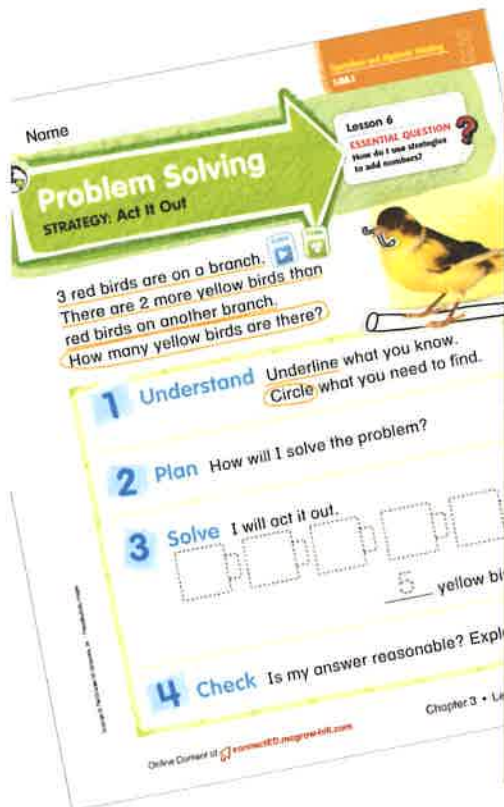# 4 Model with mathematics

What does it mean?

Models link mathematics to problem situations in everyday life. They can be diagrams, drawings, classroom objects, and manipulatives. There are also geometric, graphical, algebraic, tabular, and statistical models. Models can help students explain their thinking or 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?

Grade 1 Problem-Solving Strategy Lessons, page 243
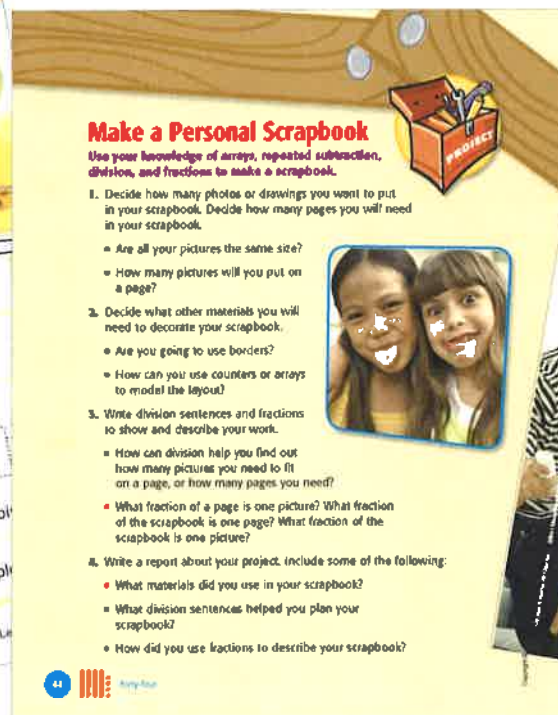
Grade 3 Ch.5 Project-Based Learning, page 44

Course 2 Career Project, page 177

4 Model with mathematics

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

Primary: McGraw-Hill My Math	Grade K	Grade 1	Grade 2
Core Lessons	TE: 35-36, 137-138, 191-192, 257-258	TE: 29-30, 153-154, 217-218, 313-314, 685-686	133B, 223-228, 241-246, 301-306, 463-468
Problem-Solving Strategy lessons	TE: 77-78, 281-282, 713-714	TE: 45-46, *243-246, 675-676	41-46, 203-208, 503-508, 561-566, 751-756
Foldables™	TE: 323-324, 381-382	TE: 279-280, 345-346, 507-508	105-106, 293-294, 591-592

