



Weather Clever Catch Ball

Objective: Students will learn many aspects of weather by tossing and catching a weather ball.

Materials:

Weather Clever Catch Ball (can be obtained from Acorn Naturalists:
www.acornnaturalists.com

Answer list

Timer and scorekeeper

Background:

Billions of people around the world tune-in to hear the weather forecast. Once we know the forecast, we know how to plan our daily activities.

In ancient history, weather forecasting was based solely upon observations of the sky. In 1634, an Italian scientist, Evangelista Torricelli, invented the barometer. It measured air pressure and was the beginning of the invention of several weather-measuring instruments. Weather forecasting took a leap forward after WWI and then again upon the invention of computers. Forecasting weather is now more advanced and safer than ever.

Procedure:

- Two or more players toss the ball to each other, answering the problem underneath or closest to their left thumb.
- Each problem is numbered and enclosed in its own space, assuring the student will know which problem to answer.
- Refer to answer list for each problem's correct solution.
- Select a timekeeper (or can be the teacher) if entire class is going to play. Allow 1 minute to answer each question.
- Line students up in 2 lines, facing each other and have student toss ball to the student facing him/her. When both students have had a chance to answer a question, the ball is passed to the next pair. Play continues until all students have had an opportunity to answer a question.
- Score can be kept on the board. The team that wins gets to be in charge of forecasting the weather for the next week.

Extensions:

- Have students play the games in the "Wild Weather Cards" pack included in the Wacky Weather Trunks. All of these games reinforce weather terminology and facts.
- Invite a local meteorologist to your classroom to discuss his/her job.
- Visit the Big Sioux Water Festival web site: www.bigsiouxwaterfestival.org and do the Acid Rain activity.

Grade Level:

4-6

Subject Areas:

Science

Setting:

Classroom

Skills:

Observation, Deductive Thinking

Prior Preparation:

Inflate the Weather Clever Catch Ball. Review with your students the weather facts that have been part of of your weather unit.

Vocabulary:

None

South Dakota Education Standards for 4th grade:

Science

Indicator 1: 3.E.1.1

3.E.1.2

Indicator 2: 4.E.2.1

Language Arts

Indicator 1: 4.L.1.1

Indicator 2: 4.L.2.2

Clever Catch Weather Ball Question and Answer Sheets

1. Too much exposure to _____ can cause skin cancer.	<i>B. Ultraviolet radiation</i>
2. The layer of the atmosphere closest to the Earth's surface is the ____	<i>A. Troposphere</i>
3. Some objects heat up faster in sunlight because they ____ energy better.	<i>C. Absorb</i>
4. The transfer of energy from the sun to the earth happens mainly by ____	<i>D. Radiation</i>
5. The two most abundant gases in the earth's atmosphere are oxygen and ____	<i>D. Nitrogen</i>
6. This gas is 78% of the Earth's atmosphere.	<i>Nitrogen</i>
7. This gas is 21% of the Earth's atmosphere.	<i>Oxygen</i>
8. The atmosphere is composed of gases, liquids, and ____	<i>Solids</i>
9. e exhale this gas when we breathe.	<i>Carbon dioxide</i>
10. The official name for the water cycle.	<i>Hydrologic cycle</i>
11. They only substance in the atmosphere that can be solid, liquid, or gas.	<i>Water</i>
12. TRUE or FALSE: The higher in the atmosphere, the colder the temperature.	<i>FALSE</i>
13. TRUE or FALSE: In direct sunlight land heats up faster than water.	<i>TRUE</i>
14. TRUE or FALSE: At night, land cools down faster than water.	<i>TRUE</i>
15. TRUE or FALSE: Water vapor is a visible gas.	<i>TRUE</i>
16. TRUE or FALSE: The earth is the only planet in our solar system with an atmosphere.	<i>FALSE</i>
17. TRUE or FALSE: The two elements nitrogen and oxygen comprise 99% of our atmosphere.	<i>TRUE</i>
18. TRUE or FALSE: The layer of the atmosphere where most weather occurs is the Troposphere.	<i>TRUE</i>
19. TRUE or FALSE: The sun is a huge ball of burning gas.	<i>FALSE</i>

