

# Easy When You Know How

*Far from being the hardest subject, math can be the engine of learning for delayed students.*

By John Mighton

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Based on my work with hundreds of elementary students, spanning 15 years, I am convinced that all children can be led to think mathematically. If you believe that a student is not capable of learning math, I recommend you read my book *The Myth of Ability: Nurturing Mathematical Talent in Every Child*.

You are more likely to help a student if you teach with the following principles in mind.

## **1. If a student doesn't understand your explanation, assume there is something lacking in your explanation, not in the student.**

When a teacher leaves a student behind, it is almost always because the teacher has not taken responsibility for examining the way he or she teaches. I often make mistakes in my lessons: sometimes I will go too fast for a student or skip steps inadvertently.

I don't consider myself a natural teacher. I know many teachers who are more charismatic or faster on their feet than I am. But I have had enormous success with students who were thought to be unteachable because, if I happen to leave a student behind, I always ask myself: what did I do wrong in that lesson? And I usually find that my mistake is that I have neglected one of the following principles.

## **2. In mathematics, it is always possible to make a step easier.**

A hundred years ago, researchers discovered that virtually all of the concepts used by working mathematicians could be reduced to one of two extremely basic operations, namely the operation of counting or the operation of grouping objects into sets.

Most people are able to perform both of these operations before they enter kindergarten. It is surprising, therefore, that schools have managed to make mathematics a mystery to so many students.

## **3. With a weaker student, the second piece of information almost always drives out the first.**

With weaker students, it is always better to introduce only one piece of information at a time. As a student learns to concentrate and approach the work with real excitement, you can begin to skip steps when teaching new material or even challenge the student to figure out the steps himself. But if the student begins to struggle with this approach, go back to teaching in small steps.

## **4. Before you assign work, verify that your student has the skills needed to complete the work.**

In our school system, it is assumed that some students will be left behind in math, but if the teacher is careful to break skills and concepts into steps that every student can understand, this needn't happen.

Before you assign a question from one of the JUMP workbooks, you should verify that your student is prepared to answer the question without your help (or with minimal help). The sheets make it easy to check, since on most worksheets, only one or two new concepts or skills are introduced.

## **5. Raise the bar incrementally.**

Any successes I have had with weaker students are almost entirely due to a technique I use which is, as a teacher once said about the JUMP method, "not exactly rocket science". When a student has mastered a skill or concept, I simply raise the bar slightly by challenging him or her to answer a question that is only incrementally more difficult. Students become very excited when they succeed in meeting a series of graduated challenges.

## **6. Repetition and practice are essential.**

Some educators seem to assume that if a child discovers an operation or a concept, he or she will always

find it easy to apply the concept in new situations and be able to recall the concept immediately — even if the student hasn't had the opportunity to think about it for a year. This certainly does not reflect my experience as a mathematician. Even mathematicians need constant practice to consolidate and remember skills and concepts.

Repetition and practice don't have to be boring. If students are encouraged to discover and extend steps by themselves, if they are made to feel as if they are meeting a series of challenges, and if they are allowed to apply their knowledge to solve interesting problems, they will happily learn even the most challenging operations.

## **7. Praise is essential.**

We've found the JUMP program works best when teachers give their students a great deal of encouragement. Because the lessons are laid out in steps that any student can master, you'll find that you won't be giving false encouragement.

We haven't observed a student yet — even among scores of remedial students — who couldn't learn math. When it is taught in steps, math may actually be the subject in which children with attention deficits and learning disabilities can most easily succeed, thereby developing the confidence and cognitive abilities they need to do well in other subjects.

As students become confident and attentive, they can begin to skip some steps and discover more mathematics independently. The new teachers' manual for the JUMP workbooks (JUMP Teaching Material) contains activities and problems that allow students to extend ideas on their own. Rather than being the hardest subject, math can be the engine of learning for delayed students.

*(Adapted with permission from the JUMP at Home: Math Worksheets for the Elementary Curriculum, grades 3-6, available at most bookstores. [www.jumptutoring.org](http://www.jumptutoring.org))*