National Center and State Collaborative

NCSC Math Activities with Scripted Systematic Instruction (MASSI): Middle School Measurement and Geometry Progress Monitoring and Skills Test

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National Center and State Collaborative

The National Center and State Collaborative (NCSC) is applying the lessons learned from the past decade of research on alternate assessments based on alternate achievement standards (AA-AAS) to develop a multi-state comprehensive assessment system for students with significant cognitive disabilities. The project draws on a strong research base to develop an AA-AAS that is built from the ground up on powerful validity arguments linked to clear learning outcomes and defensible assessment results, to complement the work of the Race to the Top Common State Assessment Program (RTTA) consortia.

Our long-term goal is to ensure that students with significant cognitive disabilities achieve increasingly higher academic outcomes and leave high school ready for post-secondary options. A well-designed summative assessment alone is insufficient to achieve that goal. Thus, NCSC is developing a full system intended to support educators, which includes formative assessment tools and strategies, professional development on appropriate interim uses of data for progress monitoring, and management systems to ease the burdens of administration and documentation. All partners share a commitment to the research-to-practice focus of the project and the development of a comprehensive model of curriculum, instruction, assessment, and supportive professional development. These supports will improve the alignment of the entire system and strengthen the validity of inferences of the system of assessments.

IDEAs that Work
U.S. Office of Special Education Programs

The contents of this assessment were developed as part of the National Center and State Collaborative by Keri Bethune, Julie Thompson, Alicia Saunders, and Diane Browder at University of North Carolina at Charlotte and verified by Amy Lehew, math content expert, under a grant from the Department of Education (PR/Award #: H373X100002, Project Officer, Susan.Weigert@Ed.gov). However, the contents do not necessarily represent the policy of the U.S. Department of Education and no assumption of endorsement by the Federal government should be made.

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These materials and documents were developed under the National Center and State Collaborative (NCSC) General Supervision Enhancement Grant and are consistent with its goals and foundations. Any changes to these materials are to be consistent with their intended purpose and use as defined by NCSC.

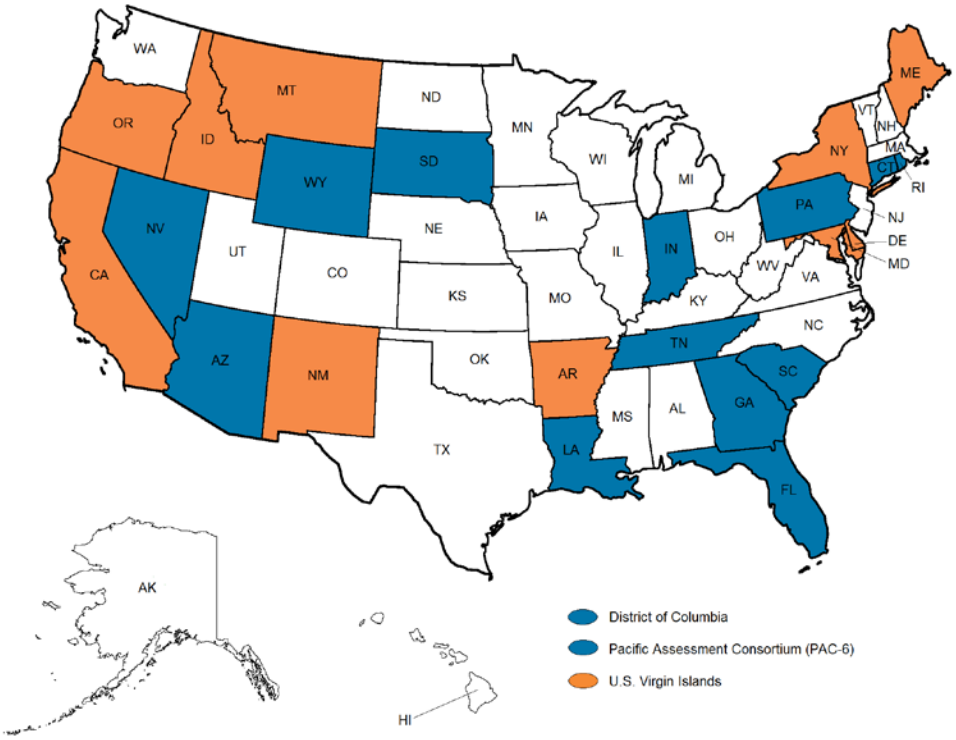
This document is available in alternative formats upon request.

National Center and State Collaborative

NCSC is a collaborative of 15 states and five organizations.

The states include (shown in blue on map): Arizona, Connecticut, District of Columbia, Florida, Georgia, Indiana, Louisiana, Nevada, Pacific Assessment Consortium (PAC-6)[1], Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, and Wyoming.

Tier II states are partners in curriculum, instruction, and professional development implementation but are not part of the assessment development work. They are (shown in orange on map): Arkansas, California, Delaware, Idaho, Maine, Maryland, Montana, New Mexico, New York, Oregon, and U.S. Virgin Islands.



*Core partner states are blue in color and Tier II states are orange in color.

[1] The Pacific Assessment Consortium (including the entities of American Samoa, Commonwealth of the Northern Mariana Islands, Federated States of Micronesia, Guam, Republic of Palau, and Republic of the Marshall Islands) partner with NCSC as one state, led by the University of Guam Center for Excellence in Developmental Disabilities Education, Research, and Service (CEDDERS).

National Center and State Collaborative

The five partner organizations include: The National Center on Educational Outcomes (NCEO) at the University of Minnesota, The National Center for the Improvement of Educational Assessment (Center for Assessment), The University of North Carolina at Charlotte, The University of Kentucky, and edCount, LLC.

