Alignment Guide

to the K–8 Standards for Mathematical Practice

CCSS

The Standards for Mathematical Practice
More Than a Label

The Common Core State Standards are made up of two main parts:

- The Standards for Mathematical Content which details what students should learn
- The Standards for Mathematical Practice which describes how students should approach mathematics. The goal of the practice standards is to instill in ALL students the abilities to be mathematically literate and to create a positive disposition for the importance of using math effectively.

What are the Standards for Mathematical Practice?

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Why does a consistent approach matter across grades K-8?

An articulated and organized K-8 instructional model to the Standards for Mathematical Practice allows students to develop a common foundation of language and format as they mature from their early elementary math experiences into more adept problem solvers in their adolescence.

The Standards for Mathematical Practice describe the ways students should be engaged with the mathematics they are learning. It is important to note that the Standards for Mathematical Practice are not taught or practiced in isolation but are developed over time.

Only in *McGraw-Hill My Math* and *Glencoe Math* is the approach to the Standards for Mathematical Practice fully articulated across all grades K-8 to ensure a successful transition from elementary to middle school and beyond!

"The Standards for Mathematical Practice describe varieties of expertise that mathematics educators, at all levels, should seek to develop in their students. These practices rest on important 'processes and proficiencies with longstanding importance on mathematics education.'"

CCSS, 2010

1 Make sense of problems and persevere in solving them.

What does it mean?
Solving a mathematical problem takes time. Mathematically proficient students use a logical process to make sense of problems, understand that there may be more than one way to solve a problem, and alter the process if needed.

What does it look like?
Students are working in small groups, investigating cases from the Problem-Solving lessons and solving problems that require higher-order thinking. They are using a process that will guide them through each problem leading towards a solution. A four-step plan—Understand, Plan, Solve, Check—tracks their progress toward a solution.

What questions do I ask?
- What is the problem? What facts do you know?
- How do the facts relate to each other? Does a picture help describe the problem?
- Is this problem similar to any others you have solved?
- What is your plan for solving the problem?
- What should you do if you get "stuck?"
- Does the answer make sense?
- Is there another way to solve the problem?

Where can I find it? (See pages referenced below for representative samples.)

Primary	Grade K	Grade 1	Grade 2
Core Lessons	TE: 17-18, 93-94, 225-226, 383-384	87-92, 147-152, 527-532	35-40, 261-266, 419-424
Core Lessons: Problem Solving exercises	38, 58, 114, 214, 392, 632	78, 170, 328, 578	90, 264, 276, 628
Problem-Solving Strategy lessons	75-78, 217-220, 603-606, 667-670	43-48, 243-248, 379-384, 465-470	41-46, 395-400
H.O.T. Problems	N/A	32, 112, 220, 482, 578	78, 194, 360, 532, 668

Intermediate	Grade 3	Grade 4	Grade 5
Core Lessons	153-158, 171-176, 199-204, 257-262	113-118, 153-158, 305-310, 393-398, 749-754	96, 172, 266, 432, 598, 774
Problem-Solving Investigation lessons	41-46, 113-118, 397-402, 735-740, 865-870	43-48, 179-184, 675-680, 831-836	61-66, 233-238, 283-288, 569-574, 657-662
H.O.T. Problems			
Check for Reasonableness	148, 162, 548	22, 258, 434, 702	254, 662, 860
Keep Trying	136, 208, 344, 464, 586, 673	250, 308, 454, 602, 677	218, 571, 574
Make a Plan	268, 374, 452, 554, 714, 768	164, 230, 338, 680, 916	180, 414, 518, 572, 680
Make Sense of Problems	26, 66, 318, 400, 610	90, 589, 706, 757, 836	58, 178, 230, 318, 495, 816
Plan Your Solution	44, 254, 670, 770, 774, 802	102, 206, 370, 436, 732, 848	108, 190, 236, 317, 394, 420

Middle School	Course 1	Course 2	Course 3
Core Lessons	71-78	167-173	423-430
Problem-Solving Investigation lessons	55-57, 297-299, 543-545	41-42, 307-309, 753-755	39-41, 217-219, 531-533
H.O.T. Problems			
Persevere with Problems	190, 228, 666	108, 196, 474	29, 428, 694

2 Reason abstractly and quantitatively.

What does it mean?
In mathematics, the concrete and abstract complement each other. Students can start with a concrete or real-world context and then represent it with abstract numbers or symbols (decontextualize), find a solution, then refer back to the context to check that the solution makes sense (contextualize).

