Air Pollution Essay, Research Paper

INTRODUCTION Air Pollution, addition of harmful substances to the atmosphere resulting in damage to the environment, human health, and quality of life. One of many forms of pollution, air pollution occurs inside homes, schools, and offices; in cities; across continents; and even globally. Air pollution makes people sick it causes breathing problems and promotes cancer and it harms plants, animals, and the ecosystems in which they live. Some air pollutants return to earth in the form of acid rain and snow, which corrode statues and buildings, damage crops and forests, and make lakes and streams unsuitable for fish and other plant and animal life.In a cities, most air pollution comes from one human activity: burning fossil fuels natural gas, coal, and oil to power industrial processes and motor vehicles. Between 1900 and 1970, motor vehicle use rapidly expanded, and emissions of nitrogen oxides, some of the most damaging pollutants in vehicle exhaust, increased 690 percent. When fuels are incompletely burned, various chemicals called volatile organic chemicals (VOCs) also enter the air. Pollutants also come from other sources. For instance, decomposing garbage in landfills and solid waste disposal sites emits methane gas, and many household products give off VOCs.Once in the atmosphere, pollutants often undergo chemical reactions that produce additional harmful compounds. Air pollution is subject to weather patterns that can trap it in valleys or blow it across the globe to damage pristine environments far from the original sources.SMOG AND ACID PRECIPITATION Smog is intense local pollution usually trapped by a thermal inversion. Before the age of the automobile, most smog came from burning coal and was so severe that in 19th-century London, streetlights were turned on by noon because soot and smog darkened the midday sky. Burning gasoline in motor vehicles is the main source of smog in most regions today. Ozone in the lower atmosphere is a poison it damages vegetation, kills trees, irritates lung tissues, and attacks rubber. Environmental officials measure ozone to determine the severity of smog. When the ozone level is high, other pollutants, including carbon monoxide, are usually present at high levels as well.In the presence of atmospheric moisture, sulfur dioxide and oxides of nitrogen turn into droplets of pure acid floating in smog. These airborne acids are bad for the lungs and attack anything made of limestone, marble, or metal. In cities around the world, smog acids are eroding precious artifacts, including the Parthenon temple in Athens, Greece, and the Taj Mahal in Agra, India. Oxides of nitrogen and sulfur dioxide pollute places far from the points where they are released into the air. Carried by winds in the troposphere, they can reach distant regions where they descend in acid form, usually as rain or snow. Such acid precipitation can burn the leaves of plants and make lakes too acidic to support fish and other living things.Smog spoils views and makes outdoor activity unpleasant. For the very young, the very old, and people who suffer from asthma or heart disease, the effects of smog are even worse: It may cause headaches or dizziness and can cause breathing difficulties. In extreme cases, smog can lead to mass illness and death, mainly from carbon monoxide poisoning. In 1948 in the steel-mill town of Donora, Pennsylvania, intense local smog killed nineteen people. In 1952 in London over 3000 people died in one of the notorious smog events known as London Fogs; in 1962 another 700 Londoners died.With stronger pollution controls and less reliance on coal for heat, today s chronic smog is rarely so obviously deadly. However, under adverse weather conditions, accidental releases of toxic substances can be equally disastrous. The worst such accident occurred in 1984 in Bhopal, India, when methyl isocyanate released from an American-owned factory during a thermal inversion caused at least 3300 deaths.INDOOR AIR POLLUTION Pollution is perhaps most harmful at an often unrecognized site inside the homes and buildings where we spend most of our time. Indoor pollutants include tobacco smoke; radon, an invisible radioactive gas that enters homes from the ground in some regions; and chemicals released from synthetic carpets and furniture, pesticides, and household cleaners. When disturbed, asbestos, a nonflammable material once commonly used in insulation, sheds airborne fibers that can produce a lung disease called asbestosis.Pollutants may accumulate to reach much higher levels than they do outside, where natural air currents disperse them. Indoor air levels of many pollutants may be 2 to 5 times, and occasionally more than 100 times, higher than outdoor levels. These levels of indoor air pollutants are especially harmful because people spend as much as 90 percent of their time living, working, and playing indoors. Inefficient or improperly vented heaters are particularly dangerous.POLLUTION CLEANUP AND PREVENTION In an effort to enforce pollution standards, pollution control authorities measure both the amounts of pollutants present in the atmosphere and the amounts entering it from certain sources. The usual approach is to sample the open, or ambient, air and test it for the presence of specified pollutants. The amount of each pollutant is counted in parts per million or, in some cases, milligrams or micrograms per cubic meter. To learn how much pollution is coming from specific sources, measurements are also taken at industrial smokestacks and automobile tailpipes.