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Student Name: _____

National Center and State Collaborative

NCSC Math Activities with Scripted Systematic Instruction (MASSI): Middle School Measurement and Geometry Progress Monitoring and Skills Test

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January 2013

Student Name: _____

MASSI: Middle School Measurement/Geometry

Options for Progress Monitoring/Formative Assessment

1. Middle School Measurement/Geometry Progress Monitoring (pg. 6-112): record student responses made during instruction on data sheet provided; teacher records each step correct during the lesson.

2. Middle School Measurement/Geometry Skills Test (pg. 13-30): a brief, on demand performance assessment; could be given weekly to see if student has mastered this lesson; also helps student practice responding in a test format.

    a. NOTE: The Skill Test can be used as a baseline assessment to check for any skills the student may already have prior to beginning the MASSI.

    b. NOTE: The Skill Test can also be re-administered to check for maintenance throughout the year.

Student Name: _____

Middle School Measurement/Geometry Progress Monitoring

Directions: Score each step during instruction or as soon as the lesson is complete. Score the step as unprompted correct with a "+." Use a system to code level of prompting required for incorrect responses (e.g., V = verbal prompt, G = gesture, P = physical). Graph the number of unprompted correct responses to monitor progress.

BUILD THE ESSENTIAL UNDERSTANDING: CONCEPT AND SYMBOLS: Perimeter, Area, Length, Width, Surface Area, Height, and Tiling to Find Area

Materials and Directions for Teacher	*Instructional Cue*	*Student Expected Response Date:*						
1. Student has a poster board.	**Show me the perimeter of your poster.**	Student uses finger to trace the outside edges of the poster.						
2. Student has a poster board.	**Show me the area of your poster.**	Student uses hand to indicate the area of the poster.						
3. Student has a poster board.	**Show me the length of your poster.**	Student uses finger to point to the length of their poster.						
4. Student has a poster board.	**Show me the width of your poster.**	Student uses finger to point to the width of their poster.						
5. Student has a net.	**Show me the surface area of your net.**	Student uses hand to indicate the surface area of the net.						
6. Student has a box.	**Show me the length of the box.**	Student uses finger to point to the length of the box.						
7. Student has a box.	**Show me the width of the box.**	Student uses finger to point to the width of the box.						
8. Student has a box.	**Show me the height of the box.**	Student uses finger to point to the height of the box.						
9. Student has a teacher provided 2-D item shaped like a rectangle.	**Show me the perimeter of the _____.**	Student uses finger to trace the outside edges of the item.						
10. Student has a teacher provided 2-D item shaped like a rectangle.	**Show me the area of the _____.**	Student uses hand to indicate the area of the item.						
11. Student has a teacher provided 2-D item shaped like a rectangle.	**Show me the length of the _____.**	Student uses finger to point to the length of their item.						
12. Student has a teacher provided 2-D item shaped like a rectangle.	**Show me the width of the _____.**	Student uses finger to point to the width of their item.						
13. Student has a net.	**Show me the surface area of the net of the _____.**	Student uses hand to indicate the surface area of the net.						

Student Name: _____

14. Student has teacher selected object (e.g., rectangular prism or cube, such as tissue box or shoe box).	**Show me the length of the __(3D object).**	Student uses finger to point to the length of their item.						
15. Student has teacher selected object (e.g., rectangular prism or cube, such as tissue box or shoe box).	**Show me the width of the __(3D object).**	Student uses finger to point to the width of their item.						
16. Student has teacher selected object (e.g., rectangular prism or cube, such as tissue box or shoe box).	**Show me the height of the __(3D object).**	Student uses finger point to the height of their item.						
17. Each student should have a photo and more than enough tiling squares to cover the picture (don't give the exact amount; give more than needed so student has to stop at the appropriate number).	**Put your tiles on your photo and count to find the area.**	Student places and counts the number of tiles on the photo (stopping when the photo is covered in tiles).						
18. Each student should have a second photo and more than enough tiling squares to cover the picture (don't give the exact amount; give more than needed so student has to stop at the appropriate number).	**Now let's try it with another photo to add to our poster. Use the tiling squares to find the area of this photo.**	Student places and counts the number of tiles on the photo (stopping when the photo is covered in tiles).						
		NUMBER CORRECT:						
6th BUILD A GRADE ALIGNED COMPONENT: Calculating area, 7th & 8th SYMBOL USE: Calculating area								
19. Worksheet 2. Poster board labeled with length and width.	**What is the length of your poster board?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the length						
20. See above.	**Now we need to find the width. What is the width of your poster board?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the width.						
21. Worksheet 2 with length and width filled into first equation.	**Now enter the formula into you calculator to solve for the area of your poster board.** Wait for students to independently enter the length into calculator or say **"What's next?"**	Student enters the length into calculator.						
22. See above.	Wait for students to independently enter the times button or say **"What's next?"**	Student enters the multiplication sign into calculator.						
23. See above.	Wait for students to independently enter the width or say **"What's next?"**	Student enters the width into calculator.						
24. See above.	Wait for students to independently enter the equals button or say **"What's next?"**	Student enters the equals button into calculator.						

Student Name: _____

25. See above.	**"What is the area of the poster board?"**	Student says or writes the area of the poster on the worksheet. Student must say unit of measurement squared (e.g., "inches squared").						
26. Worksheet 2. 2nd Poster board labeled with length and width.	**Look at your worksheet. This says length** (pointing to the length space in the equation), **What is the length of your poster board?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the length.						
27. See above.	**Now we need to find the width. What is the width of your poster board?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the width.						
28. Worksheet 2 with length and width filled into second equation.	**Now enter the formula into your calculator to solve for area of your poster board.** Wait for students to independently enter the length into calculator or say **"What's next?"**	Student enters the length into calculator.						
29. See above.	Wait for students to independently enter the times button or say **"What's next?"**	Student enters the multiplication sign into calculator.						
30. See above.	Wait for students to independently enter the width or say **"What's next?"**	Student enters the width into calculator.						
31. See above.	Wait for students to independently enter the equals button or say **"What's next?"**	Student enters the equals button into calculator.						
32. See above.	**"What is the area of the poster board?"**	Student says or writes the area of the poster on the worksheet. Student must say unit of measurement squared (e.g., "inches squared").						
		NUMBER CORRECT:						
7th BUILD A GRADE ALIGNED COMPONENT: Calculating surface area								
33. Each student should have a net and more than enough tiling squares to cover the net (don't give the exact amount, give too many so that students have to stop at the appropriate number).	**Put your tiles on your net and count to find the surface area.**	Student places and counts the number of tiles on the net (stopping when the net is covered in tiles).						
34. Second net and more than enough tiling squares.	**Now let's try it with another net. Use the tiling squares to find the surface area of this net.**	Student places and counts the number of tiles on the net (stopping when the photo is covered in tiles).						

