

GED 2002 Teachers' Handbook of Lesson Plans

Content Area Science	Lesson Title <i>Will It Rain Today or Tomorrow?</i>	Correlation to Framework 03.03/03.04/03.05/03.06	Lesson Number 40
Objectives/Learner Outcomes At the end of this lesson, the learner will be able to: <ul style="list-style-type: none"> • Use appropriate tools and techniques to gather data • Identify the elements that make up the earth's weather • Identify key elements associated with weather and weather forecasting • Recognize key terms associated with weather 		Materials/Resources/Internet Sites/Handouts/Worksheets <ul style="list-style-type: none"> • Handout – Forecasting Weather • Internet Resources <ul style="list-style-type: none"> ○ USGS Water Resources (Print Copies for Students) http://ga.water.usgs.gov/edu/watercycle.html ○ Brain Pop http://www.brainpop.com (Movies - Weather and Weather Advanced) ○ U.S. EPA – The Water Cycle at Work http://www.epa.gov/GWDW/kids/cycle.html ○ Annenberg/CPA Learner.Org http://www.learner.org/exhibits/weather/forecasting.html ○ USA EPA Kids Page (Water Cycle) http://www.epa.gov/region07/kids/wtrcycle.htm ○ Oceans Alive - Build a Model of the Water Cycle http://www.mos.org/oceans/planet/watercycle.html ○ University of Illinois – Online Guides – Meteorology http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/home.xml 	
Pre-Requisite Knowledge The learner should be able to: <ul style="list-style-type: none"> • Compare and contrast information • Interpret weather maps • Make predictions based on facts about weather systems and how they operate 		Key Words <ul style="list-style-type: none"> • Water Cycle • Evaporation • Condensation • Precipitation • Collection • Cumulus, cumulonimbus • Stratus • Cirrus • Air Pressure (low and high) • Air Temperature 	

Anticipatory Set/Introduction

Write the following letters on the board: A, C, D, E, G, H, I, L, M, N, O, P, R, S, T, U, W. Have students work in teams of 3-4. Have students write down as many weather words as they can within a time period of 4-5 minutes. Students may use each letter multiple times. They can use the same letter twice within a given word. However, they cannot write down a word that includes a letter that is not in the list. Tell students that they must be willing to defend their words when they present them to the class. Make a master list of all the words from each team on the board. Explain that this brainstorming process is a good way to get ready for a lesson by first accessing what they already know about a topic.

Preview Questions for Lesson

- Have students describe the type of weather they like best. Write down their descriptions on the board.
- How do you find what the weather is going to be for a given day? Write down all of the responses.
- What causes the weather to change from hot to cold or sunny to cloudy?
- Where does all that rain go after a storm?

Instructional Outline

Before beginning this lesson, you may wish to review information on the water cycle and weather forecasting provided in the Internet resources. This will give you more information that you can use to help your students better understand weather and weather patterns. Provide students with a copy of the handout you accessed from the Internet entitled: The Water Cycle – Follow a Drip Through the Water Cycle. Preview the text with students prior to their reading. Discuss the water cycle with students and have each one draw their own diagram of the water cycle. Have students label each element: evaporation, condensation, precipitation, and collection. Have students share their diagrams with the rest of the class.

Say: Clouds form as a result of the condensation of water in the atmosphere. Invisible water vapor becomes visible as water droplets or ice crystals as a result of cooling. Water droplets form and remain suspended in the atmosphere, hanging onto tiny particles such as dust, ash, or pollution. There are four major types of clouds: cumulus, cumulonimbus, stratus, and cirrus. You may want students to use the Internet to find pictures of each of the different types of clouds. The following sites provide excellent information with pictures and descriptions of each type of cloud: <http://australiasevereweather.com/techniques/moreadv/class.htm> and [http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/home.rxml).

