RADIATION & the ATMOSPHERE NAME _____

Partners _____

Directions: give the best answer to the following.

1. The atmosphere has four layers, which are separated by interfaces, all ending with the suffix "_____."
2. The layers are divided up based on _____ patterns.
3. The layer we live in is the _____.
4. Water vapor, dust and weather occur in the _____.
5. Very little weather occurs in the _____.
6. Temperatures can reach 1,000^{0}C in the _____.
7. There's little _____ in the Thermosphere, but its high temperatures are caused by _____ & _____ light striking air molecules.
8. More insolation is received at the (Earth's surface / outer atmosphere).
9. The one wavelength that is mostly *not* absorbed, reflected or scattered in the atmosphere is _____.
10. Harmful _____ radiation is absorbed by _____ in the _____.
11. The Earth re-radiates _____ wavelengths, which are absorbed by _____ and _____ in the _____.
12. The amount of radiation reflected by clouds depends on the _____ _____.
13. The lower the angle, the _____ insolation reflected and the _____ absorbed.
14. Polar areas tend to be cold primarily because of the presence of _____ and the low _____ _____.
15. Volcanic dust, water droplets, ice crystals and pollutants are examples of _____.
16. As the concentration of aerosols in the atmosphere increases, the amount of _____ increases, and the amount of insolation reaching Earth's surface _____.
17. How can a volcanic eruption lower world temperatures?
    _____
    _____
    _____
    _____
    _____
18. Explain how melting snow and evaporating puddles can lower the air temperature.
    _____
    _____
    _____
    _____
    _____
    _____
    _____
    _____
19. Give three reasons why land heats up and cools off more quickly than water.
    A. _____ _____
    B. _____ _____
    C. _____ _____
20. Insolation reaching the Earth's surface can either be _____ or _____.
21. EM energy radiated by the Earth's surface is called _____.
22. (Short-wave / long-wave) radiation mostly passes through the atmosphere and reaches the Earth's surface. (Short-wave / long-wave) radiation doesn't pass through, but is mostly absorbed by the atmosphere, which _____ the atmospheric temperature.
23. When short-wave energy travels through the atmosphere, is absorbed by the Earth, is re-radiated into the atmosphere as longer-wavelength infra-red, and is trapped there by the gases _____ and _____, this is called the _____ effect.
24. What is the effect of a car windshield on short-wavelength energy?
    _____
    _____
25. Why does the temperature inside the car rise above that of the surrounding air? _____
    _____
    _____
    _____
    _____
    _____
26. Over the course of a year, the Earth (is / isn't) generally in radiative balance, (meaning incoming and outgoing energy are equal).
27. From year to year, the Earth (is / isn't) in radiative balance, because average temperatures _____ from year to year.
28. When measured over decades, the Earth (does / doesn't) appear to be in radiative balance.
29. Measurements over thousands of years indicate that the Earth (is / isn't) in radiative balance.
30. Evidence that the Earth is not in radiative balance over the very long term includes _____ _____.

31. Page 11 of the E.S.R.T. shows the "Average Chemical Composition of Earth's Crust, Hydrosphere, and Troposphere." Most of the Troposphere is composed of two gases, _____ & _____; their percentages are _____ & _____, respectively.
32. Page 15 of the E.S.R.T. shows "Selected Properties of Earth's Atmosphere." According to this chart, as altitude increases, atmospheric pressure _____.
33. The concentration of water vapor varies from about _____g/m^3 to about _____g/m^3 in the Troposphere.
34. Why do you think very little weather occurs in the layers above the Troposphere?

    _____

    _____
35. The troposphere is about _____km thick. Its temperature averages about _____^{0}C on the ground to about _____^{0}C at the interface with the Stratosphere, called the _____.
36. The Stratosphere is about _____km thick. Its temperature averages about _____^{0}C at the Tropopause to about _____^{0}C at the interface with the Mesosphere, called the _____.
37. The Mesosphere is about _____km thick. Its temperature averages about _____^{0}C at the Stratopause to about _____^{0}C at the interface with the Thermosphere, called the _____.
38. The Thermosphere is about _____km thick. Its temperature averages about _____^{0}C at the Mesopause to above _____^{0}C at about _____km in altitude.
39. Describe the temperature pattern from the ground all the way to the top of the atmosphere.

    _____

    _____

    _____
40. The hottest temperatures are in the _____.
41. The coldest temperatures are in the _____.