Student Name: _____

35. Worksheet 3 and box with length, width, and height labeled.	**Look at your worksheet. This says length** (pointing to the length space in the equation)**, What is the length of the box?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the length.						
36. See above.	**We need to write length again here. Tell me one more time, what was the length?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the length.						
37. See above.	**Now we need to find the height. What is the height of the box?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the height.						
38. See above.	**We need to write height again here. Tell me one more time, what was the height?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the height.						
39. See above.	**Now we need to find the width. What is the width of the box?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the width.						
40. See above.	**We need to write width again here. Tell me one more time, what was the width?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the width.						
41. Graphing/scientific calculator and worksheet 3 with formula filled in.	**Now enter the formula into your calculator to solve for surface area.** Wait for students to independently enter "2" into calculator or say **"What's next?"**	Student enters the 2 into calculator						
42. See above.	Wait for students to independently enter "(" or say **"What's next?"**	Student enters (into calculator.						
43. See above.	Wait for students to independently enter the length into calculator or say **"What's next?"**	Student enters the length into calculator.						
44. See above.	Wait for students to independently enter the multiplication button or say **"What's next?"**	Student enters the multiplication sign into calculator.						
45. See above.	Wait for students to independently enter the height into calculator or say **"What's next?"**	Student enters the height into calculator.						
46. See above.	Wait for students to independently enter ")" or say **"What's next?"**	Student enters) into calculator.						
47. See above.	Wait for students to independently enter the plus button or say **"What's next?"**	Student enters the plus sign into calculator.						
48. See above.	Wait for students to independently enter "2" into calculator or say **"What's next?"**	Student enters the 2 into calculator.						
49. See above.	Wait for students to independently enter "(" or say **"What's next?"**	Student enters (into calculator.						

Student Name: _____

50. See above.	Wait for students to independently enter the height into calculator or say **"What's next?"**	Student enters the height into calculator.						
51. See above.	Wait for students to independently enter the multiplication button or say **"What's next?"**	Student enters the multiplication sign into calculator.						
52. See above.	Wait for students to independently enter the width into calculator or say **"What's next?"**	Student enters the width into calculator.						
53. See above.	Wait for students to independently enter ")" or say **"What's next?"**	Student enters) into calculator.						
54. See above.	Wait for students to independently enter the plus button or say **"What's next?"**	Student enters the plus sign into calculator.						
55. See above.	Wait for students to independently enter "2" into calculator or say **"What's next?"**	Student enters the 2 into calculator.						
56. See above.	Wait for students to independently enter "(" or say **"What's next?"**	Student enters (into calculator.						
57. See above.	Wait for students to independently enter the width into calculator or say **"What's next?"**	Student enters the width into calculator.						
58. See above.	Wait for students to independently enter the multiplication button or say **"What's next?"**	Student enters the multiplication sign into calculator.						
59. See above.	Wait for students to independently enter the length into calculator or say **"What's next?"**	Student enters the length into calculator.						
60. See above.	Wait for students to independently enter ")" or say **"What's next?"**	Student enters) into calculator.						
61. See above.	Wait for students to independently enter the equals/enter button or say **"What's next?"**	Student enters the equals/enter button into calculator.						
62. See above.	**"What is the surface area of the box?"**	Student says or writes the surface area of the box on the worksheet.						
		NUMBER CORRECT:						

Student Name: _____

8th BUILD A GRADE ALIGNED COMPONENT: Calculating changes in area									
63. Small piece of poster board (labeled with length and width). Worksheet 4.	**Look at your worksheet. This says length** (pointing to the length space in the equation)**, What is the length of your poster board?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the length.							
64. See above.	**Now we need to find the width. What is the width of your poster board?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the width.							
65. Graphing/scientific calculator and Worksheet 4 with first area formula filled in.	**Now enter the formula into your calculator to solve for the area of your poster board.** Wait for students to independently enter the length into calculator or say **"What's next?"**	Student enters the length into calculator.							
66. See above.	Wait for students to independently enter the times button or say **"What's next?"**	Student enters the multiplication sign into calculator.							
67. See above.	Wait for students to independently enter the width or say **"What's next?"**	Student enters the width into calculator							
68. See above.	Wait for students to independently enter the equals button or say **"What's next?"**	Student enters the equals button into calculator.							
69. See above.	**"What is the area of the poster board?"**	Student says or writes the area of the poster on the worksheet.							
70. Graphing/scientific calculator and a big piece of poster board (labeled with length and width). Worksheet 4.	**Look at your worksheet. This says length** (pointing to the length space in the equation)**, What is the length of your poster board?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the length.							
71. See above.	**Now we need to find the width. What is the width of your poster board?**	Student writes/stamps/uses Velcro numbers/points to/eye gazes to the width.							
72. See above.	**Now enter the formula into your calculator to solve for area of your poster board.** Wait for students to independently enter the length into calculator or say **"What's next?"**	Student enters the length into calculator.							
73. See above.	Wait for students to independently enter the times button or say **"What's next?"**	Student enters the multiplication sign into calculator.							
74. See above.	Wait for students to independently enter the width or say **"What's next?"**	Student enters the width into calculator							
75. See above.	Wait for students to independently enter the equals button or say **"What's next?"**	Student enters the equals button into calculator.							