Say: Now that we have learned about the water cycle and cloud types, it's time to look at elements essential to making accurate weather forecasts. Forecasting weather has a long history beginning with basic observation of weather patterns. Over the years, the tools and technology available to forecasters have improved. Today, short-range forecasts are very accurate for up to 12 hours and long-range forecasts are considered accurate up to 48 hours. Forecasters use weather satellites and radar to track weather systems and changes in the atmosphere. However, even without the high-tech equipment, you can make short term forecasts if you follow a few rules. Review with students the Handout – **Forecasting the Weather**. This handout includes information on basic elements that forecasters must use to determine weather patterns. After the students have reviewed the information, use a weather map from USA Today or a local paper and make predictions about what the weather will do in your area for the next day. Expand the activity to have students track forecasts for selected cities across the country. Check for the accuracy of the weather forecasts by watching the Weather Channel, visiting <http://www.weather.com>, or looking in local papers.

Process/Activities			
During this lesson, students will:			
<ul style="list-style-type: none"> • Read about the water cycle and how it impacts weather • Use the Internet to better understand types of clouds and the weather conditions that usually accompany each type for cloud • Track weather forecasts and determine level of accuracy 			
Product/Evaluation/Summary			
When students have completed this lesson, they will provide the teacher with a diagram of the water cycle or constructed model and a written overview of the weather for a period of 2-3 days with an assessment of how accurate the forecasts were for that period.			
Teaching to Different Types of Learners			
	Visual	Auditory	Kinesthetic/Tactile
Learning Activity	Use an overhead to show the water cycle. Label each component in different colors.	Provide oral instructions to ensure students understand what is expected of them.	Have students build a model of the water cycle. Visit the Oceans Alive website listed in the Internet Resources.
Special Differentiation Strategies	Provide the students with highlighters so that they can underline important points in the handout.	Have students watch and listen to movies about weather. Use the Brain Pop site listed in the Internet Resources. Two movies may be viewed each day at no charge to the program.	Contact the local weather station and ask if they provide tours for students or if they have a meteorologist willing to come and demonstrate some techniques for the class.
Evaluation	Have students develop their own weather forecasting charts that show the level of accuracy of each forecast.	Have students listen to weather reports on radio or television and then track the accuracy of those reports. Allow students to make an oral presentation at the end of the tracking period.	Have students make weather observations, including the identification of types of clouds, wind speed and direction, temperature, and barometric pressure.

The Family and Adult Literacy Connection

Have parents take home a copy of the water cycle activity located at: <http://www.kidzone.ws/water/bactivity1.htm> and discuss it with their children. Provide students with copies of the directions for building their own water cycle at home and have them record the reactions from their children. If the parent is tracking weather, encourage him/her to let his/her children assist in the process.

ESE/ESOL Accommodations

Weather patterns vary around the world. Have ESOL students discuss the weather patterns from their own countries. Have students talk about the accuracy of weather forecasting in their native countries. Assist ESOL students with the vocabulary of this unit. Encourage them to write their own definitions for weather terms and find pictures to accompany their definitions.

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Forecasting Weather

Basic Guidelines

Pressure Trend: The pressure reading itself is not as helpful as its trend or change. A rising barometric trend indicates high pressure and a greater chance of fair, dry weather. A falling barometric trend indicates low pressure with a chance for clouds and precipitation. To determine a trend, meteorologist record pressure readings on a regular basis.

Wind Direction: The direction that the wind blows has an effect on temperature and the weather. Wind blows counterclockwise around a low pressure system and clockwise around a high pressure system. Low pressure on a weather map gives you clues about what type of weather and temperature trends to expect in your area.

Cloud Cover: Growing cumulus clouds can indicate thunderstorms. High ice-crystal cirrus clouds can mean an approaching storm. The locations and coverage of clouds on a satellite image can help predict sunny or cloudy skies.

Tips from Forecasters

- When skies are cloudy during the day, expect lower temperatures than if skies are clear.
- When skies are clear at night, expect colder temperatures as the heat radiates from the earth's surface.
- When skies are cloudy at night, expect temperatures to fall more slowly than if skies are clear.
- A city that is west of a high pressure center can expect warmer temperatures.
- A city under the influence of a low pressure center will usually have winds from the north and colder temperatures.
- A city on the western side of a low pressure center can usually expect colder temperatures and cloudy conditions with precipitation.
- If there is sufficient moisture in the air and a cold front is approaching a city, there is a greater likelihood of precipitation.