

# Math Grade 3 Assessment Anchors and Eligible Content



Pennsylvania Department of Education

[www.pde.state.pa.us](http://www.pde.state.pa.us)

2007

**M3.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR**

**M3.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**ELIGIBLE CONTENT**

**M3.A.1.1** Apply place-value concepts and numeration to counting, ordering, grouping and equivalency.  
**Reference: 2.1.3.C, 2.1.3.I, 2.11.3.A**

- M3.A.1.1.1** Match the word name with the appropriate whole number (up through 9,999).
- M3.A.1.1.2** Differentiate between and/or give examples of even and odd number (limit to 3 digits).
- M3.A.1.1.3** Compare two whole numbers using greater than ( $>$ ), less than ( $<$ ) or equal to ( $=$ ) (up through 9,999).
- M3.A.1.1.4** Order a set of whole numbers from least to greatest or greatest to least (up through 9,999; limit sets to no more than four numbers).
- M3.A.1.1.5** Match a symbolic representation of numbers to appropriate whole numbers (e.g., base ten blocks, 7 hundreds, 4 tens and 8 ones, etc).

**EXAMPLE ITEMS**

- Jake is 47 inches tall. Mike is 39 inches tall. Which of the following correctly compares the height of each child.
  - A.  $39 > 47$
  - B.  $39 = 47$
  - C.  $47 < 39$
  - \* D.  $47 > 39$

*(New Jersey Department of Education)*

## M3.A Numbers and Operations

## Reporting Category

## ASSESSMENT ANCHOR

**M3.A.1** Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.

## ELIGIBLE CONTENT

**M3.A.1.2** Use fractions to represent quantities as part of a whole or part of a set.

*Reference: 2.1.3.D*

**M3.A.1.2.1** Write the fraction that corresponds to a drawing or part of a set (numerators 1-9, denominators 2-10. No equivalent or improper fractions or mixed numbers).

**M3.A.1.2.2** Create a drawing or set that represents a given fraction (numerators 1-9, denominators 2-10. No equivalent or improper fractions or mixed numbers).

## EXAMPLE ITEMS

- Which drawing below correctly represents one-fourth?



(Nevada Department of Education)

**M3.A Numbers and Operations**

**Reporting Category**

**ASSESSMENT ANCHOR**

**M3.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**ELIGIBLE CONTENT**

**M3.A.1.3** Count, compare and make change using a collection of coins and one-dollar bills.

**Reference: 2.1.3.E**


**M3.A.1.3.1** Count a collection of bills and coins less than \$5.00 (penny, nickel, dime, quarter, dollar). Money may be represented as 15 cents, 15¢ or \$0.15.


**M3.A.1.3.2** Compare total values of combinations of coins less than \$5.00 (penny, nickel, dime, quarter, dollar).


**M3.A.1.3.3** Make change for an amount up to \$5.00 with no more than \$2.00 change given (penny, nickel, dime, quarter, dollar).


**EXAMPLE ITEMS**

- Carmen bought a soda that cost 65 ¢ . Which coins could she use to pay for the soda?

\*  A. 

B. 

C. 

D. 

*(New Hampshire Department of Education)*

## M3.A Numbers and Operations

## Reporting Category

## ASSESSMENT ANCHOR

**M3.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.**

## ELIGIBLE CONTENT

**M3.A.2.1** Understand various meanings of operations and the relationship between them.

**Reference:** 2.1.3.K, 2.2.3.C, 2.5.3.C

**M3.A.2.1.1** Represent multiplication as repeated addition.

**M3.A.2.1.2** Demonstrate the inverse relationship between addition and subtraction using fact families and/or factors.

**M3.A.2.1.3** Identify the correct operation(s) to solve a word problem (no more than 2 operations using +, - and/or X).

## EXAMPLE ITEMS

- Which expression is **not** the same as  $3 \times 5$ ?

