

# Math Grade 5 Assessment Anchors and Eligible Content



Pennsylvania Department of Education

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

Updated August 2010

**M5.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR**

**M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**M5.A.1.1** Express numbers in equivalent forms.

**ELIGIBLE CONTENT**

**M5.A.1.1.1** Use expanded notation to represent whole numbers or decimals (whole numbers less than 10,000,000 and decimals through hundredths).

**EXAMPLE ITEMS**

- What is the expanded notation for 3,056?
  - A.  $3,000 + 5 + 6$
  - \* B.  $3,000 + 50 + 6$
  - C.  $3,000 + 500 + 6$
  - D.  $30,000 + 50 + 6$

*(Pennsylvania Department of Education)*

**Reference:**

**2.1.5.B** Use number theory concepts and **models** to represent or rename whole numbers, fractions, and decimals.

**M5.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR**

**M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**ELIGIBLE CONTENT**

**M5.A.1.2** Demonstrate understanding of place value of whole numbers and decimals.

**M5.A.1.2.1** Match the standard form to the word form of decimal numbers through the hundredths.

**M5.A.1.2.2** Identify the place value of a digit (from millions through hundredths).

**EXAMPLE ITEMS**

- Which number is two hundred six and nine-tenths?

- A. 206.09
- \* B. 206.9
- C. 206.910
- D. 2006.9

(TIMSS)

- In which number does the underlined 5 represent 5 million?

- A. 355,057,531
- \* B. 355,057,531
- C. 355,057,531
- D. 355,057,531

(Pennsylvania Department of Education)

- In which number does the 7 have the greatest value?

- A. 32,704
- B. 32,407
- C. 32,576
- \* D. 37,403

(Maine State Department of Education)

**Reference:**

**2.1.5.D** Apply place value concepts to order and compare decimals and to express whole numbers and decimals in **expanded notation**.

**M5.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR**

**M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**ELIGIBLE CONTENT**

**M5.A.1.3** Compare quantities or magnitudes of numbers.

**M5.A.1.3.1** Compare whole numbers through 9 digits using the words more, less, equal, least, most, greater than, less than or the symbols  $<$ ,  $>$ ,  $=$ .

**M5.A.1.3.2** Compare and/or order decimals through the hundredths. (Limit sets for ordering to no more than 4 numbers.)

**M5.A.1.3.3** Compare proper fractions through 16ths with like and unlike denominators.

**EXAMPLE ITEMS**

- What is 0.01 MORE than 1.08?
  - \* A. 1.09
  - B. 1.90
  - C. 9.10
  - D. 19.0

*(Connecticut State Department of Education)*

**Reference:**

**2.11.5.A** Make comparisons of numbers (e.g., more, less, same, least, most, greater than, less than).

## M5.A Numbers and Operations

## Reporting Category

### ASSESSMENT ANCHOR

**M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

### ELIGIBLE CONTENT

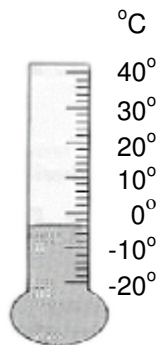
**M5.A.1.4** Use simple applications of negative numbers (number line, counting, temperature).

**M5.A.1.4.1** Locate/Identify integers on a number line (greater than or equal to -20).

**M5.A.1.4.2** Identify negative temperatures on a thermometer (through  $-20^{\circ}\text{C}$  or  $^{\circ}\text{F}$ ).

### EXAMPLE ITEMS

- This is how Anoki's thermometer looked on a cold morning in December.

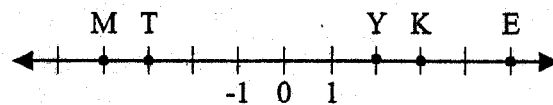


What temperature does the thermometer show?

- A.  $2^{\circ}\text{C}$
- B.  $-2^{\circ}\text{C}$
- C.  $4^{\circ}\text{C}$
- \* D.  $-4^{\circ}\text{C}$

*(New Jersey Department of Education)*

- If the interval on this number line is one unit, what is the location of point T?