Student Name: _____

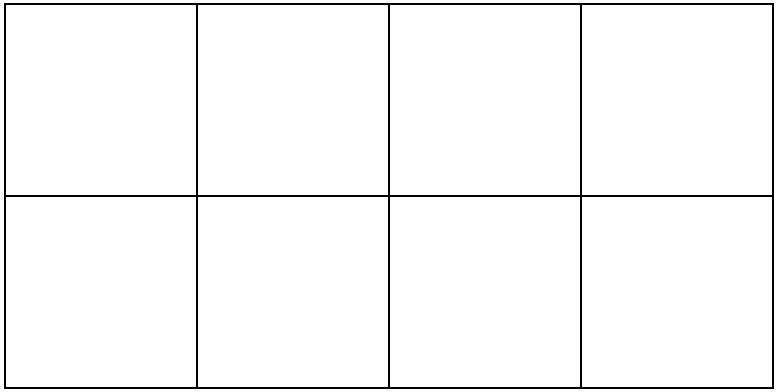
76. See above.	**"What is the area of the poster board?"**	Student says or writes the area of the poster on the worksheet.						
77. Worksheet 4 with first two equations and areas completed.	**Look at your worksheet. This says larger area** (pointing to the space in the equation)**, What is the area of the larger poster board?**	Student writes/stamps/Velcro's/ points to/eye gazes to the larger area.						
78. See above.	**This says smaller area** (pointing to the space in the equation)**, What is the area of the smaller poster board?**	Student writes/stamps/Velcro's/ points to/eye gazes to the smaller area.						
79. Graphing/scientific calculator and Worksheet 4 (see above)	**Now enter the formula into your calculator to solve for the change in area.** Wait for students to independently enter the larger area into calculator or say **"What's next?"**	Student enters the larger area into calculator.						
80. See above.	Wait for students to independently enter the minus button or say **"What's next?"**	Student enters the minus sign into calculator.						
81. See above.	Wait for students to independently enter the smaller area into calculator or say **"What's next?"**	Student enters the smaller area into calculator.						
82. See above.	Wait for students to independently enter the equals button or say **"What's next?"**	Student enters the equals button into calculator.						
83. See above.	**"What is the change in the area of the poster board?"**	Student says or writes the change in the area of the poster board on the worksheet.						
		NUMBER CORRECT:						

Student Name: _____

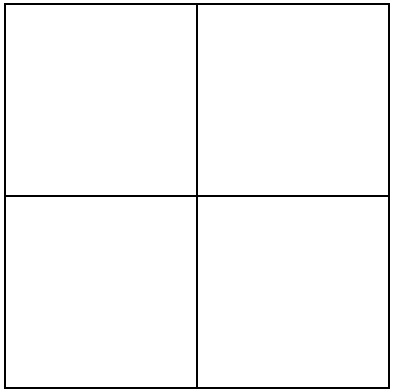
MEASUREMENT/GEOMETRY SKILL TEST 1: CONCEPT AND SYMBOLS

Note to teachers: It may be helpful to use a cover sheet of paper. Pull the cover sheet down far enough to show the model and read the text. Then, pull the sheet of paper down to show the problem and read the directions. Record "+" for an independent correct response or "-" for incorrect response in blank.

___ **MODEL: Watch me as I tile this rectangle and count how many tiles I used to find the area.**

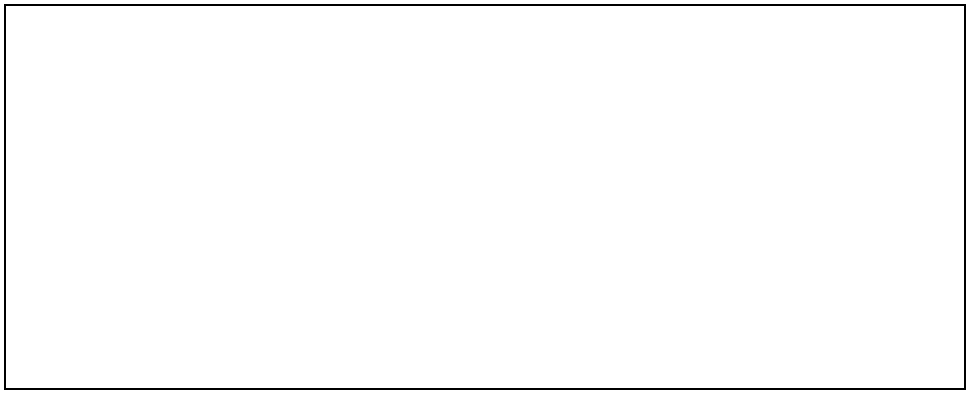


STUDENT PROBLEM: Use the tiling squares to find the area of this rectangle.

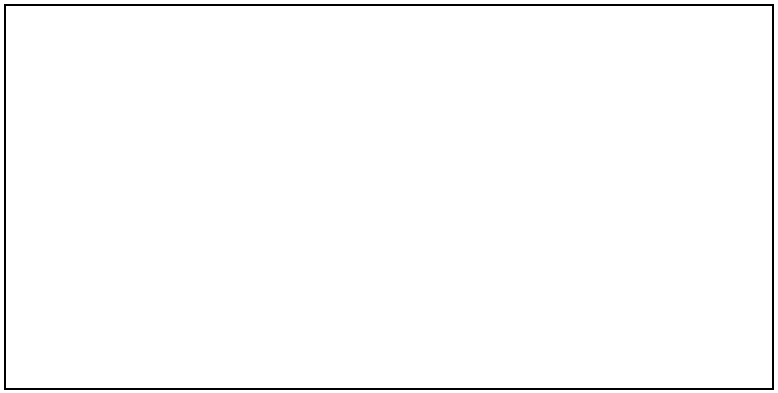


Student Name: _____

___ **Watch me as I tile this rectangle and count how many tiles I used to find the area.**



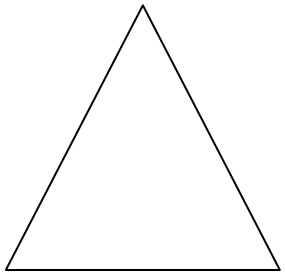
STUDENT PROBLEM: Use the tiling squares to find the area of this rectangle.



