

Nemeth Code Symbols Used in the Middle Grades and Strategies for Supporting Math Learning

Lesson 7: Teaching Math Skills to Students with
Visual Impairments and Additional Disabilities

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Objectives

Participants will be able to:

- Select and adapt materials to support learning and engagement of students with visual impairments and additional disabilities.
- Design math instruction that supports student learning in the expanded core curriculum.
- Describe strategies TVIs can utilize when collaborating with other members of the students' educational team to promote generalization of skills.
- Explain ways in which families can support their child's learning of math concepts at home and in the community.

Characteristics and Needs of Students with Additional Disabilities

- Heterogenous group
- Some students have only one additional disability, and others may have several additional disabilities, including intellectual disabilities.
- Instruction should be hands-on, individualized, and meaningful.
- Consider the short-term and long-term goals for the student.

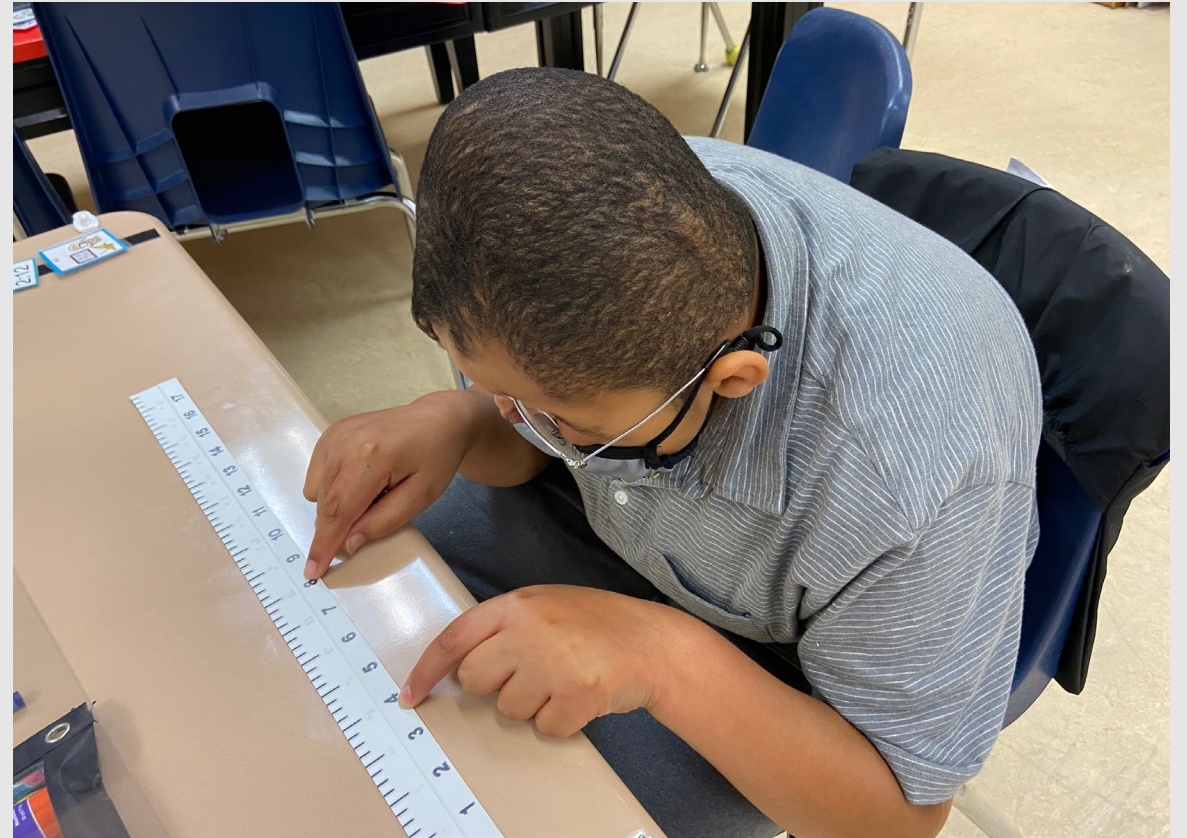
Role of the TVI

- Provide accessible materials, including braille
- Use correct math terminology
- Know state standards and how to modify them as needed
- Evaluate progress



Role of the TVI (continued)

- Understand the student's capabilities
- Monitor and adjust
- Teach what is relevant
- Anticipate success



Collaboration

- It is important that the educational team members, including parents and related service providers, communicate regularly.
- TVIs should observe in the classroom to better understand the physical environment and how successfully the student uses instructional materials, participates in class activities, and understands math-related concepts.
- TVIs should also interview the student, teacher, and paraprofessionals.
- Information gathered can be used to determine:
 - If pre-teaching and/or previewing materials would be beneficial
 - How to better support the instructional staff and student
 - If instructional materials such as clocks, timers, rulers, etc. need to be adapted
 - If instruction in using and interpreting graphics would be warranted

Curriculum for Students with VI and Additional Disabilities

- **INDIVIDUALIZED** Education Program (IEP)
- Blending of the core curriculum and expanded core curriculum
- Level of participation in the core curriculum may be:
 - Grade level standards with accommodations as needed
 - Grade level standards, but the curriculum is adapted with below grade level expectations for the student
 - Preparing for instruction – focus on communication, social interaction, motor etc. often using a functional curriculum

What is a Functional Curriculum?

