HINTS FOR HELPING STUDENTS WHO HAVE FALLEN BEHIND  by John Mighton

In response to questions asked by teachers using the JUMP program, I have compiled some suggestions for helping students who are struggling with math. I hope you find the suggestions useful. (And I hope you don't find them impractical: I know, given the realities of the teaching profession, that it is often hard to keep your head above water.) If you have any suggestions of your own, I would be glad to hear them at: jmighon@fields.utoronto.ca

1. **Teaching Number Facts**

   It is a serious mistake to think that students who don't know their number facts can always get by in mathematics using a calculator or other aids. Students can certainly perform operations on a calculator, but they cannot begin to solve problems if they lack a sense of numbers: students need to be able to see patterns in numbers, and to make estimates and predictions about numbers, in order to have any success in mathematics. A calculator cannot provide these abilities.

   It is much easier to teach students their number facts than is generally believed. In the “Mental Math” section of the JUMP Teacher’s Manual, you will find a number of effective tricks to help students learn their number facts (see, for instance, the section “How to Memorize Your Times Tables in Five Days”). After you have taught the tricks in the manual, I would recommend giving students who need extra practice daily two-minute drills and tests until they know their facts (you can give a student the same sheet repeatedly until they have memorized the facts on it – that way you don't have to do a lot of extra work preparing materials). You might also send home extra work or, whenever possible, ask parents to help their children memorize certain facts (don't overload the student – you might send home one times table or half a times table per night). Students might also quiz each other using flash cards. JUMP has shown beyond a shadow of a doubt that students will memorize material more quickly if their teacher is enthusiastic about their successes, no matter how small those successes may seem. (You might even have some kind of reward system or acknowledgment for facts learned.)

   Trying to do mathematics without knowing basic number facts is like trying to play the piano without knowing where the notes are: there are few things you could teach your students that will have a greater impact on their academic career than a familiarity with numbers.

2. **Give Cumulative Reviews**

   Even mathematicians constantly forget new material, including material they once understood completely. (I have forgotten things I discovered myself!) Children, like mathematicians, need a good deal of practice and frequent review in order to remember new material.

   Giving reviews needn't create a lot of extra work for you. I would recommend that, once a month, you simply copy a selection of questions from the workbook units you have already covered onto a single sheet and Xerox the sheet for the class. Children rarely complain about doing questions they already did a month or more ago (and quite often they won't even remember they did those particular questions). The most you should do is change a few numbers or change the wording of the questions slightly. If you don't have time to mark the review sheets individually, you can take them up with the whole class (though I would recommend looking at the sheets of any students you think might need extra help or practice).

3. **Make Mathematical Terms Part of Your Spelling Lessons**

   In some areas of math, in geometry for instance, the greatest difficulty that students face is in learning the terminology. If you include mathematical terms in your spelling lessons, students will find it easier to remember the terms and to communicate about their work.
4. **Find Five Minutes, Wherever Possible, to Help Weaker Students in Small Groups**

 Whenever I have taught JUMP in a classroom for an extended time, I have found that I generally needed to set aside five minutes every few days to give extra review and preparation to the lowest four or five students in the class. (I usually teach these students in a small group while the other students are working on other activities.) Surprisingly, this is all it takes for the majority of students to keep up (of course, in extreme cases, it may not be enough).

 I know, given current class sizes and the amount of paperwork teachers are burdened with, that it’s very hard for teachers to find extra time to devote to weaker students but, if you can find the time, you will see that it makes an enormous difference to these students and to the class in general. (By investing a little extra time in your weaker students, you may end up saving time as you won't have to deal so much with the extreme split in abilities that is common in most classes, or with the disruptive behaviour that students who have fallen behind often engage in.)

