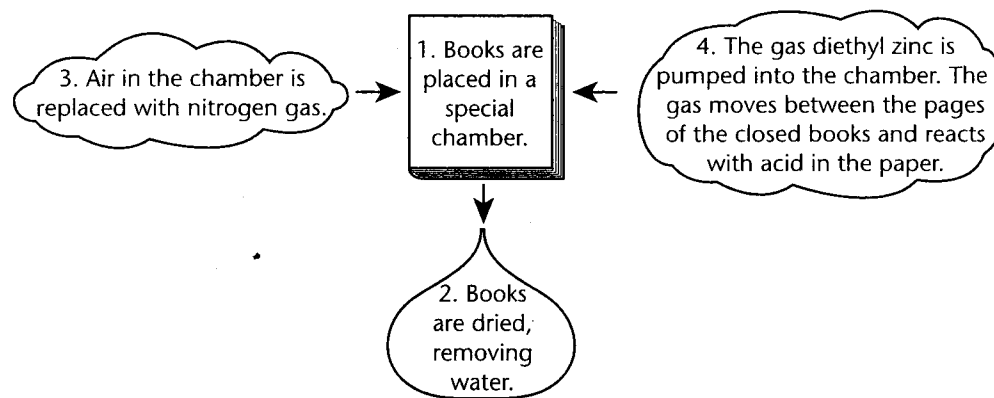


**SECTION 19-2** **ENRICH**

# Acidic Paper

From the fifteenth through the eighteenth centuries, the paper in many books was made from linen. Linen is made from the fibers of flax plants. By the nineteenth century, the printing of books had increased dramatically and, as a result, so did the demand for inexpensive paper. In response, a method was developed to produce cheap paper from wood. This process involved the use of a chemical called *alum*, which greatly increased the acidity of paper. Eventually, this acidity causes such paper to become brittle and fall apart. Thus, many books made during the nineteenth and twentieth centuries are slowly becoming too fragile to read, while older books made with linen paper are often in better condition.

Scientists have developed several chemical methods to preserve books made with acidic paper. These methods involve reacting the acid in the paper with a base. The products of these reactions are not acidic, and so the paper is protected from further damage due to acidity. The diagram below illustrates one of these processes. Today, some publishers use acid-free paper in their books. In fact, important documents are sometimes printed on paper that is basic rather than acidic.



Answer the following questions on a separate sheet of paper.

- The bases used to treat books containing acidic paper are usually gases rather than liquid solutions. Why do you think this is so? *Placing a book in a liquid solution would be much like soaking the book in water*
- Is paper made from linen more or less acidic than paper made from wood? Which type of paper lasts longer? *Less acidic; Linen paper lasts much longer*
- Why do you think that printing a document on basic paper will help to ensure that it lasts for a very long time? *It would not become brittle and fall apart as acidic paper does. Base can react with acid in the paper*
- How might the process of making paper from wood be changed to produce paper that is not acidic?

*A base might be added after the stage in which alum is added, or a process for making paper without the chemical alum could be developed.*

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