- A. -4
- \* B. -3
- C. 2
- D. 5

*(Pennsylvania Department of Education)*

### Reference:

**2.1.5.C** Use **models** to represent the concept of an **integer**, fraction, decimal, or percent.

---

**M5.A Numbers and Operations**
**Reporting Category**


---

**ASSESSMENT ANCHOR**

**M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

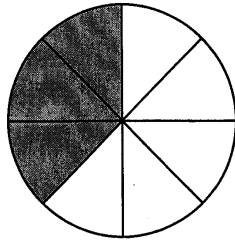
**ELIGIBLE CONTENT**

**M5.A.1.5** Use or develop models to represent fractions and/or mixed numbers.

**M5.A.1.5.1** Use or develop regions and/or sets (e.g., circle graph, base ten blocks) to model fractions and mixed numbers through hundredths (may include reducing the fractions).

**EXAMPLE ITEMS**

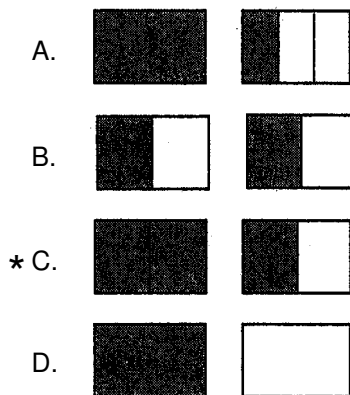
- What part of the circle is shaded?



- A.  $\frac{1}{3}$   
 \* B.  $\frac{3}{8}$   
 C.  $\frac{2}{4}$   
 D.  $\frac{5}{8}$

(Pennsylvania Department of Education)

- Which figure shows  $1\frac{1}{2}$  shaded?



(Pennsylvania Department of Education)

**Reference:**

**2.1.5.B** Use number theory concepts and **models** to represent or rename whole numbers, fractions, and decimals.

**M5.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR**

**M5.A.1 Demonstrate an understanding of numbers, ways of representing numbers, relationships among numbers and number systems.**

**ELIGIBLE CONTENT**

**M5.A.1.6** Apply number theory concepts (i.e., primes, factors, multiples, composites).

**M5.A.1.6.1** Define/list/identify prime and composite numbers less than or equal to 100.

**M5.A.1.6.2** Define/list/identify factors and/or multiples of a given whole number less than or equal to 50.

**EXAMPLE ITEMS**

- If a number can only be divided by one and itself, it is a
  - A. factor.
  - B. multiple.
  - \* C. prime.
  - D. composite.

*(Pennsylvania Department of Education)*
  
- Which of the following **best** defines the properties of a prime number?
  - A. It has more than 2 factors.
  - \* B. It has only 2 factors, one and itself.
  - C. It has more than 2 multiples.
  - D. It has only 2 multiples.

*(Pennsylvania Department of Education)*
  
- Which of the following **best** defines the properties of a composite number?
  - \* A. It has more than 2 factors.
  - B. It has only 2 factors, one and itself.
  - C. It has more than 2 multiples.
  - D. It has only 2 multiples.

*(Pennsylvania Department of Education)*
  
- Which list contains **all prime** numbers?
  - A. 1, 7, 13, 29
  - B. 2, 13, 27, 41
  - \* C. 5, 11, 29, 31
  - D. 6, 18, 21, 50

*(Pennsylvania Department of Education)*
  
- The least common multiple of 8 and 12 is \_\_\_\_\_.
  - A. 8
  - B. 12
  - C. 20
  - \* D. 24

*(Pennsylvania Department of Education)*

**Reference:**

**2.1.5.E** Develop and apply number theory concepts (e.g., **primes, factors, multiples, composites**) to represent numbers in various ways.

**M5.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR**

**M5.A.2 Understand the meanings of operations, use operations and understand how they relate to each other.**

**ELIGIBLE CONTENT**

**M5.A.2.1** Solve problems involving decimals, fractions and/or whole numbers (straight computation or word problems).

**M5.A.2.1.1** Solve problems involving addition, subtraction, multiplication and division of whole numbers (multipliers up to 2 digits – divisors one digit) and decimals including money (answer through hundredths – no divisors with decimals).

**M5.A.2.1.2** Solve problems involving addition and subtraction of fractions (through 16ths – like and unlike denominators – for unlike denominators, the LCD must be one of the given denominators).