- F.  $5 \times 3$   
 \*G.  $5 \times 5 \times 5$   
 H.  $5 + 5 + 5$   
 J.  $3 + 3 + 3 + 3 + 3$

(New York State Department of Education)

- The  $\square$  and  $\triangle$  stand for numbers in the fact family below.

$$\begin{aligned}\square + \triangle &= 15 \\ \triangle + \square &= 15 \\ 15 - \square &= \triangle \\ 15 - \triangle &= \square\end{aligned}$$

The  $\square$  and  $\triangle$  could stand for which two numbers?

- A.  $\square = 6$  and  $\triangle = 8$   
 \*  B.  $\square = 6$  and  $\triangle = 9$   
 C.  $\square = 7$  and  $\triangle = 9$   
 D.  $\square = 8$  and  $\triangle = 9$

(New Hampshire Department of Education)

- Ed and Jeanne each have 15 lion stickers. Tammy has 20. Which process could they use to find out how many they have altogether?

- A. Add 15 and 20.  
 B. Multiply 15 and 20.  
 C. Add 15 and 20, then multiply by 2.  
 \* D. Multiply 15 by 2; then add 20.

(Louisiana Department of Education)

**M3.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR****M3.A.3 Compute accurately and fluently and make reasonable estimates.****ELIGIBLE CONTENT**

**M3.A.3.1** Solve problems using addition, subtraction and multiplication (straight computation and word problems).

**Reference:** 2.1.3.L, 2.2.3.B

**M3.A.3.1.1** Solve single- and double- digit addition and subtraction problems with and without regrouping in vertical or horizontal form.

**M3.A.3.1.2** Solve problems involving multiplication through the 9's tables through  $9 \times 5$ .

**M3.A.3.1.3** Solve triple digit addition and subtraction problems without regrouping in vertical or horizontal form.

**EXAMPLE ITEMS**

- To order a free soccer ball, Cody needs 60 points. He has 27 points. How many more points does he need?

- \* A. 33
- B. 43
- C. 47
- D. 87

*(New Hampshire Department of Education)*

- In Ms. May's room there are 4 rows of desks with 5 desks in each row. How many desks are in Ms. May's room?

- A. 9
- B. 16
- \* C. 20
- D. 25

*(New Hampshire Department of Education)*

**M3.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR****M3.A.3 Compute accurately and fluently and make reasonable estimates.****ELIGIBLE CONTENT****M3.A.3.2** Use estimation skills to arrive at conclusions.**Reference: 2.2.3.E****M3.A.3.2.1** Estimate sums and differences of quantities; round 2-digit numbers to the nearest 10, and 3 digit numbers to the nearest 100, before computing (limit to two numbers).**EXAMPLE ITEMS**

- Elena worked 62 hours in April, and 59 hours in May. Which of these is the BEST estimate of the total number of hours she worked for the two months?
  - A.  $50 + 50$
  - B.  $55 + 55$
  - \*C.  $60 + 60$
  - D.  $65 + 65$

*(Adapted from TIMSS)*

## M3.B Measurement

## Reporting Category

## ASSESSMENT ANCHOR

**M3.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.**

## ELIGIBLE CONTENT

**M3.B.1.1** Determine or calculate time and elapsed time.

*Reference: 2.3.3.C, 2.3.3.D*

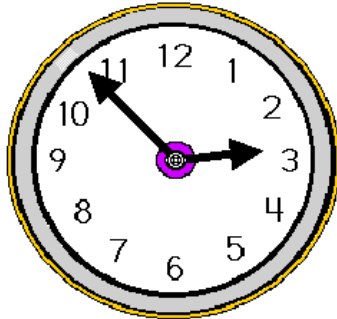
**M3.B.1.1.1** Tell/show time (analog) to the minute.

**M3.B.1.1.2** Find elapsed time to increments of 5 minutes (limited to 2 adjacent hours).

**M3.B.1.1.3** Identify times of the day and night as AM and PM.

## EXAMPLE ITEMS

- Look at the clock below.

