

<b>Core Idea</b>	<b>Task</b>	<b>Score</b>
<b>Geometry</b>	<b>Triangle</b>	
<p>This task asks students to read and interpret clues about geometric attributes of a triangle to find the side lengths. Students needed to understand geometric terms, such as, perimeter, equilateral triangle, and isosceles triangle. Students also needed to understand number properties, such as prime number, single digit, and ratio. Successful students could find a solution that met all of the clues and that would make a closed triangle.</p>		
<b>Measurement</b>	<b>Rugs</b>	
<p>This task asks students to work with perimeter and circumference of squares, triangles, and circles. Students were given the formula for circumference to help them with the calculations. Students needed to make conversions from feet and inches to feet or inches. Students also needed to find the perimeter of a semi-circle and explain why it is not the same as half the circumference. Successful students could use Pythagorean theorem to find the side length of an isosceles triangle and use that length to find the perimeter.</p>		
<b>Algebra</b>	<b>Number Calculations</b>	
<p>This task asks students to explore the order of number operations by creating examples to fit a set of conditions and test those conditions by calculating the answers to their examples. Successful students could calculate accurately with negative numbers and understand division with decimal answers. Students were then given a set of algebraic representations for the relationships that they had investigated and asked to decide which were true.</p>		
<b>Functions</b>	<b>Shelves</b>	
<p>This task asks students to work with a pattern of growing shelves, made up of boards and bricks. Students needed to use spatial thinking to find the number of boards and bricks needed, determine the height, and find the cost of the bookcase. Successful students realized that the height would include the bricks and the thickness of the boards. Students were also asked to look at a graph of the four functions in the pattern (cost, number of bricks, height, and width) and match the points on the graph with descriptions and their equations. Successful students could match the verbal description to the equation.</p>		
<b>Number</b>	<b>Take Off</b>	
<p>This task asks students to work with speed, time, and distance in the context of an Indy car race and a rocket launch. Students needed to be able to convert units of measure and work with rates. Successful students could work with a rate in either kilometer per second or meters per second to find the distance traveled given an amount of time or to find the time given the distance.</p>		