**M5.A.2.1.3** Choose the correct operation(s) to solve a problem (no more than 2 operations).

**EXAMPLE ITEMS**

- The art teacher has 824 paint brushes. He wants to put 8 brushes in a box. How many boxes can he fill?
  - A. 4 boxes
  - B. 13 boxes
  - \* C. 103 boxes
  - D. 130 boxes

*(Maryland State Department of Education)*

- Justin buys 2 cheeseburgers at \$1.55 each, large fries for \$.95, and a vanilla shake for \$1.25. How much change will Justin receive from \$10.00?
  - A. \$4.50
  - \* B. \$4.70
  - C. \$4.75
  - D. \$5.00

*(Pennsylvania Department of Education)*

- In Jean's class there are twice as many boys as girls. If there are 10 girls in the class, how many boys and girls are there in the class?
  - A. 15
  - B. 20
  - C. 25
  - \* D. 30

*(NAEP)*

**Reference:**

**2.2.5.B** Multiply and divide single- and double-digit numbers; add and subtract fractions and mixed numbers; add, subtract, multiply and divide decimals.

**2.5.5.A** Develop a plan to analyze a problem, identify the information needed to solve the problem, carry out the plan, check whether an answer makes sense, and explain how the problem was solved in grade appropriate contexts.



**M5.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR****M5.A.3 Compute accurately and fluently and make reasonable estimates.****ELIGIBLE CONTENT**

**M5.A.3.1** Apply estimation strategies to a variety of problems.

**M5.A.3.1.1** Round whole numbers through millions and decimals through hundredths.

**M5.A.3.1.2** Use estimation to solve problems involving whole numbers and/or decimals (up to 2-digit multipliers, single-digit divisors or multiples of 10; whole numbers through thousands and decimals through hundredths).

**EXAMPLE ITEMS**

- A company produced 17,175 cars in 1996. For a report, this number was rounded to the nearest hundred. Which was the number of cars given in the report?

- A. 17,000
- B. 17,100
- \* C. 17,200
- D. 17,270

*(TIMSS)*

- A total of 106,789 people attended the Rose Bowl football game. If the average ticket was \$21.52, **about** how much money did the Rose Bowl take in?

- A. \$20,000
- B. \$200,000
- \* C. \$2,000,000
- D. \$20,000,000

*(Pennsylvania Department of Education)*

- The table shows the number of tickets sold for football games. **Round** each number, **then ESTIMATE** the total number of tickets sold.

SCHOOL	NUMBER OF TICKETS SOLD
Forest Hill	2,521
Central	3,357
Market Street	982
Ridge Avenue	1,049

- A. 6000
- B. 7000
- \* C. 8000
- D. 9000

*(Pennsylvania Department of Education)***Reference:**

- 2.2.5.D** Estimate results from calculations with basic operations of whole numbers and decimals and check the **reasonableness** of those estimates.

**M5.A Numbers and Operations****Reporting Category****ASSESSMENT ANCHOR****M5.A.3 Compute accurately and fluently and make reasonable estimates.****ELIGIBLE CONTENT****M5.A.3.2** Compute accurately without the use of a calculator (straight computation or 1 operation word problems).**M5.A.3.2.1** Use addition, subtraction, multiplication and division to compute accurately without a calculator (multipliers up to 2 digits, single-digit divisors or multiples of 10 – whole numbers through thousands and decimals through hundredths - no divisors with decimals).**EXAMPLE ITEMS**

- Find the exact answer:  $900 - 201$

- \* A. 699
- B. 700
- C. 701
- D. 799

*(New Jersey Department of Education)*

- Find the exact answer:  $4 \times 25 \times 9$

- A. 90
- B. 100
- C. 360
- \* D. 900

*(New Jersey Department of Education)*

- $376 + 119 + 85$

- A. 460
- \* B. 580
- C. 1,230
- D. 1,345

*(New Jersey Department of Education)*

- $568 \div 4$

- A. 564
- \* B. 142
- C. 140
- D. 112

*(New Jersey Department of Education)***Reference:****2.2.5.B** Multiply and divide single- and double-digit numbers; add and subtract fractions and mixed numbers; add, subtract, multiply and divide decimals.

