

Macmillan/McGraw-Hill

MATH CONNECTS

2009

Grade 2

Correlated with

**Pennsylvania
Academic Standards for Mathematics**

Grade 3

**Macmillan/McGraw-Hill
800-442-9685**

2.1. Numbers, Number Systems and Number Relationships	
2.1.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:</i>	
A. Count using whole numbers (to 10,000) and by 2's, 3's, 5's, 10's, 25's and 100's.	pp. 17A, 41A, 43A, 43B, 43-44, 48, 207A, 211, CS11, CS12
B. Use whole numbers and fractions to represent quantities.	pp. 14, 17B, 17-20, 27A, 27B, 27-28, 279B, 283-284, 285-286, 287-288, 289-290, 291-292, 297-298, 299-300, 303-304, 305-306
C. Represent equivalent forms of the same number through the use of concrete objects, drawings, word names and symbols.	pp. 14, 15, 16, 17-20, 21B, 24, 27B, 28
D. Use drawings, diagrams or models to show the concept of fraction as part of a whole.	pp. 279B, 283-284, 285-286, 287-288, 289-290, 291-292, 297-298, 299-300, 303-304, 305-306
E. Count, compare and make change using a collection of coins and one-dollar bills.	pp. 51, 207G, 207H, 208, 211-214, 215-216, 217B, 217-218, 219-220, 221, 223-226, 227, 235, 237, 238
F. Apply number patterns (even and odd) and compare values of numbers on the hundred board.	pp. 43A, 43B, 43-44
G. Use concrete objects to count, order and group.	pp. 15, 16, 17B, 17-20, 21B, 21-22, 35-36, 43-44
H. Demonstrate an understanding of one-to-one correspondence.	pp. 14, 15, 16, 17-20, 21-22
I. Apply place-value concepts and numeration to counting, ordering and grouping.	pp. 13G, 17B, 17, 21B, 21-24, 147B, 147-148, 149B, 149, 150, 313, 314, 315B, 315, 316, 319B, 319-320
J. Estimate, approximate, round or use exact numbers as appropriate.	pp. 143, 143B, 163-164, 175B, 199-200, 435B, 447-448, 459-460
K. Describe the inverse relationship between addition and subtraction.	pp. 97B, 97-98, 100, 109-110, 195B, 195-196, 197A, 204
L. Demonstrate knowledge of basic facts in four basic operations.	pp. 55A, 55B, 55-56, 57-60, 63-64, 65, 67-68, 71-72, 79-80, 84, 87-88, 89-90, 91-92, 95-96, 97-98, 99, 100, 101-102, 103-104, 109-110, 479B, 479-480, 481A, 481B, 481-482, 483, 484, 485, 489-490, 491A, 495, 496, LA5-LA6, LA3-LA4, CS11-CS12, FP1-FP16

2.2. Computation and Estimation	
2.2.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:</i>	
A. Apply addition and subtraction in everyday situations using concrete objects.	pp. 55-56, 57-60, 61-62, 63-64, 67-68, 71-72, 73-74, 89-90, 91-92
B. Solve single- and double-digit addition and subtraction problems with regrouping in vertical form.	pp. 157B, 157-158, 159A, 159-160, 161, 162, 175, 181B, 183B, 183-184, 185, 189-190, 191B, 191-192, 193, 435, 441B, 441, 442, 443B, 443-444, 453B, 453-454, 455, 457B, 457-458, 465
C. Demonstrate the concept of multiplication as repeated addition and arrays.	pp. 470, 479A, 479B, 479-480, 481B, 481-482, 483, 485, 493-494, 495
D. Demonstrate the concept of division as repeated subtraction and as sharing.	pp. 469, 471, 472, 489A, 489B, 489-490, 491A, 491, 492, 496, LA3A, LA3B, LA3, LA4
E. Use estimation skills to arrive at conclusions.	pp. 163B, 163-164, 199B, 199-200, 447-448, 459-460
F. Determine the reasonableness of calculated answers.	pp. 25-26, 41-42, 61-62, 75-76, 93-94, 105-106, 123-124, 135-136, 151-152, 167-168, 185-186, 197-198, 219-220, 233-234, 255-256, 271-272, 287-288, 301-302, 317-318, 327-328, 353-354, 363-364, 385-386, 397-398, 413-414, 425-426, 445-446, 461-462, 477-478, 491-492
G. Explain addition and subtraction algorithms with regrouping.	pp. 157B, 157-158, 159A, 159-160, 161, 162, 175, 181B, 183B, 183-184, 185, 189-190, 191B, 191-192, 193, 435, 441B, 441, 442, 443B, 443-444, 453B, 453-454, 455, 457B, 457-458, 465
2.3. Measurement and Estimation	
2.3.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills to:</i>	
A. Compare measurable characteristics of different objects on the same dimensions (e.g., time, temperature, area, length, weight, capacity, perimeter).	pp. 7-8, 241G, 241H, 243, 244, 245, 248, 265B, 265-268, 269-270, 271B, 276, 375H, 381B, 385, 387B, 393B, 397B, 399-400, 405G, 406, 409B, 409-410, 411-412, 413B, 413, 414, 417B, 417-418, 421B
B. Determine the measurement of objects with non-standard and standard units (e.g., US customary and metric).	pp. 375G, 375H, 379-380, 387B, 387-388, 391B, 393B, 393-394, 397B, 409-410

