



Topic: Weather

Grade: Seventh

An integrated lesson plan covering 7 sessions of approximately 1 hour each.



Lesson-Planning Approach

Some learners perceive their “world” as a whole, where all things are interconnected and dependent upon each other. These “integrated” students face major challenges in coping with our dominant educational, social, and economic systems, which tend to present information in a linear fashion without the necessity of integration into meaningful context. Integrated students are at-risk of failing as they attempt to grasp information in ways that do not match their experience. Among large populations of at-risk students are many from Native American and similar cultures who do not regard their world as a sum of parts but as a blend of all that they experience.

This lesson plan does include some traditional, linear approaches to delivering information (checklists, rules, analysis, problem solving and organization). In addition to the traditional, linear delivery of information, this lesson plan also includes some of the following strategies, designed to appeal to at-risk students as they learn academic/life skills:

- ✓ Integration of technology
- ✓ Story telling/anecdotal information
- ✓ Non-competitive group and team work
- ✓ Performance-based assessment and rubrics
- ✓ Visual presentations and practice through technology and other means
- ✓ Project-based assignments that integrate family and community
- ✓ Activities appealing to multiple intelligences (Gardner)

Lesson Overview

In this lesson students will find statistics about storms on the Internet and use them to make a variety of graphs with Excel.

Lesson Objectives

Project Objectives: When students complete this session, they will be able to...

- ✓ Produce a set of graphs showing weather data of different storms
- ✓ Organize and display data using appropriate graphs, such as line, bar, circle, histograms, using the Excel application.

Integration of Other Functional/Academic Skills: (Critical thinking is required throughout the lesson.) Students will be able to...

- ✎ Writing: write an explanation of what the graph represents
- ✎ Science: explain how storms occur
- ✎ Social Studies: locate the areas of the United States where storms occur
- ✎ Grammar: apply standard punctuation and sentence structure in writing
- ✎ Technology: use the internet to find data on storms
- ✎ Technology: use Excel to create graphs from the data

State/National Standards (Complete as Appropriate)

Colorado State Standard Three: Students use data collection and analysis, statistics, and probability in problem-solving situations and communicate the reasoning and processes used in solving these problems.

NCTM Standard on Data Analysis and Probability: All students should select, create, and use appropriate graphical representations of data, including histograms, box plots, and scatterplots.

Websites

Required:

Search engines, such as:

www.yahoo.com

www.dogpile.com

www.about.com

Support:

www.tornadoproject.com This site has great stories about tornadoes and has all the tornadoes listed by state.

www.disastercenter.com This site has some data and a lot of information on what causes the disasters. To find the information you must scroll past the information about the 9-11 disaster.

www.esig.ucar.edu/socasp/data/tables/html

Pre-requisites

- ✎ A basic knowledge of graphs.
- ✎ A basic knowledge of searching the Internet.

Required Materials

Name

Mountain Plains Distance Learning Partnership 2001

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Algebra To Go (Great Source Education Group, Inc.) This is not required, but it is a good book. It has a good section on statistics.

Handouts

Handout 1-Data Sheet

Required Equipment/Technology

- ✦ Computers
- ✦ Internet
- ✦ Excel spreadsheet application

THE LESSON

Note: Students do not learn from what you do but from what you have them do.

Preparation

Day One

Activity	Instructor Notes
Brainstorm the kinds of storms that occur in the United States.	Tell a story about a storm that you have been through. (I have been in both hurricanes and tornadoes so I will share those experiences.)

Presentation

Day One

Activity	Instructor Notes
Examine the requirements of the project and the rubric for grading them.	Pass out the rubric with the required graphs and charts. The requirements are listed in the number five section of the rubric. Assign pairs to work together.

Practice

Day Two

Activity	Instructor Notes
View the PowerPoint slide show. Using the data on handout 1, make tables on Excel and use the tables to make graphs.	Do this as a whole class. Work through the Excel program and show how to make tables, charts, and graphs.

Performance

Days Three through Seven

Activity	Instructor Notes
Search the Internet to find data about various storms. Use the data to create the graphs required on the rubric.	I have listed several sites, but I plan to have my students use a search engine to find the data.

Lesson Assessment Strategy (Formative – As the lesson progresses)

Preparation, Presentation and Overall Implementation (Instructor)

1. Are the instructions and expectations for the class clear from the beginning?
2. Am I spending sufficient time on modeling the skills I want students to acquire?
3. Are students “connecting” to lesson project?
4. How is this lesson “integrated?”

Performance and Practice (Student)

1. Do all students have the skills to follow instructions? If not, what measures am I taking to address the challenge?
2. Are all students participating in the activities either by active observation or by voicing their thoughts?
3. Am I identifying the strengths of each student and pairing/grouping people accordingly? What results am I getting?
4. How are students performing? Are all of them able to meet 80% of the lesson objectives? If not, what am I doing to help them achieve more?

Technology

1. Is the technology working?
2. How are students reacting to the technology.
3. How are students applying or wanting to apply their technical skills in other areas?
4. What do I need to remember when I teach this lesson again?

Activity Checklist

	Brainstorm the kinds of storms that occur in the United States.
	Examine the requirements of the project and the rubric (Handout 2) for grading them.
	View the PowerPoint slide show. Using the data on handout 1, make tables on Excel and use the tables to make graphs.
	Search the Internet to find data about various storms. Use the data to create the graphs required on the rubric.

