

A "HANDY" METHOD FOR ASSESSING
MATHEMATICAL UNDERSTANDING

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In nearly every class, there are a few bright, vocal students who are eager to answer each question that you pose, many times before you finish asking it! Too often, the slower, confused, or less motivated students remain silent and uninvolved. Not only do these students often become frustrated and discouraged, it is difficult to assess any difficulties they may be having. Fortunately, there is a "handy" solution to these problems! By using hand signals, each student becomes an active participant. Here are some of the ways you may wish to use this method:

(1) Pose a question such as, "What is $-1-2$?" On the chalkboard, write three to five possible choices for an answer, including "not sure." (You may want to ask for volunteers to suggest answers.) After giving the students a period of time to choose the answer they think is correct, ask them to hold up the number of fingers which matches the number of their answer. If "-3" were the second possible response, you should see a lot of "peace" or "victory" signs throughout the classroom!

(2) If you want to assess the level of confidence the students have in their answers, you might have them indicate the answer with their right hand and make a "thumbs-up" (fairly confident) or a "thumbs-down" (weakly confident) sign with their left.

(3) If the answer is a small number, as in the first example, you may want to have the students display the actual answer on their hands. They might, in this case, hold up three fingers on one hand and make a negative sign with the index finger of the other hand. Many two-digit numbers can be expressed in various ways, encouraging creative thinking. To indicate "20," the student might hold up 2 fingers on his or her left hand and form a zero with the right hand, or the student may flash 10 fingers twice. If the number contains a decimal, you may see a student

using his or her head as a decimal point, holding up fingers next to each ear! Students will often display fractions by holding one hand on top of the other, indicating numerator and denominator.

(4) Many times the questions that you pose will have two possible answers: "Is this a true or false statement?" or "Is -7 less than or greater than -5 ?" In such instances, have the students raise their right hand to indicate one answer and their left to indicate the other.

(5) Numerous mathematical symbols and geometrical shapes can be formed by the fingers or arms. For example, you can quickly tell who knows the difference between acute, right, and obtuse angles by having the students form an example of each, using either their fingers or their arms. To answer the question, "What goes in the blank, < or >: .058___ .06 ?", the students could form the appropriate inequality sign with their fingers.

(6) To discourage students from imitating the responses of the brightest students in the class, have the students raise their hands in unison. You might also consider having the students display their answers under their desktops (providing, of course, that you are able to see their fingers) or having them briefly show you their answers when you look their way.

By using this "handy" approach, rapid assessment of each student's level of understanding is possible. More importantly, increased involvement often motivates thinking and stimulates learning, resulting in a higher level of achievement for all students.

DATES TO REMEMBER

March 18-19, 1988	OCTM Annual Meeting Youngstown, Ohio
April 6-9, 1988	NCTM Annual Meeting Chicago, Illinois
October 27-29, 1988	NCTM Regional Meeting St. Louis, Missouri
April 29-30, 1988	Ohio Section, MAA, Spring Meeting Kent State University
April 12-15, 1989	NCTM Annual Meeting Orlando, Florida