

What 9-year-olds know and can do in mathematics

The item map below illustrates a range of mathematical skills associated with scores on the long-term trend mathematics scale. Cut scores for the three performance levels reported at age 9 are highlighted in boxes on the scale. The descriptions of selected assessment questions indicate what students need to do to receive credit for a correct answer. For example, 9-year-olds with a score of 182 were likely to be able to identify a symmetric shape. Nine-year-olds with a score of 259 were likely to be able to solve an application problem involving multiple operations.

Age 9 NAEP Mathematics Item Map

Scale score	Question description
500	
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298	Multiply two fractions (MC)
291	Add two fractions with like denominators (MC - ages 13 and 17)
284	Identify a relationship shown on a number line (MC)
280	Divide a three-digit number by a two-digit number (CR)
273	Use and interpret number models (CR - age 13)
271	Use the transitive property (MC - ages 13 and 17)
262	Identify a figure based on relationship to other figures (MC - age 13)
259	Solve an application problem involving multiple operations (MC)
254	Multiply a three-digit number by a single-digit number (MC - age 13)
250	
248	Determine a simple probability from a context (MC)
244	Compute the perimeter of a square (MC - age 13)
241	Model a relationship using a number sentence (MC)
237	Convert units of length (CR)
232	Calculate elapsed time (MC)
228	Solve a problem involving conversion between units of volume (MC)
226	Divide a two-digit number by a one-digit number (CR)
222	Subtract a two-digit number from a two-digit number (CR)
211	Solve a story problem involving subtraction (CR)
209	Identify congruent triangles (MC)
206	Identify the true inequality (MC)
200	Identify whole number place value (MC)
200	
190	Read and interpret a circle graph (MC - age 13)
184	Solve a story problem involving multiplication (MC)
182	Identify a symmetric shape (MC - age 13)
165	Translate number words to numerals (MC)
158	Find the value of an unknown quantity in a number sentence (CR)
150	
106	Identify a polygon (MC)
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CR Constructed-response question MC Multiple-choice question

NOTE: Ages in parentheses indicate a cross-age question. The position of a question on the scale represents the scale score attained by students who had a 65 percent probability of successfully answering a constructed-response question, a 77 percent probability of correctly answering a three-option multiple-choice question, a 74 percent probability of correctly answering a four-option multiple-choice question, a 72 percent probability of correctly answering a five-option multiple-choice question, or a 71 percent probability of correctly answering a six-option multiple-choice question. For constructed-response questions, the question description represents students' performance rated as completely correct. Scores associated with the three performance levels reported for age 9 are boxed.