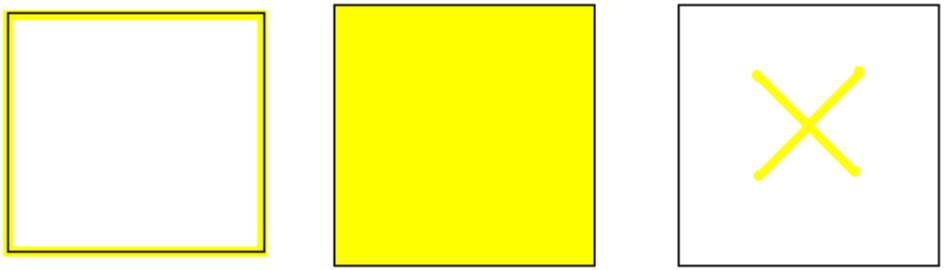
Student Name: _____

**Note: The following sections use lines and areas highlighted in yellow… If these do not show up sufficiently on your printed version, use a highlighter to make them more visible.

___ **Watch me as I use my marker to draw a line on the perimeter of this shape.**

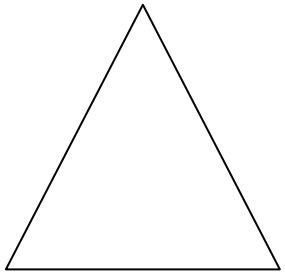


STUDENT PROBLEM: Which picture has the perimeter highlighted in yellow?

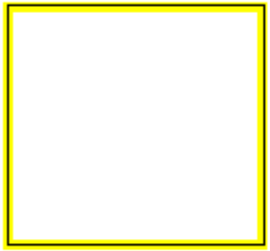


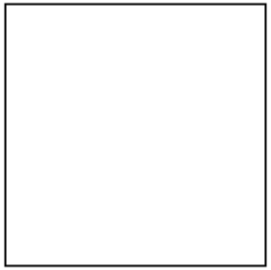
Student Name: _____

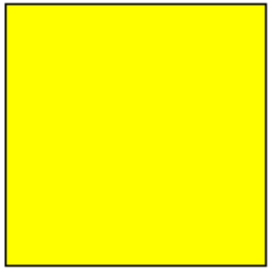
___ **Watch me as I use my marker to color in the area.**



STUDENT PROBLEM: Which picture has the area colored in yellow?



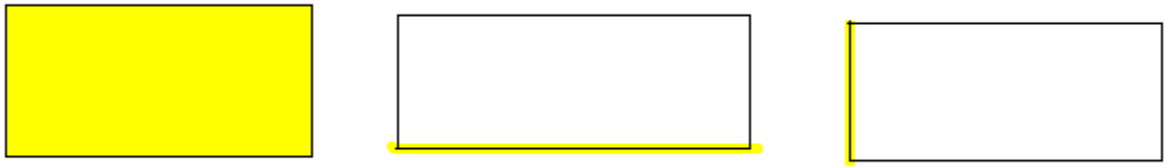




Student Name: _____

___ The length is the longest side of a rectangle. I will use my marker to draw a line along the length.

STUDENT PROBLEM: Which picture has the length in yellow?



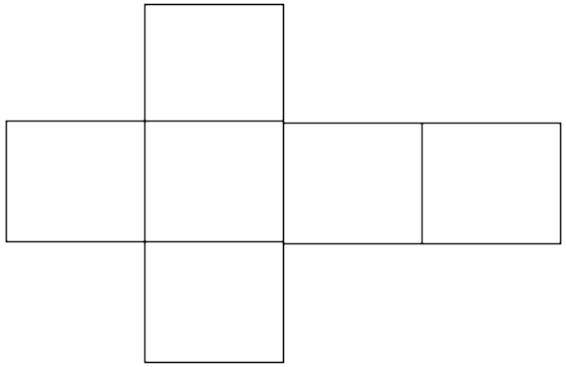
Student Name: _____

___ **The width is the shortest side of a rectangle. I will use my marker to draw a line along the width.**

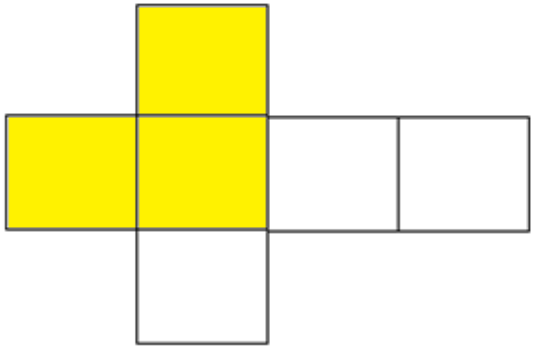
STUDENT PROBLEM: Which picture has the width in yellow?