C. Determine and compare elapsed times.	pp. 249B, 249-252, 262, 271
D. Tell time (analog and digital) to the minute.	pp. 241G, 241H, 241, 242, 249A, 249B, 249-252, 253A, 253B, 253-254, 255-256, 257, 259A, 259B, 259-260, 261A, 261B, 261-262, 263, 264, 271-272, 275-276
E. Determine the appropriate unit of measure.	pp. 379B, 385A, 387B, 387, 411A, 411B, 411-412, 413A, 415, 419
F. Use concrete objects to determine area and perimeter.	pp. 375G, 395A, 395B, 395-396
G. Estimate and verify measurements.	pp. 387-388, 393-394, 411-412, 417-418, 423-424, 425-426
H. Demonstrate that a single object has different attributes that can be measured in different ways (e.g., length, mass, weight, time, area, temperature, capacity, perimeter).	pp. 351B, 375G, 375H, 379B
2.4. Mathematical Reasoning and Connections	
2.4.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills to:</i>	
A. Make, check and verify predictions about the quantity, size and shape of objects and groups of objects.	pp. 93B, 93-94, 385B, 385-386
B. Use measurements in everyday situations (e.g., determine the geography of the school building).	pp. 375G, 375H, 380, 382, 385-386, 388, 392, 394, 397-398, 399-400, 402, 405G, 405H, 410, 413-414, 418, 422, 424, 426, 427-428, 429-430, 432
2.5. Mathematical Problem Solving and Communication	
2.5.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills to:</i>	
A. Use appropriate problem-solving strategies (e.g., guess and check, working backwards).	pp. 25-26, 61-62, 75, 93-94, 105, 106, 123-124, 151-152, 185-186, 219-220, 255-256, 287-288, 317-318, 353-354, 385-386, 398, 413-414, 445-446, 477-478
B. Determine when sufficient information is present to solve a problem and explain how to solve a problem.	Opportunities to address: pp. 2, 25-26 Refer also to Grade 3.

<p>C. Select and use an appropriate method, materials and strategy to solve problems, including mental mathematics, paper and pencil and concrete objects.</p>	<p>pp. 2, 20, 25-26, 36, 40, 41-42, 44, 45-46, 61-62, 63-64, 68, 71-72, 75-76, 77-78, 93-94, 98, 105-106, 107-108, 123-124, 134, 135-136, 137-138, 148, 150, 151-152, 160, 164, 167-168, 169-170, 180, 185-186, 190, 192, 197-198, 201-202, 214, 218, 219-220, 230, 232, 233-234, 235-236, 241A, 248, 255-256, 262, 270, 271-272, 273-274, 287-288, 301-302, 303-304, 310, 317-318, 324, 327-328, 330, 334, 335-336, 353-354, 363-364, 382, 385-386, 392, 396, 397-398, 399-400, 413-414, 422, 425-426, 429-430, 440, 445-446, 452, 458, 461-462, 463-464, 476, 477-478, 480, 491-492, 493-494, P3-P6, P7-P10, P11-P14, P15-P18</p>
<p>2.6. Statistics and Data Analysis</p>	
<p>2.6.3. GRADE 3</p>	
<p><i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills to:</i></p>	
<p>A. Gather, organize and display data using pictures, tallies, charts, bar graphs and pictographs.</p>	<p>pp. 113G, 113H, 114, 115-116, 117-118, 119-120, 121-122, 123-124, 125-126, 127-128, 129-130, 131, 132, 133-134, 135-136, 137-138, 139-140, 141-142</p>
<p>B. Formulate and answer questions based on data shown on graphs.</p>	<p>pp. 113H, 119-120, 121B, 121-122, 125, 127A, 127B, 127-128, 129B, 129-130, 132, 137-138, 266, 267, 268, 269-270, 341B, 367-368, CS1, CS2</p>
<p>C. Predict the likely number of times a condition will occur based on analyzed data.</p>	<p>pp. 127B, 128, 129B, 130</p>
<p>D. Form and justify an opinion on whether a given statement is reasonable based on a comparison to data.</p>	<p>pp. 117, 119, 121B, 122, 123-124, 128, 134, 135</p>
<p>2.7. Probability and Predictions</p>	
<p>2.7.3. GRADE 3</p>	
<p><i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills needed to:</i></p>	
<p>A. Predict and measure the likelihood of events and recognize that the results of an experiment may not match predicted outcomes.</p>	<p>pp. 133A, 133B, 133, 134, 135A, 138, 140</p>
<p>B. Design a fair and an unfair spinner.</p>	<p>Opportunity to address: p. 132</p>
<p>C. List or graph the possible results of an experiment.</p>	<p>pp. 123B, 129B, 135-136</p>