- Focused on meaningful activities
- Takes place in natural environments
- Included instruction is embedded in natural routines
- Is age appropriate
- Contains a clear beginning, middle, and end
- Incorporates students' interests and strengths
- Supports partial participation
- Emphasizes interdependence and independence

Sacks & Zatta, 2016

Math Instruction for Students Using a Functional Curriculum

- **Counting**: the number of items needed for an activity
- **One-to-one correspondence**: when placing one plate at each chair at the table
- **Money**: using the “dollar up” method to make a purchase
- **Time**: setting a timer to alert one when the brownies are baked
- **Measurement**: measuring a specific amount of an ingredient to go into a recipe

Money

- Use real money with students!
- Infuse money skills into community travel (e.g., with O&M, with family, with class).
- When practicing money skills, build on students' interests.
- Encourage families to involve students in discussions about what things cost.
- Teach use of a calculator.



Buying a Snack from a Vending Machine

Background Knowledge:

- Know the value of each coin
- Know how to count by 1s, 5s, 10s, and 25s
- Know how to use a talking calculator
- Know braille numbers, signs of operation, and decimal point

Teaching Techniques:

- Pique interest (song, etc.).
- Confirm price of snack in braille.
- To determine if they have enough money, students will add coin values using talking calculators if needed.
- Then discuss how many of each coin is needed to reach desired amount.
- Students will confirm that they have selected the right combination of coins and purchase their snack.

Time

- Telling time in digital format is much more common in the “real world”. However, using an analog clock will help you teach the student important math skills.
- Students can help design and follow a schedule they develop for a day, week, or month.
- Encourage families to have students set alarms for key events (e.g., when to get up in the morning, take out the trash).
- In the classroom, have a variety of devices that show time, so the student is familiar with seeing time on different devices (e.g., bedside clock, phone) and calendars (e.g., paper, digital).

Middle School Classroom Schedule

Background Knowledge:

- Be familiar with analog clock
- Know how to skip count by 5s and 10s
- Be familiar with clock language such as quarter hour, half hour, and hour
- Know braille numbers to 12



Teaching Techniques:

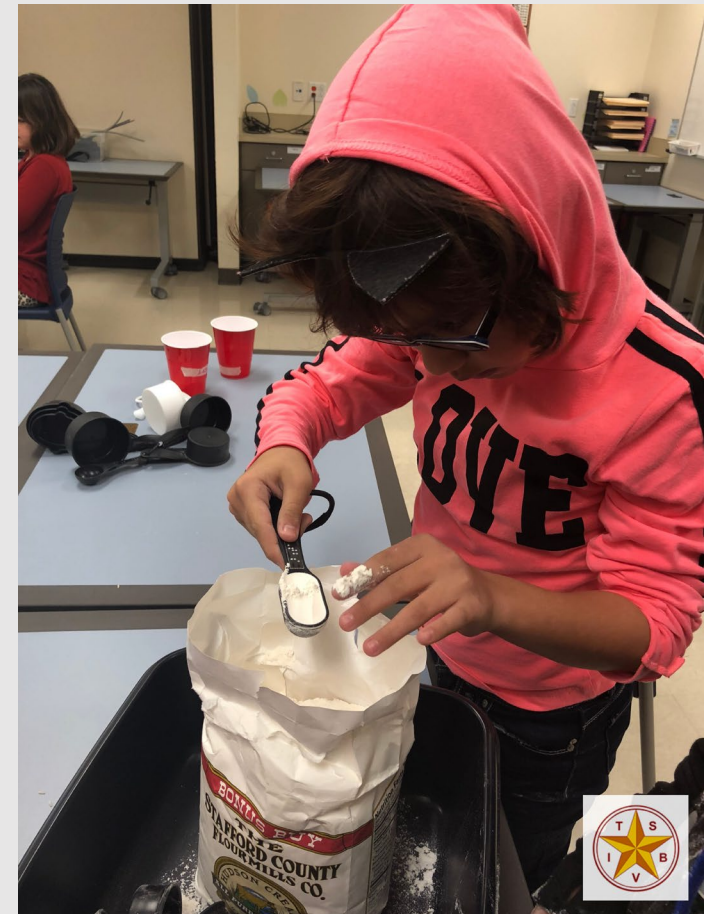
- Analyze daily schedule, including start time, dismissal time, length of periods, and length of passing.
- Next discuss how long students spend in reading and math daily.
- Then discuss how much time the student spends in lunch and recess.
- Students can also set the analog clock when they go to lunch.
- Afterwards provide a variety of questions about time as it relates to their daily and weekly schedule.

Measurement

- Students may learn to use measuring devices (e.g., ruler, yard stick, scale).
- Design measurement activities that are real-life:
 - Measuring the length of ribbon to use when wrapping a package.
 - Measuring a cup of flour for a recipe.
 - Measuring how many inches apart to plant bean plants in the garden.
 - Estimating lengths of various objects using different units of measurement (e.g., width of a door, height of their desk).

