

This unit is taken from ASCD's Understanding by Design Exchange, an online subscription program dedicated to the design of curriculum, assessment, and instruction that leads students to deep understanding of content. It was developed through ASCD's work with the Environmental Education and Training Partnership (www.eetap.org), a national project funded by the United States Environmental Protection Agency.

Unit Designer: Brenda Weiser

Science : Environmental : Earth Science

UHCL : Grades 6 - 8 : 3 : Mar. - Jun.

Title: **The Aftermath**

Topics: Hurricanes, flooding, watersheds, wetlands, health issues/diseases, emergency management plan

Time

Frame:

Start Date: Mar. 1 - Mar. 15

Status: Revised After Expert Feedback

Date 8/25/2005

Revised:

Other Designers: Tammie Hyde

Summary:

The students will explore the concepts of a hurricane's impact on the environment, society, and economics of a given community. During this unit, students will map the potential storm surge and flooding on a topographic map. In addition, the student will have to locate and report on past hurricanes in a specific geographical region. Students will also develop an overall understanding regarding the impact of a hurricane on watersheds, wetlands, water sources, society, and economics.

Print Materials Needed:

NEEDS ASSESSMENT

1. A hurricane is _____.
2. Have you ever been in a hurricane or a flood? Explain.
3. Described a storm surge and its impact on a community.
4. I would like to learn these things regarding the aftermath of a hurricane.
5. What special skills do you think you would need to know to survive the aftermath of a hurricane?
6. Name some possible injuries that can occur after a hurricane.
 - a. _____
 - b. _____
7. Name some possible health risks you may incur after a hurricane.
 - a. _____
 - b. _____

8. Why are wetlands important to a community after a hurricane?
9. Name some specific cultural or social impacts that aftermath of a hurricane would have.
10. Is there anything you can do to the environment to lessen the impact of a hurricane?

Resources:

Bill Nye the Science Guy, Storms Video and Wetlands Video
 Geoblox 8th Grade Science Book

additional websites

- <http://www.cpsc.gov/cpsc/pub/prerel/prhtml04/04197.html>
- <http://www.nationalgeographic.com/ngkids/0308/hurricane/index.html>
- http://www.fpl.com/storm/contents/hurricane_history.html
- http://www.kenner.la.us/hurricane_wwsa.html
- <http://hurricane.accuweather.com/adcbn/hurricane/index.asp?partner=accuweather>
- <http://www.fsl.noaa.gov/sos/>
- <http://hurricanesoftware.com/?Promo=overture>
- <http://hurricane.csc.noaa.gov/hurricanes/links.htm>
- http://earthobservatory.nasa.gov/NaturalHazards/natural_hazards_v2.php3?topic=storm
- <http://www.fema.com>
- <http://www.fema.gov/library/>
- <http://www.stormcenter.com/main.php>
- <http://www.spc.noaa.gov/>
- <http://www.nhc.noaa.gov/HAW2/english/intro.shtml>

Resource

Attachments:

Internet Resource Links:

- Link 1: http://seagrant.gso.uri.edu/factsheets/aftermath_hurricane.html
- Link 2: <http://www.fema.gov/kids/hurr.htm>
- Link 3: <http://www.earthsky.org/shows/>
- Link 4: <http://www.stormcenter.com/main.php>
- Link 5: <http://www.nhc.noaa.gov/>

Stage 1: Identify Desired Results

State:	National Standard Grades 6 - 8
Title:	National EE Guidelines developed by the NAAEE
Standard(s):	Strand 1: Questioning, Analysis and Interpretation Skills C) Collecting information - Learners are able to locate and collect reliable information using a variety of methods and sources. - Assess, choose, and synthesize materials from resources such as topographic maps, historical documents, and eyewitness accounts; the internet; and government records. Strand 2: Knowledge of Environmental Processes and Systems Strand 2.1: The Earth as a Physical System: A) Processes that shape the Earth - Learners have a basic

understanding of the physical processes that shape the Earth.
- Predict the consequences of specific physical phenomena such as a hurricane in a coastal area.

Strand 2.3: Humans and Their Societies:

C) Political and economic systems - Learners become familiar with political and economic systems and how these systems impact the environment.

- Identify economic and political features of the local community and state, and describe how environmental decisions can be influenced by these economic and political systems and actors.

Texas Science Standards (Grades 6 - 8)

Texas Essential Knowledge and Skills Standards (6th, 7th, & 8th Grade Science)

(6.2, 7.2, 8.2) Scientific processes. The student uses scientific inquiry methods during field and laboratory investigations. The student is expected to (E) construct maps using tools [including computers] to organize, examine, and evaluate data.

(6.3, 7.3, 8.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to (B) draw inferences based on data for products and services.