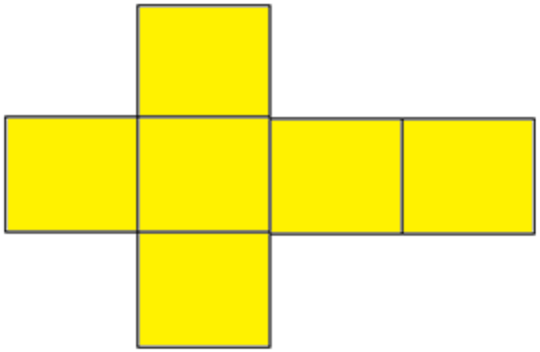
Student Name: _____

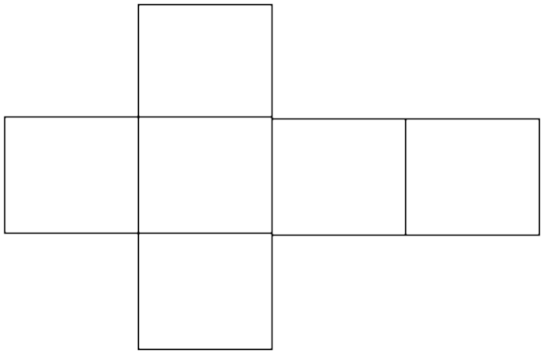
___ This is a picture of a net. A net is a shape that is flattened out on the paper. The surface area is the area inside a net. Watch as I color the surface area.



STUDENT PROBLEM: Which picture has the surface area colored in yellow?

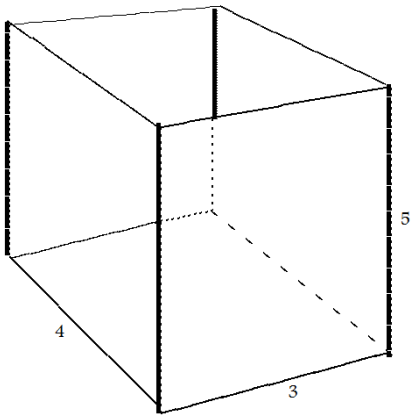




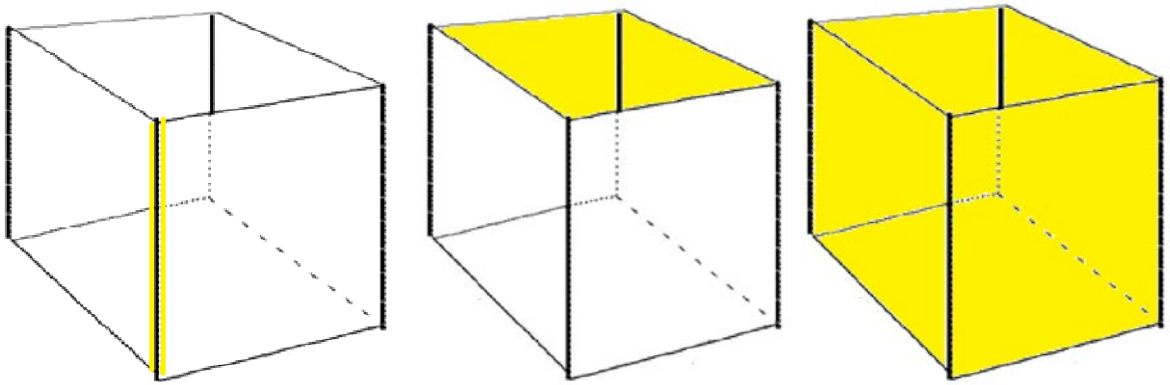


Student Name: _____

___ The height is the side of a cube/box that goes up and down. I will use my marker to draw a line along the height.



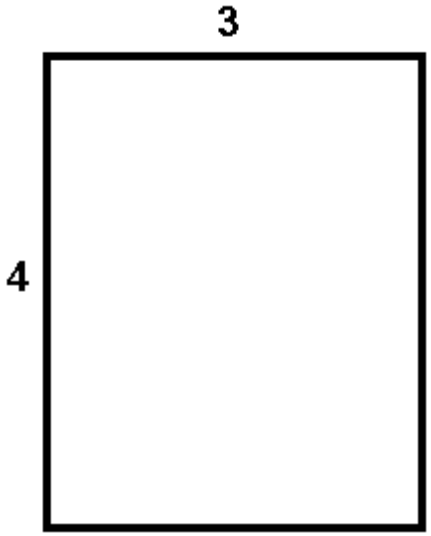
STUDENT PROBLEM: Which picture has the height highlighted in yellow?