Cooking Relates to Math in So Many Ways!

- Following a sequence of steps in a recipe – first, second, third, etc.
- Measuring ingredients for a recipe
- Learning to cut a recipe in half or double it
- Setting the temperature on the stove
- Setting the amount of time for an item to cook



Ensuring Accessibility of Instructional Materials

- Not everything (including braille items) come easily accessible and understandable to students with additional disabilities.
- When planning to teach new concepts, evaluate instructional materials and resources to ensure they are accessible to students. This may include having students do a “trial run” before the lesson so you can problem solve.
- Adaptations do not have to be extensive – they just have to work.
- After adapting the item, present it to the student again to ensure all issues have been resolved.

Let's Examine a 5th Grade Common Core Standard for Geometry

G.1:Geometry

Graph points on the coordinate plane to solve real-world and mathematical problems.

CCSS.MATH.5.G.A.1 Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

Questions to Ask Yourself

Thinking about the student:

- Is the standard appropriate as is?
- Will learning the skill(s) benefit the student?
- What skills related to the standard does the student already have?
- What skills related to the standard does the student need to be pre-taught?
- What adaptations are necessary?
- Will the student need adult support in the math class?
- How could these concepts be related to real-life, such as Point A is home and Point M is the school?

Name: _____

Ordered Pairs

Tell what point is located at each ordered pair.

1. (5,8) _____	2. (12,2) _____	3. (8,7) _____
4. (12,10) _____	5. (7,7) _____	6. (0,10) _____

Write the ordered pair for each given point.

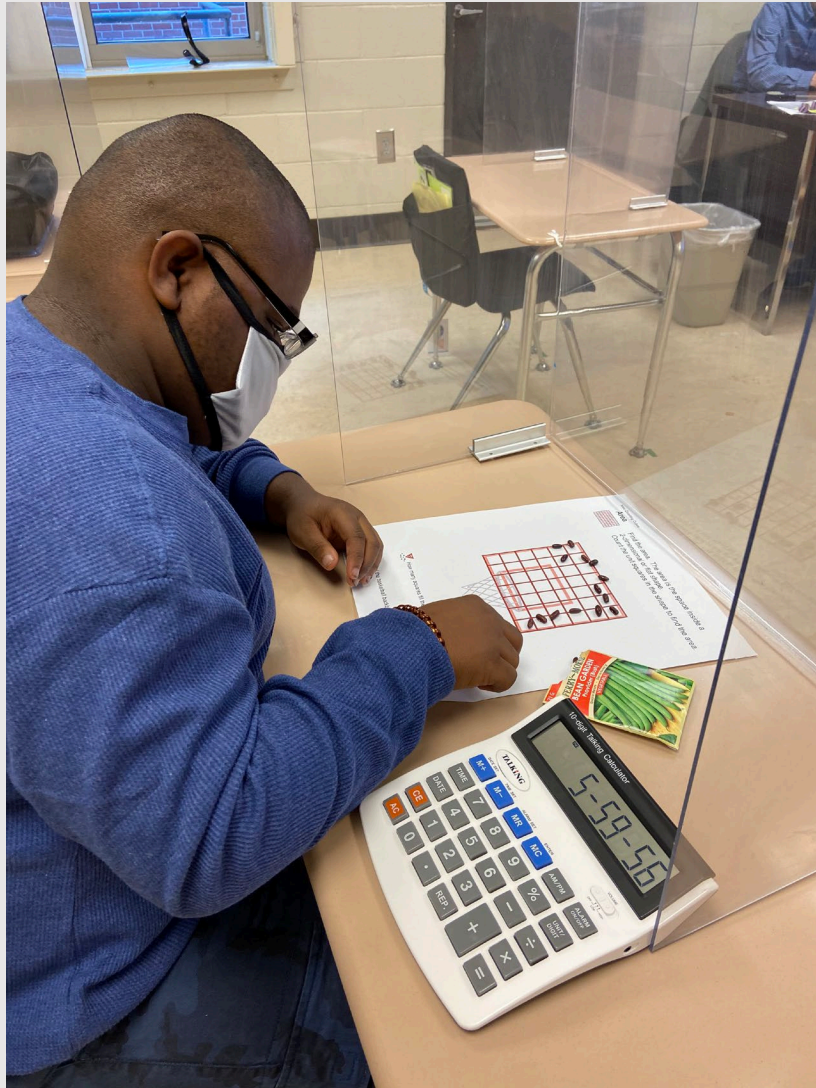
7. N _____	8. L _____	9. J _____
10. A _____	11. B _____	12. E _____

Plot the following points on the coordinate grid.

13. S (6,11)	14. T (3,5)	15. U (9,12)
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Super Teacher Worksheets - www.superteacherworksheets.com

Hands-On Instruction Using Adaptations



Some Things to Keep in Mind

- Continually evaluate what the student recalls from past instruction.
- Use hands-on, real-world learning whenever possible.
- Simpler is often better.
- Examine content across instructional areas to determine where math concepts can be reinforced.
- Work to understand how the student takes in and processes information.
- Work as a team!