(7.14, 8.14) Science concepts. The student knows that natural events and human activity can alter Earth systems. The student is expected to (A) describe the impact of a catastrophic event (hurricane or tropical storm); (A) predict land features resulting from gradual changes such as mountain building, beach erosion, land subsidence, [and continental drift] (8.14)

Understandings:

- user** Students will understand that:
1. physical processes shape the Earth.
 2. the environment can be influenced by political and economic systems.
 3. reliable information for making informed decisions regarding a hurricane's aftermath can be located and collected using a variety of methods and sources while applying critical thinking and scientific problem solving skills.
 4. human activity and natural disasters such as hurricanes can alter Earth systems.

Essential Questions:

- user** 1. What can we learn from examining past hurricane aftermaths?
- user** 2. How does the continuous improvement in a community's infrastructure apply to natural disasters?
- user** 3. To what extent are social, political, cultural, and environmental systems related to natural disasters?
- user** 4. How are local economic and political systems and actors influencing environmental decisions?
- user** 5. How are scientific questions answered?
- user** 6. In what ways have advances in human health systems impacted society's preparedness associated with natural disasters and their aftermaths?
- user** 7. What is a healthy wetland and how does it support a coastal community?
- user** 8. Which alters our lives more, nature or human activities?
- user** 9. How would life be different in a coastal community without current technology?

Knowledge and Skills:

Students will know:

1. Key terms: natural disaster, watershed, wetland, hurricane, flooding, emergency management plan, infrastructure, waterborne disease, storm surge, topographical map, epidemiology,
2. Additional Key Terms: NOAA, longitude and latitude, density in population, society, flood control, flood plain, natural vegetation, erosion, subsidence, natural resource, community health, runoff;
3. The functions and characteristics of a wetland;
4. The function and relationship between economical, cultural, and societal systems;
5. Ways to interpret maps, charts, and weather data;
6. The economic, environmental, cultural, and societal impact of past hurricanes;
7. Health risks and related issues with the aftermath of a hurricane.

Students will be able to:

1. Access and analyze information on historical storms and hurricanes;
2. Prioritize and decide on the economic needs of a hurricane stricken area;
3. Using the storm surge data, predict the area that will be impacted by flooding;
4. Identify characteristics of waterborne diseases and analyze the characteristics of environments that promote the transmission of these diseases
5. Describe and explain the functions and characteristics of wetlands along the coastal region as they relate to hurricanes and tropical storms
6. Explain how the environment, social, cultural, and economic systems are impacted by hurricanes;
7. Research and analyze information on current events as they relate to hurricanes;
8. Interpret the impact of a hurricane on land features such as beach erosion
9. Utilize maps, historical documents, and eyewitness accounts; the Internet and

government records to describe the impact of a hurricane on the environment;

10. Communicate through writing or speaking addressing how human activities can alter a hurricane's aftermath.

Stage 2: Determine Acceptable Evidence

Assessment Summary:

The assessment will consist of a variety of activities and opportunities for the students to conduct self-assessment. Below are the suggested assessments:

1. KWL Chart (initial and pre-assessment/needs assessment); also, use the pre-assessment/needs assessment at the midway point of the unit in order to adjust for students' learning or misconceptions; and use the pre-assessment/needs assessment as a post-assessment at the end of the unit.
2. Vocabulary word match - have students use prior knowledge to match key words from the unit to the definitions and give examples of each.
3. Vocabulary word/visual dictionary - students create their own dictionary that represents key words and concepts in a visual manner and have students describe each vocabulary word; no definitions. Students may add to their dictionary as the unit progresses as needed.
4. Apply knowledge of vocabulary words on assessments. This can be on-going throughout the unit.
5. Write an essay addressing the aftermath of a hurricane, including how the aftermath impacts the social, economic, cultural, and environmental aspects of society.
6. Performance Task 1: Persuasive essay with a related multimedia presentation (Building the Coastal Mall of the Wetlands) focusing on the importance of wetlands and how a hurricane's aftermath can impact wetlands. Will include peer and self-assessment opportunities.
7. Know your watershed (Project Aquatic WILD Activity Guide - Watershed; Project WET Activity Guide - Branching Out)
8. Wetlands and their important lab (Project Aquatic WILD Activity Guide - Wetland Metaphor)
9. What happens after flooding (scenario) (Project WET Activity Guide - Aftermath)
10. Selected response/short answer test/quiz addressing key vocabulary, functions and characteristics of a wetland, and impacts of a hurricane on wetlands.
11. Self-assessment - students will respond to reflection questions regarding the Flooding and Storm Surge Impact on Watersheds mapping lab and how interpreting maps, charts, and weather data can benefit human society.
12. Quiz - to assess the students' mastery of the recent concepts relating to hurricanes, tropical storms, flooding and the environmental, economic, and societal impacts.
13. Progress Check - the teacher will formally and informally monitor student progress throughout the unit. Formal monitoring may include such things as KWL charts,

responses in writing prompts and labs, quizzes over vocabulary words or recent concepts, etc. Informal assessment may include key questions (random and strategic), discussions (small and large group), behavior (teamwork, group dynamics, and lab safety), etc.