Figure 7: Overall Frequency Distribution by Total MARS Raw Scores, Grade 8

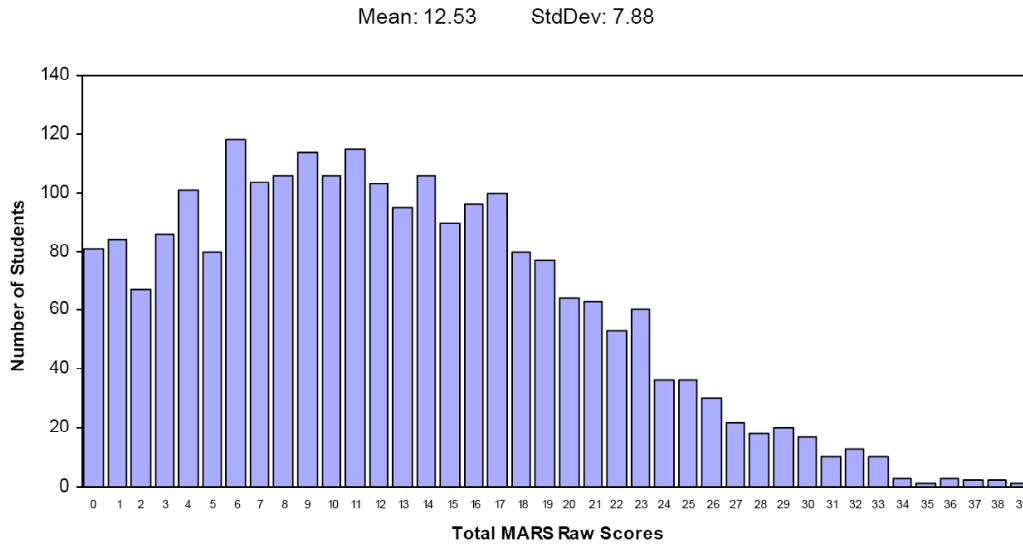
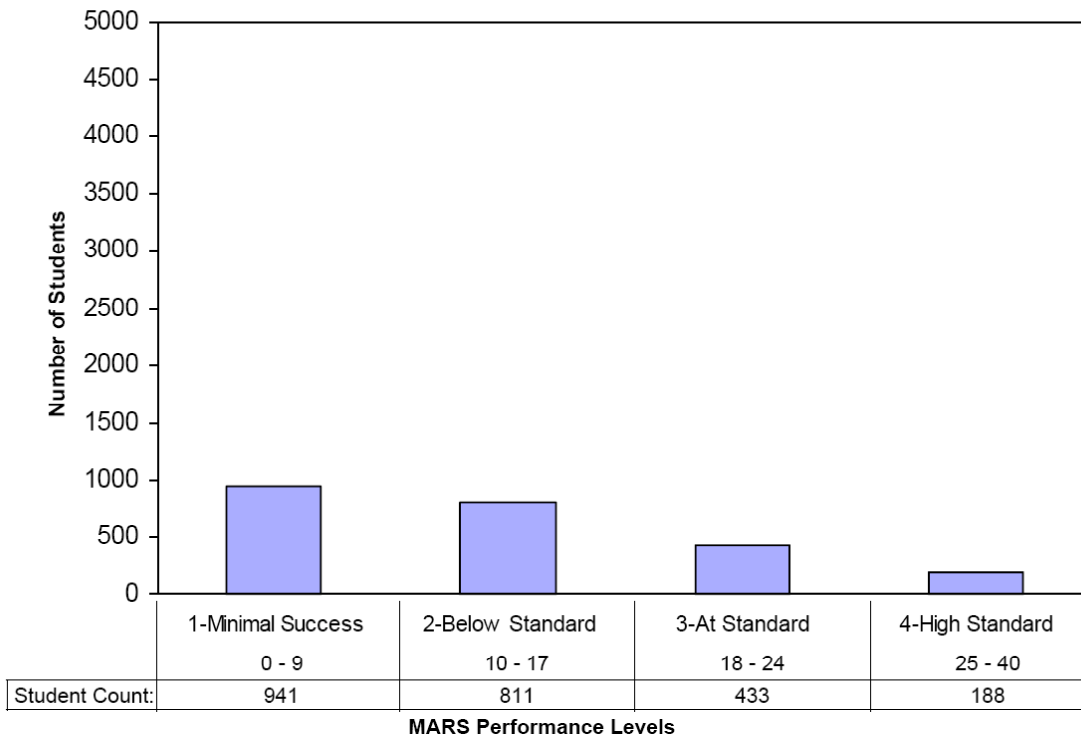


Figure 16: Bar Graph of 2007 MARS Test Performance Levels, Grade 8



## Comparison of Student Performance

Table 67: MARS Performance Level Frequency Distribution, 2001 to 2004, Grade 8

	2001		2002		2003		2004	
	Count	Percentage	Count	Percentage	Count	Percentage	Count	Percentage
Level 1	951	18.9%	1751	27.1%	2509	30.7%	2852	26.5%
Level 2	2109	41.9%	2390	37.0%	2158	26.4%	2745	25.5%
Level 3	1544	30.7%	1495	23.1%	1556	19.0%	3303	30.7%
Level 4	428	8.5%	826	12.8%	1955	23.9%	1858	17.3%

Table 67 (Cont.): MARS Performance Level Frequency Distribution, 2005 to 2007, Grade 8

	2005		2006		2007	
	Count	Percentage	Count	Percentage	Count	Percentage
Level 1	1530	48.3%	886	39.6%	941	39.7%
Level 2	716	22.6%	681	30.5%	811	34.2%
Level 3	630	19.9%	484	21.7%	433	18.2%
Level 4	294	9.3%	184	8.2%	188	7.9%

Table 68: MARS Performance Level Descriptive Statistics, 2001 to 2007, Grade 8

	2001	2002	2003	2004	2005	2006	2007
Student Count	5032	6462	8178	10758	3170	2235	2373
Std Deviation	0.87	0.98	1.15	1.06	1.02	0.97	0.95
Mean	2.29	2.22	2.36	2.39	1.90	1.98	1.94

From 2002 to 2004, the mean performance for Level 8 increased modestly, then decreased in 2005, and increased slightly in 2006. The mean performance in 2007 was slightly lower than in 2006, but the change is not statistically significant and corresponds to an effect size of only .04 standard deviation units. The percentage of students meeting or exceeding standards also decreased, from 30% in 2006 to 26% in 2007.

