100 Ways to be successful in the Earth Science

1.  The same substance always has the same density

2.  As pressure increases, density increases

3.  As temperature increases, density decreases

4.  Water expands when it freezes

5.  Most changes are cyclic

6.  Water is most dense at 4oC, when it is a liquid

7.  The universe began with a big explosion--"The Big Bang"

8.  The best model of the Earth is a sphere

9.  The altitude of Polaris equals your latitude

10. Our solar system is located on one of the outer arms of our Milky Way Galaxy

11. Latitude lines go east-west, just like the equator, but measure distances north or south.

12. Longitude lines go north-south, but measure distances east or west.

13. Longitude is based on observations of the sun

14. Use the reference tables

15. The closer the isolines (contour-isobar-isotherms-) are the steeper the slope or gradient

16. The earth rotates from west to east (24 hours)

17. The earth revolves counterclockwise (365 1/4 days)

18. All celestial objects appear to rise in the east and move west

19. The moon has phases because it revolves around the earth (remember, though, that half is always lit)

20. Planets appear to go backwards (retrograde) as the earth passes them in space

21. Summer solstice is June 21st

22. Winter solstice is December 21st

23. Equinoxes: March 21st September 23rd

24. Equator always has 12 hours of day-light

25. The lower the altitude of the sun, the longer the shadow it casts

26. Foucault's pendulum and the coriolis effect prove the earth rotates

27. Earth is closest to the sun in January

28. The closer a planet is to the sun the higher it's velocity

29.  Use the reference tables!

30.  Remember to use the reference tables.

31. Black and rough surfaces are the best absorbers and radiators

32. The half-life of a radioactive element can't be changed

33. Ocean crust is thin and made of basalt

34. Continental crust is thick and made of granite

35. Energy moves from source to sink: high to low

36. Mountains form by uplift, folding and faulting

37. Chemical weathering occurs mostly in warm, humid climates

38. Physical weathering occurs mostly in cold, humid climates (good for frost wedging)

39. Air moves clockwise and outward around a high

40. Air moves counterclockwise and inward around a low

41. Good absorbers of radiation are good radiators

42. Hottest part of the year is in July

43. Hottest part of the day is after 1:00p.m.

44. As temperature increases, air pressure decreases

45. As moisture increases, pressure decreases

46. Air pressure decreases with altitude

47. Highs are cool and dry; lows are warm and wet

48. Wind is due to air pressure differences

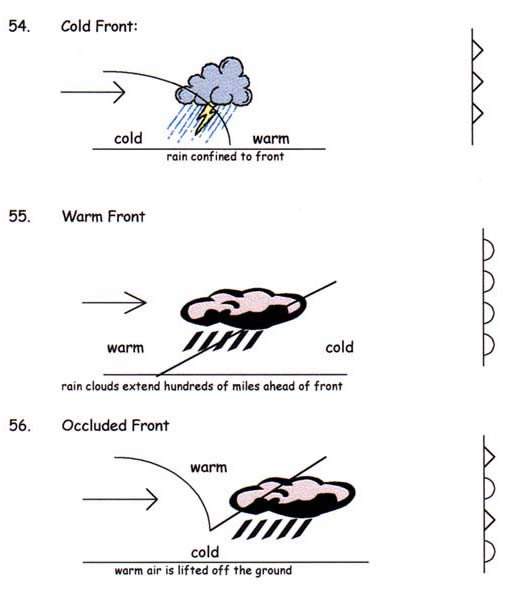
49. Wind blows from high to low pressure

50. Wind is named from the direction that it is coming from

51. The accepted value is the correct answer.  The measured value is the guess.

52. The closer the air temperature is to the dew point the greater the chance for  precipitation

53. Weather moves from west to east in the United States



57.  Cold fronts move the fastest

58.  Porosity does not depend on particle size

59.  As particle size increases, permeability increases

60.  Capillarity increases when particle size decreases

61.  Ep (potential evapotranspiration) depends on temperature

62.  Dynamic equilibrium means balance

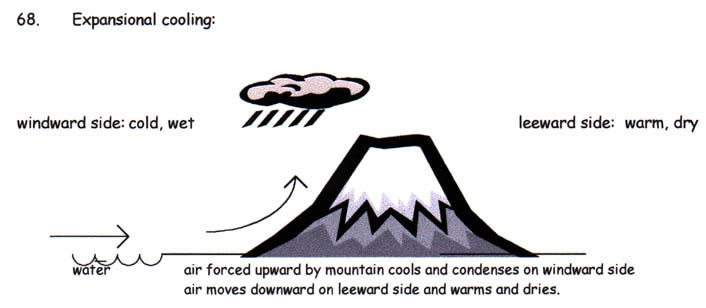
63.  Increase in latitude and altitude have the same affect on climate

64.  Vertical rays (overhead sun) can only occur between 23 1/2oN and 23 1/2oS

65.  Index fossils are good time markers (widely spread, lived a short time)

66.  Air cools and expands as it rises

67.  Large bodies of water moderate temperature (smaller temperature range)



69.  Gravity causes most erosion

70.  Streams are the number one agent of erosion

71.  Stream velocity depends on slope and discharge

72.  Velocity is fastest on the out side of meander bend

73.  Heavy, round, and dense particles settle out first

74.  Graded bedding (vertical sorting):  biggest sediments are on bottom

75.  Glacial sediments are unsorted with scratches in a U-shaped valley

76.  Sedimentary rocks may have flat layers - most likely to have fossils

77.  Igneous rock:  cools fast-small crystals;    cools slow-large crystals

78.  Metamorphic: banded-distorted structure

79.  Mineral properties depend on internal atomic arrangement

80.  Calcite fizzes with acid

81.  Isostasy: earth's crust in equilibrium (uplift & subsidence)

82.  Mid-ocean ridge - new earth being created-sea floor spreading

83.  Trenches - earth being destroyed-subduction zone

84.  P-waves are faster than S-waves

85.  P-waves - solids & liquids can pass through -- S-waves solids only

86.  You need 3 seismometer stations to plot an earthquake

87.  Undisturbed layers - bottom layer is oldest (this is the Law of Superposition)

88.  Intrusion and faults are younger than the rock they are in

89.  Unconformity means erosion (time gap in the layers)

90.  Arid (dry) landscape:  steep slopes with sharp angles

91.  Humid (wet) landscape:  smooth with rounded slopes

92.  When in doubt, see if the reference tables will help

93.  Uranium 238 is used to date old rocks

94.  Carbon 14 is used to date recent living objects

95.  Convection currents in the mantle move plates

96.  Always try to eliminate two answers

97.  When a rock is broken into smaller pieces, surface area increases and weathering rate increases

98.  Use complete sentences for the free responses

99.  Be familiar with (but don't memorize) this chart:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| DATE (APPROXIMATE) | LATITUDE OF SUN'S DIRECT RAYS | DIRECTION OF SUNRISE AND SUNSET | ALTITUDE OF NOON SUN | LENGTH OF DAYLIGHT |
| Sept. 23 (Autumnal Equinox) | Equator (0o) | Rises due East Sets due West | 48o | 12 hours |
| December 21 (Winter Solstice) | Tropic of Capricorn  (23 1/2oS) | Rises in SE  Sets in SW | 24.5o (lowest) | 8 hours  (shortest day) |
| March 21 (Vernal Equinox) | Equator (0o) | Rises due East  Sets due West | 48o | 12 hours |
| June 21 (Summer Solstice) | Tropic of Cancer  (23 1/2oN) | Rises in NE  Sets in NW | 71.5o (highest) | 16 hours (longest day) |

100.  USE THE REFERENCE TABLES!