14. WebQuest/Interview regarding historical hurricanes and storms.

15. Field experience reflections, in the student's science journal, with an emphasis on the characteristics of a local wetland and the importance of wetlands to both humans and wildlife.

16. Performance Task 2: Exhibit or brochure relating to safety and human health issues associated with a hurricane's aftermath. What do we need to know and do to be prepared for a hurricane's aftermath?

17. Science journal - Students will record reflections and self-assessments in order to rethink, discuss, and revise prior ideas.

18. Waterborne diseases and water safety issues can be addressed using the Project WET Activity Guide. (Activities: Super Sleuths - The students will be able to identify the role of water in disease transmission and compare symptoms of several waterborne diseases that could be passed within a community; Poison Pump - The students will be able to apply investigative methods to trace the source of contagious diseases; and A Grave Mistake - The students will be able to identify potential polluters).

Task/Prompt: Performance Task Scenario: Building the Coastal Mall of the Wetlands

Type: Performance Task

Topics: importance of wetlands, impact of a hurricane on wetlands

Summary:

(G) Students task is to research and deliver information about the aftermath of a hurricane.

(R) Students may take the role of an environmentalist, beach homeowner, fisherman, local politician, or builder.

(A) The audience of this scenario will be the local community who are concerned about a building permit to be award to the Coastal Mall of the Wetland. The student will present their position at a town hall meeting.

(S) Builders want to build a new mall over an existing wetland area close to a beach.

This wetland will become a parking lot with underground drainage eventually flowing into the ocean. This will spur the economy so that new housing will spring up along the beach. The challenge is to persuade the community to your point of view related to economical, environmental, social, and cultural issues.

(P) The student will create a persuasive essay with a multimedia presentation supporting or opposing the destruction of wetlands for the building of The Coastal Mall of the Wetlands. The students will present how their position will impact a hurricane's aftermath (human, environment, society, economic).

(S) The students' persuasive essay and multimedia presentation will be judged according to the attached rubric. In addition, the essay must be typed in 12 pitch font, double-spaced, and three pages in length, with page three being a works cited page. It is recommended that another student proofread the essay before it is turned into the teacher. The multimedia presentation must contain at least 10 slides and the first slide must be a title slide. The final slide in the presentation should include works cited. The content of the essay and multimedia presentation should address the function and relationship between economical, cultural, and societal systems as each relates to a wetland and the building of the mall and how building of the mall can alter a hurricane's aftermath. Of course, students will present this information based on the position and role they assume. Students should have time to practice the multimedia presentation.

Print Materials Needed:

Resources:

Resource Attachments:

Internet Resource Links:

State: National Standard

Title: National EE Guidelines

Standard(s): Strand 2- Knowledge of Environmental Processes and Systems
Strand 2.1 - The Earth as a Physical System:
A) Processes shape the Earth - Learners have a basic understanding of the physical processes that shape the Earth.
* Predict the consequences of specific physical phenomena such as a hurricane in a coastal area.
Strand 2.3 - Humans and Their Societies:
C) Political and economic systems - Learners become familiar with political and economic systems and how these systems impact the environment.
* Identify economic and political features of the local community and state, and describe how environmental decisions can be influenced by these economic and political systems and actors.

Texas Essential Knowledge and Skills Standards (6th, 7th, & 8th Grade Science)

(6.3, 7.3, 8.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to
(B) draw inferences based on data [related to promotional materials] for products and services; and

(7.14, 8.14) Science concepts. The student knows that natural events and human activity can alter Earth systems. The student is expected to
(A) describe the impact of a catastrophic event (hurricane or tropical storm);
(A) predict land features resulting from gradual changes such as mountain building, beach erosion, land subsidence, [and continental drift] (8.14)

Notes:

Student Directions:

You will research and deliver information regarding the aftermath of a hurricane. You will select one of the following interest groups (environmentalist, beach homeowner, fisherman, local politician, or builder) and represent their point of view on the building of a new mall (Coastal Mall of the Wetlands). You will present your presentation at a town hall meeting consisting of community members. In your presentation, you should persuade the community to either support or oppose the destruction of wetlands in order to build the Coastal Mall of the Wetlands.

You will create a multimedia presentation using along with a persuasive essay to present your information. You will be evaluated on the indicators of the attached rubric. In addition, the essay must be typed in 12 pitch font, double-spaced, and three pages in length, with page three being a works cited page. It is recommended that another student proofread the essay before it is turned into the teacher. The multimedia presentation must contain at least 10 slides and the first slide must be a title slide. The final slide in the presentation should include works cited. You should have time to practice the presentation.

Rubric(s)

Rubric: Performance Task Scenario: Building the Coastal Mall of the Wetlands Rubric

Summary:

Rubric: Task 1 - 6+1 Trait Writing Model: Persuasive Essay & Multimedia Presentation

Persuasive Essay

Introduction (Organization)

- (4) The introduction is inviting, states the main topic and previews the structure of the paper.
- (3) The introduction clearly states the main topic and previews the structure of the paper, but is not particularly inviting to the reader.
- (2) The introduction states the main topic, but does not adequately preview the structure of the paper nor is it particularly inviting to the reader.
- (1) There is no clear introduction of the main topic or structure of the paper.

