

How many adults do you encounter at your program who need numeracy level math instruction?

The SABES Mathematics and Numeracy Curriculum and Instruction PD Center is trying to estimate the number of students enrolled in Adult Basic Education programs in MA and a selection of other states who are in need of numeracy level (defined as CCRSAE Level A; ABE1; GLE K-1) math instruction. Further, we will want to determine what materials are available to teachers and learners and what we need to develop.

The indicators that follow might indicate an adult is in need of numeracy level (CCRS AE Level A) math instruction, in the absence of other obvious barriers (such as language barriers, literacy barriers, etc.). Many adults may have learning disabilities in math or other cognitive challenges. Some numeracy level adults may not be receiving math instruction because of literacy needs or because math instruction is not available at their level. The indicators are not meant to diagnose individuals, but to help program directors/teachers estimate how many students at this math level they have encountered at their program.

Note: Some students may have some of these indicators but do not need numeracy level instruction. Please do not count students who score higher than 300 on the MAPT math or who are successfully studying math content at CCRSAE Levels B-E. These students may have mathematical learning disabilities that require intervention, but they do not need numeracy level (CCRS AE Level A) instruction.

Indicators of Need for Numeracy Level Math Instruction

Please consider the following four categories of indicators when determining if you have encountered adults at numeracy level.

Assessment Indicators

- Scores 200 – 250 on the MAPT Math, (and this is not accounted for by other factors, such as illness, misunderstanding of test format, language barriers, etc.)
- Scores NRS Level 1 on the TABE 11/12 L, Math subsection (scale scores 300 – 448).

Mathematical Indicators¹

Shows difficulty with numeracy level skills, such as:

- Skip counting (counting by twos, fives, or tens)

¹ (Kaufmann, von Aster, Gobel, Marksteiner, & Klein, 2020), (Geary, Brown, & Samaranyake, 1991), (Pimentel, 2013)

- One digit addition and subtraction facts (uses fingers, counters, or tally marks to count total for most facts; makes frequent mistakes. Or, uses a calculator for all single digit addition/subtraction facts.)
- Recognizing small quantities 1-5 (*e.g.*, rolling a die and having to count the dots)
- Comparing two- and three-digit quantities (*e.g.*, which is larger, 199 or 213?)
- Estimation (*e.g.*, \$2.99 and \$4.89 is about \$8)
- Spatial reasoning (putting together and breaking apart shapes)

Functional Indicators²

Shows significant difficulty with adult life skills involving math, such as:

- Counting and using money
- Reading and interpreting schedules and calendars
- Reading clocks
- Managing and estimating time
- Using measurement tools
- Tasks involving spatial reasoning (*e.g.*, assembling parts)

Cognitive Indicators³

- Difficulty following multiple steps
- Easily gets lost in a task and forgets objective
- Difficulty transcribing number or letter sequences (has to write them down in very small chunks; often makes mistakes)

² (Kaufmann, von Aster, Gobel, Marksteiner, & Klein, 2020), (Vigna, et al., 2022)

³ (Kaufmann, von Aster, Gobel, Marksteiner, & Klein, 2020), (Swanson & Beebe-Frankenberger, 2004)

Resources:

- Geary, D. C., Brown, S. C., & Samaranayake, V. A. (1991). Cognitive Addition: A Short Longitudinal Study of Strategy Choice and Speed of Processing Differences in Normal and Mathematically Disabled Children. *Developmental Psychology*, 787-797.
- Kaufmann, L., von Aster, M., Gobel, S. M., Marksteiner, J., & Klein, E. (2020). Developmental Dyscalculia in Adults: Current Issues and Open Questions for Future Research. *Lernen und Lernstörungen*, 126-137.
- Pimentel, S. (2013). *College and Career Readiness Standards for Adult Education*. Retrieved from LINC'S: <http://lincs.ed.gov/publications/pdf/CCRStandardsAdultEd.pdf>
- Swanson, H. L., & Beebe-Frankenberger, M. (2004). The Relationship Between Working Memory and Mathematical Problem Solving in Children at Risk and Not at Risk for Serious Math Difficulties. *Journal of Educational Psychology*, 471-491.
- Vigna, G., Ghidoni, E., Burgio, F., Danesin, L., Angelini, D., Benavides-Varela, S., & Semenza, C. (2022). Dyscalculia in Early Adulthood: Implications for Numerical Activities of Daily Living. *Brain Sciences*, 373.