

**Kathryn Turner**

**Lesson overview**

Subject:	Earth Science
Grade:	9th
Topic:	Severe weather
Concepts:	Change; patterns, cause and effect
SOL:	ES.13 The student will investigate and understand that energy transfer between the sun and the Earth and its atmosphere drives weather and climate on Earth. Key concepts include c) severe weather occurrences, such as tornadoes, hurricanes, and major storms
Essential questions:	<ul style="list-style-type: none"><li>• What causes severe weather?</li><li>• What are the effects of severe weather?</li><li>• Where do most types of severe weather occur in America?</li><li>• How do people prepare for severe weather?</li><li>• What are patterns of all severe weather storms?</li></ul>

**Objectives**

❖ Students will know:

- Severe weather-related vocabulary - hurricanes, tornadoes, severe thunderstorms, floods, and winter storms
- Causes of severe weather
- Effects of severe weather
- Geographical regions where severe storms are likely to occur
- Disaster response/preparedness
- Career opportunities related to severe weather
- Patterns of all severe weather storms

❖ Students will understand:

- Understanding patterns and cause-and-effect relationships help us make more accurate weather predictions.
- Following safety precautions can help a person stay safe.

❖ Students will be able to do:

- Draw on a map to show where the major types of storms occur in the U.S.A.
- Explain why each type of storm occurs in a certain geographic location.
- Identify three patterns that are characteristic of all storms.
- State the causes and effects of each type of storm.

- Explain how knowing the cause and effects of storms can help us predict future storms.
- Research and write a newscast about a famous storm.

*Optional:*

- Create a severe weather safety visual.
- Interview a person about a storm they experienced.
- Write a narrative about a character who is in a storm.
- Research and give an oral presentation about careers related to severe weather.
- Play a computer game and write a paragraph giving advice about severe weather safety.

**Range or description of learner needs in your class related to this topic**

- The students in my (imaginary) classroom are currently on varying academic levels. Students have both science content knowledge and reading skills that range from below grade level (grades 7-8), on grade level (grade 9), and above grade level (i.e. grades 10-12). Additionally, they all have various interests and enjoy learning in a variety of ways (i.e. visual, kinesthetic, auditory, etc.).
- The activities in this lesson are designed to address student readiness, learning profiles, and interests.

**Factors and elements you'll need to consider in developing the Contracts**

(related to time, students, space, materials, etc.)

- Students will be given about five school days to complete the learning contract. Work time will be provided in class, but additional work outside of class may be necessary.
- A variety of materials will be provided for the learning contracts, including Internet access, books, newspaper/magazine articles, maps, charts, poster board, paper, markers, etc..
- Students will complete several learning contracts over the course of the year. It is important that they have independent work and time management skills.

**Pre-assessment plans:**

- Students will be pre-assessed for their reading level. Depending on their reading level, students will be given reading material (i.e. Internet websites, books, articles) about storms based on their ability.
- Prior to the start of the unit, students will be pre-assessed on their knowledge of weather, including severe storms.

**Specific task to be included in the contracts:**

- Please see the learning contract below.

**1. Working guidelines for students:**

- Students choose tasks from the menu. Three tasks are required, and at least two other tasks may be chosen based on interest.
- The contracts must be signed by both the student and teacher before work can commence.
- Students keep track of their progress in their daily log.
- Students work independently.
- Student work will be kept in their individual folders and will be placed in a basket at the back of the room.
- Students complete a self-evaluation once they complete all of their tasks.

**2. Time line requirements and student planning:**

- Students will be given five school days to complete their learning contract.
- Additional time may be spent on the tasks outside of class.

**3. Assigning students to contracts:**

- The tasks will be designed by the teacher and will align with the KUD's (what students need to know, understand, and be able to do).
- Students will have some choice in the specific tasks they complete based on the guidelines.

**4. Introducing the Learning Contracts to students:**

- By the time this activity is presented, students will be familiar with learning contracts, time management skills, and independent work skills.
- Each task in the learning contract will be explained to students as a whole-class.
- Students will then be given an opportunity to choose the tasks they want to complete.
- Individual students or small groups of students will meet with the teacher to discuss their contracts, which will then be signed by both the student and the teacher.

