

Earth's Atmosphere and Its Seasons

Using the TASA Earth's Atmosphere and its Seasons software, answer the following questions. When diagrams are asked for, attach an additional piece of paper. Good Luck!

1. Which type of weather event is most expensive? _____ Why do you suppose this is the case? _____
_____.
2. What is the annual number of deaths for these four types of weather? Tornadoes ____ Floods ____
Hurricanes ____ Lightning _____
3. What are four issues that result from our lifestyle (that is full of conveniences)? _____,
_____, _____, _____.
4. What is the difference between weather and climate? (Expect to see this question again and again!)

_____.
5. What are three important variables used to describe climate? _____,
_____, _____.
6. What percent of possible sunshine does Amarillo, TX receive in November? ____ Yuma? _____,
Seattle? _____
7. Does this statement refer to weather or climate? Circle the appropriate term.
 - A) We will see sunny skies today. Weather or Climate
 - B) The record low temperature in Tucson was last week, it is 21°. Weather or Climate
 - C) It is snowing in Billings, MT today. Weather or Climate
 - D) The average January snowfall in Billings is 10.9 inches. Weather or Climate
 - E) Vail is often windy. Weather or Climate
8. What is the atmosphere? _____.
9. What is the "burning" energy from the Sun that is harmful to life called? _____
10. What is air? (don't use the word "envelope") _____
_____.
11. What is the composition of air? _____
_____.
12. What does "inert" mean? _____.

13. Why do you suppose that atmospheric water concentration is higher in the tropical regions?

14. What is the relationship between cloud aerosols and water vapor? (What do they make?)

15. What can aerosols do to incoming sunlight? _____, _____, &
_____.
16. What are the factors that change the amount of energy received by the Earth from the Sun?
_____, _____, & _____.
17. Where are the numbers of hours of daylight and night the same? _____
18. What is the difference between the length of daylight at the summer and winter solstices at 60°?
_____ hours _____ min.
19. Roughly what is the angle between the Sun and the horizon in winter? _____°
20. At what angle does the sunlight penetrate the least amount of atmosphere? _____°
21. Which area would be warmer, an area in which the sunlight passes through 5.7 atmospheric thicknesses, or 1.15 atmospheric thicknesses? _____ Why? _____

22. The two most important factors that change with the seasons are: _____
_____ and _____
23. Which takes longer, a revolution or a rotation? _____
24. Why does the orientation of Earth's axis and its angle change the seasons? _____
_____.
25. In terms of the position of the Sun, what is the difference between the summer solstice in the northern hemisphere and the summer solstice in the southern hemisphere? _____
_____.
26. What's an equinox? _____
_____.

27. Fill in the table with the correct vertical angle of the Sun:

	Winter Solstice	Spring Equinox	Summer Solstice	Autumnal Equinox
Northern Hemisphere				
Southern Hemisphere				

Calculate the noon sun angle for 40° N latitude during the equinox. _____.

28. What is an analemma? _____
_____.

29. What are the ten types of electromagnetic radiation in order from shortest wavelength to longest?

_____, _____, _____,
_____, _____, _____,
_____, _____, _____ &
_____ ... phew! That's a lot!

30. Which one of these is the one that we can see? _____

31. What happens to an object that is radiated? _____

32. What is the difference between the radiation from the Sun and the radiation from the Earth in terms of wavelength? _____.

33. What are the three paths that solar energy can take? _____, _____, &

34. Increased motion of molecules results in what? _____

35. If you were strolling "strolling on the moon one day", which "merry, merry" month would it be?
_____.

36. What is albedo? _____ How does it vary? _____,
_____, and _____.

37. When the albedo is greater, how much solar energy is available? (more or less) _____

38. What is the greenhouse effect? _____

39. What are the primary heat absorbing gasses in the atmosphere? _____

40. Give a brief summary of how global warming has been changing and why. _____

41. Which container has a higher albedo? _____ Which one was warming up more quickly? _____ Is that what you expected? _____
42. What are the formulas for converting Celsius to Fahrenheit? _____
43. 41 degrees F is equal to what temperature in Celsius? _____
44. What is the mathematical error on slides 378 and 379? _____
45. What is an isotherm? _____
46. What is the temperature in Los Angeles according to the map on slide 394? _____
47. What is a temperature control? _____

48. What is the most important temperature control? _____
49. Are all places along the same parallel of latitude identical in temperature? _____
50. What are the 5 important temperature controls? _____

51. Does water or land have a thicker layer of heating during the summer? _____
52. Where was the coldest temperature ever recorded in North America? _____
How cold was it? _____
53. What is the average temperature range for San Diego? _____ For Dallas? _____
54. What are the two ways that geographic location effects the temperature? _____

55. What does the last slide say? _____