Student Name: _____

MEASUREMENT/GEOMETRY SKILLS TEST 2: Calculating Area

___ What is the area of this shape?



Area = length x width

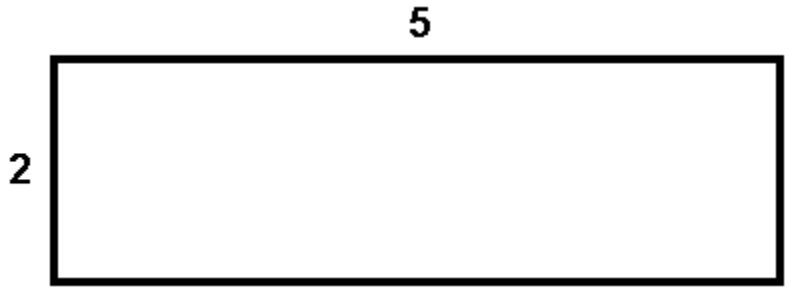
Area = _____ x _____

length width

Area = _____

Student Name: _____

___ **What is the area of this shape?**



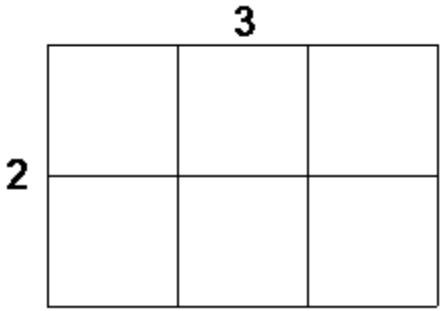
Area = length x width

Area = _____

Student Name: _____

___ **What is the area of this rectangle?** (Students can either count the tiles or use a calculator)

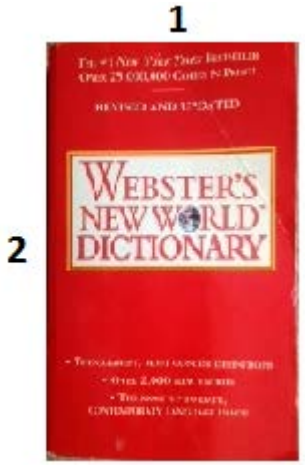
area = length x width area = _____



___ **What is the area of this book cover?**

area = length x width

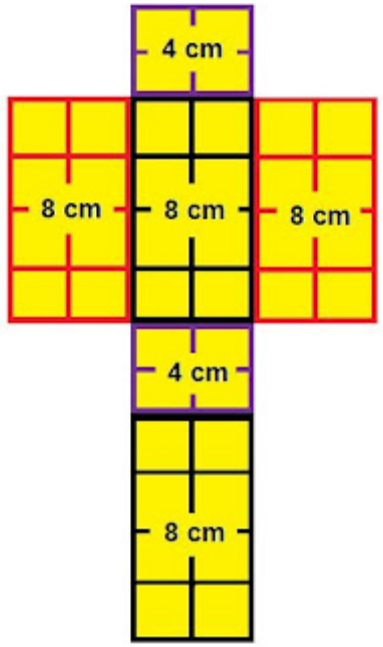
area = _____



Student Name: _____

MEASUREMENT/GEOMETRY SKILLS TEST 3: Calculating Surface Area

___ **What is the surface area of this net?** (Students can either count the tiles or use a calculator)



surface area = 2(length x height) + 2(height x width) + 2(width x length)

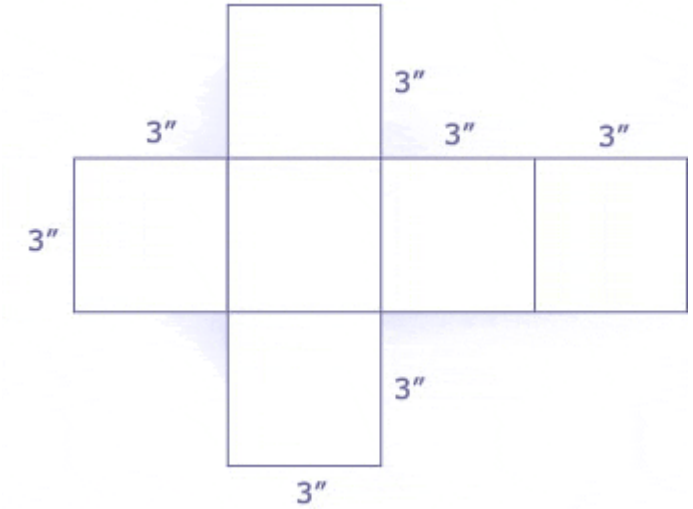
Surface area = 2(_____ x _____) + 2(_____ x _____) + 2(_____ x _____)

surface area length height height width width length

surface area = _____

Student Name: _____

___ **What is the surface area of this net?**



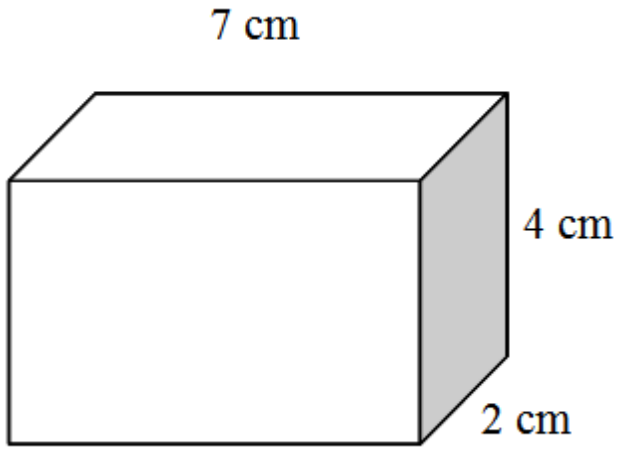
surface area = 2(length x height) + 2(height x width) + 2(width x length)

surface area = 2(_____ x _____) + 2(_____ x _____) + 2(_____ x _____)
length height height width width length

surface area = _____

Student Name: _____

___ **What is the surface area of this box?**



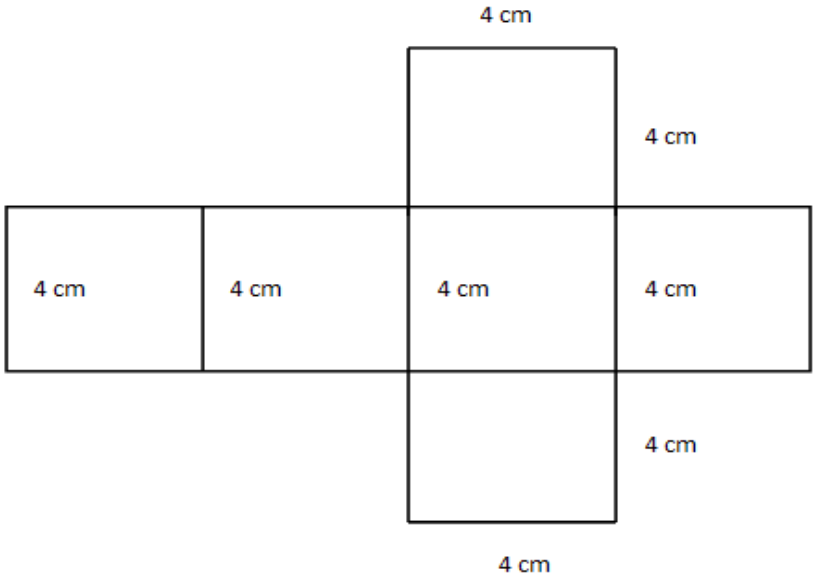
surface area = 2(length x height) + 2(height x width) + 2(width x length)

surface area = 2(_____ x _____) + 2(_____ x _____) + 2(_____ x _____)
length height height width width length