**Assessment plans :**

**1. how work will be graded**

- Student work will be graded based on six pieces of criteria:
  - How well students work throughout the week (i.e. did they work independently, did they use their time wisely)
  - If the completed folder was turned in on time
  - 1 Personal Choice task that students choose to be graded
  - 1 Teacher Choice task that is chosen by the teacher at random to be graded
  - Self-Evaluation of each task

**2. Monitoring student work and progress:**

- Teacher will act as a “guide” and monitor student work and progress throughout the week.
- Teacher checks in with students regularly to scaffold learning and check on organization of materials.

- Teacher provides clear directions, criteria and rubrics for learning contracts.
- Teacher will meet with individuals and small groups of students to check in on their progress, answer questions, and provide feedback.
- Teacher will meet with the whole-class occasionally to get a sense of how they are doing, give directions, and answer general questions.
- Students will have worked with learning contracts prior to this lesson. However, small groups of students may be pulled aside if additional work is needed. In such a case, modeling, teaching, and practicing essential skills (i.e. time management, independent work skills, record keeping) may be used.

3. Checking work for accuracy, understanding, and quality:

- A short rubric for each task will be provide to the students so they are able to check their own work for accuracy, understanding, and quality.
- The same rubric will be used by the teacher to assess student’s work and understanding.

4. Turning work in-when and how:

- Students will have one week to complete their learning contract from the day that it is presented.
- Students will turn in their tasks in their folders, which will hold all of their work and research throughout the week.
- Students will turn in:
  - At least five tasks (students will mark their Personal Choice task with a star)
  - Self-Evaluation of each task

**Learning Contracts**

**Menu of the Week:** Severe Weather

**Due:** All items in the main dish and the specified number of side dishes must be complete by the due date: March 31, 2009. You may select among the side dishes and you make decide to do some of the dessert items, as well. Upon completion of each task, be sure to fill out a self-evaluation form.

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**Main Dishes** *(Please complete all three tasks)*

**1. Map**

- Using the Internet as a resource and a map of the U.S.A, show where hurricanes, tornadoes, winter storms, severe thunderstorms, and floods are likely to occur.
- Include a map key with symbols to identify each type of severe weather.
- On the back of your map, state at least one reason why each type of event happens in particular geographic locations.

## 2. Chart

- Using the Internet, books, and additional resources, create a chart of the five major types of severe weather (hurricanes, tornadoes, winter storms, severe thunderstorms, and floods).
- Include a brief description of each type of storm, as well as their cause and effects.
- In a brief essay, identify at least three patterns that are characteristic of all storms. Also, explain how knowing the cause and effects of storms can help us predict weather in the future.

## 3. Newscast

- Using books and newspaper/magazine articles, write a newscast for a television station focusing on a famous severe weather event of your choice.
  - Give an “on-the-scene” account of the situation.
  - Describe the severe weather event, the damage being done, how people are reacting, and what emergency action is being taken.
- .....

## **Side Dishes** *(Please complete at least two tasks)*

### 1. Visual

- Using resources for research, create a visual (i.e. poster, brochure, booklet) illustrating severe weather safety.
- Include a list of what a person can do before severe weather strikes, as well as safety rules to follow during a storm.

### 2. Interview

- Interview a person who has faced a powerful act of nature.
- Write at least six interview questions to help you learn about the sequence of events, how they coped, what understanding or insight he/she gained from the experience.

### 3. Narrative

- Write a narrative passage in which the main character is in a natural disaster.
  - The narrative may be based on experiences you have had.
  - Include the sequence of events and the character’s responses to the experience.
  - Be sure to include accurate information.
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## **Desserts** *(Tasks are optional)*

### 1. Oral Presentation

- Use the Internet to develop and present an oral presentation about severe weather-related careers.

- Choose a careers to research and report on.
- Include a job description, educational requirements (i.e. school, training) and benefits of the job, as well as any interesting facts you find.

## 2. Computer Game

- Go to <http://www.theweatherchannelkids.com/weather-games/games-and-interactive/severe-weather-challenge/>
- Use your severe weather knowledge to give families help and advice about severe weather safety in their region.
- Write a paragraph about the advice you give the families.

### Rubric

\*\*The rubric will be used as a self-assesement tool for the students, as well as an assessment tool for the teacher.