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## Triangle

This problem gives you the chance to:

- use clues to solve a problem
- 

Use the six clues below to find the lengths of the sides of this triangle.

<b>CLUE 1</b> The perimeter of the triangle is 35 centimeters.	<b>CLUE 4</b> The length of one side is a prime number.
<b>CLUE 2</b> The triangle is not equilateral.	<b>CLUE 5</b> The triangle is not isosceles.
<b>CLUE 3</b> The length of one side is a single-digit number.	<b>CLUE 6</b> The ratio of the shortest side to the middle side is 1:2.

**Shortest side** = \_\_\_\_\_ **cm.**    **Middle side** = \_\_\_\_\_ **cm.**    **Longest side** = \_\_\_\_\_ **cm.**

Show how you figured it out.

Task 1: Triangle	Rubric	
The core elements of performance required by this task are: • use clues to solve a problem  Based on these, credit for specific aspects of performance should be assigned as follows	points	section points
<p>1. Gives correct answers: <b>6, 12, 17</b></p> <p><i>Partial credit</i></p> <p>Gives answers that satisfy all six clues but are not closed figures such as: 1, 2, 32; 2, 4, 29; 3, 6, 26; 4, 8, 23; 5, 10, 20</p> <p>Gives answers that satisfy five clues and are closed figures such as: 8, 16, 11</p> <p>Gives answers that satisfy five clues but are not closed figures such as: 11, 22, 2; 6, 12, 23; 1, 11, 23</p> <p>Gives answers that satisfy four clues and are closed figures such as: 7, 14, 14; 9, 18, 8</p> <p>Mentions and uses at least three of the given clues</p> <p><i>Partial credit</i></p> <p>Shows evidence of using at least two of the given clues.</p>	<p>6</p> <p>(4) or (4)</p> <p>(3) or (3)</p> <p>2</p> <p>(1)</p>	<p>8</p>
<b>Total Points</b>		<b>8</b>

## Triangle

Work the task and look at the rubric. What are the big mathematical ideas being assessed in this task?

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What are your classroom norms about showing work or justifying an answer? What would you like to see in terms of explanations for this task?

Look at the work shown for Triangle. How many of your students showed explicit evidence for thinking about or considering: (*Remember a scalene drawing can be evidence of two clues*)

Perimeter of 35 cm.	Not equilateral triangle	Not isosceles triangle	One side a single digit	One side a prime number	Ratio of 1:2

Which clues seemed difficult for students in showing their thinking?

Which clues did they seem to not understand? Do you think the issue was vocabulary (e.g. confusing prime and square numbers or prime and odd numbers)? Do you think it was a mathematical concept (e.g. not understanding ratio)?

What surprised you about student work?

How could you use some of the student work with the class to help develop more sophisticated ideas about showing work and justifying an answer?

Now look at answers to part 1. How many of your students could:

Give the correct solution	Satisfy all 6 clues but was not a closed figure	Satisfy 5 clues and closed figure	Satisfy 5 clues and not a closed figure	Satisfy 4 clues and a closed figure	Other

Why do you think making a closed figure was difficult for students? What did they have to think about to meet this requirement?

Was there a pattern to the types of clues they forgot to consider?

Which clues seemed most difficult for them to meet in their solutions?

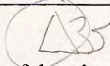
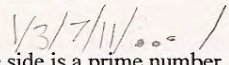
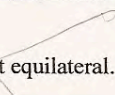
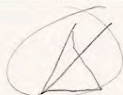

What does this make you think about in planning a geometry unit for next year?

## Looking at Student Work on Triangle

Student A tries out several ideas before reaching the final answer. Notice how the student makes diagrams and shows thinking about clues in the clue section, e.g. listing the single digit numbers, starting a list of primes, and sketching possible shapes suggested by the clues. Then the student talks about the use of clues and order used to find the final solution.