**M5.B Measurement****Reporting Category****ASSESSMENT ANCHOR**

**M5.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.**

**ELIGIBLE CONTENT**

**M5.B.1.1** Select appropriate units (customary or metric) to measure specific attributes of objects.

**M5.B.1.1.1** Select the appropriate unit for measuring weight (mass), capacity, length, perimeter and area.

**EXAMPLE ITEMS**

- What is the most reasonable width of a standard door?
  - \* A. 36 inches
  - B. 36 feet
  - C. 36 centimeters
  - D. 36 meters

*(Pennsylvania Department of Education)*

- What units would be best to use to measure the weight (mass) of an egg?
  - A. centimeters
  - B. milliliters
  - \* C. grams
  - D. kilograms

*(TIMSS)*

- Which is the BEST unit to measure the amount of water needed to fill a swimming pool?
  - \* A. gallons
  - B. quarts
  - C. pints
  - D. cups

*(Connecticut State Department of Education)*

- Which of the following is usually measured in feet?
  - A. The thickness of a coin
  - B. The length of a paper clip
  - \* C. The length of a car
  - D. The distance between New York City and Chicago

*(NAEP)*

**Reference:**

**2.3.5.B** Select and use appropriate instruments and units for measuring quantities to a specified level of accuracy.

**M5.B Measurement****Reporting Category****ASSESSMENT ANCHOR**

**M5.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.**

**ELIGIBLE CONTENT**

**M5.B.1.2** Solve problems using simple conversions and/or add and subtract measurements.

**M5.B.1.2.1** Convert using linear measurements, capacity, and weight (mass) within the same system to the unit immediately above or below the given unit (using only the units below – use a conversion chart or a “hint” with problems e.g., hint: 16oz = 1lb).

- Metric using mm, cm, m and km; mL and L; g and kg
- Customary using cup, pint, quart, gallon; in, ft, yd; oz, lb

**M5.B.1.2.2** Add or subtract linear measurements, (feet and inches) or units of time (hours and minutes), without having to regroup with subtraction (answer should be in simplest form).

**EXAMPLE ITEMS**

- Ladybug A climbed eight feet up a tree. Ladybug B climbed 94 inches up a tree. How much **farther** did Ladybug A climb?
  - \* A. 2 inches
  - B. 22 inches
  - C. 12 inches
  - D. 6 inches

*(Pennsylvania Department of Education)*

- A board 2 feet long is cut into 8 pieces of equal length. How long is each piece?
  - A.  $\frac{1}{4}$  inch
  - \* B. 3 inches
  - C. 4 inches
  - D. 6 inches

*(Pennsylvania Department of Education)*

- The entrance to a building is 6 feet 8 inches high. A man is 5 feet 9 inches tall. His hat adds 5 inches to his total height. How much space is there between the top of his hat and the top of the entrance?
  - \* A. 6 inches
  - B. 9 inches
  - C. 1 foot 1 inch
  - D. 6 feet 2 inches

*(Pennsylvania Department of Education)*

**Reference:**

**2.3.5.C** Calculate perimeter and area, and sums and differences of measurements.

**2.3.5.D** Perform basic conversions within a system.

**M5.B Measurement****Reporting Category****ASSESSMENT ANCHOR**

**M5.B.1 Demonstrate an understanding of measurable attributes of objects and figures, and the units, systems and processes of measurement.**

**ELIGIBLE CONTENT**

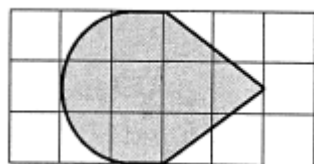
**M5.B.1.3** Estimate and/or compare the perimeters or areas of 2 figures without computation.

**M5.B.1.3.1** Estimate which polygon (shown on a grid) has a greater perimeter or area (compare either area to area or perimeter to perimeter).

**M5.B.1.3.2** Estimate the area of an irregular figure shown on a grid.

**EXAMPLE ITEMS**

- Each block on the grid equals 1 square unit. **Estimate** the **area** of the shaded figure.



- A. 5 square units
- \* B. 8 square units
- C. 11 square units
- D. 13 square units

*(Pennsylvania Department of Education)*

**Reference:**

**2.3.5.F** Estimate and verify measurements of length, perimeter, area, **volume**, capacity, temperature, time, weight, and angles.

**M5.B Measurement****Reporting Category****ASSESSMENT ANCHOR****M5.B.2 Apply appropriate techniques, tools and formulas to determine measurements.****ELIGIBLE CONTENT****M5.B.2.1** Use appropriate tools to determine measurements.**M5.B.2.1.1** Use a ruler to measure to the nearest  $\frac{1}{8}$  inch or centimeter.**EXAMPLE ITEMS****Reference:****2.3.5.B** Select and use appropriate instruments and units for measuring quantities to a specified level of accuracy.