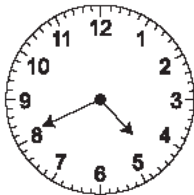


What time is shown on the clock?

- A. 2:46
- B. 2:48
- \* C. 2:53
- D. 3:07

*(Maryland State Department of Education)*

- What time is shown on the clock?



- \* A. 4:41
- B. 5:41
- C. 8:23
- D. 8:25

*(Nevada Department of Education)*



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**M3.B Measurement**

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**Reporting Category**

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**ASSESSMENT ANCHOR**

**M3.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.**

**ELIGIBLE CONTENT**

**M3.B.1.2** Use the attributes of length, area, volume and weight of objects.

**Reference:** 2.3.3.A, 2.3.3.E

**M3.B.1.2.1** Select an appropriate unit for the attribute being measured.

**M3.B.1.2.2** Compare and/or order objects according to length, area, or weight.

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**EXAMPLE ITEMS**

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**M3.B Measurement**

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**Reporting Category**

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**ASSESSMENT ANCHOR****M3.B.2 Apply appropriate techniques, tools and formulas to determine measurements.****ELIGIBLE CONTENT****M3.B.2.1** Determine the measurement of objects with non-standard and standard units.*Reference: 2.3.3.B, 2.3.3.F***M3.B.2.1.1** Use a ruler (provided) to measure to the nearest  $\frac{1}{2}$  inch.

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**EXAMPLE ITEMS**

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**M3.B Measurement**

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**Reporting Category**

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**ASSESSMENT ANCHOR****M3.B.2 Apply appropriate techniques, tools and formulas to determine measurements.****ELIGIBLE CONTENT****M3.B.2.2** Estimate measurements of familiar objects.*Reference: 2.3.3.G***M3.B.2.2.1** Match the object with its approximate measurement (all measurements given must be of the same system, e.g., about how tall is a soda pop can? 5 inches, 5 feet, 5 yards, etc.).

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**EXAMPLE ITEMS**

**M3.C Geometry**

**Reporting Category**

**ASSESSMENT ANCHOR**

**M3.C.1 Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.**

**ELIGIBLE CONTENT**

**M3.C.1.1** Identify and/or describe two- and three- dimensional objects.

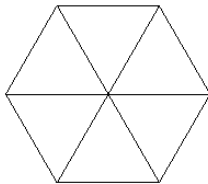
*Reference: 2.9.3.A*

**M3.C.1.1.1** Name/identify/describe geometric shapes in two dimensions (circle, square, rectangle, triangle, pentagon, hexagon, octagon).

**M3.C.1.1.2** Name/identify geometric shapes in three dimensions (sphere, cube, cylinder, cone, pyramid, rectangular prism).

**EXAMPLE ITEMS**

- Here is a hexagon.



The hexagon is divided into six

- \* A. triangles
- B. squares
- C. pentagons
- D. rectangles

(TIMSS)

- If Carl connects the points shown below with line segments, what shape will he make?

.Y

X.

˘Z

- \* A. triangle
- B. square
- C. rectangle
- D. hexagon

(New Hampshire Department of Education)

- Which shape is a pyramid?

\*  A.



B.



C.



D.



(New Hampshire Department of Education)