### Student A

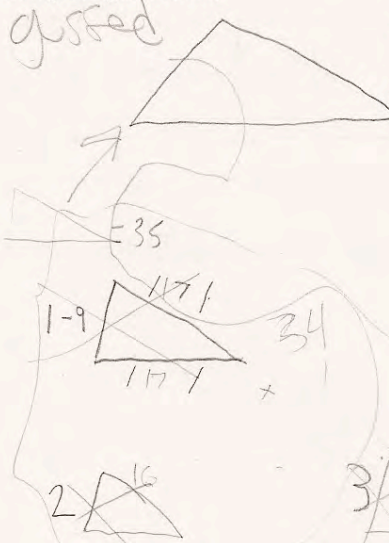
Use the six clues below to find the lengths of the sides of this triangle.

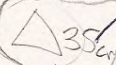
<b>CLUE 1</b>  The perimeter of the triangle is 35 centimeters.	<b>CLUE 4</b>  The length of one side is a prime number.
<b>CLUE 2</b>  The triangle is not equilateral.	<b>CLUE 5</b>  The triangle is not isosceles.
<b>CLUE 3</b>  The length of one side is a single-digit number.	<b>CLUE 6</b> The ratio of the shortest side to the middle side is 1:2.

Shortest side = 6 cm. Middle side = 12 cm. Longest side = 17 cm.

Show how you figured it out.

gussed



6 is a one digit ✓  
 then I multiplied  $6 \times 2 = 12$  ✓  
 then   
 I subtracted the sum of 6+12 from 35 the perimeter & checked if that was prime finally the remainder was 17 which is prime ✓

$35 - (6 + 12) = 17$

$\frac{6}{12} = \frac{1}{2}$

17 ✓

2<sup>2</sup>

Student B seems to just know the answer and shows evidence of using 3 or 4 clues. Notice that the student doesn't realize that the hypotenuse of a right triangle should be the longest side. However that is not being assessed in this task.

### Student B

Shortest side = 6 cm. Middle side = 12 cm. Longest side = 17 cm. 6 6

Show how you figured it out.

$P = 35 \text{ cent}$  ✓ ✓  
 side 1 =           
 side 2 =          (PRIME #) ✓  
 ratio: S TO M = 1:2 ✓ ✓

Student C produces one of the most common incorrect answers. The solution meets all six of the clues, but does not produce a closed figure. The short and middle side must add up to more than the longest side. *What kinds of questions or experiences can help students build up this type of knowledge? How do we help students think about making a closed figure?*

### Student C

Use the six clues below to find the lengths of the sides of this triangle. ✓

<b>CLUE 1</b> The perimeter of the triangle is 35 centimeters.	<b>CLUE 4</b> The length of one side is a prime number.
<b>CLUE 2</b> The triangle is not equilateral.	<b>CLUE 5</b> The triangle is not isosceles.
<b>CLUE 3</b> The length of one side is a single-digit number.	<b>CLUE 6</b> The ratio of the shortest side to the middle side is 1:2.

Shortest side = 5 cm. Middle side = 10 cm. Longest side = 20 cm. (4) (4)

Show how you figured it out.

5 is a single digit number ✓ 5 is a prime number ✓  
 so I x 5 by 2 ✓ to get then put them to add 5 (2)  
 and - then them 35 ✓ ✓

Student D makes a closed figure and uses 5 of the 6 clues. The student either doesn't understand ratio or can't use it in trying to satisfy the other clues. *Is this a question of habit of mind: checking all the clues systematically? Is this a question of productive disposition: I have met most of the conditions, but don't want to persist to see if there is a better solution? How do we help students develop productive habits of mind?*

**Student D**

Shortest side = 5<sup>x</sup> cm. Middle side = 13<sup>x</sup> cm. Longest side = 17<sup>✓</sup> cm. (4)

Show how you figured it out.

Scalene

$5 + 13 + 17 = 35 \text{ cm.}$

7 prime  
5 Single digit. 2

Student E has produced the correct solution. The student makes a list of single digits and starts a list of prime numbers. The student also considers the ratio 1:2; see the check marks by the 6/12 and 7/14 pairs. Notice how the student has a sketch of an equilateral triangle, then an isosceles triangle and finally makes a scalene triangle to suggest thinking about those clues. Interestingly, many students think the alternative to equilateral and isosceles is a right triangle.