**M5.B Measurement****Reporting Category****ASSESSMENT ANCHOR****M5.B.2 Apply appropriate techniques, tools and formulas to determine measurements.****ELIGIBLE CONTENT****M5.B.2.2** Solve problems involving length, time, weight (mass), capacity, temperature, perimeter and/or area.**M5.B.2.2.1** Find the perimeter of a figure drawn and labeled (with the same units throughout).**M5.B.2.2.2** Find the area of a square or rectangle (with the same units throughout - whole numbers only).**M5.B.2.2.3** Solve problems involving weight, time, temperature, length and capacity (with the same units throughout - limited to 3 digits).**EXAMPLE ITEMS**

- Find the perimeter of a rectangular swimming pool having sides of 30 ft and 10 ft.

30 ft.

- A. 300 ft
- \* B. 80 ft
- C. 150 ft
- D. 40 ft



10 ft.

*(Pennsylvania Department of Education)*

- Ted went to the beach at 10:30 a.m. and came home at 2:00 p.m. How many hours was he gone?

- A. 8 ½
- B. 4 ½
- \* C. 3 ½
- D. 2 ½

*(NAEP)*

- Mrs. Gonzalez had twins weighing 6 lb 9 oz and 5 lb 13 oz. What was the total weight of both babies?

- A. 12 lb 22 oz
- B. 12 lb 10 oz
- \* C. 12 lb 6 oz
- D. 11 lb 10 oz

*(Pennsylvania Department of Education)***Reference:****2.3.5.B** Select and use appropriate instruments and units for measuring quantities to a specified level of accuracy.**2.3.5.C** Calculate perimeter and area, and sums and differences of measurements.**2.3.5.D** Perform basic conversions within a system.

**M5.C Geometry****Reporting Category****ASSESSMENT ANCHOR**

**M5.C.1 Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.**

**ELIGIBLE CONTENT**

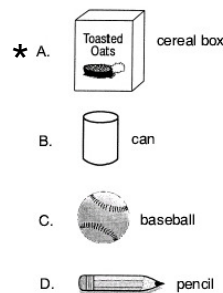
**M5.C.1.1** Define and/or use basic properties of quadrilaterals (parallelograms, squares, rectangles, trapezoids, rhombi), triangles, circles, pyramids, cubes, and/or prisms.

**M5.C.1.1.1** Identify, and/or classify cubes, rectangular prisms or pyramids using faces, vertices and edges.

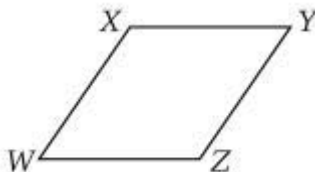
**M5.C.1.1.2** Identify and/or describe properties of all types of quadrilaterals (parallelogram, rectangle, rhombus, square, trapezoid).

**EXAMPLE ITEMS**

- Which item is an example of a rectangular prism?



(Pennsylvania Department of Education)



- In the figure above, WXYZ is a parallelogram. Which of the following is NOT necessarily true?
  - A. Side WX is parallel to side ZY.
  - B. Side XY is parallel to side WZ.
  - C. The measures of angles W and Y are equal.
  - D. The lengths of sides WX and ZY are equal.
  - ★ E. The lengths of sides WX and XY are equal.

(NAEP)

**Reference:**

**2.9.5.A** Identify, describe, and define 1-, 2-, and 3-dimensional shapes and their related parts, and classify and compare 2- and 3- dimensional shapes on the basis of their properties.

**2.10.5.A** Identify and compare parts of right triangles, including right angles, acute angles, hypotenuses, and legs.



**M5.C Geometry****Reporting Category****ASSESSMENT ANCHOR**

**M5.C.1 Analyze characteristics and properties of two- and three- dimensional geometric shapes and demonstrate understanding of geometric relationships.**

**ELIGIBLE CONTENT**

**M5.C.1.2** Represent and/or use properties of lines, line segments, rays, points and planes.

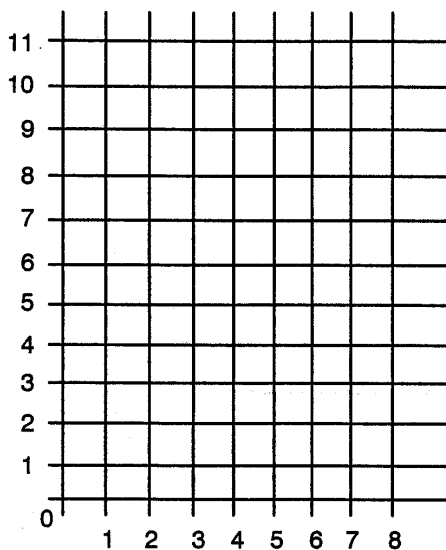
**M5.C.1.2.1** Identify, draw and/or label points, lines, line segments and rays.