Sequencing (Organization of the essay)

- (4) Details are placed in a logical order, and the way they are presented effectively keeps the interest of the reader.
- (3) Details are placed in a logical order, but the way in which they are presented or introduced sometimes makes the writing less interesting.
- (2) Some details are not in a logical or expected order, and this distracts the reader.
- (1) Many details are not in a logical or expected order. There is little sense that the writing is organized.

Recognition of Reader (Voice)

- (4) The reader*s questions are anticipated and answered thoroughly and completely.
- (3) The reader's questions are anticipate and answered to some extent.
- (2) The reader is left with one or two questions. More information is needed to "fill in the blanks".
- (1) The reader is left with several questions.

Capitalization & Punctuation (Conventions)

- (4) Writer makes no errors in capitalization or punctuation, so that paper is

exceptionally easy to read.

(3) Writer makes a few errors in capitalization or punctuation, but the paper is still easy to read.

(2) Writer makes some errors in capitalization and/or punctuation that catch the reader's attention and interrupt the flow.

(1) The writer makes many errors in capitalization and/or punctuation that catch the reader's attention and greatly interrupt the flow.

Word Choice within the Essay

(4) Writer uses vivid words and phrases that linger or draw pictures in the reader's mind, and the choice and placement of the words seems accurate, natural and not forced.

(3) Writer uses vivid words and phrases that linger or draw pictures in the reader's mind, but occasionally the words are used inaccurately or seem overdone.

(2) Writer uses words that communicate clearly, but the writing lacks variety, punch or flair.

(1) Writer uses a limited vocabulary that does not communicate strongly or capture the reader's interest. Jargon or clichés may be present and detract from the meaning.

Focus on Topic (Content)

(4) There is one clear, well focused aftermath issue. The writer's point of view stands out and is supported by detailed information.

(3) The aftermath issue and the writer's point of view are clear but the supporting information is general.

(2) The aftermath issue and the writer's point of view are somewhat clear but there is a need for more supporting information.

(1) The aftermath issue is not clear. There is a seemingly random collection of information.

Conclusion (Organization)

(4) The conclusion is strong and leaves the reader with a feeling that they understand what the writer is "getting at."

(3) The conclusion is recognizable and ties up almost all the loose ends.

(2) The conclusion is recognizable, but does not tie up several loose ends.

(1) There is no clear conclusion, the paper just ends.

Rubric Task 1 - Rubric 2

Multimedia Presentation

Presentation

(4) Well-rehearsed with smooth delivery that holds audience attention.

(3) Rehearsed with fairly smooth delivery that holds audience attention most of the time.

(2) Delivery not smooth, but able to maintain interest of the audience most of the time.

(1) Delivery not smooth and audience attention often lost.

Attractiveness

(4) Makes excellent use of font, color, graphics, effects, etc. to enhance the presentation.

(3) Makes good use of font, color, graphics, effects, etc. to enhance the presentation.

(2) Makes good use of font, color, graphics, effects, etc. but occasionally these detract from the presentation content.

(1) Use of font, color, graphics, effect, etc. but these often distract from the presentation

Content

(4) Covers topic in-depth with precise, well supported data. Develops complex concepts and relationships about topic.

(3) Covers topic effectively with well supported data. Takes topic beyond facts and details.

(2) Covers topic with general facts with little elaboration.

(1) Needs more accurate information to cover topic.

Organization

(4) Content is well organized using headings or bulleted lists to group related material.

(3) Uses heading or bulleted lists to organize, but the overall organization of topics appears flawed.

(2) Content is logically organized for the most part.

(1) There was no clear or logical organizational structure, just lots of facts.

Oral Presentation

(4) Interest, well-rehearsed with smooth delivery that holds audience attention.

(3) Relatively interesting, rehearsed with a fairly smooth delivery that usually holds audience attention most of the time.

(2) Delivery not smooth, but able to hold audience attention most of the time.

(1) Delivery not smooth and audience attention lost.

Knowledge Gained

(4) All the important elements of the persuasive issue are understood and correctly interpreted as a solution to a particular aftermath issue.

(3) The problem of the aftermath issue and the persuasive solution are generally valid.

(2) The problem of the aftermath issue is understood but the persuasive solution is weak and information is flawed.

(1) The problem of the aftermath issue is misunderstood.

Task/Prompt: Dealing with the Aftermath Exhibit or Brochure

Type: Performance Task

Topics: safety and health related to a hurricane's aftermath, FEMA

Summary:

(G) Students will research and deliver safety and health information to the public dealing with the aftermath of Hurricane Wendy.

(R) Students are members of the local emergency management team put in place after a devastating hurricane to prepare for the next hurricane or tropical storm.

(A) The audience will be the entire public affected by the Hurricane Wendy.

