-media, such as the Internet, is a great multi-sensory tool that enhances student inquiry and higher levels of understanding.

The Infusion of Internet Computer Technology and Curriculum Content

It has become common knowledge that the Internet represents the most accessible cache of information in the history of mankind. The question, though, becomes that of how the Internet is best used within the school setting. This section seeks to determine (a) the learning value of Internet use in terms of curricular infusion, and (b) how to engage in the design and creation of quality curriculum integrated web-based resources.

The Learning Value of Technology Infused Curricula

The benefits to learning with the aid of the Internet are great in number. In an article that examines the worth of the Internet's infusion with curriculum, Swain, Bridges, and, Hresko (1996) assert that learning with the use of the internet allows for (a) a greater level of control of a student's own learning experience, (b) a high level of flexibility given the depth and complexity of the exploration that a student would like to complete, (c) experiences that might otherwise be impossible, such

as virtual field trips and other audio or visual experiences, and (d) a much more in-depth understanding of the content at hand. These authors are quick to point out though, that just because a student uses the Internet does not mean that the learning is curriculum specific, rich, or relevant. They stress that teacher assembled, curriculum specific web explorations tend to foster a greater outcome than merely allowing students to freely explore a topic with the use of a web search engine. In other words, the learning will only be as significant as the guidance or direction the students are given within their curricular exploration.

A significant and influential article that served to guide the creation of this unit involved the rationale of technology and curriculum integration. Kumar and Bristor (1999) contend that "the use of video [could include animations] and audio-rich technology [that the Internet includes] enables the presentation of learning environments embedded with information in a real-world context" (p. 41). The focus of education in the twenty-first century ought to be that of making it connect to the real world. Furthermore, Kumar and Bristor were able to go so far as to suggest a set of criteria for integration of technology to a given curriculum. Kumar and

Bristor suggest that (a) the context for use must be readily available (accessible), (b) the context for use must contain information that will secure student interest, (c) the information within the context must be written in a language that students will be able to understand, (d) the curriculum must be at the heart of the exploration, and (e) foremost, the content must be appropriate to the audience for which it is intended.

What this means in terms of this author's project is that this unit must be designed so as to serve the needs of the content and audience for which it is created.

The Design and Creation of Curriculum Integrated Web-Based Resources

Cassarino (2003) suggests that it is vital that instructional design and web interface design be considered two separate and distinct processes. She states:

> The Web interface is a bridge between instruction and learning...Instructional designers [should] take careful selection of instructional themes well suited for web-based instruction. Mapping content on the Web to cognitive [learning] strategy used by the learner is the way an eLearning [curricular infused computer-based] environment should evolve. (p. 460)

This demonstrates the need for considerable devotion to starting the design by organizing of content and

instructional focus, and then concentrating on the best web design/interface to allow for a cohesive Web exploration.

In terms of the Web design phase of online-project development, there needs to be great consideration given to the marriage of design efficiency and motivational interfaces (Loh & Williams, 2003). Loh and Williams produced a study that greatly effected the design of this author's product. They surveyed sixth grade students to find out what constitutes good web site design. Loh and Williams discovered that students actually prefer function over presentation. Here are the details of their findings in order of student reported relevance and importance.

1. A web site for student use needs to load quickly. If a student has to wait too long for a web site to load, it is likely that they will not utilize the site at all.
2. A Web site for student use needs to be easy to navigate. It needs to be user friendly and intuitive in organization. If a student cannot find his or her way around a site, or they get lost within its pages or links, it is not likely that they will further utilize the site.

3. A Web site for student use needs to include the pertinent information for which it is being visited. In other words, the fanciness of a site is useless unless it has what the students are looking for.
4. A Web site for student use needs to include only relevant, high interest visual and audio content that serves the page without slowing down the its loading speed. Students indicated that they would much rather have a more simplified site that loads quickly than the most 'tricked out' site that takes a great deal of time to load.

What this study clearly indicates to this author is the content has to be at the forefront of web design process and that the structure of the site has an important role to furthering the utilization of the content. It is important for both the instructional and structural design of this site to follow the advice of the above authors.

Constructivist Implications for Learning

"We learn from experiencing phenomena (objects, events, activities, processes), interpreting those experiences based on what we already know, reasoning about

them, and reflecting on the experiences and the reasoning" (Jonassen, Peck, & Wilson, 1999, p. 2). This is called "meaning making" (Bruner, 1990).

Meaning making is at the center of a learning movement called constructivism. Constructivism is quickly gaining acceptance in the field of technology education as a methodology that supports advanced levels of learning (Jonassen, Peck, & Wilson, 1999). Some argue that true constructivism is hard to achieve in a computer-based environment, mostly because this forum lacks true human interaction (Gance, 2002). However, as Jonassen, Peck, and Wilson adequately clarify and correct, communication within constructivism is beyond mere human interaction. Furthermore, they describe what really constitutes successful constructivism practices.

1. "Constructivists believe that knowledge is constructed [built/formed by the learner], not made" (p. 3). In other words, students learn by investigating unknowns to build a picture of reality.
2. "Knowledge construction results from activity, so knowledge is embedded in activity" (p. 3). What this implies is that experiencing content will foster true learning longevity.

3. "Knowledge is anchored in and indexed by the content in which the learning activity occurs" (p. 3). In other words, knowledge is often attached to the context in which the learning takes place.

4. "Meaning is in the mind of the knower" (p. 4). Moreover, we construct our own meanings and it is possible to grow and change our own meanings from seeing or experiencing others' perspectives.

5. "Meaning making is prompted by a problem, question, confusion, disagreement, or dissonance (a need or desire to know) and so involves personal ownership of that problem" (p. 5). In other words, seeking to clarify personal knowledge voids creates a rich anchored learning experience. Vygotsky (1978) refers to this learning emphasis as Problem Based Learning. With this, learning results from situational necessity.

6. "Knowledge-building requires articulation, expression, or representation of what is learned (meaning that is constructed)" (p. 5). What this means is that there must be a period or

opportunity for reflection. Students must revisit learning so as to build knowledge constructs that will lend to future learning.

7. "Not all meaning is created equally" (p. 6). This idea asserts that every individual's constructed meaning of a similar problem may not have the same value. In other words, allowances for multiple perspectives (sharing sessions, group activity, etc.) can aid a student, but ultimately one's own constructed meanings have a greater worth to that individual's learning.

Constructivism offers to this project a rationale for student empowered learning. Students will be (a) engaging in learning so as seek clarity among the unknowns, (b) constructing and reconstructing their own meaning constructs over the course of the unit, and (c) employing experience to analyze and clarify character actions.

Summary

A great deal of information as to how this web-based curricular unit ought to be constructed was gained from this review of literature. Specifically, this review of literature directed the formation of this unit in the following ways:

1. The design of this unit should focus on having students interact with the unknown elements of what they read, so as to convert the unknown to that which is familiar. Furthermore, this unit needs to utilize what students know so as to build on and extend their cognitive structures. This will result in an experiential interaction within the meanings of the reading content.
2. The design of this unit should focus on content, not the use of technology. The technology will need to be used as a means of satisfying the exploration within the content. Carefully mapping the unit prior to any consideration of technology incorporation will insure that the curriculum is the focus.
3. The content design of this unit should focus on finding content specific Internet-based resources that include (a) information that is understandable by and appropriate for 6th grade students, (b) audio, video, animation, and graphic content, and (c) content that is of high interest.
4. The structural design of this site should provide a simple, user-friendly layout that

(a) is easy to navigate, (b) utilizes simple graphic and audio items, (c) provides for quick loading, and (d) contains high interest relevant content.

5. The design of this unit should adhere to the constructivist principles of learning. The goal should be that students construct their own meanings as they interact with both book and site content.

CHAPTER THREE

PROJECT DESIGN PROCESSES

Introduction

It was important that the experience and insight of past research and literature be a companion and guide to this project. Thus the design process that follows is both a reflection of the unit objectives and a product of advice derived from past literature.

Analysis

This project was specifically developed for use with 6^{th} grade students. This author's advanced ability (mix of gifted students and high achievers) language arts group is tactically (due to this author having earned a certificate in Gifted and Talented Education) comprised of high ability learners, including some identified gifted students. They all read very well, some even above grade level. They are a very independent group, as the classroom environment is structured to create, meet, and foster that ability. They have very good computer and Internet navigation skills, as they are regularly required to utilize technology within the school curriculum. Students are required to think critically about content on a daily basis, as it is at the heart of their educational

experience. Likewise, students are trained to use higher-level thinking skills. The one problem that consistently appears from year to year is that student knowledge of science is very limited, as previous teachers have unfortunately swapped science curriculum time for more state-testing specific learning. Thus, assuming that students have any knowledge of meteorology would likely be mistaken. As a result, book-specific science content needs to be presented so that students will be able to fully understand the meteorological events and the resulting meanings within this novel.

Design

Content

The end result of this project was a web-based comprehensive unit that simultaneously integrates the (a) strategic reading of the book according to proven constructivist practices, (b) applicable meteorological study, (c) study of grade level vocabulary, d) integration of higher level thinking skills and questioning, and (e) California grade six English-language arts standards.