**Student E**

<b>CLUE 1</b> The perimeter of the triangle is 35 centimeters. ✓	<b>CLUE 4</b> The length of one side is a prime number. ✓
<b>CLUE 2</b> The triangle is not equilateral. ✓	<b>CLUE 5</b> The triangle is not isosceles. ✓
<b>CLUE 3</b> The length of one side is a single-digit number. ✓	<b>CLUE 6</b> The ratio of the shortest side to the middle side is 1:2. ✓

Shortest side = 6 cm. Middle side = 12 cm. Longest side = 17 cm. 6

Show how you figured it out.

1 2 3 4 5 6 7 8 9

6 12 17 ✓

7 11 13 17 ✓

13 17 ✓

11 ✓

12 18 ✓

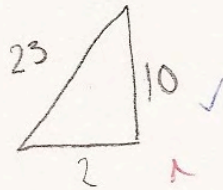
2 3 5 7 11 13 17 ✓

Student F is another example of a student not making a closed figure. Notice that the sketch is an isosceles right triangle, even though the numbers show a scalene triangle. The student shows evidence of using clues 2 and 1.

**Student F**

Shortest side = 2 cm. Middle side = 10 cm. Longest side = 23 cm.

Show how you figured it out.



35 ✓  
- 2  
-----  
33  
- 10  
-----  
23 ✓

Student G makes a closed figure,  $7 + 13 > 15$ . The student ignores or doesn't use the ratio clue. Notice that the first instinct of many students is to divide the perimeter by 3.

**Student G**

<p><b>CLUE 1</b></p> <p>✓ The perimeter of the triangle is 35 centimeters.</p>	<p><b>CLUE 4</b></p> <p>✓ The length of one side is a prime number.</p>
<p><b>CLUE 2</b></p> <p>✓ The triangle is not equilateral.</p>	<p><b>CLUE 5</b></p> <p>✓ The triangle is not isosceles.</p>
<p><b>CLUE 3</b></p> <p>✓ The length of one side is a single-digit number.</p>	<p><b>CLUE 6</b></p> <p>✗ The ratio of the shortest side to the middle side is 1:2.</p>

Shortest side = 7 cm. Middle side = 13 cm. Longest side = 15 cm. (3)(4)

Show how you figured it out.

35.0  
3  
---  
05  
- 3  
---  
20  
- 18  
---  
2

11  
2  
---  
10  
- 1  
---

The triangle can't be an equilateral or isosceles so each side is different. ✓ ✓ 2

15  
+ 13  
+ 7  
---  
35 ✓

Student H has difficulty with the clue about the shape not being an isosceles triangle. In two places the student has clearly written (and then crossed out) that all the sides are different, then replaced it with two sides are the same. This logic of what is a negative of an isosceles triangle is difficult for students.

**Student H**

Use the six clues below to find the lengths of the sides of this triangle.

<p><b>CLUE 1</b> ✓</p> <p>The perimeter of the triangle is 35 centimeters.</p>	<p><b>CLUE 4</b> ✓</p> <p>The length of one side is a prime number.</p>
<p><b>CLUE 2</b> ✓</p> <p>The triangle is not equilateral.</p>	<p><b>CLUE 5</b> ✗</p> <p>The triangle is not isosceles.</p>
<p><b>CLUE 3</b> ✓</p> <p>The length of one side is a single-digit number.</p>	<p><b>CLUE 6</b> ✗</p> <p>The ratio of the shortest side to the middle side is 1:2.</p>

Shortest side = 9 cm. Middle side = 17 cm. Longest side = 9 cm.  $35 \begin{pmatrix} 3 \\ 3 \end{pmatrix}$

Show how you figured it out.

~~All sides different~~  $\frac{15}{17}$

one side = single digit

prime

35 cent.

~~2 sides are the same~~

~~2 sides same~~

~~All sides different~~

2 sides same

8

Page 1 Triangle Test 8 (5)

Student I shows his thinking in the clue boxes, making a list of single digit numbers, circling the “nots,” and trying to list the prime numbers. However the student confuses prime numbers with square numbers. Like many students, Student I forgets to, or can’t, use the ratio clue.