Technology Checklist

Project

Making a Bar Graph	
	Open Excel.
	In cell A1 type the title of the first table. Center and merge the title through B2.
	In column A (starting with cell A2) type the items in the left side of the table on Handout 3. In column B (starting with cell B2) type the items in the right side of the table. Change all the fonts to size 8.
	Select cells A2 through B15.
	Click on chart wizard.
	Choose bar graph.
	Click Next.
	Click Next.
	Change title to Middle School Enrollment.
	Label the y axis as Number of Students.
	Label the x axis as Grades.
	Click on Legend to remove the legend.
	Click Finish.
	Move the bar graph so that it is on the right side of the table.
	Double click on the x axis (the vertical one).
	Click on scale. Change Number of Categories Between the Tick Marks to 1.
	Click OK.
	You have finished the bar graph.

Making a Circle Graph	
	Beginning in A20 put in the second table.
	In cell A20 type the title of the second table. Center and merge the title through B20.
	In column A (starting with cell A21) type the items in the left side of the table on Handout 3. In column B (starting with cell B21) type the items in the right side of the table. Change all fonts to size 8.
	Select cells A21 through B24.
	Click on Chart Wizard.
	Choose Pie and click on the top left sub-type.
	Click Next.
	Click Next.
	Click on Data Labels. Click on Show Percent.
	Click Next.
	Click Finish.
	Shrink and move the graph to fit to the right of the table.

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	You have finished the circle graph.
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Making a Line Graph	
	Beginning in A29 put in the second table.
	In cell A29 type the title of the second table. Center and merge the title through B20.
	In column A (starting with cell A30) type the items in the left side of the table on Handout 3. In column B (starting with cell B35) type the items in the right side of the table. Change all fonts to size 8.
	Select cells A29 through A35. Go to Format-Cells. Change number to Date. Choose type March-98. Click OK.
	Click on Chart Wizard.
	Choose Line and click on the top left sub-type.
	Click Next.
	Click Series. Fill in the name with Enrollment.
	Click Next.
	Click Title. Change Title to Middle School Enrollment. Change x axis to Years. Change y axis to Number of Students.
	Click Next.
	Click Finish.
	Shrink and move to the right of the table. (Be sure all the years are showing.)
	You have finished the line graph.

Handout One

Handout 3: Data

Mancos School Enrollment

Grade	Enrollment
Kindergarten	
First	
Second	
Third	
Fourth	
Fifth	
Sixth	
Seventh	
Eighth	
Ninth	
Tenth	
Eleventh	
Twelfth	

Enrollment by School

School	Enrollment
Elementary School Grades K-5	
Middle School Grades 6-8	
High School Grades 9-12	

Middle School Enrollment

October 2001	Enrollment
October 2000	
October 1999	
October 1998	
October 1997	
October 1996	

Rubric

Points	Graph	Writing
5	<ul style="list-style-type: none"> <input type="checkbox"/> You have four different kinds of graphs (all made on the computer) using data from the Internet. <input type="checkbox"/> Each graph is labeled with a title, axis labels, and a legend. <input type="checkbox"/> The graphs you chose are appropriate for the data you chose. <input type="checkbox"/> You include copies of the data tables you made on the computer. They are labeled and easy to understand. 	<ul style="list-style-type: none"> <input type="checkbox"/> You explain clearly how the storms you chose occur. <input type="checkbox"/> You tell why they occur where they do. <input type="checkbox"/> You use correct punctuation, grammar, spelling, and sentence structure.
4	<ul style="list-style-type: none"> <input type="checkbox"/> You have four different kinds of graphs (all made on the computer) using data from the Internet. <input type="checkbox"/> Each graph has some labels. <input type="checkbox"/> Most of the graphs you chose are appropriate for the data you chose. <input type="checkbox"/> You include copies of the data tables you made on the computer. They are labeled. 	<ul style="list-style-type: none"> <input type="checkbox"/> You explain clearly how the storms you chose occur. <input type="checkbox"/> You tell why they occur where they do. <input type="checkbox"/> You use correct punctuation, grammar, spelling, and sentence structure in most of your paper.
3	<ul style="list-style-type: none"> <input type="checkbox"/> You have three different kinds of graphs (all made on the computer) using data from the Internet. <input type="checkbox"/> Each graph has some labels. <input type="checkbox"/> Most of the graphs you chose are appropriate for the data you chose. <input type="checkbox"/> You include copies of the data tables you made on the computer. They are labeled. 	<ul style="list-style-type: none"> <input type="checkbox"/> You explain how the storms you chose occur. <input type="checkbox"/> You tell why they occur where they do. <input type="checkbox"/> You use correct punctuation, grammar, spelling, and sentence structure in some of your paper.
2	<ul style="list-style-type: none"> <input type="checkbox"/> You have two different kinds of graphs (both made on the computer) using data from the Internet. <input type="checkbox"/> Each graph has some labels. <input type="checkbox"/> At least one of the graphs you chose are appropriate for the data you chose. 	<ul style="list-style-type: none"> <input type="checkbox"/> You explain how the storms you chose occur. <input type="checkbox"/> You tell why they occur where they do. <input type="checkbox"/> You have many mistakes in punctuation, grammar, spelling, and sentence structure in your paper.
1	<ul style="list-style-type: none"> <input type="checkbox"/> You have one graph (made on the computer) using data from the Internet. <input type="checkbox"/> The graph has at least a title. 	<ul style="list-style-type: none"> <input type="checkbox"/> You explain how the storms you chose occur. <input type="checkbox"/> You use very little correct punctuation, grammar, spelling, and sentence structure in your paper.

Rubric for Weather Project