(S) The students' home town has been devastated by Hurricane Wendy. Major health and safety hazards needed to be addressed so the public can deal with the

aftermath of this hurricane. Public awareness is essential but the community was not prepared. Now, the community wants to be prepared so they are asking for some educational and outreach materials to be designed for distribution within the community. The student needs to address injury prevention, electrical safety, temporary repairs, drinking water and food safety, assessing loss and damages, insurance claims, and coping with disasters.

(P) Students will prepare a tri-fold brochure or tri-fold exhibit to educate the public in health and safety after a hurricane based on what was learned from historical hurricanes.

(S) Student's brochure or exhibit will be assessed according to the attached rubric. The brochure should be tri-fold using back and front of paper. The exhibit should be a standard size tri-fold exhibit board of any color. Safety and health issues should be documented as well as illustrated.

Print Materials Needed:

Resources:

Resource Attachments:

Internet Resource Links:

State: National Standard

Title: National EE Guidelines

Standard(s): Strand 1. Questioning, Analysis and Interpretation Skills
C) Collecting information - Learners are able to locate and collect reliable information using a variety of methods and sources.
* Assess, choose, and synthesize materials from resources such as topographic maps, historical documents, and eyewitness accounts; the internet; and government records.

Strand 2 - Knowledge of Environmental Processes and Systems

Strand 2.1 - The Earth as a Physical System:

A) Processes shape the Earth - Learners have a basic understanding of the physical processes that shape the Earth.

*Predict the consequences of specific physical phenomena such as a hurricane in a coastal area.

Strand 2.3 - Humans and Their Societies:

C) Political and economic systems - Learners become familiar with political and economic systems and how these systems impact the environment.

*Identify economic and political features of the local community and state, and describe how environmental decisions can be influenced by these economic and political systems and actors.

Texas Essential Knowledge and Skills Standards (6th, 7th, & 8th Grade Science)

(6.2, 7.2, 8.2) Scientific processes. The student uses scientific inquiry methods during field and

laboratory investigations. The student is expected to

(E) construct maps using tools [including computers] to organize, examine, and evaluate data.

(6.3, 7.3, 8.3) Scientific processes. The student uses critical thinking and scientific problem solving to make informed decisions. The student is expected to

(B) draw inferences based on data [related to promotional materials] for products and services; and

(C) represent the natural world using models and identify their limitations.

(7.14, 8.14) Science concepts. The student knows that natural events and human activity can alter Earth systems. The student is expected to (A) describe the impact of a catastrophic event (hurricane or tropical storm);

(A) predict land features resulting from gradual changes such as mountain building, beach erosion, land subsidence, [and continental drift] (8.14)

Notes:

Student Directions:

You will research and deliver safety and health information to the public regarding the aftermath of a hurricane. In your case, Hurricane Wendy has just hit your community. The community is coping with the aftermath but major health and safety hazards needed to be addressed and the community wasn't prepared. Now, the community wants to be prepared so they are asking for some educational and outreach materials to be designed for distribution within the community. You are a member of the local emergency management team and you need to reach the general public affected by the hurricane. There are major health and safety issues to be addressed along with assessing loss and damages, insurance claims, and just coping with the disaster. So, in order to be prepared for the next hurricane or tropical storm, you are to prepare a tri-fold brochure or exhibit that will be used to educate the public regarding the health and safety after a hurricane. Your brochure or exhibit will be graded based on the appropriate rubric. In addition, the brochure should be tri-fold using back and front of paper. The exhibit should be a standard size tri-fold exhibit board of any color. Safety and health issues should be documented as well as illustrated.

Rubric(s)

Rubric: Dealing with the Aftermath Exhibit or Brochure

Summary:

Rubric: Task 2 - Rubric 1 Brochure/Exhibit

Content - Accuracy

(4) Accurate and relevant facts, and important ideas for all three topics (health, safety, and hurricane preparedness) are displayed on the exhibit/brochure to communicate the content clearly and effectively.

(3) Accurate and relevant facts, and important ideas for two of the three topics (health, safety, and hurricane preparedness) are displayed on the exhibit to communicate the content clearly and effectively.

(2) Accurate and relevant facts and important ideas for at least one of the three topics (health, safety, and hurricane preparedness) are displayed on the exhibit to communicate the content clearly and effectively or inaccuracies exist.

(1) Accurate and relevant facts and important ideas relating to the three topics (health, safety and hurricane preparedness) are not displayed on the exhibit to communicate the content clearly and effectively or major inaccuracies exist.

Required Elements

(4) The exhibit includes all required elements as well as additional information.

(3) All required elements are included on the exhibit.

(2) Most of the required elements are included on the exhibit.

(1) Several required elements were missing.

Graphics - Clarity

(4) Graphics are all in focus and the content easily viewed and identified.

(3) Most graphics are in focus and the content easily viewed and identified.

(2) Some graphics are in focus and the content easily viewed and identified.

(1) Many graphics are not clear or are too small.

Graphics - Relevance

(4) All graphics are related to the topic and make it easier to understand. All borrowed graphics have a source citation.