**EXAMPLE ITEMS**

- Complete the table below. The rule is add 4.

$x$	$y$
1	
3	
5	
7	

On the graph below, plot the points from the table.



If you connect these points, which of the following would you see?

- A. rectangle
- B. circle
- \*C. line segment
- D. ray

*(Pennsylvania Department of Education)*

**Reference:**

**2.9.5.A** Identify, describe, and define 1-, 2-, and 3-dimensional shapes and their related parts, and classify and compare 2- and 3- dimensional shapes on the basis of their properties.

**M5.C Geometry****Reporting Category****ASSESSMENT ANCHOR****M5.C.2 Identify and/or apply concepts of transformations or symmetry.****ELIGIBLE CONTENT**

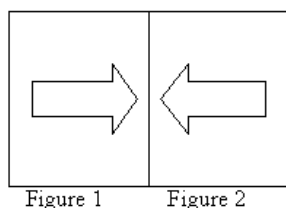
**M5.C.2.1** Analyze transformations and/or use symmetry to analyze mathematical situations.

**M5.C.2.1.1** Draw or identify a translation (slide), reflection (flip) or rotation (turn) of a 2-dimensional shape.

**M5.C.2.1.2** Identify the number of lines of symmetry and/or draw all lines of symmetry in a two-dimensional polygon.

**EXAMPLE ITEMS**

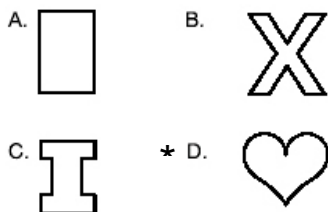
- Which of the following describes the change in Figure 1 to Figure 2?



- A. slide
- B. turn right
- \* C. flip
- D. turn left

*(New Jersey Department of Education)*

- Which of the following figures has exactly one line of symmetry?



*(Pennsylvania Department of Education)*

**Reference:**

**2.9.5.B** Predict and describe the result of a **translation** (slide), **rotation** (turn), or **reflection** (flip) of a 2-dimensional shape.

**2.9.5.A** Identify, describe, and define 1-, 2-, and 3-dimensional shapes and their related parts, and classify and compare 2- and 3- dimensional shapes on the basis of their properties.

---

---

**M5.C Geometry**

**Reporting Category**

---

---

**ASSESSMENT ANCHOR**

**M5.C.3 Locate points or describe relationships using the coordinate plane.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 5.**

---

**EXAMPLE ITEMS**

**M5.D Algebraic Concepts****Reporting Category****ASSESSMENT ANCHOR****M5.D.1 Demonstrate an understanding of patterns, relations and functions.****ELIGIBLE CONTENT****M5.D.1.1** Create or extend patterns.**M5.D.1.1.1** Extend or find a missing element in a numerical or simple geometric pattern (+, -,  $\times$  or  $\div$  of whole numbers). Pattern must show 3 repetitions.**M5.D.1.1.2** Create or replicate a numerical or geometric pattern showing 3 repetitions of that pattern (+, -,  $\times$  or  $\div$  of whole numbers may be used).**EXAMPLE ITEMS**

- Which number belongs in the box?

□, 34, 32, 30, 28, . . .

- A. 26
- B. 35
- \* C. 36
- D. 37

*(New Hampshire Department of Education)*

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

5, 8, 7, 10, 9, 12, 11, . . .

- \* A. 14
- B. 12
- C. 10
- D. 8

*(New Jersey Department of Education)*

- At his work, Mr. Brown puts wheels on new tricycles. How many wheels would he need for six tricycles? Use the table below to help you.

Number of Tricycles	1	2	3	4	5	
Number of Wheels	3	6	9	12	?	?

