Graphing the Weather

Summary

Students take weather readings using simple weather instruments and predict the weather in this lesson. They take readings for a month during a season and chart it. With the information, they can graph what is happening with each instrument each day and use the data to show patterns the storms follow for that particular season.

Materials

Pattern blocks
Barometer
Anemometer
Weather vane
Thermometer
Rain gauge
Ruler
Graph paper
Colored pencils
Weather Data Chart

- Recognizing Changes in Different Events

Additional Resources
Books

- *Weather Forecasting*
  , by Gail Gibbons; ISBN 0689716834
- *Weather*
  , by Seymour Simon; ISBN 0060884398
- *Dr. Fred's Weather Watch: Create and Run Your Own Weather Station*
  , by Fred Bortz; ISBN 0071347992
- *Earth's Weather*
  , by Rebecca Harman; ISBN: 1403470650

Background for Teachers

Meteorologists gather information each day about the weather using their weather instruments. They have been gathering this information for decades. With all this data they gathered they look for patterns. When they notice a certain pattern for any given day, they can predict the weather. Many years ago before there were satellites, Doppler Radar and specialized weather instruments they would just use a barometer, thermometer, weather vane, anemometer, hygrometer, and rain gauge to predict the weather. When they saw the barometer at a certain pressure, the temperature at a certain level, and the wind blowing at a certain speed and a certain direction they could generally predict what the weather was going to be like the next day. Now with the all their special weather instruments added to these other tools they can predict the weather pretty well.
Just like meteorologists of old, students can take the weather readings using the simple weather instruments and be able to predict the weather. To do this they must take these reading for a month during a season and chart it. With the information, they can graph what is happening with each instrument each day. As storms are coming in and going out, the written data shows certain patterns the storms follow for that particular season. When they graph each instrument each day they can see what happens to each instrument as a storm comes in and when it leaves. It is also fun to compare the graphs of the instruments to each other each day. The more they do it the more they will see the

patterns of the storms. It is recommended that students do a month of instrument reading for each season so they can know the patterns of each season.

Intended Learning Outcomes

1. Use science process and thinking skills.
4. Communicate effectively using science language and reasoning.

Instructional Procedures

Invitation to Learn

Put the students' desks in groups or six. Hand out some pattern blocks to each student. Give them a couple of minutes for each to make something that shows a somewhat complicated pattern. Have them make it so the pattern is recognizable and can be added upon. It can be in any shape or design he/she desires. Have each student show his/her pattern to the group. Have the group discuss the patterns they see in each one to see if they can add more pattern blocks to continue the pattern. Discuss as a whole class how we are able to know which types of blocks should be placed next to complete the pattern. Ask the class where we might see patterns each day. Ask where we might rely on patterns. Tell the class that we are going to talk about patterns of the weather. We rely on these patterns so the weather can be predicted.

Instructional Procedures

Part One

- One month previous to doing this activity have the students take instrument readings of the weather each day with a barometer, thermometer, anemometer, weather vane, rain gauge/ruler, and noticing the types of clouds in the sky.
- Put the students in groups of six.
- Pass out to the groups the *Weather Data Chart* that shows the recorded data telling the weather readings of the weather elements--precipitation, cloud type, air temperature, wind speed, wind direction, and barometric pressure.
- Pass out the *Recognizing Changes in Different Weather Events* worksheet. This is a list of weather events that happen regularly.
- As a group, have the students look for the dates that led up to each weather event on the *Weather Data Chart* --fair weather, cloudy weather, rainy weather, snowy weather, snowy weather, windy weather, and cold weather. Have the students write down on their *Recognizing Changes in Different Weather Events* worksheets the dates they found for each weather event. Have them share with each other the dates they found.
- After the groups have worked together, have the class share what they found.
- Have a discussion about weather events of what is happening to the weather elements in each weather event.

Part Two

- Put the students in the same groups they were in before.
- Have the students take out their *Recognizing Changes in Different Weather Events* worksheet.
- Review with the students what they have done so far. (They have recognized that changes happen with each weather instrument when there is a weather change.)
- Pass out some graph paper.
- Assign each group a weather event they are going to graph. Assign each student one of the weather elements to graph (air pressure, temperature, wind speed, wind direction, precipitation, and cloud type) for that weather event.
- By using the *Weather Data Chart* and the dates they found that are on the *Recognizing Changes in Different Weather Events* worksheet, have them graph their own weather element readings of the dates of their category. If there is more than one event in each category, make

sure they graph each set of dates separately if there is time.

Part Three

Put the students in the same groups they were in before.

Review with them what each group has done so far. They written down dates that lead to weather events on the *Recognizing Changes in Different Weather Events* worksheet acquired from the *Weather Data Sheet*. They each graphed a weather element change in one of the weather events.

Now that the students have graphed the information for each event, have each student write about the pattern he/she sees for the type of weather element he/she was assigned.

Have the group of student tell each other, one by one, what happened to each weather element for the event they graphed. They may even tell it about each on day by day.

