AN OUTLINE FOR PROCESS DESCRIPTION

A description of how things work or happen divides the process into its parts or principles. Colleagues and clients need to know how stock and bond prices are governed, how your bank reviews a mortgage application, how an optical fiber conducts an impulse, and so on. A process description must be detailed enough to allow readers to follow the process step by step.

Much of your college writing explains how things happen. Your audience is your professor, who will evaluate what you have learned. Because this person knows *more* than you do about the subject, you often discuss only the main points, omitting the types of details that uninformed readers would require.

But your real challenge comes in describing a process for audiences who know *less* than you do, and who are neither willing nor able to fill in the blank spots; you then become the teacher, and the audience members become your students.

Introduce your description by telling what the process is, and why, when, and where it happens. In the body, tell how it happens, analyzing each stage in sequence. In the conclusion, summarize the stages, and describe one full cycle of the process.

Sections from the following general outline can be adapted to any process description:

I. Introduction
- A. Definition, Background, and Purpose of the Process
- B. Intended Audience (usually omitted for workplace audiences)
- C. Prior Knowledge Needed to Understand the Process
- D. Brief Description of the Process
- E. Principle of Operation
- F. Special Conditions Needed for the Process to Occur
- G. Definitions of Special Terms
- H. Preview of Stages

II. Stages in the Process
- A. First Major Stage
  1. Definition and purpose
  2. Special conditions needed for the specific stage
  3. Substages (if applicable)
     - a.
     - b.
- B. Second Stage (and so on)

III. Conclusion
- A. Summary of Major Stages
- B. One Complete Process Cycle

Adapt this outline to the process you are describing.

A SITUATION REQUIRING PROCESS DESCRIPTION

The following document is patterned after the sample outline.

A Process Description for a Nontechnical Audience

The Situation. Bill Kelly belongs to an environmental group studying the problem of acid rain in its Massachusetts community. (Massachusetts is among the states most affected by acid rain.) To gain community support, the environmentalists must educate citizens about the problem. Bill's group is publishing and mailing a series of brochures. The first brochure explains how acid rain is formed (Figure 19.5).

Audience and Use Profile. Some will already be interested in the problem; others will have no awareness (or interest). Therefore, explanation is given at the lowest level of technicality (no chemical formulas, equations). But the explanation needs to be vivid enough to appeal to less aware or less interested readers. Visuals create interest and illustrate the situation simply. To give an explanation thorough enough for broad understanding, the process is divided into three chronological steps: how acid rain develops, spreads, and destroys.

Clear title tells readers what to expect and also promotes awareness of the issue

Introduction orients readers via a definition

Initial description uses functional sequencing ("How does it work?"), as does the remainder of the description

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HOW ACID RAIN DEVELOPS, SPREADS, AND DESTROYS

Introduction

Acid rain is environmentally damaging rainfall that occurs after fossil fuels burn, releasing nitrogen and sulfur oxides into the atmosphere. Acid rain increases the acidity level of waterways because these nitrogen and sulfur oxides combine with the air's normal moisture. The resulting rainfall is far more acidic than normal rainfall. Acid rain is a silent threat because its effects, although slow, are cumulative.

Power plants burning oil or coal are primary causes of acid rain. The burnt fuel is not completely expended, and residue enters the atmosphere. Although this residue contains several potentially toxic elements, sulfur oxide and, to a lesser extent, nitrogen oxide are the major problems: These chemical culprits combine with moisture to form sulfur dioxide and nitric acid, which then rain down to earth.

FIGURE 19.5 A Process Description for a Nontechnical Audience Readers can follow the process as it unfolds.

The Process

How Acid Rain Develops. Once fossil fuels have been burned, their usefulness ends. It is here that the acid rain problem begins (Figure 1).