5. **Teach Dense Pages in the Workbooks in Sections**

 Fitting the full curriculum into 300 pages was not an easy task. Some pages in our workbooks are more cramped than we would have liked, and some pages do not provide enough practice or preparation. If you feel a worksheet is too dense or introduces too many skills at once, assign only two or three questions from the worksheet at a time. Give your students extra practice before they attempt the questions on the page: you can create questions similar to the ones on the page by just changing the numbers or by changing the wording slightly.

 When we reprint the workbooks next year, we will make an effort to fix pages that are too dense, either by adding extra pages to the workbooks or by moving some of the exercises into the Teacher’s Manuals. We are presently gathering feedback from teachers in the program about which pages need to be fixed.

6. **Change Difficult Behaviour Using Success and Praise**

 In my experience, difficult children respond much more quickly to praise and success than to criticism and threats. Of course, a teacher must be firm with students, and must establish clear rules and boundaries, but I've found it's generally easier to get kids to adhere to rules and to respect others if they feel admired and successful.

 I have worked with hundreds of children with attention deficits and behavioural problems over the past 15 years (even in the correctional system), and I have had a great deal of success changing behaviour using a simple technique: if I encounter a student who I think might cause problems in a class I'll say: "You're very smart. I'd better give you something more challenging." Then I give the student a question that is only incrementally harder – or that only looks harder – than the one they are working on. For instance, if a student can add three fractions with the same denominator, I give them a question with four fractions. (I never give a challenge to a difficult student unless I'm certain they can do the question.) I always make sure, when the student succeeds in meeting my challenge, that they know I am impressed. Sometimes I even pretend to faint (students always laugh at this) or I will say: "You got that question but you'll never get the next one." Students become very excited when they succeed in meeting a series of graduated challenges. And their excitement allows them to focus their attention and make the leaps I have described in *The Myth of Ability*. (Of course you don't have to use my exact techniques: teachers find different ways to praise their students, but I think passion is essential.)

 The technique of raising the bar is very simple but it seems to work universally: I have used it in inner-city schools, in behavioural classes and even in the detention system and I have yet to meet a student who didn't respond to it. Children universally enjoy exercising their minds and showing off to a caring adult.
Although JUMP covers the traditional curriculum, the program demands a radical change in the way teachers deliver the curriculum: JUMP is based on the idea that success is not a by-product of learning, it is the very foundation of learning. If you aren't willing to give difficult students graduated challenges that they can succeed at, and if you aren't willing to be excited at their successes, then we would implore you not to use JUMP.

In mathematics, it is extremely easy to raise the bar incrementally: I don't know of any other subject in which a teacher can break skills into such minute steps and can gauge so precisely the size of the step and the student's readiness to attempt a new step. I believe there is no other subject in which it is easier to harness the attention and enthusiasm of difficult students.

I know that in a big class it's extremely hard to give attention to difficult students, but sometimes a few five-minute sessions spent giving a student a series of graduated challenges (that you know they can succeed at) can make all the difference to the student (and to your stress levels!).

(NOTE: Once students develop a sense of confidence in math and know how to work independently, you can sometimes allow them to struggle more with challenges: students need to eventually learn that it's natural to fail on occasion and that solving problems sometimes takes a great deal of trial and error.)

7. Make Math a Priority
I've occasionally met teachers who believe that, because they survived school without knowing much math or without ever developing a love of the subject, they needn't devote too much effort to teaching math in their own classes. There are two reasons why this attitude is extremely harmful to students:

(i) It is easier to turn a good student into a bad student in mathematics than in any other subject: mathematical knowledge is cumulative; when students miss a step or fall behind, they are often left behind permanently. Students who fall behind in mathematics tend to suffer throughout their academic careers and end up being cut off from many jobs and opportunities.

(ii) JUMP has shown that mathematics is a subject where students who have reading delays, attention deficits and other learning difficulties can experience immediate success (and the enthusiasm, confidence and sense of focus children gain from this success can quickly spill over into other subjects). In neglecting mathematics, a teacher neglects a tool that has the potential to transform the lives of weaker students.