(3) All graphics are related to the topic and most make it easier to understand. All borrowed graphics have a source citation.

(2) All graphics relate to the topic. Most borrowed graphics have a source citation.

(1) Graphics do not relate to the topic OR several borrowed graphics do not have a source citation.

Attractiveness

(4) The brochure/exhibit is exceptionally attractive in terms of design, layout, and neatness.

(3) The brochure/exhibit is attractive in terms of design, layout, and neatness.

(2) The brochure/exhibit is acceptably attractive though it may be a bit messy.

(1) The exhibit is distractingly messy and very poorly designed. It is not attractive.

Knowledge Gained

(4) Student can accurately answer all questions related to facts in the brochure/exhibit and processes used to create the brochure/exhibit.

(3) Student can accurately answer most questions related to facts in the brochure/exhibit and processes used to create the brochure/exhibit.

(2) Student can accurately answer some questions related to facts in the brochure/exhibit and processes used to create the brochure/exhibit.

(1) Student appears to have insufficient knowledge about the facts or processes used to create the brochure/exhibit.

Other assessment evidence to be collected:

Product check

1. KWL Chart (initial and pre-assessment/needs assessment); also, use the pre-assessment/needs assessment at the midway point of the unit in order to adjust for

students' learning or misconceptions; and use the pre-assessment/needs assessment as a post-assessment at the end of the unit.

2. Vocabulary word match - have students use prior knowledge to match key words from the unit to the definitions and give examples of each.

3. Vocabulary word/visual dictionary - students create their own dictionary that represents key words and concepts in a visual manner and have students describe each vocabulary word; no definitions. Students may add to their dictionary as the unit progresses as needed.

4. Apply knowledge of vocabulary words on assessments. This can be on-going throughout the unit.

5. Write an essay addressing the aftermath of a hurricane, including how the aftermath impacts the social, economic, cultural, and environmental aspects of society.

6. Performance Task 1: Persuasive essay with a related multimedia presentation (Building the Coastal Mall of the Wetlands) focusing on the importance of wetlands and how a hurricane's aftermath can impact wetlands. Will include peer and self-assessment opportunities.

7. Know your watershed (Project Aquatic WILD Activity Guide - Watershed; Project WET Activity Guide - Branching Out)

8. Wetlands and their important lab (Project Aquatic WILD Activity Guide - Wetland Metaphor)

9. What happens after flooding (scenario) (Project WET Activity Guide - Aftermath)

14. WebQuest/Interview regarding historical hurricanes and storms.

16. Performance Task 2: Exhibit or brochure relating to safety and human health issues associated with a hurricane's aftermath. What do we need to know and do to be prepared for a hurricane's aftermath?

18. Waterborne diseases and water safety issues can be addressed using the Project WET Activity Guide. (Activities: Super Sleuths - The students will be able to identify the role of water in disease transmission and compare symptoms of several waterborne diseases that could be passed within a community; Poison Pump - The students will be able to apply investigative methods to trace the source of contagious diseases; and A Grave Mistake - The students will be able to identify potential polluters).

Selected Response/Short-answer test/quiz

10. Selected response/short answer test/quiz addressing key vocabulary, functions and characteristics of a wetland, and impacts of a hurricane on wetlands.

12. Quiz - to assess the students' mastery of the recent concepts relating to hurricanes, tropical storms, flooding and the environmental, economic, and societal impacts.

Student self-assessment

1. KWL Chart (initial and pre-assessment/needs assessment); also, use the pre-assessment/needs assessment at the midway point of the unit in order to adjust for students' learning or misconceptions; and use the pre-assessment/needs assessment as a post-assessment at the end of the unit.

6. Performance Task 1: Persuasive essay with a related multimedia presentation (Building the Coastal Mall of the Wetlands) focusing on the importance of wetlands and how a hurricane's aftermath can impact wetlands. Will include peer and self-assessment opportunities.

11. Self-assessment - students will respond to reflection questions regarding the Flooding and Storm Surge Impact on Watersheds mapping lab and how interpreting maps, charts, and weather data can benefit human society.

15. Field experience reflections, in the student's science journal, with an emphasis on the characteristics of a local wetland and the importance of wetlands to both humans and wildlife.

17. Science journal - Students will record reflections and self-assessments in order to rethink, discuss, and revise prior ideas.

Process check

13. Progress Check - the teacher will formally and informally monitor student progress throughout the unit. Formal monitoring may include such things as KWL charts, responses in writing prompts and labs, quizzes over vocabulary words or recent concepts, etc. Informal assessment may include key questions (random and strategic), discussions (small and large group), behavior (teamwork, group dynamics, lab safety), etc.

