

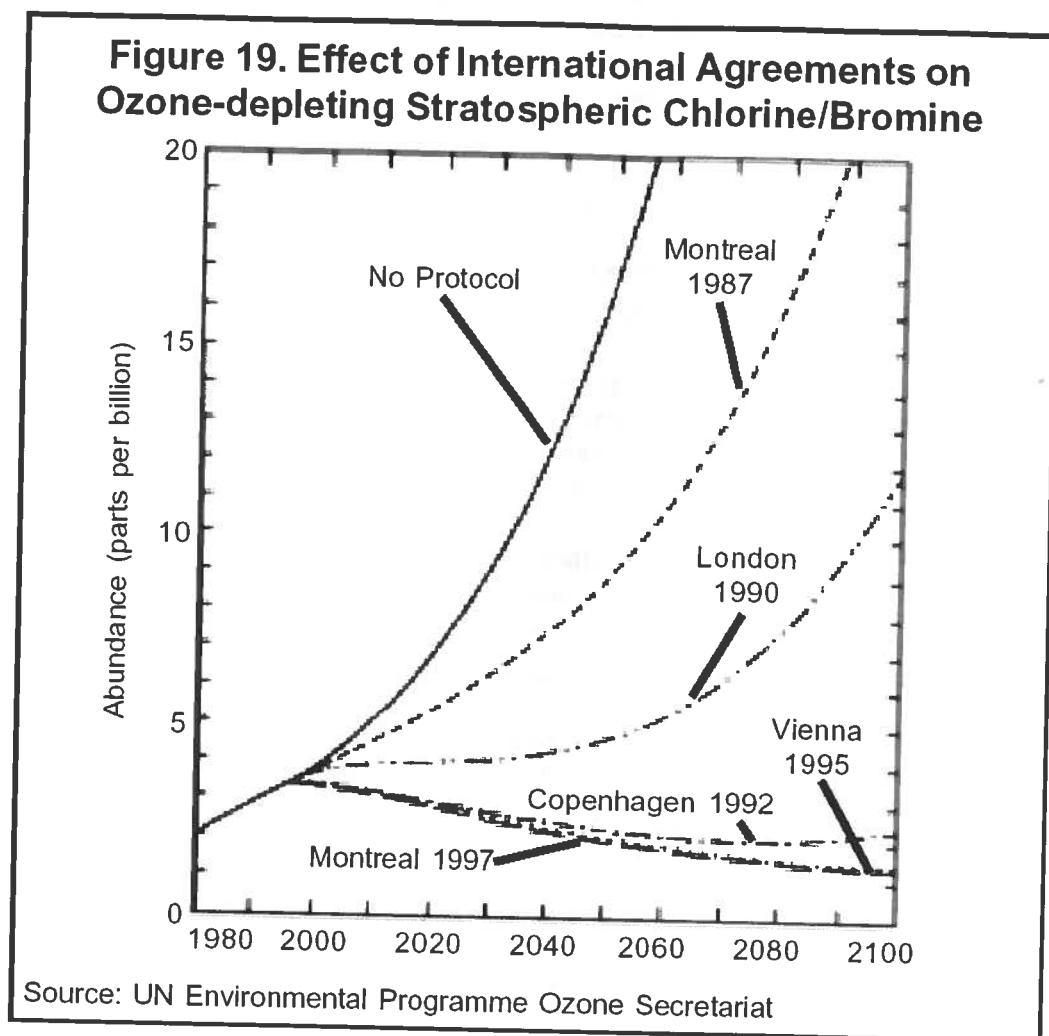
Science That Matters
Quiz 5
December 5, 2013

Multiple Guess. Circle the letter corresponding to the best answer. Please mark your answers clearly as unclear answers will be marked wrong. Other questions, please make your answers clear. 1 point each.

1. Most years since 1980, the Antarctic ozone hole is approximately the size of what?
a. Europe b. Western Australia c. Saudi Arabia d. Australia e. North America
2. Ozone is an important trace constituent in the stratosphere because it
a. protects the earth's surface from harmful infrared radiation
b. destroys harmful chlorine atoms c. absorbs DNA-damaging ultraviolet light (UV-C)
d. makes the sky appear red in the evening e. prevents the greenhouse effect
3. If you dropped a 16 pound bowling ball and a copper BB at the same time from the Empire State Building, which of the following statement is true?
a. the bowling ball will hit the ground first b. the BB will hit the ground first
c. they will both hit the ground at the same time e. I need more information
4. Which of the following gases ***IS NOT*** a greenhouse gas because it does not absorb infrared radiation?
a. methane (CH₄) b. oxygen (O₂) c. carbon dioxide (CO₂)
d. water vapor (H₂O) e. Ozone (O₃)
5. Electromagnetic radiation of lower energy (longer wavelengths) than visible light that contributes to atmospheric warming when absorbed by carbon dioxide, water vapor and a number of other greenhouse gas molecules.
a. microwave b. infrared c. ultraviolet d. radio e. none of these
6. Which of the following is a source of atmospheric methane?
a. rice paddies b. termites c. livestock d. wetlands e. all the above
7. Burning fossil fuels releases what 2 greenhouse gasses to the atmosphere?
a. carbon dioxide and nitrous oxide b. oxygen and helium
c. ozone and methane d. nitrogen and water vapor
8. The Vikings who colonized Greenland during the Medieval Warm Period died out because of which climate event?
a. The Year Without a Summer b. The Upper Dryas Period
c. The Holocene Climate Optimum d. The Dark Ages e. The Little Ice Age
9. The height of the last Ice Age occurred approximately how many years ago?
a. 1,000 b. 10,000 c. 100 d. 20,000 e. 2,000,000

