



National Center and State Collaborative

# **NCSC Math Activities with Scripted Systematic Instruction (MASSI): Middle School Equations 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.



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](mailto: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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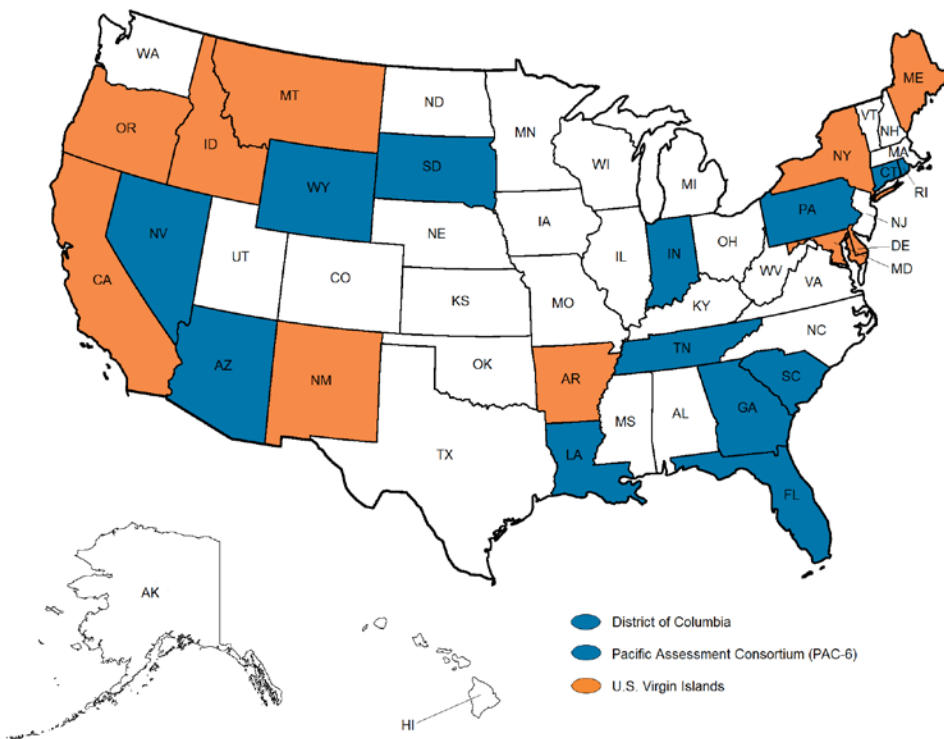


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NCSC is a collaborative of 15 states and five organizations.

The states include (shown in blue on map): Arizona, Connecticut, District of Columbia, Florida, Georgia, Indiana, Louisiana, Nevada, Pacific Assessment Consortium (PAC-6)<sup>1</sup>, 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.



<sup>1</sup> 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).



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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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# **NCSC Math Activities with Scripted Systematic Instruction (MASSI): Middle School Equations Progress Monitoring and Skills Test**

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# MASSI: Middle School Equations

## Options for Progress Monitoring/Formative Assessment

1. Middle School Equations Progress Monitoring (pg. 7-9): record student responses made during instruction on data sheet provided; teacher records each step correct during the lesson.
2. Middle School Equations Skills Test (pg. 10-13): 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 readministered to check for maintenance throughout the year.

## Middle School Equations Progress Monitoring

*Directions: Score each step during instruction or as soon as the lesson is complete. Score the step as unprompted correct with a "+" or prompted correct with a "p."  
Graph the number of unprompted correct responses to monitor progress.*

### **BUILD ESSENTIAL UNDERSTANDINGS – CONCEPT AND SYMBOLS: Identifying the Number from a Sentence**

#### **6<sup>th</sup> 7<sup>th</sup> BUILD A GRADE ALIGNED COMPONENT: Creating an Equation**

#### **8<sup>th</sup> BUILD ESSENTIAL UNDERSTANDING: Symbol Concept**

<i>Materials and Directions for Teacher</i>	<i>Instructional Cue</i>	<i>Student Expected Response</i>						
1. Student has "Shawn" story problem.	<b>Circle the numbers.</b>	Student circles/eye gazes to numbers in story problem.						
2. "Slade" story problem and equation template	<b>Write the first number.</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "2".						
3. See above.	Wait for students to independently write plus or say <b>"What do you write next?"</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "+".						
4. See above.	Wait for students to independently write c or say <b>"What do you write next?"</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "c".						
5. See above.	Wait for students to independently write equal or say <b>"What do you write next?"</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "=".						
6. See above.	Wait for students to independently write 4 or say <b>"What do you write next?"</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "4".						
7. "Jacob" story problem and equation template	<b>Write the equation that represents this problem. Use the letter g to represent the unknown cost of the game. Write the first number.</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "4".						
8. See above.	Wait for students to independently write plus or say <b>"What do you write next?"</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "+".						
9. See above.	Wait for students to independently write g or say <b>"What do you write next?"</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "g".						
10. See above.	Wait for students to independently write equal or say <b>"What do you write next?"</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "=".						
11. See above.	Wait for students to independently write 10 or say <b>"What do you write next?"</b>	Student writes/stamps/uses Velcro numbers/points to/eye gazes to "10".						
		NUMBER CORRECT:						