What does it look like?
Students are using numbers and writing mathematical number sentences, which evolves into writing expressions, equations, and inequalities in middle grades, to describe real-world contexts and to solve problems. They begin with concrete models to represent number and develop an awareness of number sense to determine unknowns.

What questions do I ask?
- What math words describe the situation?
- Can you describe the situation using fewer words?
- What operations are suggested?
- What symbols can you use?
- What does the unknown, or variable, represent?
- Does your answer make sense in this problem?
- Does your answer fit the facts given in the problem?

Where can I find it? (See pages referenced below for representative samples.)

Primary	Grade K	Grade 1	Grade 2
Core Lessons	23-25, 29-31, 109-111, 147-149, 403-405	23-26, 29-31, 57, 109-111, 147-149, 403-405	127, 129, 145, 296, 413, 510, 615, 645
Core Lessons: Problem-Solving exercises	26, 64, 182, 260, 334, 406, 452	64, 162, 316, 613, 654	138, 498, 548, 674
Foldables™	TE: 9-10, 91-92, 177-178, 255-256, 441-442	9-10, 107-108, 445-446	411, 481-482, 643-644

Intermediate	Grade 3	Grade 4	Grade 5
Throughout the text	94, 154, 527-550, 805	113-118, 153-158, 288, 465-470, 543-548	157-160, 471-540, 489
H.O.T. Problems			
Reason	168, 214, 316, 432, 712	76, 232, 244, 342, 448, 520, 720, 928	230, 364, 692, 720, 838
Stop and Reflect	154, 206, 322, 514, 580	14, 264, 536, 570, 882, 934	268, 398, 646, 734
Understand / Use Symbols	176, 260, 454, 700, 702	118, 214, 234, 302, 434, 442, 562, 610	83, 212, 588, 762, 809
Use Algebra	102, 112, 342, 434, 764	214, 232, 610, 666	218, 276, 282, 592, 750
Use Number Sense	76, 102, 280, 336, 452	70, 150, 228, 424, 502, 668	40, 128, 382, 828

Middle School	Course 1	Course 2	Course 3
Core Lessons	527, 528, 553	132, 472, 642	130-131, 147
Inquiry Labs	560, 660	214, 366, 434	120
H.O.T. Problems			
Reason Abstractly	206, 323, 566	353, 392, 401	157, 293, 384

3 Construct viable arguments and critique the reasoning of others.

What does it mean?
Sound mathematical arguments require a logical progression of statements and reasons. Students can clearly communicate their thoughts and defend them.

What does it look like?
Students are talking and writing about mathematics and sharing their thoughts with others. They are drawing conclusions, making conjectures, explaining their reasoning, justifying their conclusions, and challenging other students' conclusions. In the primary grades, students may refer to concrete or real-world examples to help explain their thinking to others.

What questions do I ask?
- How did you get that answer?
- Is that always true?
- Why does that work?
- Can you use objects in the classroom to show that your answer is correct?
- Can you give me a "non-example"? or a counterexample?
- What conclusion can you draw? What conjecture can you make?
- Is there anything wrong with that argument?

Where can I find it? (*See pages referenced below for representative samples.*)

Primary	Grade K	Grade 1	Grade 2
My Vocabulary Card Activities	TE: 6-8, 90, 254, 484-486, 688-690	TE: 6-8, 208, 628-630	TE: 104, 478-480, 640-642
Core Lessons	540-541, 545-548	57, 110, 191, 366, 418, 477, 511, 564, 663	18, 56, 135, 173, 510-11, 531, 653, 740, 772
Problem-Solving Strategy lessons	TE: 501B to 501-502, 545B to 547-548	43-48, 465-470, 673-678	315-320, 395-400, 677-682
H.O.T. Problems	N/A	156, 356, 368, 572	226, 310, 486, 660, 688, 768
Talk Math	N/A	12, 116, 314, 460, 596	36, 172, 230, 658, 704
Write Math	N/A	52, 232, 350, 474	38, 174, 324, 454, 742, 786

Intermediate	Grade 3	Grade 4	Grade 5
Core Lessons	551-556, 633-638, Chapter 12	37-42, 359-364, 851-856	227-232, 271, 276, 583-588
Problem-Solving Investigation lessons	113-118, 397-402, 551-556	179-184, 255-260, 531-536, 755-760	657-662; 813-818
H.O.T. Problems			
Draw a Conclusion	110, 174, 194, 274, 662	28, 313, 428, 652, 746	58, 196, 582, 624
Justify Conclusions	46, 72, 147, 380, 460, 718	210, 374, 714, 844, 924	124, 222, 562, 622
Find the Error exercises	82, 162, 214, 310, 648	20, 144, 344, 462, 520, 662, 738, 908	32, 130, 274, 332, 680, 966
Which One Doesn't Belong?	444, 530, 668, 808	244, 416, 718, 804	46, 160, 484, 566, 754, 970
Talk About It	94, 378, 646, 754, 834	210, 342, 460, 500, 652, 888	38, 190, 350, 708, 924