Content Design Specifics

In order to fully understand how and why this web site was designed, it will be helpful to understand what this site served to accomplish.

The first step was to detail what was to be investigated in order for students to gain the full experience this book can offer. Foremost, the California grade six English-language arts standards (see highlighted portions of the standards in Appendix B for highly utilized standards) would be at the heart of the project. Since higher level thinking skills tend to further the standards, it was essential that students would consistently apply in-depth thinking to support the standards.

As for the meteorology content that needed to be integrated, each chapter was carefully reviewed and a meteorological content outline was developed. These were articulated with the time sequence of the book to ensure that students received needed meteorological information in time to understand it prior to its occurrence in the study of the book. This was a very time-consuming process, but the results justified the time spent. Identified below is the chapter-specific meteorological content that needed to be investigated by students.

1. Forward
    a. All about Tornado Alley
    b. U.S. tornado occurrence state rankings data
2. Chapter Three
    a. All about Hail
3. Chapter Four
    a. All about wind speed classifications
4. Chapter Five
    a. Tornado warnings and watches: What is the difference?
    b. Tornado frequency by state
    c. What does the siren for a tornado warning really sound like?
5. Chapter Six
    a. What would it be like inside the eye of a tornado?
    b. What are some of the odd behaviors of tornadoes?
    c. All about air pressure
6. Chapter Seven
    a. What does tornado damage really look like?
7. Chapter Eight
    a. All about Dr. Ted Fujita and the F-Scale

b. Cyclonic tornadoes VS Anti-cyclonic tornadoes

8. Chapter Ten

a. All about the causes of tornado formation

b. Tornado Statistics: What percent are classified as weak, average, and strong?

After this determination, web page links that would best align to these events and portions of reading were identified. Two specific web sites, usatoday.com and weather.com, were of particularly great help. These two sites contain a breadth of information and links to aid students in their investigations of meteorology (see Appendix D for addresses).

This book has been used with this author's sixth graders for 5 years now. For this project, the goal was to involve students in the Grand Island, NE experience. It was important to have the students experience the people and the effects this event had on them. Thus it was vital, if possible, to have them experience from first-hand accounts and photos, what the characters of this book would have gone through. To support this, a web search produced a link to the Grand Island Independent online newspaper, which had an entire sub-site devoted to the

actual tornado outbreak (see Appendix D for address). Included within this site are the following.

1. Stories and first-hand accounts from survivors of the real Grand Island tornado outbreak.
2. Pictures of the sustained damage. Included are photos of places that are mentioned within the book.
3. Meteorological data (pictures, Doppler radar, satellite photos, etc.) from the storms as provided by the National Weather Service.
4. A map of the outbreak that provides highly detailed data (path, speed, duration, characteristics, etc.) about each twister.

Site Design Outline

I. Unit Expectations
   - A. Materials
   - B. Prerequisites
   - C. Chapter Expectations
   - D. Product Requirements
   - E. For Best Results

II. Chapter Pages
   - A. Introduction
   - B. Vocabulary
   - C. Pre-Reading

D. Read

III. Final Test

A. Literature Based Questions

B. Meteorological Based Questions

IV. Extension

A. Prediction

B. Watch Movie

C. Create Product of Learning

Site Design Specifics

A simplified, less is more, web site was designed. It was important that this web site be uniform, easy to navigate, and somewhat predictable to students. After all, if the content is not organized in a user centered manner, a web site will not likely be one in which learners will conquer the given objectives (Beer, 2000). Students need to dedicate the bulk of in-depth thought to the project tasks, instead of cogitating how to get from one place to another.

Home Page Design

As detailed in Figure 1 (see Figure C1 in Appendix C for a non-detailed screenshot), the home page is simple, consisting of worded blue links accented with unlinked tornado icons. There is a link to the (a) 'Before You

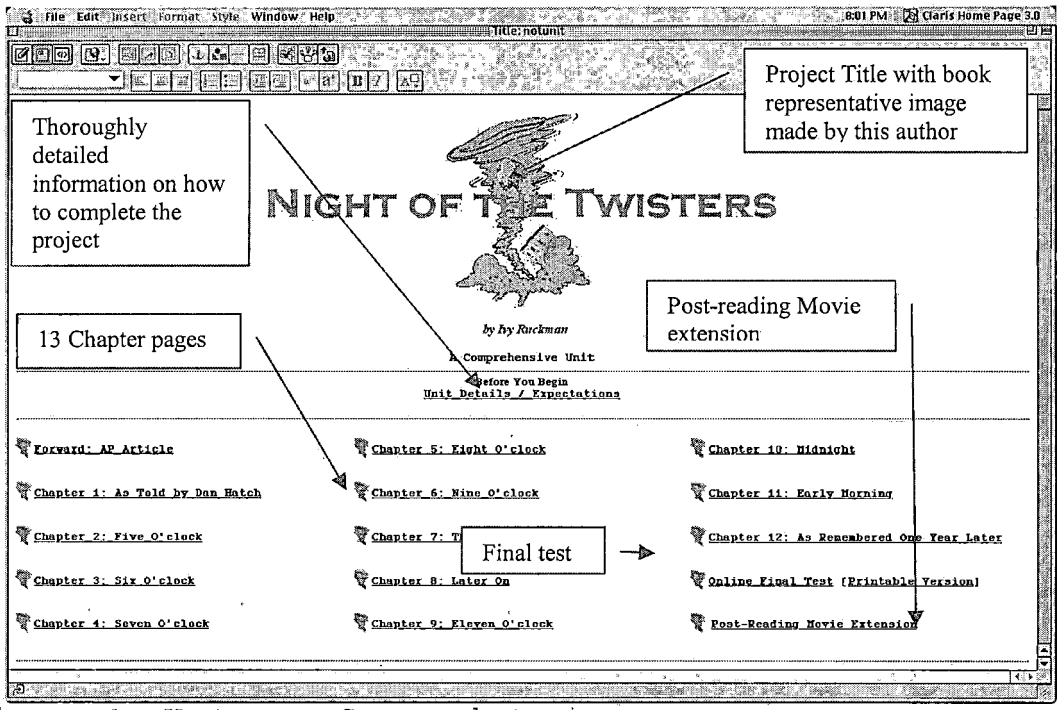


Figure 1. Homepage Screenshot

Begin' section, (b) twelve chapters, (c) tests [both online and printable versions], and (d) a movie compare and contrast page. The page has a simple white background with blue links, a large brown heading-due to its association with tornadoes, and an easily legible font and size. These fonts, colors, and sizes were chosen because of their universal acceptance, easiness to read, and overall relationship to the needs of this particular project. Adorning the top center of the page is a centered, self-made tornado graphic that includes an uprooted tree, a house, along with the book title and

author. This was a last-minute addition to the page that aimed to enhance it according its theme.

'Before You Begin' and 'Post Reading Movie Extension'

As detailed in Figures 2 and 3 (see Figures C2 and C3 in Appendix C for non-detailed screenshots), the 'Before You Begin' and 'Post Reading Movie Extension' pages both consist of a necessity-based layout according to the unique needs of each page. They feature a white background, blue links, black print, and brown headings- due to the color's association with tornadoes. These settings, fonts, colors, and sizes were chosen because of their universal acceptance, easiness to read, and overall relationship to the needs of this particular project. These pages, along with all pages beyond the home page, are set up with left justification so as to be in a similar format to a word processing document. For navigational ease, all links on this page are set to open in a new browser window. As a last minute design modification, a centered, self-made tornado graphic with book title and author was added.