Headers in "The Process" mirror the description's title

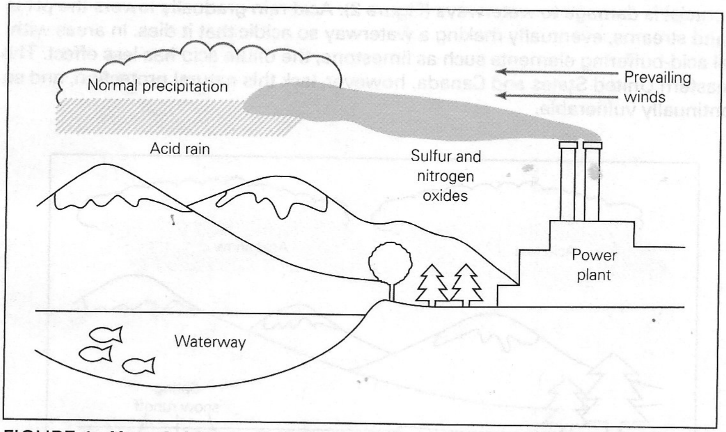

FIGURE 1 **How Acid Rain Develops and Spreads**

Clearly labeled visual enhances prose description of process

Acid level is measured by pH readings. The pH scale runs from 0 through 14—a pH of 7 is neutral. (Distilled water has a pH of 7.) Numbers above 7 indicate increasing alkalinity. (Household ammonia has a pH of 11.) Numbers below 7 indicate increasing acidity. Movement in either direction on the scale means multiplying by 10. Lemon juice, with a pH value of 2, is 10 times more acidic than apples, with a pH of 3, and 1,000 times more acidic than carrots, with a pH of 5.

Additional definition introduces a new concept ("pH")

Because of carbon dioxide (an acid substance) normally present in air, unaffected rainfall has a pH of 5.6. At this time, the pH of precipitation in the northeastern United States and Canada is between 4.5 and 4. In Massachusetts, rain and snowfall have an average pH reading of 4.1. A pH reading below 5 is considered abnormally acidic, and therefore a threat to aquatic populations.

How Acid Rain Spreads. Although we might expect areas containing power plants to be most severely affected, acid rain can in fact travel thousands of miles from its source. Stack gases escape and drift with the wind currents, traveling great distances before they return to earth as acid rain (Figure 1).

For roughly two to five days after emission, the gases follow the prevailing winds far from the point of origin. Estimates show that about 50 percent of the acid rain that affects Canada originates in the United States; conversely, 15 to 25 percent of U.S. acid rain originates in Canada.

The tendency of stack gases to drift makes acid rain a widespread menace. More than 200 lakes in the Adirondacks, hundreds of miles from any industrial center, cannot support life because their water has become so acidic.

FIGURE 19.5 (*Continued*)

Headers in "The Process" mirror the description's title

How Acid Rain Destroys. Acid rain causes damage wherever it falls. It erodes various types of building rock such as limestone, marble, and mortar. Damage to buildings, houses, monuments, statues, and cars is widespread. Many priceless monuments have already been destroyed, and even trees of some varieties are dying.

More crucial is damage to waterways (Figure 2). Acid rain gradually lowers the pH in lakes and streams, eventually making a waterway so acidic that it dies. In areas with natural acid-buffering elements such as limestone, the dilute acid has less effect. The northeastern United States and Canada, however, lack this natural protection, and so are continually vulnerable.

Second labeled visual provides graphic illustration of the process

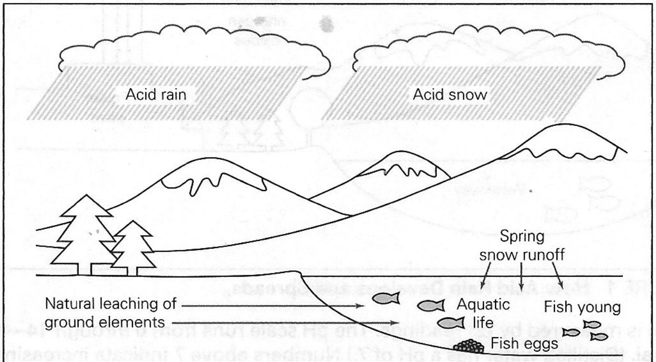

FIGURE 2 **How Acid Rain Infiltrates Waterways**

The pH level in an affected waterway drops so low that some species cease to reproduce. A pH of 5.1 to 5.4 means that entire fisheries are threatened: once a waterway reaches a pH of 4.5, fish reproduction ceases.

In the northeastern United States and Canada, the acidity problem is compounded by the runoff from acid snow. During winter, acid snow sits with little melting, so that by spring thaw, the acid released is greatly concentrated. Aluminum and other heavy metals normally present in soil are also released by acid rain and runoff. These concentrated toxins leach into waterways, affecting fish in all stages of development.

Conclusion summarizes the process and implicitly solicits audience support

Summary

Acid rain develops from nitrogen and sulfur oxides emitted by the burning of fossil fuels. In the atmosphere, these oxides combine with ozone and water to form precipitation with a low pH. This acid precipitation returns to earth miles from its source, damaging waterways that lack natural buffering agents. The northeastern United States and Canada are the most severely affected areas in North America.

FIGURE 19.5 (*Continued*)