- A. 15
- B. 16
- \* C. 18
- D. 21

*(Nevada Department of Education)***Reference:****2.8.5.C** Recognize, describe, extend, create, replicate, and form a rule for a variety of **patterns**, **sequences**, and relationships verbally, numerically, symbolically, and graphically.

**M5.D Algebraic Concepts****Reporting Category****ASSESSMENT ANCHOR****M5.D.1 Demonstrate an understanding of patterns, relations and functions.****ELIGIBLE CONTENT****M5.D.1.2** Analyze patterns.**M5.D.1.2.1** Form a rule based on a given pattern, or illustrate a pattern based on a given rule (+, -, x or ÷ of whole numbers may be used). Patterns must show 3 repetitions.**EXAMPLE ITEMS**

- Ann and Carol are making a necklace out of beads. The pattern they have used so far is shown. Which of the choices below would continue this pattern?

△△○△△□    △△○△△◇    △△○△△□

- A. △△○△△□  
 B. □□○□□△  
 \* C. △△○△△◇  
 D. △△○△△○

*(Pennsylvania Department of Education)***Reference:****2.8.5.D** Determine a functional rule from a table or graph.

**M5.D Algebraic Concepts****Reporting Category****ASSESSMENT ANCHOR**

**M5.D.2 Represent and/or analyze mathematical situations using numbers, symbols, words, tables and/or graphs.**

**ELIGIBLE CONTENT**

**M5.D.2.1** Select and/or use appropriate strategies, including concrete materials, to solve or represent expressions or number sentences.

**M5.D.2.1.1** Solve for a missing number (blank, question mark, variable) in an equation involving a single operation whole numbers only.

**M5.D.2.1.2** Match a realistic situation to an equation, expression, inequality ( $<$ ,  $>$ ,  $=$ ), table or graph (variable must be isolated, e.g.,  $17 + 39 = n$ ).

**EXAMPLE ITEMS**

- Look at the equation below.  
 $125 \times N = 375$   
 What value of N makes this equation correct?

- A. 2
- \* B. 3
- C. 4
- D. 5

*(Maryland State Department of Education)*

- If  $N \times 8 = 96$ , what is the value of N?

- \* A. 12
- B. 88
- C. 104
- D. 768

*(New Jersey Department of Education)*

**Reference:**

**2.8.5.B** Select and use strategies, including concrete objects, to solve number sentences (**equations** and **inequalities**) and explain the method of solution.

**2.8.5.E** Use concrete objects and combinations of symbols and numbers to create **expressions**, **equations**, and **inequalities** that model mathematical situations.

**2.8.5.F** Describe data represented in **equations**, **inequalities**, tables, or graphs and/or create a story that matches that data.

---

---

**M5.D Algebraic Concepts**

**Reporting Category**

---

---

**ASSESSMENT ANCHOR**

**M5.D.3 Analyze change in various contexts.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 5.**

---

**EXAMPLE ITEMS**

---

---

**M5.D Algebraic Concepts**

**Reporting Category**

---

---

**ASSESSMENT ANCHOR**

**M5.D.4 Describe or use models to represent quantitative relationships.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 5.**

---

**EXAMPLE ITEMS**



**M5.E Data Analysis and Probability****Reporting Category****ASSESSMENT ANCHOR**

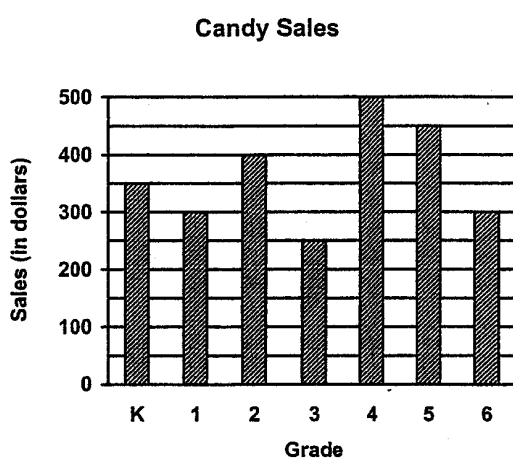
**M5.E.1** Formulate or answer questions that can be addressed with data and/or organize, display, interpret or analyze data.

**ELIGIBLE CONTENT**

**M5.E.1.1** Organize, display and/or interpret data using pictographs, tallies, tables, charts, line, bar graphs.

**M5.E.1.1.1** Display and/or interpret data shown in tallies, tables, charts, pictographs, bar graphs, line graphs and using a title, appropriate scale, and labels.