Pollution is controlled in two ways: with end-of-the-pipe devices that capture pollutants already created, and by limiting the quantity of pollutants produced in the first place. End-of-the-pipe devices include catalytic converters in automobiles and various kinds of filters and scrubbers in industrial plants. In a catalytic converter, exhaust gases pass over small beads coated with metals that promote reactions changing harmful substances into less harmful ones. When end-of-the-pipe devices first began to be used, they dramatically reduced pollution at a relatively low cost. As air pollution standards become stricter, it becomes more and more expensive to further clean the air. In order to lower pollution overall, industrial polluters are sometimes allowed to make cooperative deals. For instance, a power company may fulfill its pollution control requirements by investing in pollution control at another plant or factory, where more effective pollution control can be accomplished at a lower cost.End-of-the-pipe controls, however sophisticated, can only do so much. As pollution efforts evolve, keeping the air clean will depend much more on preventing pollution than on curing it. Gasoline, for instance, has been reformulated several times to achieve cleaner burning. Various manufacturing processes have been redesigned so that less waste is produced. Car manufacturers are experimenting with automobiles that run on electricity or on cleaner-burning fuels. Buildings are being designed to take advantage of sun in winter and shade and breezes in summer to reduce the need for artificial heating and cooling, which are usually powered by the burning of fossil fuels.The choices people make in their daily lives can have a significant impact on the state of the air. Using public transportation instead of driving, for instance, reduces pollution by limiting the number of pollution-emitting automobiles on the road. During periods of particularly intense smog, pollution control authorities often urge people to avoid trips by car. To encourage transit use during bad-air periods, authorities in Paris, France, make bus and subway travel temporarily free.Indoor pollution control must be accomplished building-by-building or even room-by-room. Proper ventilation mimics natural outdoor air currents, reducing levels of indoor air pollutants by continually circulating fresh air. After improving ventilation, the most effective single step is probably banning smoking in public rooms. Where asbestos has been used in insulation, it can be removed or sealed behind sheathes so that it won t be shredded and get into the air. Sealing foundations and installing special pipes and pumps can prevent radon from seeping into buildings.On the global scale, pollution control standards are the result of complex negotiations among nations. Typically, developed countries, having already gone through a period of rapid (and dirty) industrialization, are ready to demand cleaner technologies. Less developed nations, hoping for rapid economic growth, are less enthusiastic about pollution controls. They seek lenient deadlines and financial help from developed countries to make the expensive changes necessary to reduce pollutant emissions in their industrial processes.Nonetheless, several important international accords have been reached. In 1988, the United States and 24 other nations agreed in the Long-Range Transboundary Air Pollution Agreement to hold their production of nitrogen oxides, a key contributor to acid rain, to current levels. In the Montreal Protocol, adopted in 1987 and strengthened in 1990 and 1992, most nations agreed to stop or reduce the manufacture of CFCs. In 1992 the United Nations Framework Convention on Climate Change negotiated a treaty outlining cooperative efforts to curb global warming. The treaty, which took effect in March 1994, has been legally accepted by 160 of the 165 participating countries.In December 1997 at the Third Conference of the United Nations Framework Convention on Climate Change in Japan, more than 160 nations formally adopted the Kyoto Protocol. This agreement calls for industrialized nations to reduce their emissions of greenhouse gases to levels 5 percent below 1990 emission levels between 2008 and 2012. The United States, which releases more greenhouse gases than any other nation, has traditionally been slow to support such strong measures. The U.S. Senate may be reluctant to ratify the Kyoto Protocol because it does not require developing countries, such as China and India, to meet similar emissions goals.All these antipollution measures have helped stem the increase of global pollution emission levels. Air pollution control is a race between the reduction of pollution from each source, such as a factory or a car, and the rapid multiplication of sources. Smog in cities is expected to increase as the number of cars and miles driven continues to rise. Meanwhile, developing countries are building up their own industries, and their citizens are buying cars as soon as they can afford them. Ominous changes continue in the global atmosphere. New efforts to control air pollution will be necessary as long as these trends continue. TABLE OF CONTENTS INTRODUCTION 1SMOG AND ACID PRECIPITATION 2INDOOR AIR POLLUTION 3POLLUTION CLEANUP AND PREVENTION 3