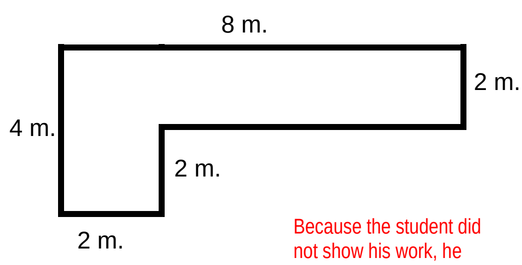
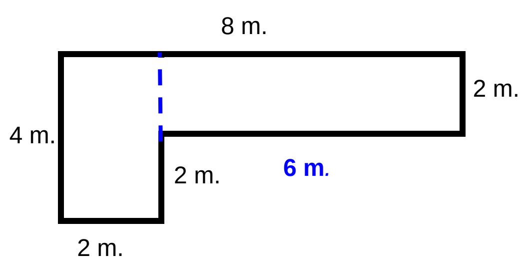
Why Students Need to Show Their Work in Math

When students show their work, they: 1.) organize their problem-solving; 2.) go through the necessary steps one at a time to get an accurate solution; 3.) provide a "trail" for going back to check their answers; and 4.) show me exactly what they did, so that I can intervene if necessary at the point where help is needed, or even give partial credit. By showing their work, students are more accurate and avoid habits that will impede their math progress.

Many bright students can "see" answers mentally because initially, new concepts are in the context of small numbers. That is fine for mental math exercises such as basic math facts, estimation, and multiplying or dividing by 10's. However, numbers soon get more complex (decimals, fractions, large numbers) and the calculations become too difficult to perform mentally and still be accurate. At some point variables take the place of numbers. Therefore, students need to practice, know, and be comfortable with a real and strategic process for organizing their problem-solving.

Below are three examples. The top row is incorrect, the bottom is correct.

	Perimeter and Area of Irregular Shapes	Calculations Requiring Common Denominators	Order of Operations
Wrong	 Perimeter = **18 m.** Area = **24 sq. m.** Because the student did not show his work, he cannot easily double-check his process, and the teacher must "guess" at what point the error took place.	$5\frac{3}{8}$ $+\ 2\frac{1}{2}$ **$7\frac{3}{4}$** Neither the student nor the teacher can tell how the student got this answer, so the mistake is likely to occur again.	$24 / 2 \times 2^2 + (5 \times 3) \times 2 =$ **36** Neither the student nor the teacher can check to see if the mistake is in calculating, or if it is how the student used "order of operations"
Right	 Perimeter = **8+2+6+2+2+4=24 m.** Area = **(6x2) + (4x2) = 12+8 = 20 sq. m.** By showing his work and the number model, the student can easily double-check his own work. The teacher can see this student's approach to solving the problem and can check the calculations.	$5\frac{3}{8} = \mathbf{5\frac{3}{8}}$ $+\ 2\frac{1}{2} = \mathbf{2\frac{4}{8}}$ **$7\frac{7}{8}$** The student can check his work. If the answer is incorrect, the teacher can see where the error occurred in order to help the student in future calculations.	P $24 / 2 \times 2^2 + \underline{(5 \times 3)} \times 2 =$ E **$24 / 2 \times \underline{2^2} + 15 \times 2 =$** MD **$\underline{24 / 2 \times 4} + \underline{15 \times 2} =$** AS **$48 + 30 = 78$** The student can check his work because he solved one step at a time. If the answer is incorrect, the teacher can see where the error occurred in order to help the student in future calculations.

Parents, please make sure your child is showing his/her work. When students do not show their work, they will not get credit for their answer (thus get low scores), and they will still be required to do it over. From a teaching point of view, it is difficult to pinpoint students' actual mistakes, and I need to be able to analyze their problem-solving process. Many of these problem-solving skills are forerunners to Algebra, a course that is just around the corner!

We want to set students up for math success – now and in the future. This means showing their work in problem-solving on a regular basis!