Stage 3: Plan Learning Experiences and Instruction

Learning Activities:

1. KWL Chart to be used with pre-assessment, midway and at the end of the unit. Students interact with teacher in a whole group to complete a large KWL chart focusing on hurricanes, their impact on the environment, society, economics, and cultures, and associated terminology. Once the students have identified "What" they want to know, these prompts can serve to help guide the unit. (W, H)

2. Needs assessment - attached. (H, E2)

3. Explain final tasks - Introduce Essential Questions - The teacher will lead discussions to further clarify the learning goals and objectives for the unit to make sure the students know and understand the learning goals, why they are learning the content, and what is required of them at the end of the unit. (W, H, E2)

4. What can we learn from examining past hurricane aftermaths? Students respond to this prompt in their science journal and offer a detailed explanation regarding their

answers. Response may begin with but not limited to these sentence stems, "After a hurricane ... can occur." or "As a result of a hurricane, you can see...." The teacher may have the student create their own questions or statements to address what can we learn from examining past hurricane aftermaths. (H, E2, T)

5. Direct instruction - various topics and content. The teacher may provide note pages, handout materials, or supplemental materials to address the needs of the learners. (On going throughout unit as needed.) (E1, T)

6. Vocabulary words match - have students use prior knowledge to match key words from the unit to the definitions and give examples of each. Have the students check their understandings of the vocabulary through peer evaluation and self evaluation. The teacher can make adjustments to address the needs of the learners. (E1, R, E2, T)

7. Vocabulary word/visual dictionary - students create their own dictionary that represents key words and concepts in a visual manner and have students describe each vocabulary word; no definitions. This approach can allow for the needs of differentiated learners to be addressed. Students may add to their dictionary as the unit progresses as needed. Students may present their dictionaries to others in the class for a quick peer evaluation and progress check. (E1, R, E2, T)

8. Word wall - as the students learn key vocabulary, the words are placed on a large wall chart as a visual reminder of the words learned and as a progress tracking chart. Students may participate in placing peer reviews/comments on the word wall. This can be on-going throughout the unit as needed. (E1, R, T)

9. Apply knowledge of vocabulary words on assessments. This can be on-going throughout the unit. (R, E2)

10. Know your Watershed (Project Aquatic WILD Activity Guide - Watershed). In this activity, the student will be able to discuss characteristics of a watershed, explain how a watershed drains or moves water within a watershed, and give examples of watershed conservation. Embedded in this activity are options for differentiated learning by including a variety of learning styles (hands-on, inquiry-based, writing prompts, additional reading resources, audio-visual materials, etc.). (E1, T)

11. Flooding and Storm Surge Impact on watersheds Mapping Lab. Map a 20' storm surge on a topographic map of coastal area. Identify the land that would be flooded and discuss the impact on the community. Discuss beach erosion to promote various perspectives and allow students to reconsider their preconceived notions/knowledge (allowing for shifting of thoughts or beliefs). Include a field experience if possible to a beach or an area that has been flooded due to a storm surge or tropical storm. (H, E1, R, T)

12. Wetlands and their importance lab (Project Aquatic WILD Activity Guide - Wetland Metaphor). Students will be able to describe the characteristics of a wetland and evaluate the importance of wetlands to both humans and wildlife. Embedded in this activity are options for differentiated learning by including a variety of learning styles (hands-on, inquiry-based, writing prompts, additional reading resources, audio-visual materials, etc.). (E1, R, T)

13. Field experience or field trip to examine the characteristics of a local wetland and evaluate the importance of wetlands to both humans and wildlife, if possible in your area. Students will record their observations in their science journal (using the best method for each student) and reflect on their beliefs. Allow time for students to re-examine their beliefs regarding wetlands. (H, E1, R, T)

14. Wetland Wheel - Students will be given an opportunity to design a graphic organizer to illustrate their understanding of the concept of wetlands and their importance. Students may use library books, notes, and other resources to accommodate their differing needs. (E1, T, O)

15. Flip Chart Wetland Tour - Post flip chart paper around the room with the following questions: a. What do you really understand about wetlands? b. What questions and uncertainties do you have about wetlands? c. How has what you learned about wetlands relate to the present and future? d. How does what you've learned about wetlands connect to other learnings in this unit? Now have the students walk around the room to self-assess their knowledge and understandings regarding wetlands. Students may write directly on each flip chart paper to record their comments or use sticky notes that can be placed on the flip chart paper. Once the class has completed the tour, then discuss the comments/answers. (R, E2, T)

16. What is a persuasive essay? Either the entire class or small groups brainstorm about positions that could be taken when writing a persuasive essay relating to building on current wetlands. Discuss what a persuasive essay "does." (E, T)

17. Storyboard for multimedia presentation. Students will prepare a slide by slide plan of their multimedia presentation on paper before they begin to create it on the computer. Students will present their multimedia draft to their teacher in order to gain feedback prior to proceeding to the final product. (R, E2, T)

18. Performance Task 1: Persuasive essay with a related multimedia presentation (Building the Coastal Mall of the Wetlands) focusing on the importance of wetlands and how a hurricane's aftermath can impact wetlands. Will include peer and self-assessment opportunities. Presentation of Performance Task where appropriate. (H, E1, R, T)