10. Which of the following is NOT true about ozone in the troposphere?
- a. production is caused, in part, by nitrogen oxides from automobile exhaust
 - b. it can trigger asthma
 - c. it contributes to reduced yield in plant crops
 - d. it fades dyes
 - e. it can cause lung damage
 - f. they are all true facts about ozone in the troposphere
11. The driver of an automobile driving at 60 MPH (88 ft/s) breaks to a stop in 8 seconds to avoid hitting a dog. If the vehicle travels 160 feet while stopping, what is the average acceleration of the vehicle during the stopping process?
- a. 30 MPH
 - b. -44 ft/s/s
 - c. -11 ft/s/s
 - d. -30 ft/s/s
 - e. He didn't stop and the dog is dead
12. Who was the first scientist to recognize and understand that changes in Earth's orbital parameters (Eccentricity, Inclination, Precession) could cause Ice Ages?
- a. Milutin Milankovitch
 - b. Manny Milchtoast
 - c. Millard Fillmore
 - d. Karl Marx
 - e. Groucho Marx
13. A young lady walks one-half mile (east) from her home to the supermarket. She stops at a friend's house on her way home which is half-way between her home and the supermarket. What is her net displacement from her home to her friend's house?
- a. three-quarters mile
 - b. one-quarter mile, east
 - c. three-quarters mile, west
 - d. Three-quarters mile, east
14. Which of the following is an example of a recessive human blood type phenotype?
- a. AA
 - b. OO
 - c. O
 - d. Oo
 - e. AO
15. Which of the following is known as the "weather layer" of the atmosphere?
- a. ionosphere
 - b. stratosphere
 - c. thermosphere
 - d. mesosphere
 - e. troposphere
16. Which of the following gasses is the most important greenhouse gas responsible for maintaining Earth's mild climate?
- a. helium
 - b. carbon dioxide
 - c. water vapor
 - d. methane
 - e. nitrous oxide
17. Which is not an example of non-sliding friction?
- a. walking
 - b. tires getting traction on dry pavements
 - c. slipping and falling on ice
 - d. using your hand to turn a doorknob
 - e. they are all examples of non-sliding friction
18. Speed is defined as the change of _____ with respect to time.
- a. acceleration
 - b. distance
 - c. velocity
 - d. gravity
 - e. force
19. Which of the following is not an effect of exposure to UV-C and UV-B radiation?
- a. severe sunburn
 - b. genetic damages
 - c. skin cancer
 - d. leathery, prematurely-aged skin
 - e. all of the above are serious effects of UV B and C radiation exposure

20. Which of the following is the chemical formula for ozone?
- a. O_2 b. CO_2 c. CH_4 d. O_3 e. O_4



Use the above graph to answer the next questions.

21. Based on the Montreal Protocol of 1987, when, if ever, will stratospheric chlorine (Cl) and bromine (Br) reach 1980 levels, allowing ozone levels to recover to pre-industrial levels?
22. Based on the Montreal Treaty of 1997, when, if ever, will stratospheric chlorine (Cl) and bromine (Br) reach 1980 levels, allowing ozone levels to recover to pre-industrial levels?
23. A mother has type A blood. List her possible genotypes. _____

24. A father has type B blood. List his possible genotypes. _____

25, 26. Assume in question 23 the mother is heterozygous and in question 24 the father is homozygous. On the back, use a Punnett square to show the possible genotypes for their children.(1 point). To the side of the Punnett square list the possible phenotypes for the child (1 point). You must show your work to receive credit

27. Your instructor's favorite Eco-Nazi is:

- a. Al Gore b. Al Gore c. Al Gore d. Al Gore e. Al Gore

28. 13. An airplane changes its speed from 400 MPH to 500 MPH in 100 seconds. A child on a scooter goes from 0 mph to 4 mph in 2 seconds. The one with the greater average acceleration

- a. the plane because it has a significantly higher speed
b. the scooter because both time and change in speed matter
c. the plane because it experiences a greater change in its speed
d. impossible to determine with the information given

29.-30. **Coal, oil and natural gas are generally referred to as "fossil fuels"** and their use tends to rise the CO₂ levels in the atmosphere whereas burning "renewable" carbon sources, such as ethanol produced from biomass, are considered carbon-neutral. Why the difference? Answer on the back of the page.

Extra Credit (up to 3 points). On the back of the page, list and discuss several things we can do as an individual and as a society, to decrease greenhouse emissions.

Extra Credit (up to 2 points). Based on the chart above, what is a likely scenario for terrestrial life on Earth if we do nothing about Cl and Br in the stratosphere? Answer on the back of the page.

Extra Credit (up to 3 points) Isaac Newton is credited with inventing calculus, which is just an easy way to solve algebraic problems involving large data sets. Using calculus, he developed 3 laws of motion. Please list these laws and briefly discuss them.

Extra Credit (up to 4 points). In class we discussed friction. Please list the 2 main types of friction and give an example of each.