Middle School	Course 1	Course 2	Course 3
Inquiry Labs	30, 672, 738	64, 232, 612	388, 410, 640
H.O.T. Problems			
Find the Error	466, 630, 678	148, 239, 486	86, 186, 416
Which One Doesn't Belong?	530, 556	156, 392	428
Justify Conclusions	52, 262, 350, 630	172, 628, 762	48, 56, 646

4 Model with mathematics.

What does it mean?
Models link mathematics to problem situations in everyday life. They can be diagrams, drawings, classroom objects, and manipulatives, or geometric, graphical, algebraic, tabular, statistical models. Models can help students to explain their thinking or to search for patterns.

What does it look like?
Students are using a variety of models, including physical manipulatives, drawings, charts, tables, graphs, and symbols to solve problems.

What questions do I ask?
- How do you use this math at home?
- When are you going to use this?
- Why is mathematics important in your life?
- How could using another object help you solve this problem in a different way?
- Is it better to use a table or an equation to solve this problem?
- Why might it be better to draw a picture to solve this problem?
- Does your answer make sense?

Where can I find it? (*See pages referenced below for representative samples.*)

Primary	Grade K	Grade 1	Grade 2
Core Lessons	TE: 93B, 145B, 197B, 231B	11-14, 115-118, 248, 353-356, 661-664	133B, 223-228, 241-246, 301-306, 463-468
Problem-Solving Strategy lessons	75-78, 281-284, 713-716	141-144, 243-246, 515-518	41-46, 203-208, 503-508, 561-566, 751-756
Foldables™	TE: 323-324, 381-382	345-346, 507-508, 633-634	105-106, 293-294, 591-592

Intermediate	Grade 3	Grade 4	Grade 5
Hands On Lessons	265-270, 501-506, 595-600, 779-784	209-214, 341-346, 499-504, 839-844	113-118, 257-262, 481-486, 759-764
Core Lessons: One Way/Another Way	301, 319, 365, 47	167, 261, 543, 613, 669	55, 125, 412, 461, 740
Core Lessons: Real-World Examples	225, 333, 389, 639, 697	153, 255, 393, 517, 613, 845	175-176, 178, 201, 238, 382, 563, 692
Model Math exercises	90, 98, 198, 380, 440	14, 152, 396, 610, 934	116, 352, 510, 780
Chapter Projects	TE: 244A, 364A, 428A	TE: 134A, 278A, 328A, 630A	TE: 10A, 302A, 480A, 800A

Middle School	Course 1	Course 2	Course 3
Real-World Links	117, 387, 837	73, 81, 233	153, 295
Unit Projects	649-650	527-528	103-104
Career Projects	247-248, 791-792	177-178, 335-336	161-162, 355-356
Graphic Novels	175, 511, 803	97, 431, 609	169, 503, 585
Model with Mathematics and Multiple Representations exercises	12, 114, 540, 600	49, 78, 87, 362	120, 249, 428, 706

5 Use appropriate tools strategically.

What does it mean?
Certain tools, including estimation and virtual tools, are more appropriate than others when solving mathematical problems, and students should understand the benefits and limitations of each tool.

What does it look like?
Students are actively making choices in selecting a tool/strategy to solve a problem. A variety of tools should include such items as paper and pencil, physical objects, virtual manipulatives, bar diagrams, and calculators. It should also include such strategies as estimation, mental math, making a spreadsheet, using graphing software, or the Internet to solve problems.

What questions do I ask?
- What tool would you like to use to solve this problem?
- What are the limitations of using this tool?
- Do you need an exact answer?
- How can you use estimation as a tool?
- Can you solve this mentally?
- Can you find information on the Internet?
- Can you use solve this problem using another tool?
- Would it be helpful to use a virtual manipulative?