20. TRUE or FALSE: There is a higher percentage of oxygen in rocks than in our air.	<i>TRUE</i>
21. Meteorologists measure the amount of rainfall by using a ____	<i>B. Rain gauge</i>
22. An object used to measure wind direction is a ____	<i>C. Wind vane</i>
23. A device that is used to determine the dew point and relative humidity is ____	<i>D. Sling psychrometer</i>
24. Atmospheric pressure is measured by using a ____	<i>A. Barometer</i>
25. Current weather information and data are plotted on ____	<i>D. Weather maps</i>
26. This object is used to measure air temperature.	<i>Thermometer</i>
27. Wind speed is measured by using a(n) ____	<i>Anemometer</i>
28. Meteorologists rely on spacecraft called ____	<i>Orbiting weather satellites</i>
29. As warm air rises, it expands and ____	<i>Cools</i>
30. The freezing temperature of water is ____	<i>0°C or 32°F</i>
31. When air is saturated with water vapor it has 100% ____.	<i>Relative humidity</i>
32. TRUE or FALSE: All thermometers must have liquid inside of them.	<i>FALSE</i>
33. TRUE or FALSE: Clouds form when air rises and warms up.	<i>FALSE</i>
34. TRUE or FALSE: Meteorologists classify clouds by height and shape.	<i>TRUE</i>
35. TRUE or FALSE: Most rain is produced by the cirrus clouds.	<i>FALSE</i>
36. TRUE or FALSE: Barometric pressure is often measured in millibars.	<i>TRUE</i>
37. TRUE or FALSE: Every cloud droplet needs to have a particle to condense upon.	<i>TRUE</i>
38. TRUE or FALSE: Cumulus clouds often have flat bottoms.	<i>TRUE</i>
39. TRUE or FALSE: Some clouds are made of ice crystals.	<i>TRUE</i>
40. TRUE or FALSE: A recording barograph keeps a log of atmospheric pressure.	<i>TRUE</i>

41. TRUE or FALSE: Meteorologists still do measurements in the English system.	<i>TRUE</i>
42. The study of the earth's atmosphere and its weather is called ____.	<i>D. Meteorology</i>
43. When moisture falls to the ground, we call it ____.	<i>C. Precipitation</i>
44. The boundary between two air masses is called a ____.	<i>A. Front</i>
45. A recently developed tool crucial to weather forecasters is ____.	<i>B. Computer</i>
46. A huge body of air of similar characteristics is called a(n) ____.	<i>D. Air mass</i>
47. The official name for a weather person is ____.	<i>Meteorologist</i>
48. The weather always changes when one of these pass.	<i>A Front</i>
49. The "recipe" for a cloud droplet includes water vapor and ____.	<i>A small particle</i>
50. The ultimate source of energy for earth's weather system is ____.	<i>Our sun</i>
51. The region of the earth that receives the most sunlight in a year.	<i>Equatorial</i>
52. On a weather map blue triangles show this type of front.	<i>Cold front</i>
53. Several days of rain is usually caused by a H or a L?	<i>L = Low pressure</i>
54. Strong winds and thunderstorms would accompany which type of front?	<i>Cold</i>
55. TRUE or FALSE: The jet stream is a skinny white cloud produced when an airliner flies overhead.	<i>FALSE</i>
56. TRUE or FALSE: When clouds cover the entire sky it is said to be undercast.	<i>FALSE</i>
57. TRUE or FALSE: The weather produced by cold and warm fronts is much the same.	<i>FALSE</i>
58. TRUE or FALSE: Cold air sinks, warm air rises.	<i>TRUE</i>
59. TRUE or FALSE: In the continental US, most air masses move from East to West.	<i>FALSE</i>
60. TRUE or FALSE: Meteorologists have no clue about weather over the oceans.	<i>FALSE</i>
61. TRUE or FALSE: Lines on a weather map connecting point of equal temperature are called isotherms.	<i>TRUE</i>