Student Name: \_\_\_\_\_

**6<sup>th</sup> 7<sup>th</sup> BUILD A GRADE ALIGNED COMPONENT: Solving Equation for Variable**

**8<sup>th</sup> BUILD ESSENTIAL UNDERSTANDING: Continue Building Symbol Concept**

12. "Slade" story problem, paper with equation written on it, and number line.	<b>What number do you start at?</b>	Student points to, says, or otherwise indicates "2".						
13. See above.	<b>Now what number will you count to?</b>	Student points to, says, or otherwise indicates "4".						
14. See above.	<b>Start at 2 and count until you get to 4.</b>	Student places finger on (or begins eye gaze) 2 and counts jumps...One. Two (stopping at number 4).						
15. See above.	<b>What does c equal? Write it.</b>	Student points to, says, or otherwise identifies 2 and writes "2".						
16. "Jacob" story problem, paper with equation written on it, and number line.	<b>Now, you need to solve for g.</b>	Student points to, says, or otherwise indicates "4".						
17. See above.	Wait for students to begin counting up or say <b>"What's next?"</b>	Student places finger on (or begins eye gaze) 4 and counts jumps...One. Two. Three. Four. Five. Six (stopping at number 10).						
18. See above.	Wait for students to write 6 or say <b>"What's next?"</b>	Student points to, says, or otherwise identifies 6 and writes "6".						
		NUMBER CORRECT:						



8 <sup>th</sup> BUILD A GRADE ALIGNED COMPONENT: Solving Multiplication Equation for Variable						
19. Story problem, blank "isolating and solving for variable" template, and calculator	<b>Write the first number in the yellow box.</b>	Student writes 3 in yellow box.				
20. See above.	<b>Now write the variable in the blue box.</b>	Student writes g in blue box.				
21. See above.	<b>Write the total in the purple box.</b>	Student writes 12 in purple box.				
22. See above.	<b>Remember we need to isolate the variable. Write the equation again and divide both sides by three.</b>	Student writes equation on next line and divides each side by three.				
23. See above.	<b>Point to the left side of their equation. The threes cancel each other out on this side. Cross out the threes.</b>	Student crosses out the threes on the left side.				
24. See above.	<b>Write the variable and the left over numbers below.</b>	Student writes the remaining variable and numbers below.				
25. See above.	<b>Good you isolated the variable. Now use your calculator to divide 12 by 3. Type 12.</b>	Student types 12 into calculator.				
26. See above.	<b>Push divided by.</b>	Student pushes division symbol.				
27. See above.	<b>Push 3.</b>	Student pushes 3.				
28. See above.	<b>Push enter.</b>	Student pushes enter.				
29. See above.	<b>Write your answer.</b>	Student writes answer.				
30. Problem $4x=20$ , "isolating and solving for variable" template, and calculator.	<b>Solve for x.</b>	Student writes equation on his/her worksheet.				
31. See above.	Wait for students to rewrite equation below or say <b>"What's next?"</b>	Student rewrites equation on next line.				
32. See above..	Wait for students to divide both sides by 4 or say <b>"What's next?"</b>	Student divides both sides by 4.				
33. See above.	Wait for students to cross out fours on left side or say <b>"What's next?"</b>	Student crosses out fours on left side.				
34. See above.	Wait for students to rewrite remaining numbers below or say <b>"What's next?"</b>	Student rewrites remaining numbers below.				
35. See above.	Wait for students to use calculator to solve for x or say <b>"What's next?"</b>	Student uses calculator to solve for x.				
36. See above.	Wait for students to write answer or say <b>"What's next?"</b>	Student writes answer below.				
		NUMBER CORRECT:				

## **EQUATION 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 circle the numbers in the word problem.**

Adolfo had 4 pencils. He found more.  
Now he has 6 pencils.

**STUDENT PROBLEM: Your turn. Circle the numbers in the word problem.**

Puja collected 3 watercolor sets. Her  
teacher handed her some more. She  
has 7 total.

\_\_ MODEL: Watch me as I write an equation from the word problem.

Izzy painted 3 flowers. Later he painted some more. He painted 7 flowers in all.

Equation: \_\_\_\_\_

STUDENT PROBLEM: Write an equation from the word problem.

Jesse bought 1 postcard. Then she bought some more. Now she had 4 postcards.

Equation: \_\_\_\_\_

**EQUATION SKILL TEST 2: Solving equation for variable.**

1)  $2 + k = 9$ . Solve for  $k$ .  
 $k = \underline{\hspace{2cm}}$

2)  $9 + w = 15$ . Solve for  $w$ .  
 $w = \underline{\hspace{2cm}}$

3)  $1 + b = 11$ . Solve for  $b$ .  
 $b = \underline{\hspace{2cm}}$

**EQUATION SKILL TEST 3: Solving multiplication equation for variable.**

\_\_\_\_ 1. Solve for d.

$$6d = 18$$

$$d = \underline{\hspace{2cm}}$$

\_\_\_\_ 2. Solve for f.

$$4f = 24$$

$$f = \underline{\hspace{2cm}}$$