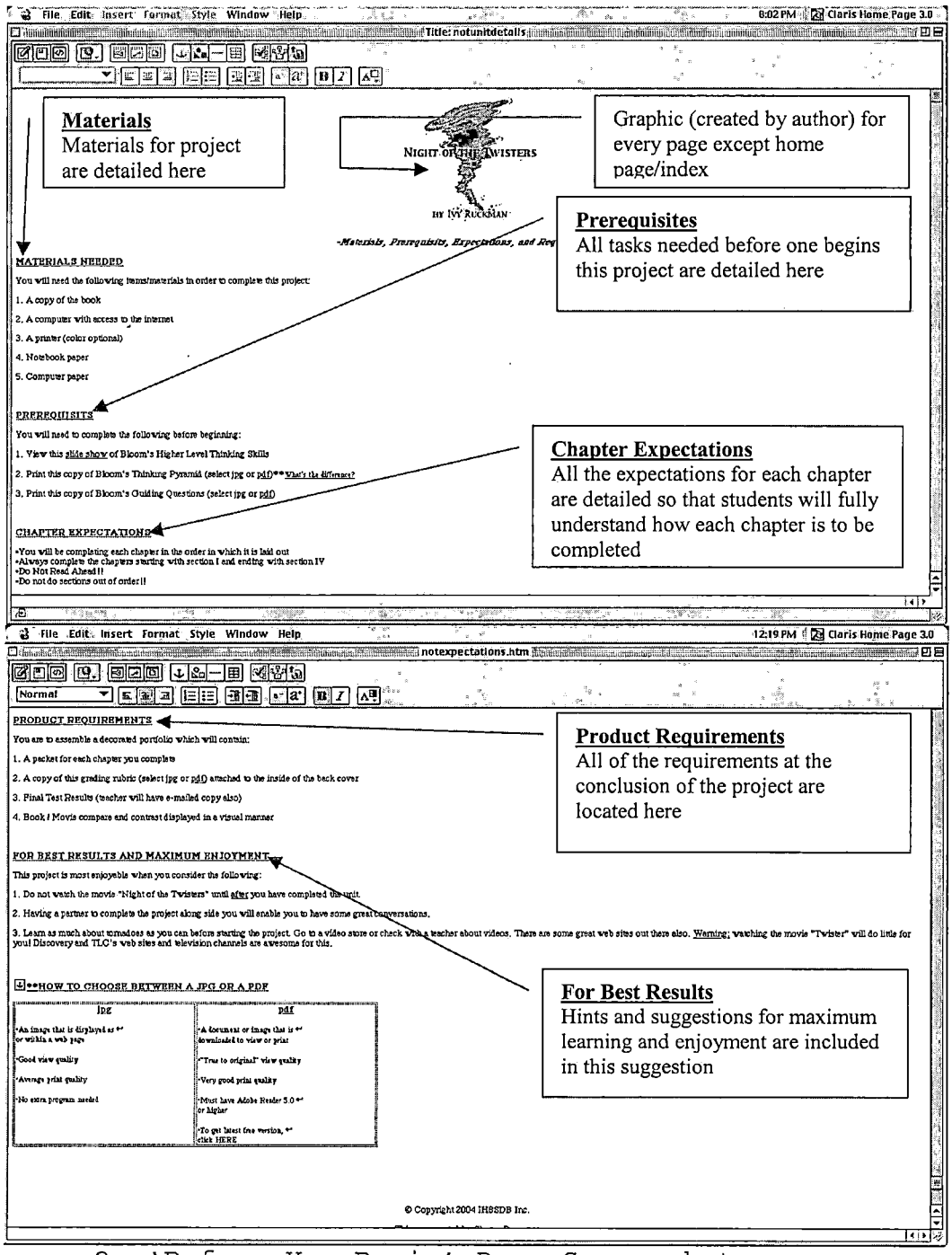


Figure 2. 'Before You Begin' Page Screenshot

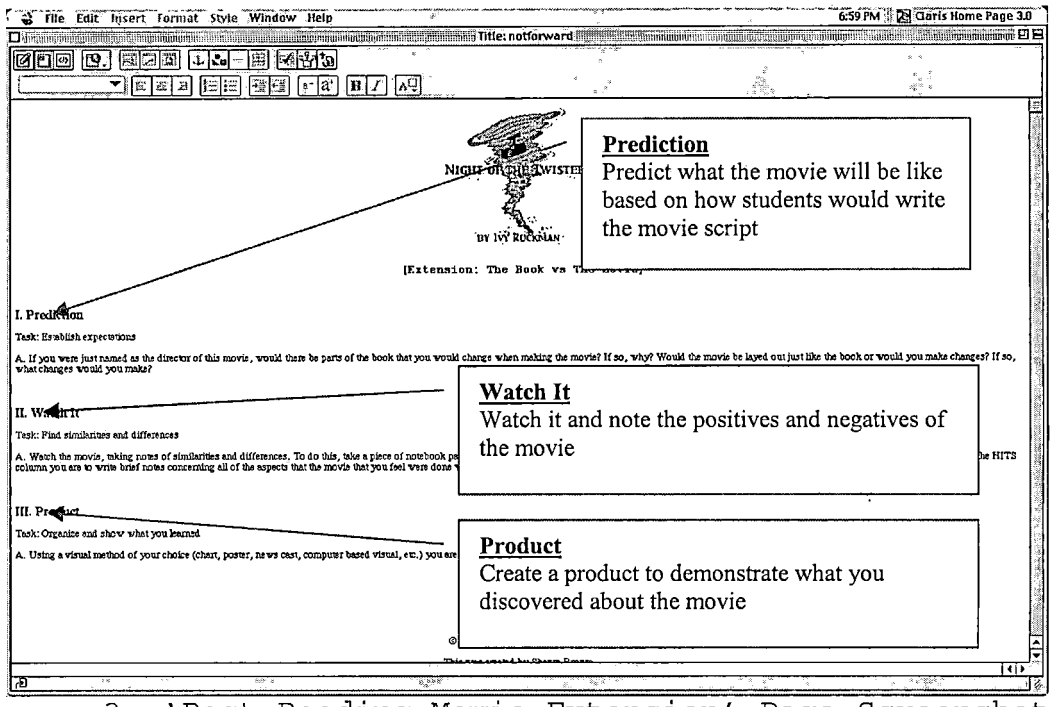


Figure 3. 'Post Reading Movie Extension' Page Screenshot

Chapter Pages

As shown in Figure 4 (see Figure C4 in Appendix C for a non-detailed screenshot), the development of the chapter pages first involved the creation of a document design template. The template features a white page with left justification, a black heading, a brown sub-heading, black level 3 headings, and brown level four headings. All remaining print is black, with the exception of the links, which are traditional blue. The template locks the spacing of all four categories so as to get a "cookie cutter" appearance from chapter page to chapter page. These settings, fonts, colors, and sizes were chosen because of

their universal acceptance, easiness to read, and overall relationship to the needs of this particular project. For navigational ease, all links on this page are set to open in a new browser window. The chapter pages each feature a centered, self-made tornado graphic (brown) that includes the book title and author.

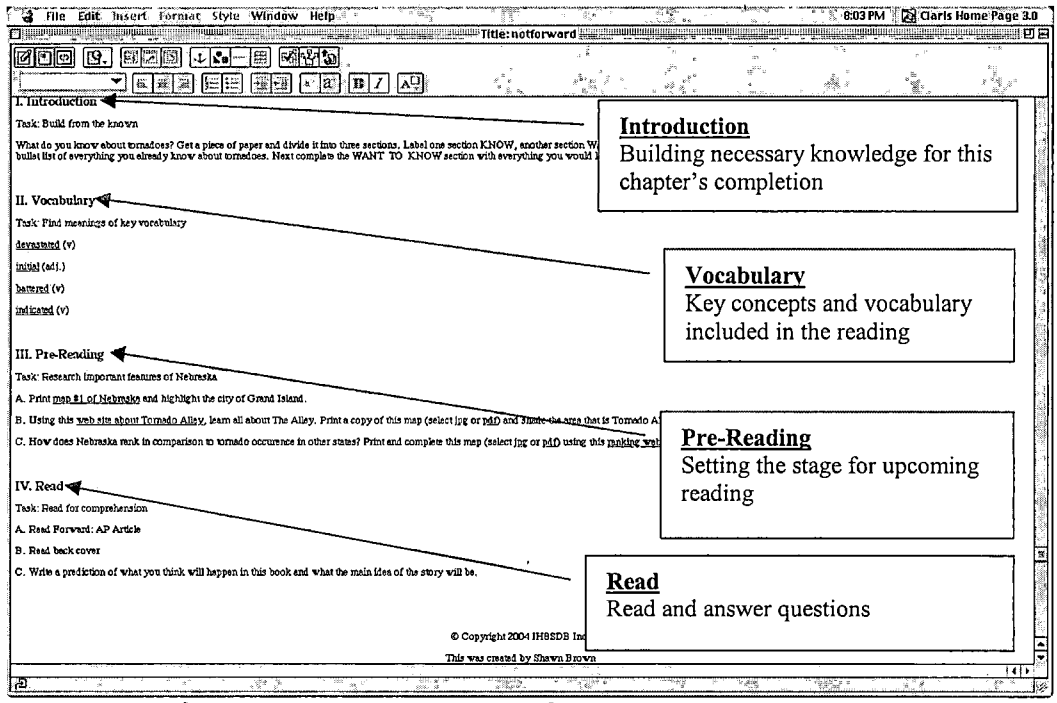


Figure 4. Chapter Page Screenshot

Final Test

As shown in Figure 5 (see Figure C5 in Appendix C for a non-detailed screenshot), the final test is an electronic version that is both created and accessed at discovery.com. The test contains 36 multiple-choice questions. The test document default settings feature a