**ASSESSMENT ANCHOR**

**M3.C.2 Identify and/or apply concepts of transformations or symmetry.**

**ELIGIBLE CONTENT**

**M3.C.2.1** Apply the concepts of transformations and symmetry.

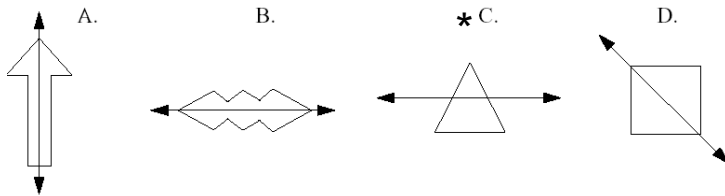
*Reference: 2.9.3.E, 2.9.3.F, 2.9.3.H*

**M3.C.2.1.1** Identify/draw one line of symmetry in a two-dimensional figure.

**M3.C.2.1.2** Identify symmetrical two-dimensional shapes.

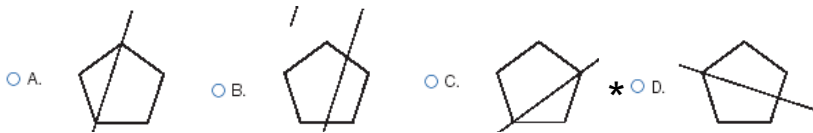
**EXAMPLE ITEMS**

- Which of these does NOT show a line of symmetry?



(TIMSS)

- In which figure below is a line of symmetry shown?



(New Hampshire Department of Education)

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**M3.C Geometry**

**Reporting Category**

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**ASSESSMENT ANCHOR**

**M3.C.3 Locate points or describe relationships using the coordinate plane.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 3.**

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**EXAMPLE ITEMS**

## ASSESSMENT ANCHOR

## M3.D.1 Demonstrate an understanding of patterns, relations and functions.

## ELIGIBLE CONTENT

**M3.D.1.1** Recognize, describe, or extend a variety of patterns.

*Reference: 2.8.3.A, 2.11.3.D*

**M3.D.1.1.1** Extend or find a missing element in a pattern of numbers or shapes (pattern must show 3 repetitions – if multiples are used, limit to 2, 3 or 5).

**M3.D.1.1.2** Identify/describe the rule for a pattern shown (pattern must show 3 repetitions – if multiples are used, limit to 2, 3 or 5).

## EXAMPLE ITEMS

- Use the number pattern below to answer the question.

0, 1, 3, 6, 10, 15, ?

Which number is next in this pattern?

- A. 30
- \* B. 21
- C. 20
- D. 16

*(New Hampshire Department of Education)*

- If this pattern continues, what is the next number?

4, 7, 10, 13, 16, 19, . . .

- A. 21
- \* B. 22
- C. 23
- D. 24

*(New Jersey Department of Education)*

- Which rule below best describes this skip counting pattern?

100, 95, 90, 85, 80, 75, 70, 65, . . .

- A. Add 5 to each number to get the next number.
- \* B. Subtract 5 from each number to get the next number.
- C. Multiply each number by 5 to get the next number.
- D. Divide each number by 5 to get the next number.

*(Nevada Department of Education)*

**M3.D Algebraic Concepts****Reporting Category****ASSESSMENT ANCHOR**

**M3.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

**ELIGIBLE CONTENT**

**M3.D.2.1** Create/model expressions, equations and inequalities to match a problem situation.

**Reference: 2.8.3.D**

**M3.D.2.1.1** Create or match a story to a given combination of symbols (+, −, ×, <, >, =) and numbers.

**M3.D.2.1.2** Choose the number sentence that matches a given story (one operation, + or − only).

**EXAMPLE ITEMS**

- Kamala bought a box of crayons for 29¢. She also bought a coloring book for 65¢. Which number sentence shows how much money Kamala spent on the crayons and coloring book?
  - A.  $65¢ - 29¢ = \underline{\hspace{1cm}}$
  - B.  $\underline{\hspace{1cm}} + 29¢ = 65¢$
  - \* C.  $29¢ + 65¢ = \underline{\hspace{1cm}}$
  - D.  $65¢ + \underline{\hspace{1cm}} = 29¢$

*(New Jersey Department of Education)*



**M3.D Algebraic Concepts****Reporting Category****ASSESSMENT ANCHOR**

**M3.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

**ELIGIBLE CONTENT**

**M3.D.2.2** Determine the missing number or symbol in a number sentence.

**Reference: 2.8.3.B, 2.8.3.F**

**M3.D.2.2.1** Find a missing number that makes a number sentence true (1-digit or 2-digit numbers up to 18 using +, - or  $\times$  through  $9 \times 5$ ).