19. Outline for writing - students will prepare a draft outline of the content of their essay before actually writing it. The draft will be presented to the teacher for approval prior to proceeding to the final copy. The content of the essay will be linked to the multimedia presentation. (E1, R, E2, T)

20. Allow time, as determined by the teacher, for the students to practice their presentation in front of their peers and receive feedback by their peers. (R, E2, T)

21. Aftermath of a hurricane (Project WET Activity Guide - Aftermath). Students will assess economic effects of water-related disasters, such as hurricanes, for both individuals and communities. Embedded in this activity are options for differentiated learning by including a variety of learning styles (hands-on, inquiry-based, writing prompts, additional reading resources, audio-visual materials, etc.). (E1, T)

22. Unit Progress Chart - This large wall organizer is designed like a calendar. It should track the progress of the students as they work their way through the unit, develop key understandings, and accomplish key objectives/tasks/assignments. This can be continued throughout the unit. (W, T, O)

23. Quiz - to assess the students' mastery of the recent concepts relating to hurricanes, tropical storms, flooding and the environmental, economic, and societal impacts. (E1)

24. Illustrate economic impact according to culture, fishing, beaches, businesses, and subdivisions using graphic organizers during a group discussion. (H, E1, T, O)

25. Student will prepare a WebQuest report on past hurricane on specific geographical region. The student may be given the option of conducting a personal interview with someone who experienced a hurricane in their community or utilize the library and conduct research on local newspaper articles or other resources. The student needs to address the number of people evacuated or displaced, the damage cost, the number of people who died, and infrastructure damage. How do you rebuild and where do you start? (R, T)

26. WebQuest Self Assessment. Have the student answer the following questions regarding their WebQuest: a. What would you do differently with your WebQuest? Why? b. What are you most proud of on your WebQuest? Why? c. What are most disappointed in regarding your WebQuest? Why? d. What grade or score would you give yourself on your WebQuest? Why? (E2)

27. Write an essay addressing the aftermath of a hurricane, including how the aftermath impacts the social, economic, cultural, and environmental aspects of society. (E1, T)

28. Storyboard for brochure or exhibit. Students will prepare a plan for their brochure or exhibit on paper before they begin to create it on the computer or on the display board. (R, T)

29. Outline for writing - students will prepare a draft outline of the content of their essay before actually writing it. The content of the essay will be linked to the multimedia presentation. (E1, R, T)

30. Performance Task 2: Exhibit or brochure relating to safety and human health issues associated with a hurricane's aftermath. What do we need to know and do to be prepared for a hurricane's aftermath? Presentation of Performance Task where appropriate. (H, E1, R, T)

31. Guest speaker can be invited to the class to discuss how current environmental decisions are influenced by local economic and political systems and actors. It is critical that these guest speakers are not brought into the room too soon. You want the students to have an understanding of how current environmental decisions are influenced by local economic and political systems and actors before the speakers arrive so that they can interact with the speakers intelligently. In small groups, have your students brainstorm some questions that could be asked. You should review the questions in advance, either by a team of students (or the teacher) to ensure the quality of the question. As a follow-up to the speaker, have the students reflect on the speaker's presentation to re-examine his/her point of view and understandings. You may ask them to write their comments in their science journals. (H, R, T)

32. Waterborne diseases and water safety issues can be addressed using the Project WET Activity Guide. (Activities: Super Sleuths - The students will be able to identify the

role of water in disease transmission and compare symptoms of several waterborne diseases that could be passed within a community; Poison Pump - The students will be able to apply investigative methods to trace the source of contagious diseases; and A Grave Mistake - The students will be able to identify potential polluters). (E1, T)

33. Progress Check - the teacher will formally and informally monitor student progress throughout the unit. Formal monitoring may include such things as KWL charts, responses in writing prompts and labs, quizzes over vocabulary words or recent concepts, etc. Informal assessment may include key questions (random and strategic), discussions (small and large group), behavior (teamwork, group dynamics, and lab safety), etc. (This will be on-going throughout the unit.) (H, E1, R, E2, T, O)

Notes: The following tasks might be used by the teacher as advance preparation for the unit. This includes: securing a guest speaker; appropriate field trip information, permission, arrangements are made; preparation of target vocabulary; and identification of key words and phrases that will need to be mastered by the students during the course. (E, T, O) In addition, the teacher may need to secure resource materials from the library, identify key URL/Internet sites, and computer labs for the research portion of the unit. (E, T, O) Also, identify and secure all lab equipment needed for the appropriate activities/labs. (E, T, O)

The activities from Project WILD, Project WET, and WOW: The Wonders of Wetlands are interdisciplinary and encourage a variety of assessments, including self-assessment and reflection. Each activity selected allows the teacher to address differentiated learning and a variety of teaching strategies. (E1, E2, R, T) Finally, the teacher may want to select one of the two performance tasks to implement with this unit depending on the level of the student. Performance task one (essay and presentation) may meet the needs of your learners better than performance task two (brochure) or the other way around. This allows for you to address the needs of your learners. (E,T,O)