<p><b>1. <u>Map</u></b></p> <p>___ Follow directions</p> <p>___ Map is correct and labeled</p> <p>___ Includes map key</p> <p>___ 5 reasons given for occurrence of event</p> <p>___ Neat and accurate</p> <p><b>Total:</b> ___</p>	<p><b>2. <u>Chart</u></b></p> <p>___ Follow directions</p> <p>___ Description of each storm</p> <p>___ Causes of each storm</p> <p>___ Effects of each storm</p> <p>___ Essay includes required elements</p> <p>___ Essay is accurate</p> <p>___ Chart is neat and content is accurate</p> <p><b>Total:</b> ___</p>	<p><b>3. <u>Newscast</u></b></p> <p>___ Follow directions</p> <p>___ Description of famous event</p> <p>___ Description of damage</p> <p>___ Description of how people are reacting</p> <p>___ Description of emergency action</p> <p>___ Content is accurate</p> <p><b>Total:</b> ___</p>
<p><b>4. <u>Visual</u></b></p> <p>___ Follow directions</p> <p>___ At least 6 things a person can do before a storm to prepare</p> <p>___ At least four things a person can do during a storm to stay safe</p> <p>___ Visual is neat and accurate</p> <p><b>Total:</b> ___</p>	<p><b>5. <u>Interview</u></b></p> <p>___ Follow directions</p> <p>___ At least 6 clear questions about events, experience, and insight</p> <p>___ Questions require more than a yes and no answers</p> <p>___ Questions and answers neatly written</p> <p><b>Total:</b> ___</p>	<p><b>6. <u>Narrative</u></b></p> <p>___ Follow directions</p> <p>___ Events are sequential</p> <p>___ Characters response is included</p> <p>___ Narrative has a beginning, middle, and end</p> <p>___ Narrative is neat and accurate</p> <p><b>Total:</b> ___</p>
<p><b>7. <u>Oral Presentation</u></b></p> <p>___ Follow directions</p> <p>___ Career identified</p>	<p><b>8. <u>Computer Game</u></b></p> <p>___ Follow directions</p> <p>___ Game is played</p>	

<p>___ Clear job description</p> <p>___ Educational requirements</p> <p>___ Benefits of job</p> <p>___ Interesting facts</p> <p>___ Presentation is clear and accurate</p> <p><b>Total:</b> _____</p>	<p>___ Paragraph includes advice to families</p> <p>___ Paragraph is well-written and accurate</p> <p><b>Total:</b> _____</p>	
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**Analyzing you Learning Contracts**

1. How are the sample contracts alike in intent and structure? How are they different in intent and structure?

The sample contracts all have the same general intent. They are all agreements between students and teachers about how students will meet the learning objectives. The contracts all provide students with many tasks to choose from and the tasks are completed individually. While the intent of the contracts is the same, the structure of the contracts varies. Some are in the form of traditional contracts, while others are more creative (i.e. menus, tic-tac-toe board).

2. What do you see as essential feature of or elements in making sure students are successful with leaning contracts?

It is important that the learning contracts have identified goals and that students are given clear directions, clear tasks, and clear expectations. When students know what is expected of them and are given tasks that are appropriate, they are likely to be successful. Assessment is also an essential component of the contracts, as well as a schedule of due dates and conferences.

3. What is the link between pre- assessment and learning contracts?

Pre-assessment is just as important before completing learning contracts as it is with any other assignment. It is not fair to ask students to complete work that is too easy for them – it is a waste of time. Similarly, it is not fair to ask students to complete work that is too difficult for them. Tasks should be created for certain students based on their readiness, which can be determined through pre-assessments.

4. Think of several ways the teachers might have given direction for competing contracts successfully when not all students would complete the same task.

It is important that all students have the same general directions for completing a learning contract (i.e. choose a certain number of tasks from the menu, have the contract signed by the teacher and the student, work independently). That way, all students are given the same expectations and directions to follow. As far as directions for each individual task, the teacher could meet with a student individually or with a small group of students who are all completing the same set of tasks to discuss the directions. In addition to having the directions be told orally,

they should be written down and clear, so students can refer back to them.

5. What questions do you have as a result of examining these contracts?

How does a teacher find time to create a lot of different tasks? Are there resources available that will give teachers content-specific tasks (so they don't always have to come up with them from scratch?)?

Lesson Adapted from:

[www.pvusd.net/Departments/GATE/ITU/documents/5-1-natures-fury-2007.rtf](http://www.pvusd.net/Departments/GATE/ITU/documents/5-1-natures-fury-2007.rtf)