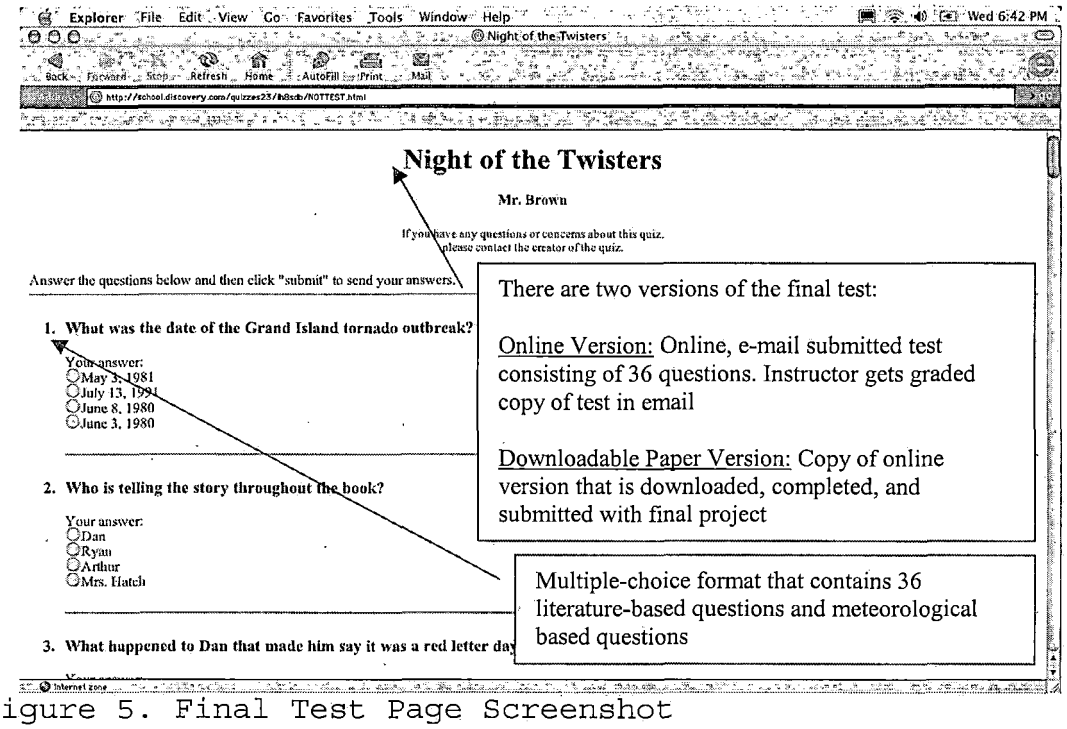


Figure 5. Final Test Page Screenshot

large legible print on a white background. The test features a 'take and submit' format that sends the graded test directly to this author's e-mail account. The printable version of the test is a PDF-converted form of the online test. With this test version, students simply download and print the pages, complete the test, and submit it to the instructor.

Development

Content Development

The development of the content structure was the most important task in this project. This author began by a cover-to-cover reading of the book again, so as to fully

appreciate what the book could potentially accomplish. The book was then read a third time; however, this time, it was read chapter by chapter. For each chapter, notes were made of (a) essential vocabulary, (b) important meteorological elements that required further investigation, (c) sections that required some thought/meta-cognition/analysis in order to get the full meaning from that portion of text, (d) passages that would lend themselves to higher level thinking, (e) elements that effectively would lend themselves to covering the state standards, (f) and questions that would be utilized to check for understanding and comprehension.

The next step was to locate the web sites to support the needs of each chapter. This was a time consuming portion of the content development phase. Knowledge of web search techniques greatly helped, but ultimately, finding the best sites for each chapter meant patiently screening dozens of web sites.

The third step involved the creation of the design document template for the chapter pages. It was important that every chapter page be uniformly consistent. This was established by selecting headings that would comprise each chapter page: Introduction, Vocabulary, Pre-Reading, and

Read. It was decided that each section would be detailed in the following manner:

I. *Introduction:* This involves questions or investigations that tie previous reading or learning in with the main idea of the current chapter.

II. *Vocabulary:* This section focuses on having students investigate unfamiliar words that they encounter within the reading of that particular chapter.

III. *Pre-Reading:* This section focuses on bringing the student mind-set within the chapter that is about to be read. This requires that the student apply their experiences and thoughts (cognitive structures) to issues that they are about to read. The goal is for them to feel a connection to the reading before they actually get into each particular chapter.

IV. *Reading:* This section requires that students read and answer the questions that follow the completion of the chapter's reading. The questions are structured toward assessing learning, as well as having students critically reexamine the material they just completed.

With the template designed, each chapter page was written out on paper so as to have it ready it for web conversion.

The fourth step involved writing the questions for the final test. Utilizing both the text-based and weather-based requirements of each chapter, 36 questions were developed that would assess whether or not the student mastered all the given chapter materials.

The fifth step was to develop the content for the 'Post Reading Movie Extension' section. To do this, the movie was viewed to decide the focus for this section of the project. Because the movie is such a departure from the novel, it was decided that there should be a compare/contrast focus, which consequently aligns with the state standards for the 6^{th} grade (see Figure C3 in Appendix C).

The sixth step was to organize the chapter pages, test(s), and Post Reading Movie Extension expectations into one comprehensive set of expectations. This resulted in the 'Before You Begin' section. It is here that students find the details for how the entire project will be completed. All pre-requisite information is located here in order to aid the users in accomplishing this

project to the best of their ability and in accordance to the project guidelines and expectations.

Site Development

Once the content design was complete and written out on paper, the structuring of the sequence and the creation of the site began.

The entire site was developed using Claris Homepage 3.0 and AppleWorks 6.0. A simple homepage with unlinked subordinate web page titles was created first. A tornado image was then created using AppleWorks, which was inserted onto the center of this homepage. Next, a chapter page template was created, which was immediately duplicated for each of the 12 chapters. Following this, the chapter pages were linked to the home page subordinate web page titles. Next, the 'Post Reading Movie Extension' page was created and linked back to the home page. Finally, the 'Before You Begin' was created and linked back to the homepage.

With the web site template complete, AppleWorks was utilized for the word processing of the material. When the word processing of a page was complete, a simple copy-paste maneuver was used to insert the material from the AppleWorks word processing document into the web site. Approximately 20 hours later, the site was built.

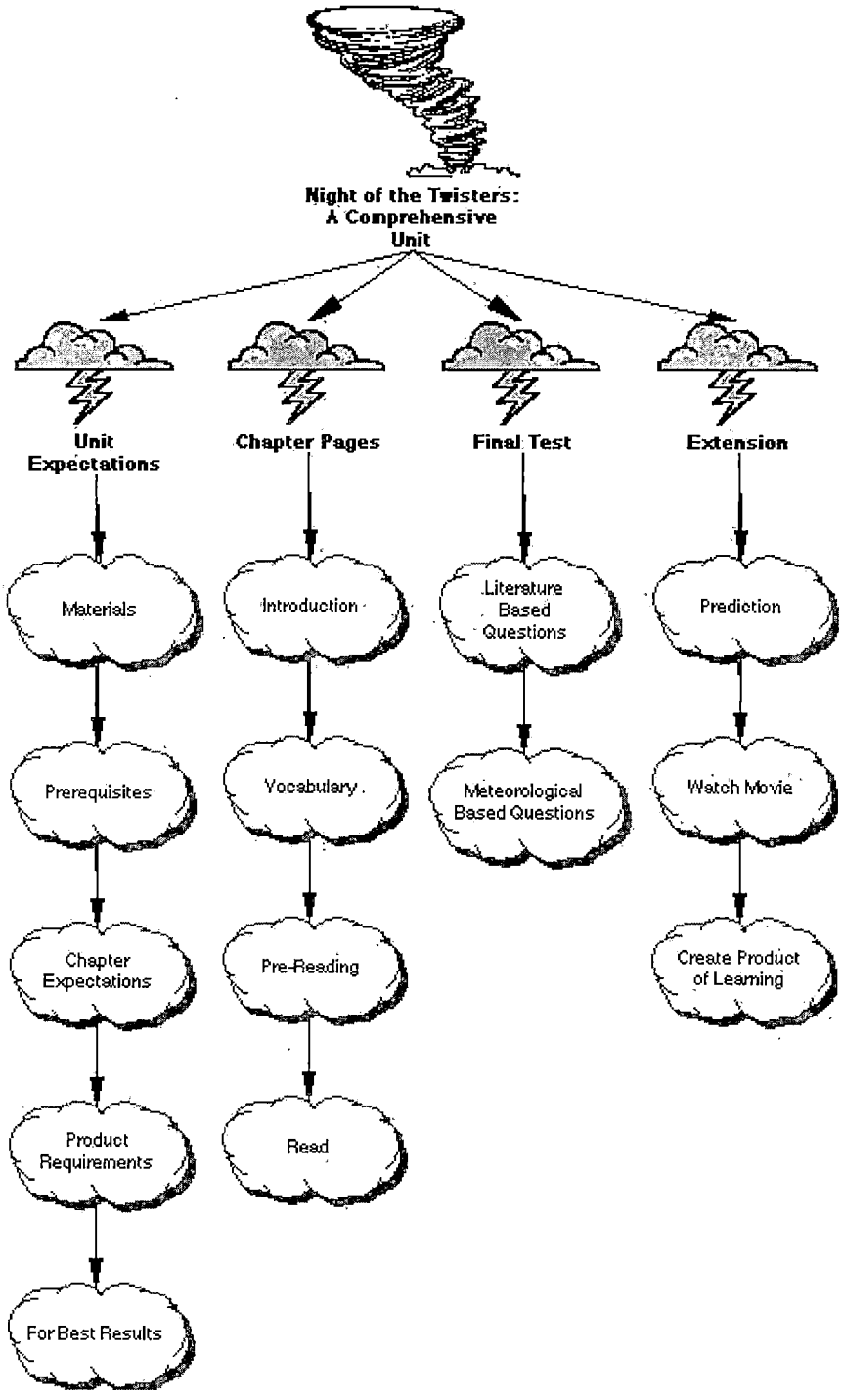


Figure 6. A Flowchart of the Site Organization

Implementation

It is intended that this project be utilized in one of the following ways.