Intermediate: McGraw-Hill My Math	Grade 3	Grade 4	Grade 5
Hands On Lessons	TE: 93-98, 193-198, 765-770, 833-838	209-214, TE: 341-346, TE: 499-504, 887-892	TE:24, 113-118, TE: 481-486, TE: 507-514
Core Lessons: One Way/Another Way	TE: 301-302, 319-320, 365-366, 785-786	167, 261, 543, 613, 669	55, 125, 412, 461, 740
Core Lessons: Real-World Examples	TE: 9-10, 383-384, 449-450, 539-540, 639-640	153, 255, 393, 517, 613, 845	175-176, 178, 227-232, 379-384
Model Math Exercises	90, 98, 198, 380, 440	14, 152, 396, 610, 934	116, 352, 510, 580, 780
Chapter Projects	TE: *235-236, 357-358, 421-422	TE: 125-126, TE: 271-272, TE:321-322, TE: 623-624	1-2, 295-296, 471-472, 787-788

Middle School: Glencoe Math	Course 1	Course 2	Course 3
Real-World Links	137, 387, 837	73, 81, 233	15, 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

* Shown on previous page.

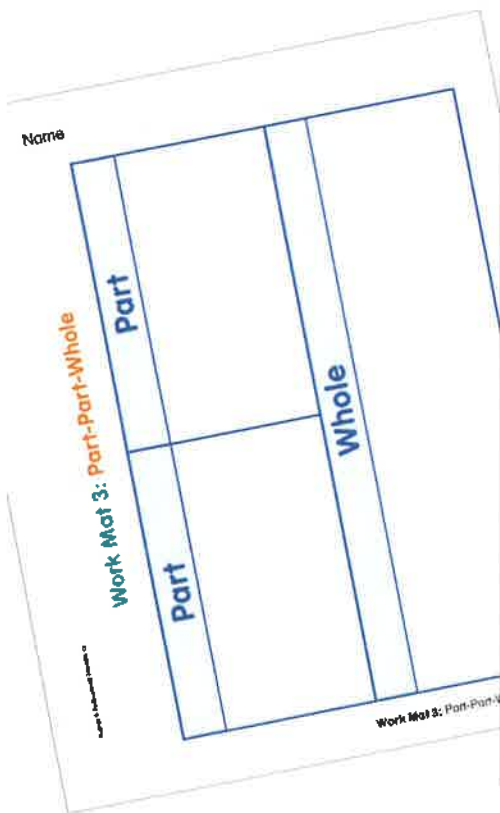# 5 Use appropriate tools strategically

What does it mean?

Certain tools, including estimation and virtual tools, are more appropriate than others when solving mathematical problems. 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. Tools should include such items as paper and pencil, physical objects, virtual manipulatives, bar diagrams, and calculators. They should also include such strategies as estimation, mental math, making a spreadsheet, using graphing software, or using 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?