Where can I find it? (*See pages referenced below for representative samples.*)

Primary	Grade K	Grade 1	Grade 2
Core Lessons	32, 71, 140, 278, 310, 328, 399, 644, 664	17-22, 115-120, 217-220, 392, 583-584	363-368, 419-425, 425-430, 645-650
Work Mats	WM1-WM8	WM1-WM8	WM1-WM8
Digital Dashboard	TE: 45B, 275B, 559B, 713B	TE: 81B, 153B, 385B, 635B	TE: 139B, 223B, 357B, 619B, 759

Intermediate	Grade 3	Grade 4	Grade 5
Hands-On Lessons	633-638, 645-650, 723-728	43-48, 209-214, 293-298, 573-578	37-42, 323-328, 519-524, 759-764
Core Lessons	108-113, 133-138, 435-440, 709-714	73-78, 197-202, 285-290, 329-334	119-124, 215-220, 429-434, 683-688
Use Math Tools/ Mental Math exercises	136, 156, 222, 330, 471, 478, 572	66, 78, 96, 200, 314, 349, 700, 876	134, 262, 332, 358, 360
Digital Dashboard	TE: 257B, 397B, 715B	TE: 135B, 341A, 425B, 637B, 873B	TE: 113A, 183B, 487B, 551B, 613B, 941B
Work Mats	WM1-WM8	WM1-WM8	WM1-WM8

Middle School	Course 1	Course 2	Course 3
Core Lessons	75, 137-144	14, 111-118	81-89, 215
Inquiry Labs	15-18, 97-100, 209-210	7-8, 175-176, 411-414, 563-566	67-70, 141-144, 179-180
Unit Projects	170, 926	186, 704	104, 656

6 Attend to precision.

What does it mean?
Precision in mathematics is more than calculating efficiently and accurately. It is also the ability to communicate the language of mathematics precisely.

What does it look like?
Students are using clear and precise vocabulary in their communications with others. They are also identifying the attributes of measurement, correctly labeling answers, specifying units of measure, labeling graphs correctly, defining variables, and using correct math symbols to avoid any miscommunications.

What questions do I ask?
- How can the everyday meaning of a math term help you remember the math meaning?
- Is this term similar to something you already know?
- What does the math symbol mean? How do you know?
- Does your answer make sense? Did you try another method to check you work?
- What does the variable represent?
- Have you checked your answer for the correct labels?
- Have you labeled the graph correctly?
- When should you use that symbol?

Where can I find it? (*See pages referenced below for representative samples.*)

Primary	Grade K	Grade 1	Grade 2
Core Lessons	TE: 69-70, 151-152, 403-404, 469-470	23, 88, 173, 282, 325-328, 379-382, 515-518	75-80, 107, 114, 134, 301, 521-582, 637-724
Core Lessons: Fluency Practice	369-370,427-428	93-94, 197-198, 267-268, 331-332	93-94, 151-152, 209-210, 279-280
Core Lessons: Problem Solving exercises	20, 272, 292, 354, 554	238, 356, 468, 604	84, 200, 553, 670
My Vocabulary Cards / Vocabulary Check	89-90, 245, 371, 579-580	95, 103-106, 199, 333, 341-344, 707-708	95, 102, 103-104, 153, 218, 522, 587-590, 639-642
Reflect	168, 316, 432, 574, 682	202, 438, 500, 550, 622	98, 518, 582, 634

Intermediate	Grade 3	Grade 4	Grade 5
My Vocabulary Cards	187, 565, 749	57, 409, 479, 481, 865, 867, 869	5-8, 75-78, 475-478, 545-548
Building on the Essential Question	214, 432, 788	20, 138, 332, 468, 616	134, 306, 470, 640, 774
Talk About It/Write About It	208, 246, 633	210, 232, 374, 462, 500, 564	88, 90, 190, 192, 350, 352, 802, 804
Be Precise exercises	142, 222, 310, 408, 59	284, 522, 648, 726, 892	308, 406, 458, 616, 768
Explain to a Friend exercises	316, 394, 444, 616	48, 376, 422, 616, 746	54, 102, 192, 340, 632

Middle School	Course 1	Course 2	Course 3
Vocabulary Start-Up	129, 433, 513	191, 271, 613	7, 111, 181
Vocabulary Check	81, 128, 727	179, 253, 603	42, 99, 163
Building on the Essential Question	62, 452, 750	76, 236, 642	132, 600, 644

7 Look for and make use of structure.

What does it mean?
Mathematics is based on a well-defined structure. Mathematically proficient students look for that structure to find easier ways to solve problems.

What does it look like?
Students are looking for patterns and using properties to help with alternative methods of computing. Students are making use of comparison terms and seeking shortcuts to solutions. They are using graphic organizers and Foldables™ to show examples/non-examples, classify shapes/numbers, and explain the structure of algebraic expressions.

What questions do I ask?
- Can you think of an easier way to find the solution?
- How can using what you already know help you solve this problem?
- How are numerical expressions and algebraic expressions the same? How are they different?
- What do two-dimensional shapes have in common with three-dimensional shapes? How do they differ?
- Why can taking a number apart help you add or subtract?
- How would you use a tally chart to make a bar graph?
- Why does making a table help you solve a problem?