Method #1: Individual Access

This project can easily be used for independent study-completed by any student with advanced reading, technology, and thinking ability. This will be internet-based, thus it can be accessed from any computer with an Internet connection. This can also work well as a home-based independent project. If in the future a more mixed-ability group presents itself, the unit can be utilized with the few high achievers/advanced students using the available classroom computers.

Method #2: Computer Lab Access

Optimally, this project will consist of a whole class being able to access it all at once. As for this author, the whole class will be accessing it all at once utilizing a site computer lab. One lab session will be spent (1 hour) each day for the completion of each of the assigned tasks. The goal is for at least the first three sections of each chapter to be completed in the lab. The 'Read' section will be completed without the use of the Internet. If a student has difficulty completing all of a chapter's

tasks, they will be able to print the chapter page for completion at a later time.

Evaluation

Content Evaluation

At the conclusion of the unit each year, two methods are to be used to test the success of the web site content: The class test average and the success of the finished student portfolios. The expectation for the final test is a class average of 85% or better. The expectation for the portfolio is an average of B or better. Revisions of the web site from year to year will be based on these outcomes. If a class fails to meet these expectations, there is to be an examination of the highly problematic questions/tasks to determine if adjustments need to be made. Thus far, no class has failed to meet the expectations. The only content revisions that have occurred since its inception have been the updating of weather links and some slight rewording in a couple of chapters.

Site Structure Evaluation

The evaluation of the site structure is an ongoing process in that the site is treated as problems become

apparent. Initial student use identified the following issues that needed and received immediate attention.

1. It was determined that all links needed to be set to open in a new browser window. This became apparent after many students would (a) get lost in relation to the chapter or home page, or (b) get so far into a linked web site that pressing the back button became a confusing and time consuming chore.
2. It became obvious that items needing to be printed by the students needed to be in both JPG (web picture) and PDF (personal display) formats.

Student Unit Evaluation

For the purposes of this project, a formative evaluation was conducted (see Appendix E). Five students were chosen (two high performing students, two medium performing students, and one low performing student), each based on the results of their test and portfolio. They completed an informal survey that aimed to get more design and content specific feedback than mere performance data would permit. Figure 7 below details the results.

Results Details

As Figure 7 details, overall, the survey indicated that the web site served the purpose for which it was designed.

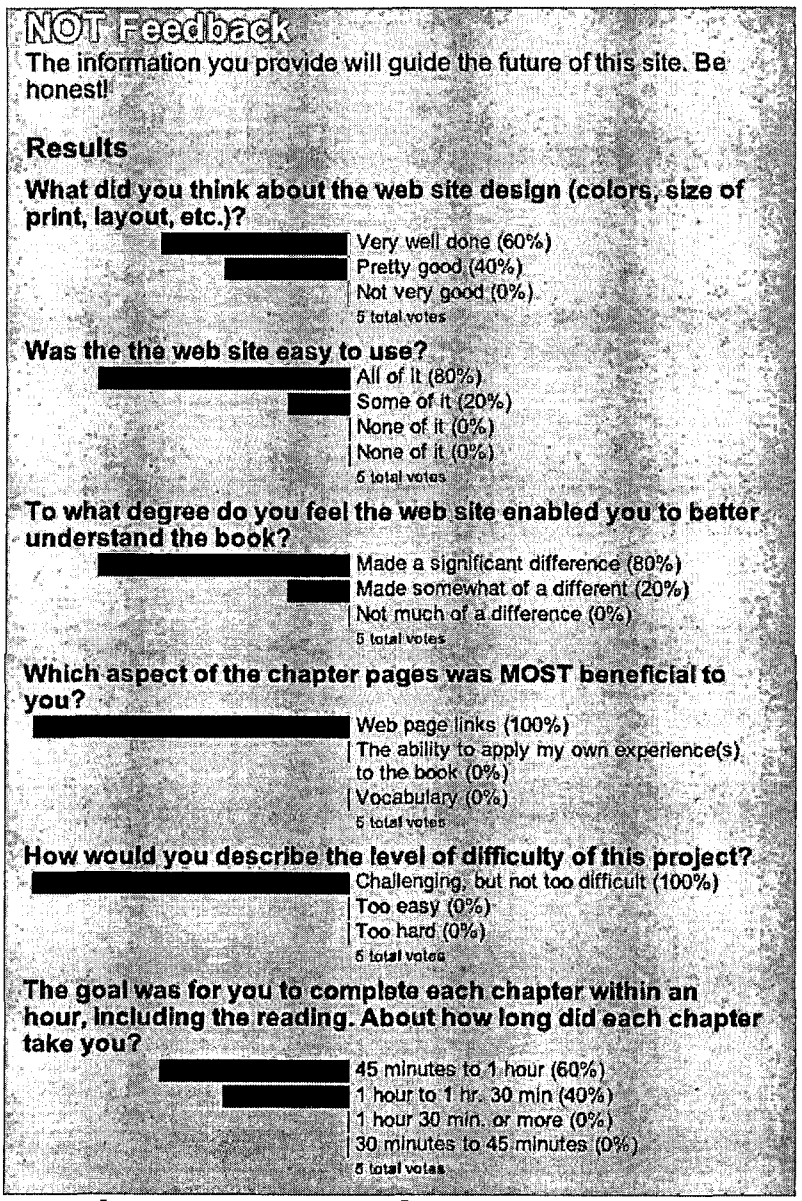


Figure 7. Student Survey Results

Question #1 Findings: Three out of five students found the site to be very well designed. Two people gave it a rating of pretty good. This indicates that overall, the students liked the site layout and it served the purposes of the project.

Question #2 Findings: Four out of five students found the entire site to be user friendly. One person said it was somewhat difficult to use. The exact reason for this rating is unknown. It is possible to speculate that navigating the meteorological links may have contributed to this, as this project task seems to be the most challenging for students.

Question #3 Findings: Four out of five students found the entire site to enhance the meaning of the book. One person said it was somewhat able to enhance the book. Since reading ability and depth of comprehension varies by student, it is possible for students to feel as though some, not all, aspects of the unit enabled a better understanding.

Question #4 Findings: All five students agreed that the web sites were critical to the success of the project.

Question #5 Findings: All five students agreed that the web unit was created at a level that was challenging for them, neither too difficult or simplistic.

Question #6 Findings: Four out of five students fell within the time allotments that were expected for the chapters of this project. One person indicated that it took them longer. Since there was not a significant difference in time between this student and the others, and students are allowed to finish outside of the allotted time, 1 person taking longer than an hour bears no great significance.

Conclusion

All in all, this survey indicated that this is a quality product that is meeting the needs of the target audience and curricular content.

Summary

In summary, the goal of this project was for student users to achieve a high level of (a) reading comprehension, (b) meteorology knowledge as related to tornado phenomena, (c) critical/ analytical thought as related to higher level thinking, and (d) vocabulary development.

As demonstrated by the results, this author is confident that this project produces a much higher level of learning than the book alone otherwise produces.

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

Introduction

The completing of this web-based curricular unit was of great value. Although it required a significant amount of time, the outcome and effect on the learning outcomes of this book's reading made it well worthwhile. As a result of this project, several conclusions are noted. Further, there are several recommendations from the project that are also presented.

Conclusions

The conclusions extracted from the project are as follows.

1. Technology infused literature units can be a very powerful method for learning beyond media print.
2. Experiencing or living what occurs in print produces greater outcomes than mere reading for basic comprehension can produce.
3. The Internet can be a valuable partner with curriculum.
4. Content must be at the forefront of web-based unit creation. Site design detail is important,

but only in relation to the content. If you end up with an intricate site that accomplishes nothing, valuable learning time will be wasted.

5. This unit should be under constant revision. For example, it contains time specific inferences, such as to the 911 attacks on the World Trade Centers. These will have to be updated as time passes in order to be relevant to the students who will use the site at that time.

6. The format of this unit can be utilized and duplicated for many types of classroom literature that involve elements of reality. This author has already begun the creation of a comprehensive unit for the Joan Lowery Nixon book "The Haunting." Because this reading selection involves the need for investigation into the life of Edgar Allen Poe, The Civil War, and the plantations of the South, this offers a rich opportunity for unit development.

Recommendations

The recommendations resulting from the project are as follows.

1. One should carefully detail the curricular objectives prior to beginning the construction of a literature unit.
2. One should test a newly constructed, online unit with a small group, prior to whole class implementation.
3. One should frequently apply an analytical eye to the site to see if it is the quality that they intended. What one believes to be adequately worded is not always the case. What one believes to be user friendly is not always the case in application.
4. It is important to regularly check the site hyperlinks to make sure they are still accurate and active.

Summary

Chapter four has reviewed the conclusions extracted from the project. Given the results that this literature unit has produced, it is inevitable that this author will

apply the same approach to create many other curricular unit projects.