**Student I**

Use the six clues below to find the lengths of the sides of this triangle. ✓

<p><b>CLUE 1</b> ✓</p> <p>The perimeter of the triangle is <u>35</u> centimeters.</p>	<p><b>CLUE 4</b> ✓</p> <p><del>9, 16, 25, 30, 49</del> ✓</p> <p>The length of one side is a <u>prime number</u>. ✓</p>
<p><b>CLUE 2</b> ✓</p> <p>The triangle is <u>not equilateral</u>.</p>	<p><b>CLUE 5</b> ✓</p> <p>The triangle is <u>not isosceles</u>.</p>
<p><b>CLUE 3</b> ✓</p> <p>The length of <u>one side</u> is a <u>single-digit number</u>. ✓</p>	<p><b>CLUE 6</b> ✓</p> <p>The ratio of the shortest side to the middle side is 1:2. ✓</p>

Shortest side = 9 cm. Middle side = 10 cm. Longest side = 16 cm. (3)

Show how you figured it out. ✓

While initially Student J’s solution looks trivial. Student J is able to use 5 of the clues in the solution. However, the dimensions will not make a triangle;  $2+4=6$  so the sides will make overlapping line segments. Notice the drawing shows a scalene drawing with fairly good proportions for the dimensions given.

**Student J**

Shortest side = 2 cm. Middle side = 4 cm. Longest side = 6 cm. (3) 3

Show how you figured it out.



Notice that Student K meets 5 clues, but the drawing is an equilateral triangle. The student gets points for evidence because the sides are marked with dashes to indicate different sizes. *How do you think mental images, like all triangles have an equilateral shape like the green pattern block, inhibit student thinking? Is it important to make sketches that more closely resemble the actual size for thinking purposes?*

**Student K**

The length of one side is a single-digit number.	The ratio of the shortest side to the middle side is 1:2.
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Shortest side = 9 cm. Middle side = 11 cm. Longest side = 15 cm. (4)

Show how you figured it out.

35 cm

5, 11, 11

9

10+10+15=35  
- 1 11

9+11+15=35 ✓✓

(2)

Student L makes an isosceles model with two equal sides. This is the second most standard sketch for students making triangles. So even though the student writes “not an isosceles,” the dimensions given fit the definition for isosceles.

**Student L**

Shortest side = 5 cm. Middle side = 15 cm. Longest side = 15 cm. (3)

Show how you figured it out.

5 = prime number, a single digit ~~number~~

15 = makes it not an isosceles ✗

+ 15

35 = perimeter ✓

(1)

15 cm

15 cm

5 cm

Student M divides the perimeter by 3, but doesn't use the information. Notice that the student uses the clue of a ratio of 1:2 in the drawing, but when it doesn't produce a prime number modifies the solution. The student doesn't persevere to make sure all the clues are met.

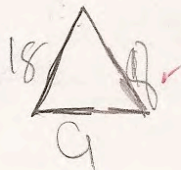
**Student M**

<b>CLUE 1</b> The perimeter of the triangle is 35 centimeters. ✓	<b>CLUE 4</b> The length of one side is a prime number. ✓
<b>CLUE 2</b> The triangle is not equilateral. ✓	<b>CLUE 5</b> The triangle is not isosceles. ✓
<b>CLUE 3</b> The length of one side is a single-digit number. ✓	<b>CLUE 6</b> The ratio of the shortest side to the middle side is 1:2. ✗

Shortest side = 8 cm. Middle side = 11 cm. Longest side = 16 cm. (4) 4

Show how you figured it out.

$$\begin{array}{r} 11.66 \\ 3 \overline{)35} \\ \underline{3} \\ 05 \\ \underline{3} \\ 20 \\ \underline{14} \\ 20 \\ \underline{15} \\ 20 \end{array}$$



$$\begin{array}{r} 2 \overline{)35} \\ \underline{2} \\ 15 \\ \underline{14} \\ 16 \end{array}$$

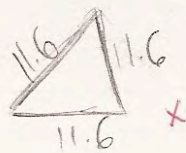
0 0

Student N seems to think that math is just about calculations that can be solved with a calculator. What would be next steps with this student?

