

**THE YOUNG CHEMIST: A  
BOOK OF LABORATORY  
WORK, FOR BEGINNERS**

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The Young Chemist: A Book of Laboratory Work, for Beginners by John Howard Appleton

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**JOHN HOWARD APPLETON**

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THE  
YOUNG CHEMIST:  
A BOOK  
OF  
LABORATORY WORK,  
FOR BEGINNERS.

BY  
JOHN HOWARD APPLETON, A. M.,  
PROFESSOR OF CHEMISTRY IN BROWN UNIVERSITY.

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*THIRD EDITION.*

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## PREFACE TO THE REVISED EDITION.

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THE purpose of this little book is to aid in the instruction of pupils in chemistry. The method employed is the experimental or object method.

Every experienced teacher has remarked the wonderful ease and pleasure with which beginners in chemistry—*when they are allowed to perform experiments*—grasp the facts and principles of the science. It has also been recognized that the only objections to the experimental method arise from the greater expenditure of the teacher's time, and from the cost of supplies.

It is hoped that this little book removes one of these objections; and, fortunately, chemical apparatus and supplies can now be had at very low prices.

The following are some of the characteristic advantages of the book—

*First.*—The apparatus described, and the supplies called for, are of *the very simplest character*.

*Second.*—The experiments are described in clear and simple language, and in direct form; the pupil can hardly fail to perform them successfully, even without special aid from the teacher.

*Third.*—Dangerous experiments have been excluded. (But, of course, care must always be exercised in experimenting.)

*Fourth.*—The chemical elements are discussed in a scientific order which, while it aids the memory, does so upon correct principles.

*Fifth.*—Formulas and reactions are introduced freely, so that the student learns the new nomenclature and new notation without suspecting it. (But a systematic discussion of these subjects has been offered for purposes of reference, or for such other use as the teacher may judge best to make of it.)

It may also be added that this book is not an experiment. For many years it has been used with great success by many professors and teachers of wise judgment and large experience.

The present edition has been carefully revised throughout, and it is hoped that in its improved form it may be found to possess additional usefulness.

BROWN UNIVERSITY, 1889.





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## HINTS TO TEACHERS.

I. **PERFORM** slowly several experiments before the class. Let the pupils perform the same experiments (and no others), each at his own desk. After this let the pupils learn carefully the entire description of the experiments so performed.

It is highly desirable to have the pupils learn the *outline* of a given chapter, and recite it day after day, until the work of that chapter is finished. They thus discover the logical relation which binds the separate experiments into one whole; they also discover the scientific plan of the work.

II. Use extreme caution in experimenting. Be careful not to vary the conditions of an experiment, as stated in the book. Be exceedingly careful when you attempt experiments other than those described in this book.

Do not allow pupils to approach too near to an experiment in progress.

III. Use very small quantities of the substances prescribed.

IV. In preparing a gas, the most convenient apparatus is a side-neck flask or a side-neck test-tube.

The cuts need no explanation.



FIG. 1.—Evolving a gas by use of a side-neck flask.



FIG. 2.—Evolving a gas by use of a side-neck test-tube.