The worth and learning potential of coupling experiential literature practices with Internet-based curricular investigations is quite extraordinary. The combining of these potent elements takes learning from a simplistic methodology to a rich and complex learning endeavor.

APPENDIX A

CD OF PROJECT

APPENDIX B

ENGLISH-LANGUAGE ARTS CONTENT STANDARDS

(e.g., classic and contemporary literature, magazines, newspapers, online information). In grade six, students continue to make progress toward this goal.

Structural Features of Informational Materials

2.1 Identify the structural features of popular media (e.g., newspapers, magazines, online information) and use the features to obtain information.

2.2 Analyze text that uses the compare-and-contrast organizational pattern.

Comprehension and Analysis of Grade-Level-Appropriate Text

2.3 Connect and clarify main ideas by identifying their relationships to other sources and related topics.

2.4 Clarify an understanding of texts by creating outlines, logical notes, summaries, or reports.

2.5 Follow multiple-step instructions for preparing applications (e.g., for a public library card, bank savings account, sports club, league membership).

Expository Critique

2.6 Determine the adequacy and appropriateness of the evidence for an author's conclusions.

2.7 Make reasonable assertions about a text through accurate, supporting citations.

2.8 Note instances of unsupported inferences, fallacious reasoning, persuasion, and propaganda in text.

3.0 Literary Response and Analysis

Students read and respond to historically or culturally significant works of literature that reflect and enhance their studies of history and social science. They clarify the ideas and connect them to other literary works. The selections in *Recommended Readings in Literature, Kindergarten Through Grade Eight* illustrate the quality and complexity of the materials to be read by students.

Structural Features of Literature

3.1 Identify the forms of fiction and describe the major characteristics of each form.

Narrative Analysis of Grade-Level-Appropriate Text

3.2 Analyze the effect of the qualities of the character (e.g., courage or cowardice, ambition or laziness) on the plot and the resolution of the conflict.

3.3 Analyze the influence of setting on the problem and its resolution.

3.4 Define how tone or meaning is conveyed in poetry through word choice, figurative language, sentence structure, line length, punctuation, rhythm, repetition, and rhyme.

3.5 Identify the speaker and recognize the difference between first-and third-person narration (e.g., autobiography compared with biography).

3.6 Identify and analyze features of themes conveyed through characters, actions, and images.

3.7 Explain the effects of common literary devices (e.g., symbolism, imagery, metaphor) in a variety of fictional and nonfictional texts.

Literary Criticism

3.8 Critique the credibility of characterization and the degree to which a plot is contrived or realistic (e.g., compare use of fact and fantasy in historical fiction).

Writing

1.0 Writing Strategies

Students write clear, coherent, and focused essays. The writing exhibits students' awareness of the audience and purpose. Essays contain formal introductions, supporting evidence, and conclusions. Students progress through the stages of the writing process as needed.

Organization and Focus

1.1 Choose the form of writing (e.g., personal letter, letter to the editor, review, poem, report, narrative) that best suits the intended purpose.

1.2 Create multiple-paragraph expository compositions:

a. Engage the interest of the reader and state a clear purpose.

b. Develop the topic with supporting details and precise verbs, nouns, and adjectives to paint a visual image in the mind of the reader.

c. Conclude with a detailed summary linked to the purpose of the composition.

1.3 Use a variety of effective and coherent organizational patterns, including comparison and contrast; organization by categories; and arrangement by spatial order, order of importance, or climactic order.

Research and Technology

1.4 Use organizational features of electronic text (e.g., bulletin boards, databases, keyword searches, e-mail addresses) to locate information.

1.5 Compose documents with appropriate formatting by using word-processing skills and principles of design (e.g., margins, tabs, spacing, columns, page orientation).

Evaluation and Revision

1.6 Revise writing to improve the organization and consistency of ideas within and between paragraphs.

2.0 Writing Applications (Genres and Their Characteristics)

Students write narrative, expository, persuasive, and descriptive texts of at least 500 to 700 words in each genre. Student writing demonstrates a command of standard American English and the research, organizational, and drafting strategies outlined in Writing Standard 1.0.
Using the writing strategies of grade six outlined in Writing Standard 1.0, students:

2.1 Write narratives:

a. Establish and develop a plot and setting and present a point of view that is appropriate to the stories.

b. Include sensory details and concrete language to develop plot and character.

c. Use a range of narrative devices (e.g., dialogue, suspense).

2.2 Write expository compositions (e.g., description, explanation, comparison and contrast, problem and solution):

a. State the thesis or purpose.

b. Explain the situation.

c. Follow an organizational pattern appropriate to the type of composition.

d. Offer persuasive evidence to validate arguments and conclusions as needed.

2.3 Write research reports:

a. Pose relevant questions with a scope narrow enough to be thoroughly covered.

b. Support the main idea or ideas with facts, details, examples, and explanations from multiple authoritative sources (e.g., speakers, periodicals, online information searches).

c. Include a bibliography.

2.4 Write responses to literature:

a. Develop an interpretation exhibiting careful reading, understanding, and insight.

b. Organize the interpretation around several clear ideas, premises, or images.

c. Develop and justify the interpretation through sustained use of examples and textual evidence.

2.5 Write persuasive compositions:

a. State a clear position on a proposition or proposal.

b. Support the position with organized and relevant evidence.

c. Anticipate and address reader concerns and counterarguments.

Written and Oral English Language Conventions

The standards for written and oral English language conventions have been placed between those for writing and for listening and speaking because these conventions are essential to both sets of skills.

1.0 Written and Oral English Language Conventions

Students write and speak with a command of standard English conventions appropriate to this grade level.

Sentence Structure

1.1 Use simple, compound, and compound-complex sentences; use effective coordination and subordination of ideas to express complete thoughts.

Grammar

1.2 Identify and properly use indefinite pronouns and present perfect, past perfect, and future perfect verb tenses; ensure that verbs agree with compound subjects.

Punctuation

1.3 Use colons after the salutation in business letters, semicolons to connect independent clauses, and commas when linking two clauses with a conjunction in compound sentences.

Capitalization

1.4 Use correct capitalization.

Spelling

1.5 Spell frequently misspelled words correctly (e.g., their, they're, there).

Listening and Speaking

1.0 Listening and Speaking Strategies

Students deliver focused, coherent presentations that convey ideas clearly and relate to the background and interests of the audience. They evaluate the content of oral communication.

Comprehension

1.1 Relate the speaker's verbal communication (e.g., word choice, pitch, feeling, tone) to the nonverbal message (e.g., posture, gesture).

1.2 Identify the tone, mood, and emotion conveyed in the oral communication.

1.3 Restate and execute multiple-step oral instructions and directions.

Organization and Delivery of Oral Communication

1.4 Select a focus, an organizational structure, and a point of view, matching the purpose, message, occasion, and vocal modulation to the audience.

1.5 Emphasize salient points to assist the listener in following the main ideas and concepts.

1.6 Support opinions with detailed evidence and with visual or media displays that use appropriate technology.

1.7 Use effective rate, volume, pitch, and tone and align nonverbal elements to sustain audience interest and attention.

Analysis and Evaluation of Oral and Media Communications

1.8 Analyze the use of rhetorical devices (e.g., cadence, repetitive patterns, use of onomatopoeia) for intent and effect.

1.9 Identify persuasive and propaganda techniques used in television and identify false and misleading information.

2.0 Speaking Applications (Genres and Their Characteristics)

Students deliver well-organized formal presentations employing traditional rhetorical strategies (e.g., narration, exposition, persuasion, description). Student speaking demonstrates a command of standard American English and the organizational and delivery strategies outlined in Listening and Speaking Standard 1.0.
Using the speaking strategies of grade six outlined in Listening and Speaking Standard 1.0, students:

2.1 Deliver narrative presentations:

a. Establish a context, plot, and point of view.

b. Include sensory details and concrete language to develop the plot and character.

c. Use a range of narrative devices (e.g., dialogue, tension, or suspense).

2.2 Deliver informative presentations:

a. Pose relevant questions sufficiently limited in scope to be completely and thoroughly answered.

b. Develop the topic with facts, details, examples, and explanations from multiple authoritative sources (e.g., speakers, periodicals, online information).

2.3 Deliver oral responses to literature:

a. Develop an interpretation exhibiting careful reading, understanding, and insight.

b. Organize the selected interpretation around several clear ideas, premises, or images.

c. Develop and justify the selected interpretation through sustained use of examples and textual evidence.

2.4 Deliver persuasive presentations:

a. Provide a clear statement of the position.

b. Include relevant evidence.

c. Offer a logical sequence of information.

d. Engage the listener and foster acceptance of the proposition or proposal.

2.5 Deliver presentations on problems and solutions:

a. Theorize on the causes and effects of each problem and establish connections between the defined problem and at least one solution.

b. Offer persuasive evidence to validate the definition of the problem and the proposed solutions.