**Student N**

Shortest side = 11.6 cm. Middle side = 11.6 cm. Longest side = 11.6 cm. 0 0

Show how you figured it out.



$$35 \div 3 = 11.66666667$$

0 0

<b>Student Task</b>	Use geometric properties, attribute, and number clues to solve a problem about a triangle.
<b>Core Idea 4 Geometry and Measurement</b>	<b>Apply the appropriate techniques, tools, and formulas to determine measurements.</b>

*Based on teacher observation, this is what eighth graders know and are able to do:*

- Find a perimeter of 35 cm.
- Satisfy at least 3 clues.
- Most gave solutions that were for scalene triangles.

*Areas of difficulty for eighth grade students:*

- Making a closed figure (smallest plus middle side totals more than the longest side)
- Understanding the definition for prime numbers.
- Forgetting or not using ratio of sides = 1:2.
- Many students drew an equilateral or isosceles triangle even when sides were labeled with 3 different numbers
- Assuming scalene triangles had right angles

## MARS Test Task 1 Frequency Distribution and Bar Graph, Grade 8

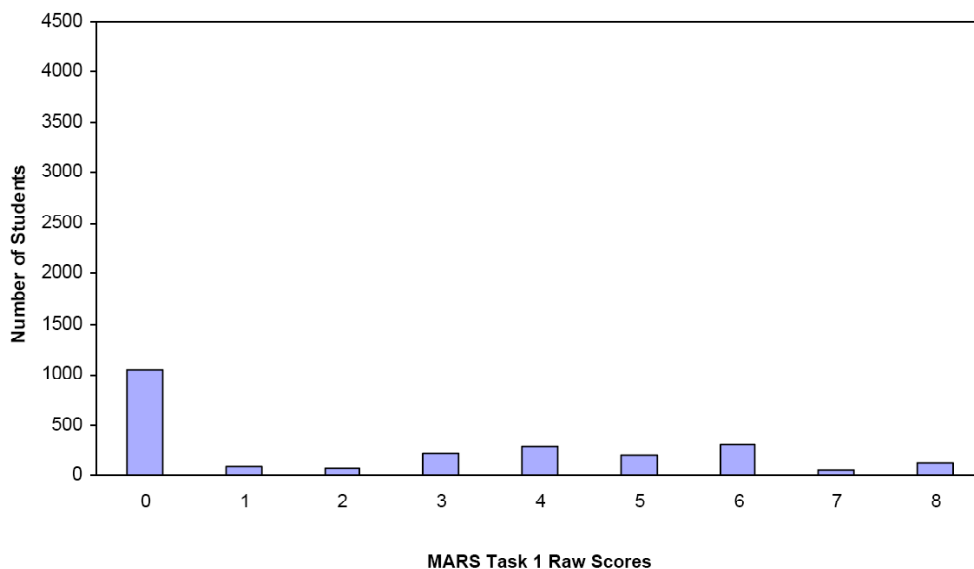
### Task 1 - Triangle

Mean: 2.60      StdDev: 2.68

Table 40: Frequency Distribution of MARS Test Task 1, Grade 8

Task 1 Scores	Student Count	% at or below	% at or above
0	1045	44.0%	100.0%
1	82	47.5%	56.0%
2	62	50.1%	52.5%
3	223	59.5%	49.9%
4	286	71.6%	40.5%
5	199	79.9%	28.4%
6	309	93.0%	20.1%
7	46	94.9%	7.0%
8	121	100.0%	5.1%

Figure 49: Bar Graph of MARS Test Task 1 Raw Scores, Grade 8



*The maximum score available for this task is 8 points.*

*The minimum score needed for a level 3 response, meeting standards, is 4 points.*

More than half the students, 56%, could show evidence of using two of the clues; usually perimeter and a drawing indicating not an equilateral or not an isosceles triangle. Less than half the students, 40%, could either satisfy all 6 clues but not make a closed figure or satisfy 5 clues and make a closed figure, with no explicit use of clues or satisfy 5 clues without making a closed figure or satisfy 4 clues with a closed figure and show evidence of using at least 2 clues. Some students, about 20% could either show a correct solution with no work or satisfy all 6 clues but not make a closed figure or satisfy 5 clues and make a closed figure with evidence of using 3 or more clues. 44% of the students scored no points on this task. 57% of the students with this score attempted the task.

