



- 1▶ While air pollution is not entirely restricted to man-made substances, in the vast majority of areas where it is a problem, human activity has been the primary cause. The Industrial Revolution, which took place from the late eighteenth to the early nineteenth century, generated the first notable increase of air pollution. As the use of coal became widespread to fuel factories and heat homes during this period, residents of large cities began to notice a smoky haze that hung over their heads. This haze was termed “smog” in the early twentieth century by Dr. Henry Antoine Des Voeux, who spoke at a public health meeting about the combination of smoke and fog that had adversely affected the health of London citizens.
- 2▶ Further modernization, especially of transportation, has led to smog being introduced into suburban and rural environments. The extensive rail system that started expanding in the late 1800s across the United States conveyed people and cargo to distant locations while the trains simultaneously puffed clouds of coal-produced smog along their path. The introduction of automobiles with oil as their fuel source compounded the issue by allowing individuals to add to the steadily increasing amount of air pollution. Personal vehicles permitted couples and families to travel long distances more easily, and promoted the settlement of previously untouched areas. An ever-growing global network of roads, and the proliferation of affordable vehicles have allowed air pollution to impact areas once considered safe from its effects.
- 3▶ Today, the oxidation of exhaust gases from cars and trucks is one of the primary sources of the world’s pollution. This foggy vapor, poised over some of the world’s largest cities, and growing to include smaller ones, is more accurately called “photochemical smog.” It results from chemical reactions that take place in the air, using the energy of sunlight. The production of smog begins when gases are created in the cylinders of vehicle engines. In these cylinders, oxygen and nitrogen gas combine as the fuel burns to form nitric oxide (NO), a colorless gas. The nitric oxide is forced out into the air through the vehicle tailpipe along with other gases.
- 4▶ When the gas reaches the air, it comes into contact with available oxygen from the atmosphere and combines with the oxygen to produce nitrogen dioxide (NO<sub>2</sub>), which is a gas with a brownish hue. This nitrogen dioxide plays a role in the formation of acid rain in wetter or more humid climates and tends to decompose back into nitric acid as it releases an oxygen atom from each molecule; the released oxygen atoms quickly combine with oxygen (O<sub>2</sub>) molecules to form ozone (O<sub>3</sub>). The brownish colored nitrogen dioxide is partially responsible for the brown color in smoggy air; the ozone is the toxic substance that causes irritation to eyes.
- 5▶ In actuality, smog is far more hazardous in warm, sunny, dry weather than during rainy weather. This is because the air in the upper part of the atmosphere can become warm enough in these types of climatic conditions to prevent vertical circulation. Warm air tends to rise, so when the upper atmosphere is cooler than the lower, it pushes the cool air down and the warm air up, carrying whatever pollutants are trapped in the lower level up and away from people. However, when the upper layer of air is as warm as, or warmer than the lower level, the air does not circulate vertically and the impurities remain in the lower level of air that people breathe. The issue is made worse for cities that are in the basins of valleys, surrounded by mountain ranges, because the mountains act as an additional barrier to air movement. Thus, cities that sit in valleys, and are in climates where it is warm and dry for much of the year, such as Los Angeles, suffer the harmful effects of air pollution more than other locales.
- 6▶ As smog has become an international issue, especially in connection with the potential of global warming—still a controversial and debated concept—attempts to limit its production have intensified. The Kyoto Protocol, named after the Japanese city where it was initially adopted, is the most well-known of recent efforts. The protocol called for member nations of the United Nations to establish policies that would contain, and

While context clues can help you determine which answer choice is correct, it is not the only vocabulary skill you should rely on. The TOEFL iBT® test does include vocabulary questions in which they expect you to already know the meaning of the highlighted word without the use of context clues.

Don’t read the sentence containing the target vocabulary word only for the word’s meaning. Pay attention to the information the sentence is telling you about the topic. This can help you answer other questions on the test.