APPENDIX C

SCREEN SHOTS

Figure C1. Non-detailed Homepage Screenshot

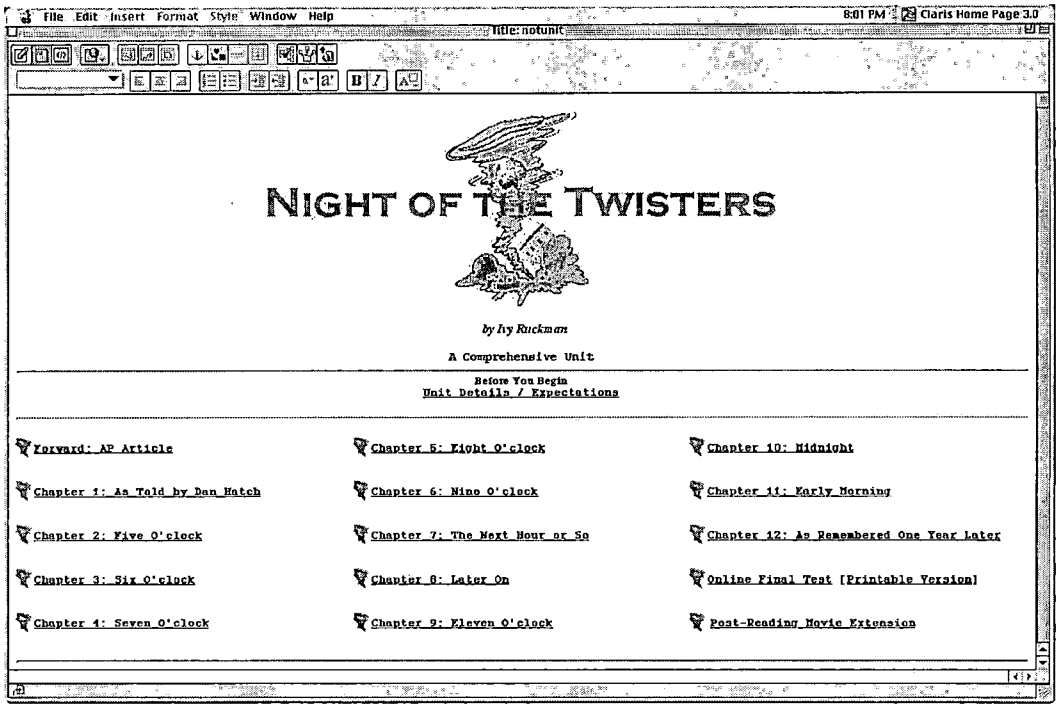


Figure C2. Non-detailed 'Before You Begin' Page Screenshot

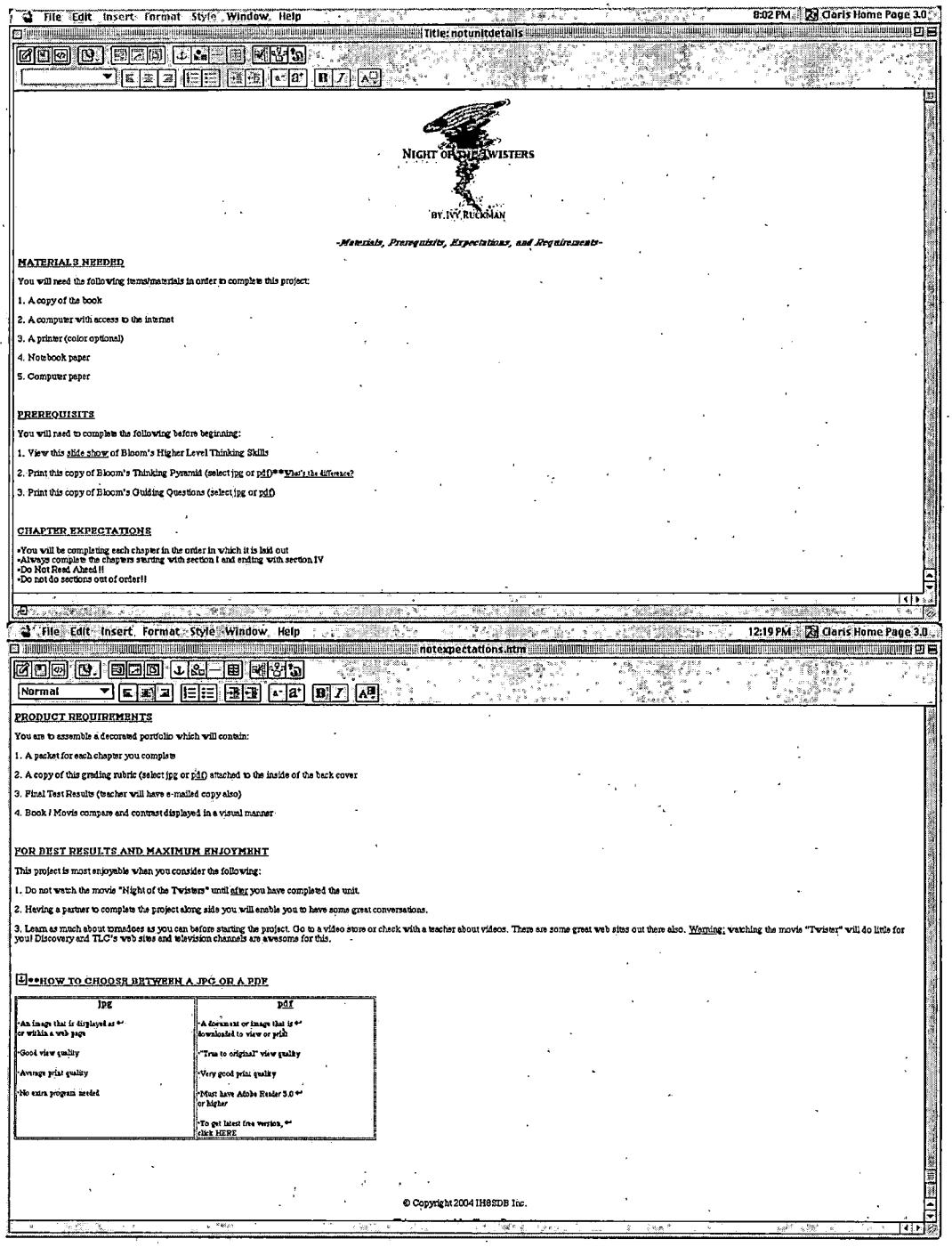


Figure C3. Non-detailed 'Post Reading Movie Extension' Page Screenshot

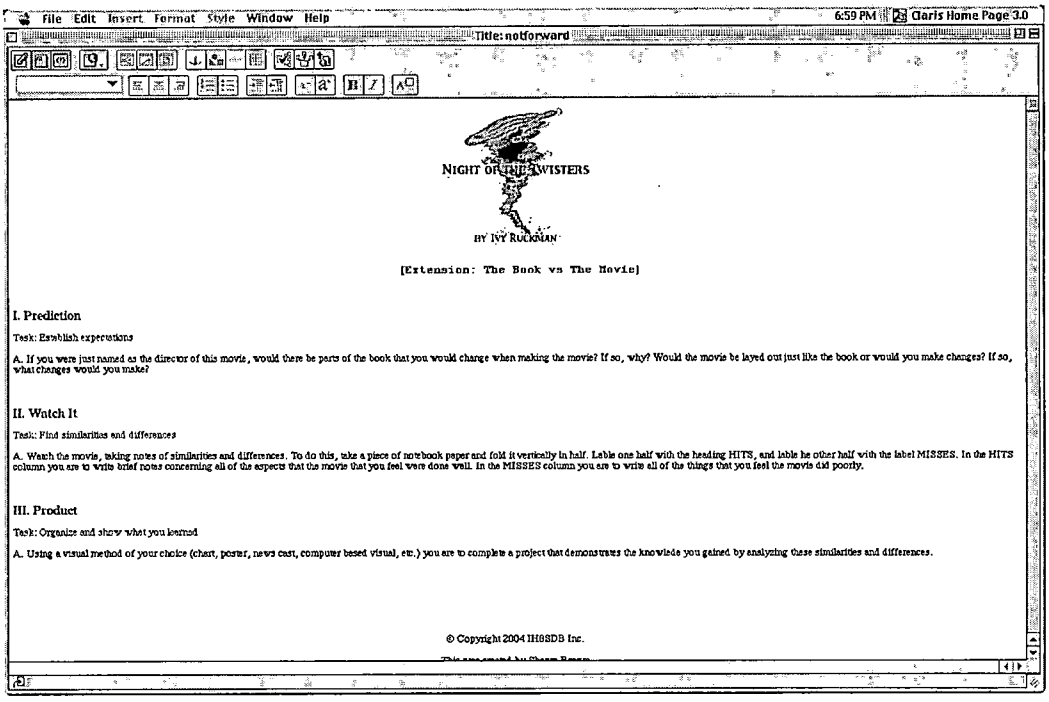


Figure C4. Non-Detailed Chapter Page Screenshot

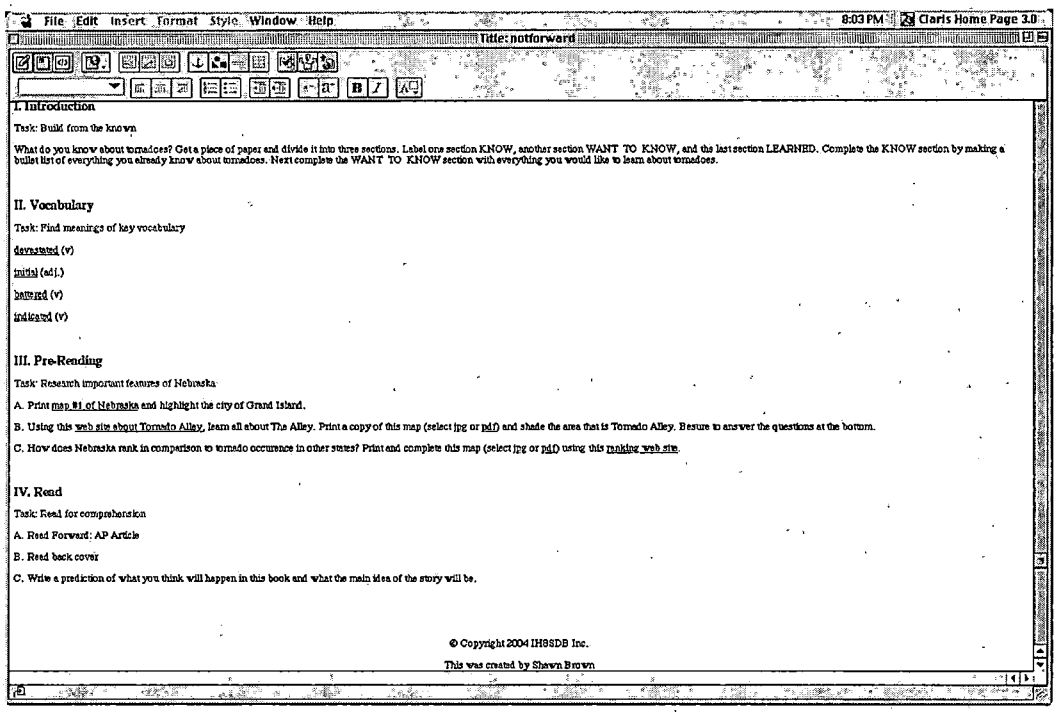
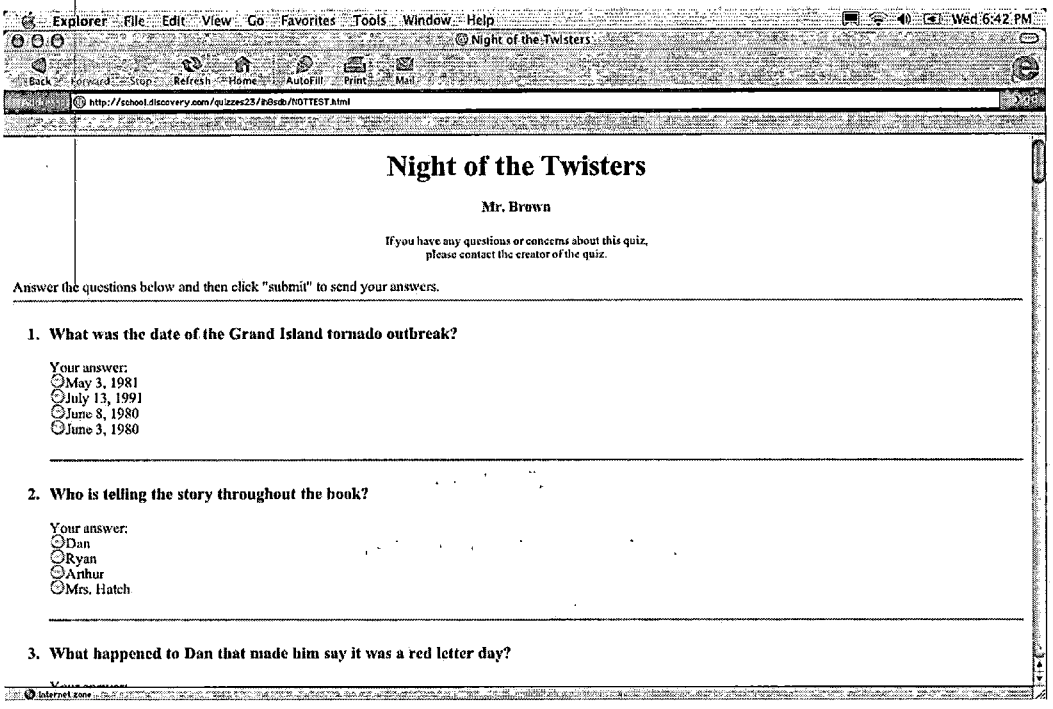