A grid will be provided to display data on bar graphs or line graphs.

**EXAMPLE ITEMS**

Which grade sold half as much candy as fourth grade?

- A. K
- B. 1
- \* C. 3
- D. 6

*(Pennsylvania Department of Education)*

- This table shows the AVERAGE number of people that shop at Rocco's store for each day of the week.

Day	Average Number of People
Monday	102
Tuesday	80
Wednesday	95
Thursday	132
Friday	157

Rocco needs to close early one day next week. Based on this data, which day would be BEST for Rocco to close early?

- A. Monday
- \* B. Tuesday
- C. Wednesday
- D. Thursday

*(Connecticut State Department of Education)*

**Reference:**

**2.6.5.B** Use pictures, tallies, tables, charts, bar graphs, line graphs, diagrams, and graphs to organize, display, and analyze data.

**M5.E Data Analysis and Probability****Reporting Category****ASSESSMENT ANCHOR****M5.E.2 Select and/or use appropriate statistical methods to analyze data.****ELIGIBLE CONTENT**

**M5.E.2.1** Describe data sets using mean, median, mode and/or range.

**M5.E.2.1.1** Determine the mean/average (answer is a whole number), median (answer is a whole number or average of 2 numbers) and range of data (up to 10 numbers).

**M5.E.2.1.2** Identify the mode in a set of data (up to 10 numbers).

**EXAMPLE ITEMS**

- Luke took the temperature of the water in the swimming pool every 2 hours starting at 10:00 A.M. The temperatures he recorded are listed below.

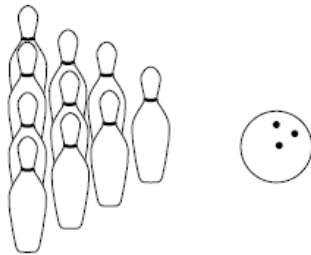
74° 78° 79° 74° 70°

What is the mode of this data?

- A. 70°
- \* B. 74°
- C. 75°
- D. 79°

*(New Jersey Department of Education)*

- Malcolm is on an after-school bowling team. The team bowls once every week. His scores for the first 3 weeks were 98, 107, and 101. What was his average (mean) score?



- A. 107
- \* B. 102
- C. 101
- D. 99

*(New Jersey Department of Education)*

**Reference:**

- 2.6.5.C** Calculate **mean** and **range**, identify the **median** and the **mode** of a set of data, and use these quantities to describe the data.

**M5.E Data Analysis and Probability****Reporting Category****ASSESSMENT ANCHOR****M5.E.3 Understand and/or apply basic concepts of probability or outcomes.****ELIGIBLE CONTENT**

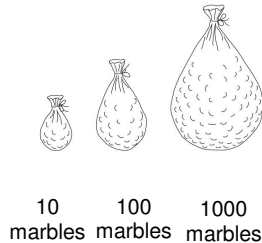
**M5.E.3.1** Predict or determine all possible combinations, outcomes and/or calculate the probability of a simple event.

**M5.E.3.1.1** Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (information could be represented by pictographs, bar graphs, charts, tables and/or spinners).

**M5.E.3.1.2** Determine the probability of an outcome (e.g., a coin toss, a roll of a number cube) and express as a fraction without reduction.

**EXAMPLE ITEMS**

- There is only one red marble in each of the bags shown below. Without looking, you are to pick a marble out of one of the bags. Which bag would give you the greatest chance of picking the red marble?



- \* A. Bag with 10 marbles
- B. Bag with 100 marble
- C. Bag with 1000 marbles
- D. It makes no difference

(NAEP)

**Reference:**

- 2.7.5.A** Predict and calculate the likelihood of **simple events**.
- 2.7.5.B** Predict and determine why some outcomes of a particular event are certain, more likely, less likely, equally likely, or impossible.
- 2.7.5.C** Express **probabilities** as fractions and/or decimals.

---

---

**M5.E Data Analysis and Probability**

**Reporting Category**

---

---

**ASSESSMENT ANCHOR**

**M5.E.4 Develop and/or evaluate inferences and predictions or draw conclusions based on data or data displays.**

**ELIGIBLE CONTENT**

**Not assessed at Grade 5.**

---

**EXAMPLE ITEMS**