Have the students share what they learned with the whole class about each weather event.

Put the graphs on the wall in weather event groups, labeling each one. Put the statement the students wrote about the weather element change by each graph.

Have them continue to use the instruments to find more weather data within the same season.

Have them gather enough data to be able to make a prediction by graphing the data and comparing it to the data that data that has already been taken. Have them predict what the upcoming weather will be.

Extensions

For the advanced learners, have the students watch a weather forecast on TV. Have the students watch to see what the different forecasts are for different parts of the state. Have them tell why the forecasts are different for the different parts of the state.

For the advanced learners, have the students watch a weather forecast on TV. Have them watch for a pattern in the weather broadcast. Have them watch the meteorologist's forecast and tell why he/she predicted that forecast.

For the special learner, have him/her work with someone in the group to help him/her understand the information they are graphing and what it means.

Math V, 1; Put all the graphs about one weather event on one graph paper so the information can be compared about each weather element.

Choral Reading of poetry about weather is always fun to do.

Use the follow rhythm music to enhance science. This activity uses sets of percussion musical instruments, or "found" instruments that students discover in the classroom (tapping pencil, shaking pencil box, etc.)

Sound Storm

Invite class to tap the rhythm to music. (The music should represent a storm.) They may keep the beat on their laps, tap their feet, nod the rhythm with their heads, etc. (See suggested titles for use.)

Divide into groups. Assign or have students choose a Summer Storm or Winter Storm. They will create a "Sound Storm" that will represent their choice.

Have the pattern for each storm posted, or give each group a copy of the pattern to follow.

Plan which instruments will best "mimic" the sounds and represent the steps in the pattern of their storm. (If students have not explored instruments lately, it might be necessary to "test" their sounds during a discovery time.)

Have specific music chosen for them to use. Remind them they need to follow the pattern correctly in order to have a storm that is typical of summer or winter.

Practice together to the music. They might need to have a conductor in order to stay together and play the instruments in the correct sequence.

Have fun! Exploring the sounds and the steps of the storm means everyone will have a different

interpretation. There is no "right" answer!

Summer Storm Pattern
Sun shines
Temperature warm
Sudden gusts of wind
50-60 mph
Abrupt change
Dark clouds
Bursts of rain
Thunder
Lightning
Strong rain continues
Less thunder/lightning
Wind slows
Sun returns
Temperature cooler

Winter Storm Pattern
Wind begins
Wind gets stronger
No sign of rain clouds-just cirrus
Stratus clouds on horizon
Wind blowing hard
Temperature warms from south winds
Stratus clouds dark and close
Snow begins to fall silently
Wind dies down
Snow falls
Very quiet as snow falls

Music to use: sound clips of Vivaldi's *Four Seasons*
Suggest Summer-presto, mvt 2 for the summer storm
Thunder and Lightning, by Decca Records PolyGram Company, 1995 CD.

Family Connections

Make a copy of the graph the student made and let him/her take it home. Have the student explain it to his/her family what category he/she worked with and what his/her job was. Have him explain what his graph means.

The teacher can type up the patterns that were found for each category. Give each student in each group the pattern statements of each weather element. Have the student explain the patterns of his/her category.

Have the students go to http://www.weather.com each evening for a few days to find out what each weather instrument reading is. Have him/her record it for a few days on a paper. From what they learned in class, have each student find the pattern for one of the weather events studied. Have him/her predict what the weather will be in the upcoming day(s).

Assessment Plan

In the first activity, watch carefully that the dates they wrote show a change in the weather event.

In the second activity, look at the graphs they made to make sure they are accurate.

In the third activity, read the statements they wrote that tell about their patterns.

Have the students take more reading of the weather as a group. Have them look at the patterns and tell what type of weather event will be coming up in the near future--storm, wind, fair weather,

etc.

Give the students a scenario of a weather pattern. See if they can identify what type of weather event the pattern is leading up to.

Bibliography

Research Basis

Armstrong, T. (1994). *Multiple intelligences in the classroom*. Alexandria, VA: Association for Supervision and Curriculum Development.

Multiple intelligences let students choose a method of learning in connecting one subject to other subjects to their world. The integration of instructional methods focuses on teaching a standard in one curricular area and matching it to a standard in another curricular area such as integrating science with Language Arts, math, math, or social studies. As educators teach with this idea in mind it helps students see a connection between subjects relating to the real world. It helps students understand their world better to see how subjects relate to each other. This method puts into practice the teaching of multiple intelligences.

Ketch, A. (2005). Conversation: the comprehension connection. *The Reading Teacher*, Vol. 59, No. 1, pp. 8-18.

Students who engage in conversation in the classroom become reflective thinkers. Conversation brings meaning to students as they contemplate to understand our complex world. Conversation is the comprehension connection. There are literature circles, book clubs, whole-class discussions, pair-share, small-group discussion, and individual conferences that help in conversation comprehension.

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