Grade 1 Work Mat, page WM3
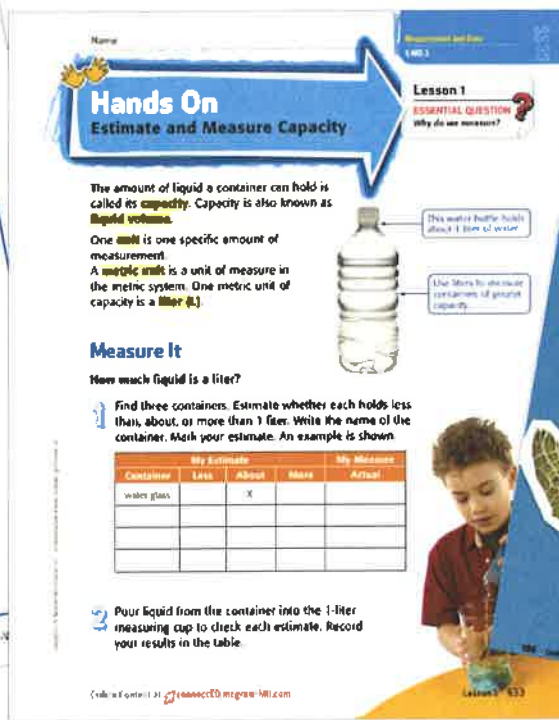
Grade 3 Hands On, page 633
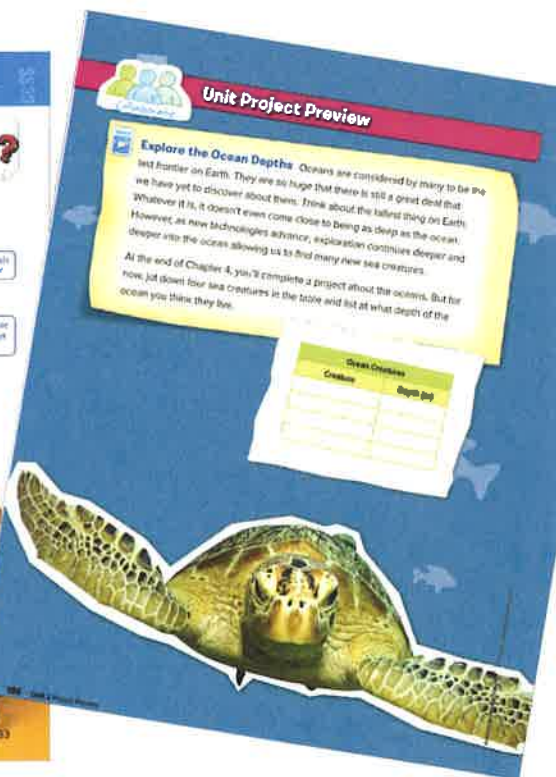
Course 2 Unit Project Preview, page 186

5 Use appropriate tools strategically

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

Primary: *McGraw-Hill My Math*	Grade K	Grade 1	Grade 2
Core Lessons	TE: 23-24, 69-70, 191-192, 277-278, 309-310, 339-340, 641-642, 661-662	TE: 17-18, 129-130, 217-218, 221-222, 391-392, 403-404	363-368, 419-425, 425-430, 645-650
Work Mats	WM1, WM2, *WM3-WM8	WM1-WM8	WM1-WM8
Digital Dashboard	1A-1D, 249A-249D, 479A-479B, 683A	1A-1F, 99A-99F, 337A-337F, 623A-623C	TE: 139B, 223B, 357B, 619B, 759

Intermediate: *McGraw-Hill My Math*	Grade 3	Grade 4	Grade 5
Hands-On Lessons	TE: 153-158, *633-638, 645-650	TE: 43-48, TE: 499-504, TE: 561-566	163-168, 323-328, 519-524, 759-764
Core Lessons	TE: 225-230, 613-618, 691-696, 703-708	73-78, 197-202, 279-284, 329-334	TE: 429-434, 671-678, TE: 777-782
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: 235A-235B, 357A-357D, 623A-623D	TE: 125A-125D, TE: 321A-321D, TE: 405A-405D	TE: 71A-71D, TE: 371A-371F, TE: 787A-787F
Work Mats	WM1-WM8	WM1-WM8	WM1-WM8

Middle School: *Glencoe Math*	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

* Shown on previous page.