surface area = _____

Student Name: _____

___ **What is the surface area of this net?**

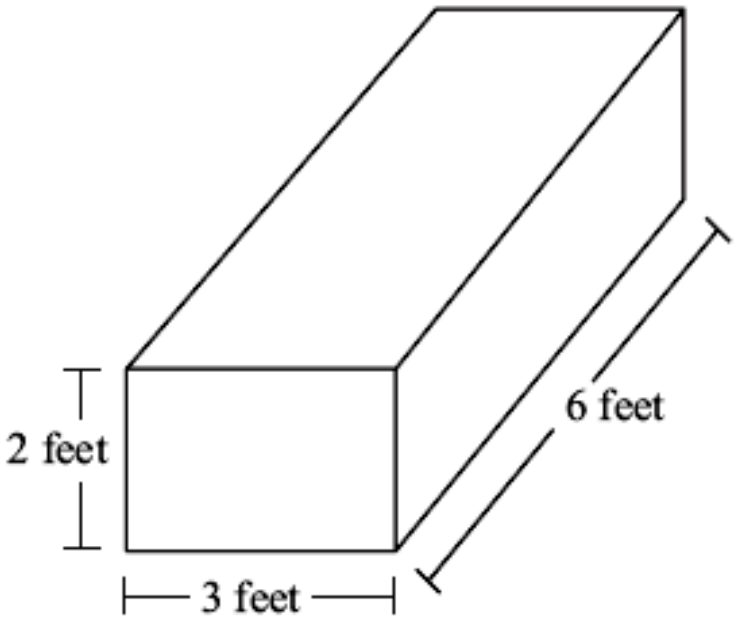


surface area = 2(length x height) + 2(height x width) + 2(width x length)

surface area = _____

Student Name: _____

___ **What is the surface area of this box?**



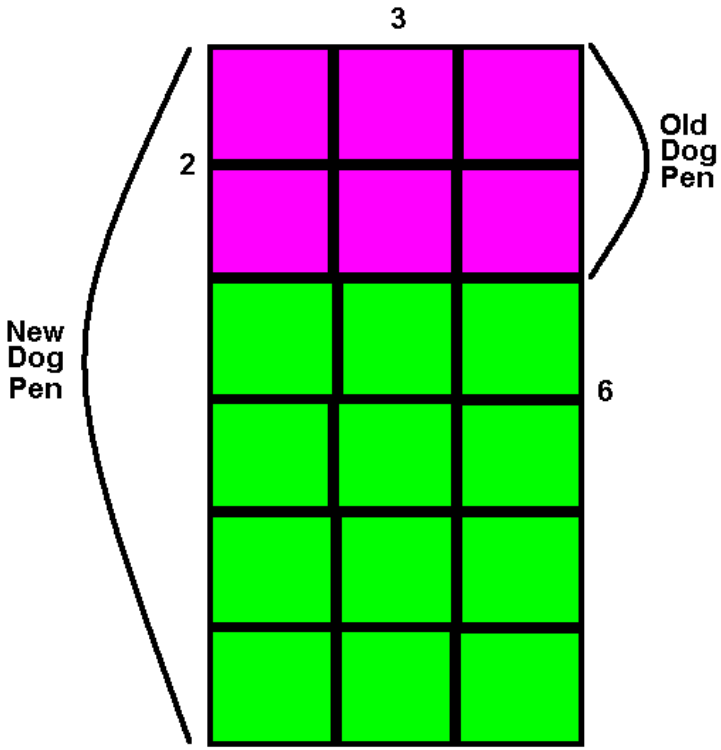
surface area = 2(length x height) + 2(height x width) + 2(width x length)

surface area = _____

Student Name: _____

MEASUREMENT/GEOMETRY SKILLS TEST 4: Calculating Changes in Area

Bobby has a dog named Fido. Fido has a dog pen that is 2 feet by 3 feet. But, as Fido grew bigger he got too big for the old pen, so Bobby made the pen bigger. The new dog pen is 3 feet by 6 feet. What is the change in the area?



Area = length x width

Area Old Dog Pen = _____

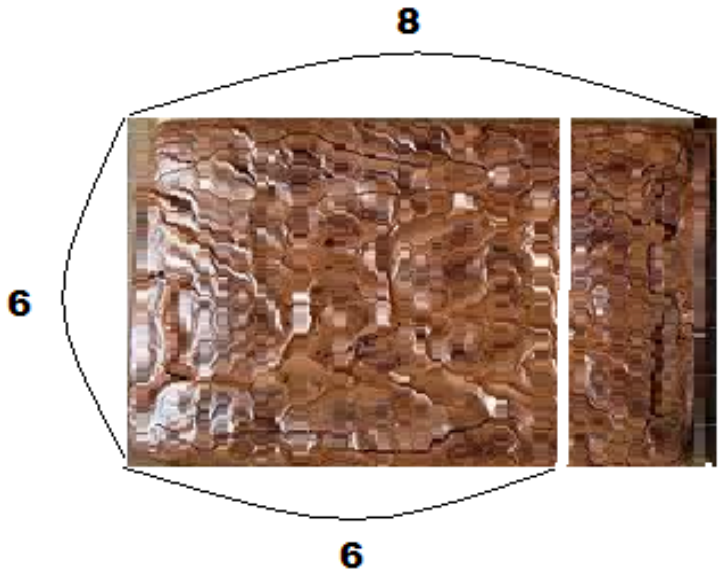
Area New Dog Pen = _____

Change in Area = Larger Area – Smaller Area

Change in Area = _____

Student Name: _____

Jose made some brownies as a birthday gift for his sister. He made the brownies in a 6 inch by 8 inch pan. But then he realized that the gift box for the brownies was 6 inches by 6 inches, so he had to cut the brownies to make them fit. What is the change in the area?



Area = length x width

Area First Brownies = _____

Area Second Brownies = _____

Change in Area = Larger Area – Smaller Area

Change in Area = _____