

**GRAMMAR-SCHOOL
ALGEBRA, SEVENTY-FIVE
SUGGESTIVE LESSONS
FOR BEGINNERS**

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Grammar-School Algebra, Seventy-Five Suggestive Lessons for Beginners by Wm. M. Giffin

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WM. M. GIFFIN

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Grammar-School Algebra

SEVENTY-FIVE SUGGESTIVE LESSONS
FOR BEGINNERS

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Grammar-School Algebra



PREFACE.

While preparing this little manual for the grammar-school children who may use it, the author has had for his guide the well-known pedagogical principle, "The primary concepts and ideas in every branch of knowledge should be taught objectively in all grades of school." There has seemed to him to be too sudden a transition from the numerical to the literal symbol. So much explanation, too, is the rule that children from the start gain an idea that algebra is an *alias* for mystery. While it must be admitted that there are many new truths to be learned by the pupil in its study, it should not be forgotten, on the other hand, that it contains much that is in no way contradictory to what he has already learned, and which, if given a chance, with no hint that it is something new, he can use in another form.

The author has for some time felt that there should be a difference, other than in thickness, between the book prepared for grammar-school children and the book prepared for the high-school pupil. The expression $(x + y)^2 = x^2 + 2xy + y^2$, for example, should mean something more to a child than the letters of the alphabet

which the answer contains. It can be made to do so if the teacher will make an effort to present proper conditions for its application *to things*. A study of the lessons here presented will show that such an effort has been made by the author; how effectually he will not presume to say, but will be pardoned if he expresses a hope that the little work will meet with the approbation of those into whose hands it may find its way.

WILLIAM M. GIFFIN.

COOK COUNTY NORMAL SCHOOL,
CHICAGO, 1895.

TO THE TEACHER.

The author has purposely avoided the exercises so often given in most algebras, viz., find the value of x in the following equation, $x + 2 = 12$, for the reason, that, in his judgment, such exercises are not productive of mental growth. The child has simply to recall certain facts already learned by rote to work the equation *made for him*. On the other hand, if he be given the conditions, viz., a certain number increased by two equals twelve, he not only has to recall the facts as before, but he has to draw an inference and through this inference to *form his own equation*, which becomes a part of himself, thus enhancing its value and causing its solution to be far more pleasurable. We must not forget that "teaching is but the presentation of external conditions for educative self-effort. Thinking is not in itself educative; it becomes educative only when the conscious action is intense, and the conscious activities are immediately needed for development." *

On pp. 99-108 are found many exercises which, though simple in themselves, are much more valuable

* Talks on Pedagogics.

than the isolated equations referred to. It is thought they will hardly be necessary for those children who are quick to grasp new principles, while others who are slower may require many repetitions. They may be used at the time the pupils first take up the subjects or as a final review.

Only such factoring and fractions are given as are required for the child's immediate use. For this reason, also, nothing has been done with the "highest common divisor," the "lowest common multiple" (as such), or quadratic equations. In short, the book is not a high school book, but a preparation for the high school book.

Those teachers who desire to test the children on the fundamental operations, fractions, factoring and square root, with questions having no answers given, will find such tests on pages 113 to 128. They have been added as supplemental work which the teacher may or may not use, as he thinks best.

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