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.
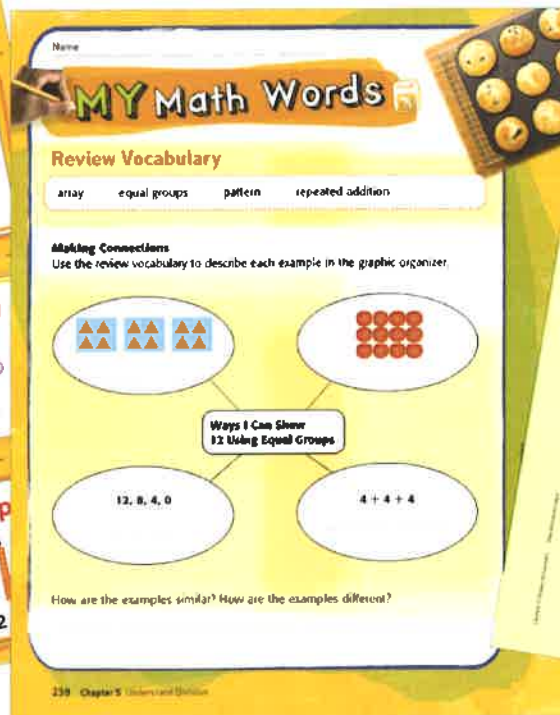
What does it look like?
Students are using clear and precise vocabulary in their communications with others. They are identifying the attributes of measurement, labeling answers, specifying units of measure, labeling graphs correctly, defining variables, and using correct math symbols to avoid any miscommunications.
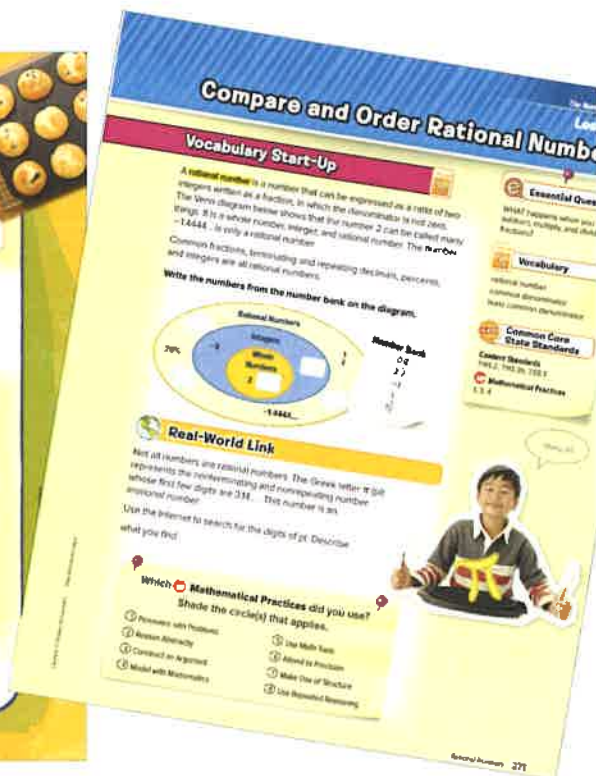
What questions do I ask?
- How can the everyday meaning of a math term help you remember the math meaning?
- Is this term similar to something you already know?
- What does the math symbol mean? How do you know?
- Does your answer make sense? Did you try another method to check you work?
- What does the variable represent?
- Have you checked your answer for the correct labels?
- Have you labeled the graph correctly?
- When should you use that symbol?
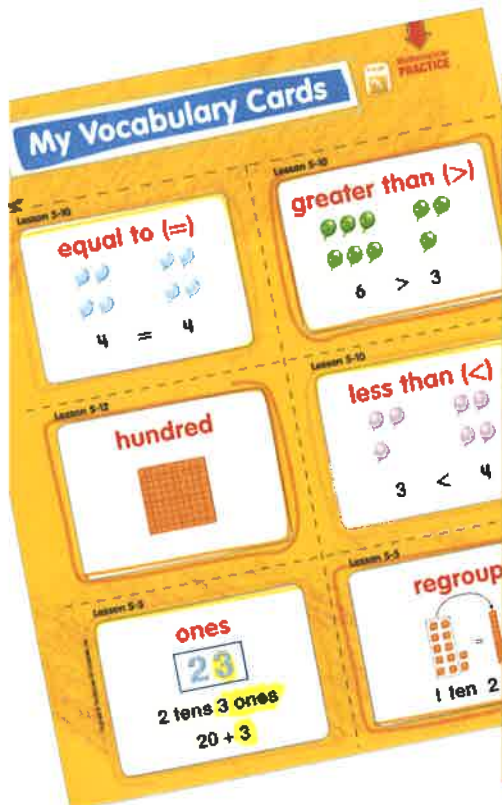
Grade 1 My Vocabulary Cards, page 341   Grade 3 My Math Words, page 238   Course 2 Vocabulary Start-Up, page 271