**M3.D.2.2.2** Identify the missing symbol (+, -, =, <, >) that makes a number sentence true.

**EXAMPLE ITEMS**

- Which symbol below should go in the box to make this number sentence true?

$$20 - 17 \square 10 - 7$$

- A. +
- B. >
- C. <
- \* D. =

*(Nevada Department of Education)*

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**M3.D Algebraic Concepts**

**Reporting Category**

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**ASSESSMENT ANCHOR**

**M3.D.3 Analyze change in various contexts.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 3.**

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**EXAMPLE ITEMS**

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**M3.D Algebraic Concepts**

**Reporting Category**

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**ASSESSMENT ANCHOR**

**M3.D.4 Describe or use models to represent quantitative relationships.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 3.**

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**EXAMPLE ITEMS**

**M3.E Data Analysis and Probability****Reporting Category****ASSESSMENT ANCHOR**

**M3.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.**

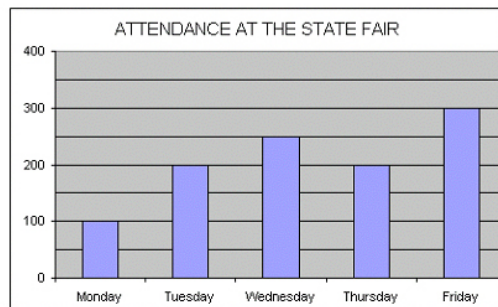
**ELIGIBLE CONTENT**

**M3.E.1.1** Answer questions based on data shown on tables, charts, and bar graphs.

**Reference:** 2.6.3.B, 2.7.3.D, 2.11.3.B

**M3.E.1.1.1** Analyze data shown on tables, charts, or bar graphs using the concepts of largest, smallest, most often, least often and middle.

**M3.E.1.1.2** Describe, interpret and/or answer questions based on data shown in tables, charts or bar graphs.

**EXAMPLE ITEMS**

The graph above shows the number of tickets sold for the first five days of the week. How many tickets were sold on the third day of the week?

- A. 100
- B. 150
- C. 200
- \* D. 250

(New Jersey Department of Education)

**M3.E Data Analysis and Probability**

**Reporting Category**

**ASSESSMENT ANCHOR**

**M3.E.1 Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.**

**ELIGIBLE CONTENT**

**M3.E.1.2** Organize or display data using tables, charts, bar graphs.

**Reference: 2.6.3.A, 2.7.3.C**

**M3.E.1.2.1** Graph data or complete a graph given the data (grid is provided).

**M3.E.1.2.2** Translate information from one type of display to another (e.g., convert tally chart to bar graph). Limit to tally charts, bar graphs and tables.

**EXAMPLE ITEMS**

- Tom asked several friends if they had read his favorite book, *Superfudge*. This is the data he collected.

yes	no	yes	yes
yes	yes	no	no
no	no	yes	no
yes	yes	no	yes

Answer	Tally	Number
No		7
Yes		

Tom recorded the NO answers in the chart above. What should he enter in the YES tally column of his chart?

- A. |||||
- B. ||||| ||
- C. ||||| |||||
- \* D. ||||| |||||

*(New Hampshire Department of Education)*

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**M3.E Data Analysis and Probability**

**Reporting Category**

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**ASSESSMENT ANCHOR**

**M3.E.2 Select and/or use appropriate statistical methods to analyze data.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 3.**

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**EXAMPLE ITEMS**

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**M3.E Data Analysis and Probability**

**Reporting Category**

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**ASSESSMENT ANCHOR**

**M3.E.3 Understand and/or apply basic concepts of probability or outcomes.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 3.**

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**EXAMPLE ITEMS**

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**M3.E Data Analysis and Probability**

**Reporting Category**

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**ASSESSMENT ANCHOR**

**M3.E.4 Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 3.**

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**EXAMPLE ITEMS**