Figure C5. Non-detailed Final Test Page Screenshot



Unit Web Site

http://www.hesperia.k12.ca.us/euc/gradelevelpages/6thgradespecialpages/sbrown/NOT/notunit.htm

USA Today

http://asp.usatoday.com/weather/weatherfront.aspx?POE=HFTABWEA

Weather.com

http://www.weather.com/

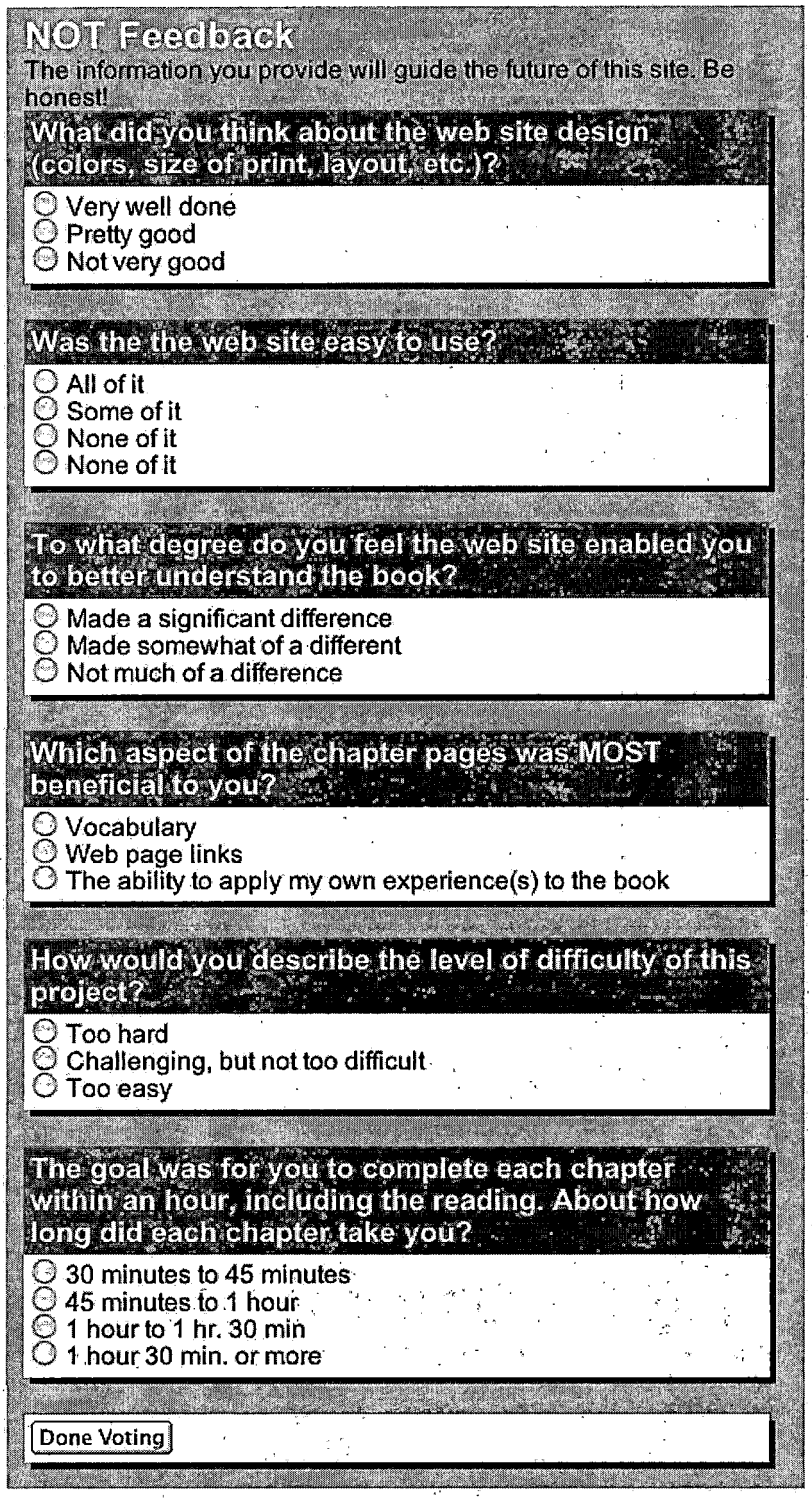
The Grand Island Independent Site

http://www.theindependent.com/twisters/

APPENDIX E

STUDENT SURVEY

Figure 11. Student Survey



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