6 Attend to precision

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

Primary: McGraw-Hill My Math	Grade K	Grade 1	Grade 2
Core Lessons	TE: 61-62, 151-152, 403-404, 469-470	23-24, 75-76, 87-88, 153-154, 385-386, 589-590	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	135-136, 183-184, 238, 475-476, 637-638, 683-684	84, 200, 553, 670
My Vocabulary Cards/Vocabulary Check	TE: 88-90, 578-580 / 245-246, 371-372	TE:102-108, 340, *341-346, 706-707 / 95-96, 199-200, 333-334	95, 102, 103-104, 153, 218, 522, 587-590, 639-642
Reflect	TE: 167-168, 315-316, 431-432, 573-574, 681-682	TE: 201-202, 437-438, 499-500, 549-550, 621-622	98, 518, 582, 634

Intermediate: McGraw-Hill My Math	Grade 3	Grade 4	Grade 5
My Vocabulary Cards	TE: *238-244, 564-566, 748-750	57-58, 409-410, 479-482, 865-470	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	94, 266, 596, 754, 766	210, 232, 374, 462, 500, 564	88, 90, 190, 192, 350, 352, 802, 804
Be Precise Exercises	142, 222, 310, 408, 589	284, 522, 648, 726, 892	308, 406, 458, TE: 522, 585-586, 768
Explain to a Friend Exercises	316, 394, 444, 616	48, 376, 422, 616, 746	52, 102, 192, 340, 632

Middle School: Glencoe Math	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

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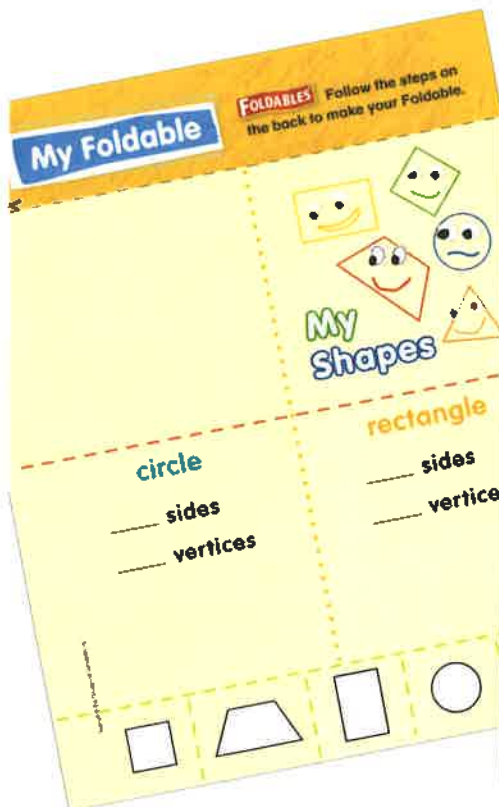# 7 Look for and make use of structure

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?