## Triangle

Points	Understandings	Misunderstandings
<b>0</b>	57% of the students with this score attempted the task.	They didn't show any evidence of using the clues or produce solutions meeting the conditions of at least 4 clues. Many of their solutions were isosceles triangles.
<b>1</b>	Students could show evidence of using 2 clues.	22% of all students showed evidence of using perimeter. 8% showed evidence of thinking about prime numbers. 7% showed evidence of using single digits. About 7% made drawings which showed that they weren't thinking about equilateral and/ or isosceles triangles. 25% of all students who attempted the task, showed no direct evidence of using the clues.
<b>3</b>	Students could either show a solution satisfying 5 clues but not making a closed figure or satisfying 4 clues and making a closed figure. Students with this score total did not show evidence of using any of the clues.	9% of all students could give a solution meeting 5 clues, but not making a closed figure. 11% of all students could make a closed figure using 4 clues. The most common of these was 5, 15, 15.
<b>4</b>	Students could either give the same solutions as those with a score of 3 but show some evidence of using clues or they showed no clues but could satisfy all 6 clues and not make a closed figure or satisfy 5 clues and make a closed shape.	18% of the students could give a solution that met all 6 clues, but did not make a closed figure. The most common solution in this category was 5, 10, 20. This was produced by 11% of the students.
<b>6</b>		Students with this score could meet all the conditions, but did not show how they used the clues or they could show their use of at least 3 clues and get a partial of 4 points for their solution.
<b>8</b>	Students could use clues about perimeter, single digit number, not an isosceles or equilateral triangle, one side a prime number, and small to middle side with a ratio of 1:2 to get a unique solution that forms a closed figure. They also showed evidence of using at least 3 of the 6 clues.	

## **Implications for Instruction**

All students should have opportunities to solve rich, interesting problems. Students need more experiences with problem-solving. They need practice organizing information. Students at this level did not have a systematic way for checking their ideas against all of the clues and tended to focus on only one or two clues.

Students at this level may need more constructive help learning problem-solving strategies and practicing logical reasoning. Students should be exposed to problems designed to help them learn to work backwards, make an organized list, make a drawing or model, use a table, etc. A good collection of these problems can be found in materials such as Problem-Solving Experiences in Mathematics, by Randy Charles from Addison-Wesley Publishing Company or Problem Solving in Mathematics, by Lane County Mathematics Project available from Dale Seymour Publications. These resources are helpful because they provide you will sample dialogues to help you visualize what might happen in the classroom. Many of these students do not have habits of mind for self-talk or asking themselves questions, like: What do I know? What I have found out? Can I define or make a list of important information? Have I satisfied all the conditions? How could I convince someone else that my answer makes sense? What other strategies can I try?

Students need to be exposed to a variety of types of triangles and other shapes, so that they don't visualize all triangles as equilaterals or have only one visual model for a trapezoid. Many students at this level don't recognize shapes that are rotated, but rely on orientation for shape recognition. Many of these students would also benefit from opportunities to draw or sketch 3-dimensional shapes.

Students need more experiences, that help them develop geometric vocabulary and focus them on geometric attributes. Students can then use their knowledge of these geometric attributes to solve problems or analyze problem situations

## **Ideas for Action Research**

### **Eliminate possibilities**

Give students some problems that help them think about scope and then narrow down the possible answers. Start with some number games. At first you might have someone pick a number between 1 and 100. Then have the class try to narrow down the answers by asking questions that can be answered "yes" or "no". How many questions did it take the class to find the number? Play the game several times. After a while encourage them to give reasons for their clues, start to develop self-talk about their choices. You might want to limit the number of greater than and less than questions. As their logic skills develop, try changing the activity to be about 2-and 3-dimensional shapes. At first you might have to be the one giving the clues.

Another task might be a logic problem:

In a certain bank the jobs of cashier, manager, and teller are held by Brown, Jones, and Smith but not necessarily in that order.

- The teller, who was an only child, earns the least.
- Smith, who married Brown's sister, earns more than the manager.

Who has which job?

Encourage students to explain their thought process or strategy.