Where can I find it? (*See pages referenced below for representative samples.*)

Primary	Grade K	Grade 1	Grade 2
Core Lessons	94-95, 179B, 180-181, 232-233, 237B	43-45, 307-309, Chapter 7	69-74, 81-86, 165-170, 177-182, 327-332
Graphic Organizers: My Math Words	88, 172, 436, 686	102, 206, 340, 442, 626, 706	102, 160, 288, 638, 728
Graphic Organizers: Reflect	248, 530, 682	98, 272, 702, 740	98, 284, 582, 792
Foldables™	537-538, 581-582, 621-622	9-10, 279-280, 345-346, 633-634	9-10, 527-528, 737-738

Intermediate	Grade 3	Grade 4	Grade 5
Core Lessons covering Properties of Operations, Expressions, and Equations	61-66, 67-72, 79-84, 133-138, 271-276	61-66, 161-166, 293-298, 407-474	113-118, 119-124, 195-200, 341-348
Graphic Organizers: My Math Words	4, 128, 626	56, 128, 408, 556, 768	74, 374, 608, 790
Graphic Organizers: Reflect	124, 286, 492	188, 270, 320, 764, 860	70, 242, 470, 540, 786
Foldables™	59, 238, 427, 831	133-134, 411-412, 483-484, 695-696	9-10, 155-156, 479-480, 611-612, 799-800
Identify Structure exercises	298, 374, 504, 796, 838	64, 250, 294, 488, 514	84, 266, 340, 496, 770

Middle School	Course 1	Course 2	Course 3
Core Lessons	429-431, 441-448, 473-480	241-242, 367-382, 387-394	89-96
H.O.T. Problems			
Identify Structure	64, 270, 350	208, 268, 372	12, 226, 542
Graphic Organizers	134, 160, 788	181, 271, 349	94, 116, 580, 636
Foldables™	82, 506, 728, 856	92, 604, 700, 850	100, 256, 652

8 Look for and express regularity in repeated reasoning.

What does it mean?
Recognizing a pattern can lead to results more quickly and efficiently.

What does it look like?
Students are looking for shortcuts or generalizations. They look for patterns when representing and counting numbers. Repetitive experiences in describing their thinking helps students to make connections between what they know and new situations which require similar thinking.

What questions do I ask?
- Do you see a pattern?
- Have you seen this pattern before?
- Is this pattern like one you've seen before? How is it different?
- What does this problem remind you of?
- Is this problem similar to something you already know?
- What would happen if you…?

Where can I find it? (*See pages referenced below for representative samples.*)

Primary	Grade K	Grade 1	Grade 2
Core Lessons: See and Show/On My Own	36-37, 138-139, 192-193, 238-239, 422-423	117, 295, 537, 609	24-25, 108-109, 698-699
Core Lessons: Modeling the Math	TE: 11B, 111B, 237B, 635B	TE: 127B, 347B, 635B	TE: 139B, 229B, 765B
Core Lessons	237-242, 565-570, 623-628	49-51, 185-188, 391-394, 429-432, 725-728	23-28, 69-74, 101-156, 327-332, 363-368, 771-776
Problem-Solving Strategy lessons	75-80, 455-480, 501-506	379-382, 465-467, 515-520673-678	119-124, 315-320, 395-400, 605-610
H.O.T. Problems	N/A	84, 124, 362, 400	84, 226, 310, 360, 486
Core Lessons: Fluency Practice	369-370,427-428	93-94, 267-268, 331-332	93-94, 209-210, 279-280

Intermediate	Grade 3	Grade 4	Grade 5
Core Lessons (including Chapter 6)	67-72, 73-78, 199-204, 257-262, 289-356	67-72, 197-202, 279-284, 329-334, 407-474	99-104, 175-180, 411-416, 513-518
Problem-Solving Investigation lessons	219-224, 327-332, 551-556	179-184, 255-260, 431-436, 531-536	417-422, 660, 816, 976
Look for a Pattern exercises	32, 342, 554, 590, 776	72, 316, 416, 500, 678, 834	40, 92, 110, 422, 450, 815

Middle School	Course 1	Course 2	Course 3
Core Lessons	379-386, 587-594	263-270, 357-364, 356-366	7-14, 181-188
Problem-Solving Investigations	211-213	225-227	405-407
H.O.T. Problems			
Identify Repeated Reasoning	13, 43, 322	224, 225, 238, 554	13, 20, 405, 459

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Includes K–8 Scope and Sequence

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the K-8 Scope and Sequence of
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