62. Which of these planets does not experience weather storms?	<i>A. Mercury</i>
63. When storms become dangerous, one of these is issued.	<i>D. Warning</i>
64. The official name for a towering thunderstorm is ____.	<i>B. Cumulonimbus</i>
65. Severe storms most often occur along ____.	<i>C. Fronts</i>
66. A thunderstorm cloud is called ____.	<i>D. Cumulonimbus</i>
67. Earth's highest wind speeds occur in a vortex called a ____.	<i>Tornado</i>
68. The largest storm on earth is called a ____.	<i>Hurricane</i>
69. The relatively calm and clear area in the middle of a hurricane is its ____.	<i>Eye</i>
70. Grains of ice, ice pellets, or frozen raindrops are called ____.	<i>Sleet</i>
71. A cloud that comes into contact with the earth's surface is called ____.	<i>Fog</i>
72. A product of ice clouds or water vapor that is frozen is termed ____.	<i>Snow</i>
73. TRUE or FALSE: Thunderstorms most often occur along warm fronts.	<i>FALSE</i>
74. TRUE or FALSE: Thunder is caused when lightning heats and causes expansion of air.	<i>TRUE</i>
75. TRUE or FALSE: More and more evidence indicates that Global Warming is happening.	<i>TRUE</i>
76. TRUE or FALSE: One always hears thunder before seeing the bolt of lightning.	<i>FALSE</i>
77. TRUE or FALSE: Hurricanes called doubloons do much damage in Polar Regions.	<i>FALSE</i>
78. TRUE or FALSE: Many airports are now equipped with Doppler Sonar.	<i>FALSE</i>
79. TRUE or FALSE: Hurricanes in the western Pacific Ocean are called Typhoons.	<i>TRUE</i>
80. The earth's atmosphere acts like ____.	<i>B. A green house</i>
81. When certain pollutants combine with water vapor this can be the result.	<i>D. Acid rain</i>
82. Which substance is a problem when produced by burning fossil fuels?	<i>D. All of them</i>

83. This is the most important factor in worldwide environmental problems.	<i>B. Human population growth</i>
84. Which of the following are considered fossil fuels?	<i>D. All of them</i>
85. How have humans modified the water cycle?	<i>D. All of them</i>
86. The problem is not the Greenhouse Effect; it is ____.	<i>Global warming</i>
87. The name for the combination of fog and smoke is ____.	<i>Smog</i>
88. The large ocean current that effects worldwide weather is ____.	<i>El Nino</i>
89. Air pollution travels because of the ____.	<i>Prevailing winds</i>
90. The average weather for a region over a period of time is ____.	<i>Climate</i>
91. If these melt, sea level will rise significantly.	<i>Polar ice caps</i>
92. When billions of particles are put into clouds to cause precipitation it is called ____.	<i>Cloud seeding</i>
93. TRUE or FALSE: Acid rain is bad for buildings but does not affect living things.	<i>FALSE</i>
94. TRUE or FALSE: The ozone molecules in the stratosphere protects us from UV light.	<i>TRUE</i>
95. TRUE or FALSE: Automobile exhaust does not contribute to acid rain	<i>FALSE</i>
96. TRUE or FALSE: Coal burning in power plants produces high amounts of sulfur.	<i>TRUE</i>
97. TRUE or FALSE: Acid rain can fall hundreds of miles from the pollution source.	<i>TRUE</i>
98. TRUE or FALSE: Some soils can neutralize acid rain.	<i>TRUE</i>
99. TRUE or FALSE: Acid fog and acid dew can be worse than acid rain.	<i>TRUE</i>
100. TRUE or FALSE: The Aurora Borealis occurs in an atmospheric layer called the ionosphere.	<i>TRUE</i>