D. Analyze data using the concepts of largest, smallest, most often, least often and middle.	pp. 120, 121B, 121-122, 123B
2.8. Algebra and Functions	
2.8.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills to:</i>	
A. Recognize, describe, extend, create and replicate a variety of patterns including attribute, activity, number and geometric patterns.	pp. 39B, 39-40, 41A, 43A, 43B, 43-44, 48, 105, 255-256, 333B, 333-334, 353-354
B. Use concrete objects and trial and error to solve number sentences and check if solutions are sensible and accurate.	pp. 5-6, 83A, 101B, 101-102, 103A, 103B, 104, 109-110, 175A, 185-186, 195-196
C. Substitute a missing addend in a number sentence.	pp. 5-6, 83A, 101B, 101-102, 103A, 103B, 104, 109-110, 175A, 185-186, 195-196
D. Create a story to match a given combination of symbols and numbers.	Opportunities to address: pp. 78, 108, 130
E. Use concrete objects and symbols to model the concepts of variables, expressions, equations and inequalities.	Refer to Grade 3.
F. Explain the meaning of solutions and symbols.	pp. 5-6, 101B, 101-102, 103B
G. Use a table or a chart to display information.	pp. 123B, 123-124, 126
H. Describe and interpret the data shown in tables and charts.	pp. 123B, 123-124, 126
I. Demonstrate simple function rules.	Opportunities to address: pp. 113A, 119-120 Refer also to Grade 3.
J. Analyze simple functions and relationships and locate points on a simple grid.	pp. 113A, 119-120, 341B, 367B, 367-368, 372
2.9. Geometry	
2.9.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills to:</i>	
A. Name and label geometric shapes in two and three dimensions (e.g., circle/sphere, square/cube, triangle/pyramid, rectangle/prism).	pp. 345B, 347-348, 349, 350, 351B, 359B, 361A

B. Build geometric shapes using concrete objects (e.g., manipulatives).	pp. 341G, 341H, 347B, 353B, 357B, 361B, 361-362, 363B, 370
C. Draw two- and three-dimensional geometric shapes and construct rectangles, squares and triangles on the geoboard and on graph paper satisfying specific criteria.	pp. 341G, 341H, 347B, 351B, 353B, 357B, 359B, 360, 361B, 361-362, 363A, 363B, 370
D. Find and describe geometric figures in real life.	pp. 9-10, 341-342, 347, 348, 352, 355, 358, 359B, 369-370, 371
E. Identify and draw lines of symmetry in geometric figures.	pp. LA13B, LA13-LA14
F. Identify symmetry in nature.	p. LA13A Refer also to Grade 3.
G. Fold paper to demonstrate the reflections about a line.	Opportunity to address: p. CS6 Refer also to Grade 3.
H. Show relationships between and among figures using reflections.	p. CS6 Refer also to Grade 3.
I. Predict how shapes can be changed by combining or dividing them.	pp. 361B, 361-362, 363A, 363B, 372
2.10. Trigonometry	
2.10.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills to:</i>	
A. Identify right angles in the environment.	Opportunities to address: pp. 351, 358 Refer also to Grade 3.
B. Model right angles and right triangles using concrete objects.	Opportunities to address: pp. 351, 353B, 357B, 358 Refer also to Grade 3.

2.11. Concepts of Calculus	
2.11.3. GRADE 3	
<i>Pennsylvania's public schools shall teach, challenge and support every student to realize his or her maximum potential and to acquire the knowledge and skills to:</i>	
A. Identify whole number quantities and measurements from least to most and greatest value.	pp. 7-8, 13, 35-36, 38, 241G, 241H, 243, 244, 245, 248, 265B, 265-268, 269-270, 271B, 276, 309, 329-330, 375H, 381B, 385, 387B, 393B, 397B, 399-400, 405G, 406, 409B, 409-410, 411-412, 413B, 413, 414, 417B, 417-418, 421B
B. Identify least and greatest values represented in bar graphs and pictographs.	pp. 113H, 119-120, 121B, 121-122, 125, 127A, 127B, 127-128, 129B, 129-130, 132, 137-138, 266, 267, 268, 269-270, CS1, CS2
C. Categorize rates of change as faster and slower.	Refer to Grade 3.
D. Continue a pattern of numbers or objects that could be extended infinitely.	pp. 39B, 39-40, 41A, 43A, 43B, 43-44, 48, 105, 255-256, 333B, 333-334, 353-354