Grade 1 My Foldable, page 633
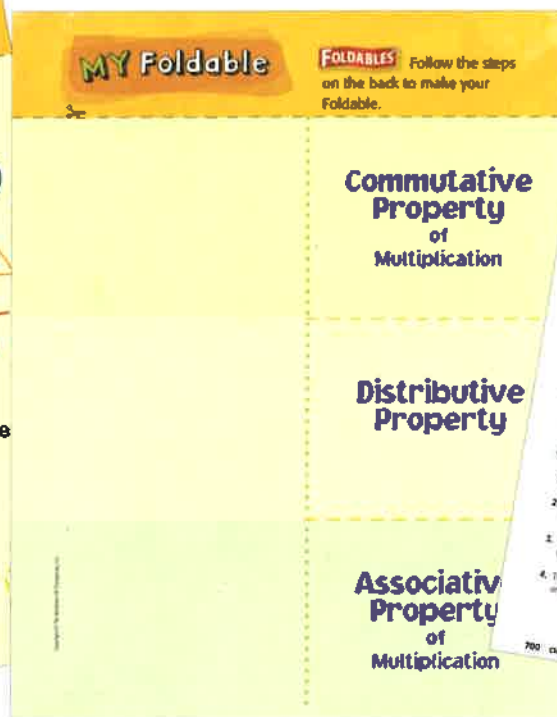
Grade 3 My Foldable, page 499
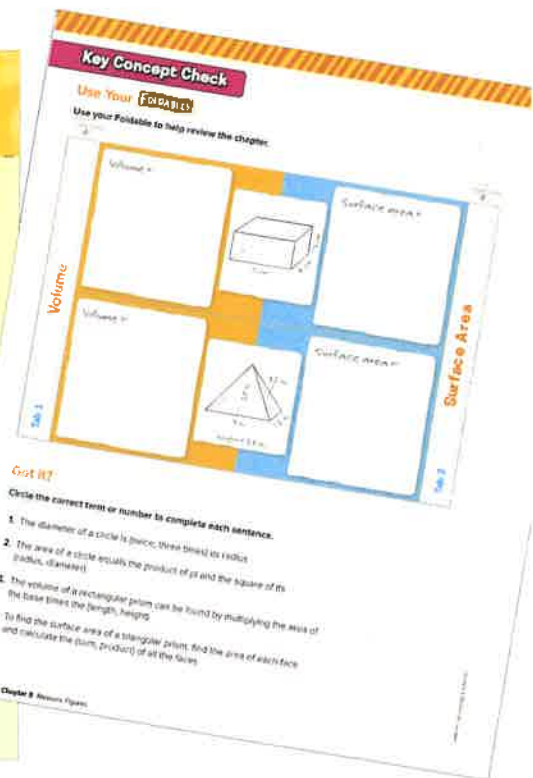
Course 2 Foldables, page 700

7 Look for and make use of structure

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

Primary: *McGraw-Hill My Math*	Grade K	Grade 1	Grade 2
Core Lessons	TE: 119-120, 145-146, 225-226, 331-332, 551-552, 693-694	TE: 115-116, 229-230, 319-320, 447-448, 589-590	69-74, 81-86, 165-170, 177-182, 327-332
Graphic Organizers: My Math Words	88, 172, 436, 686	TE: 102-104, 206-208, 340-342, 442-444, 626-628, 706-708	102, 160, 288, 638, 728
Graphic Organizers: Reflect	TE: 247-248, 529-530, 681-682	TE: 97-98, 271-272, 701-702, 739-740	98, 284, 582, 792
Foldables™	TE: 537-538, 581-582, 619-622	TE: 7-10, 279-280, 343-346, 629-*633,634	9-10, 527-528, 737-738

Intermediate: *McGraw-Hill My Math*	Grade 3	Grade 4	Grade 5
Core Lessons	61-66, 73-78, 295-300, 455-460	61-66, 161-166, 293-298, 405-474	113-118, 119-124, 195-200, 341-346
Graphic Organizers: Reflect	124, 286, 492	188, 270, 320, 764, 860	70, 242, 470, 540, 786
Foldables™	TE: *499-500, 827-832	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, 294-296, 488, 514	84, 266, 340, 496, 770

Middle School: *Glencoe Math*	Course 1	Course 2	Course 3
Core Lessons	39-46, 485-492, 783-790	215-222, 367, 374, 375-382	277-284
H.O.T. Problems			
Identify Structure	64, 270, 350	208, 268, 372	12, 226, 542
Graphic Organizers	44, 160, 788	182, 271, 349	94, 116, 580, 636
Foldables™	82, 506, 728, 856	92, 604, *700, 850	100, 256, 652

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8 Look for and express regularity in repeated reasoning
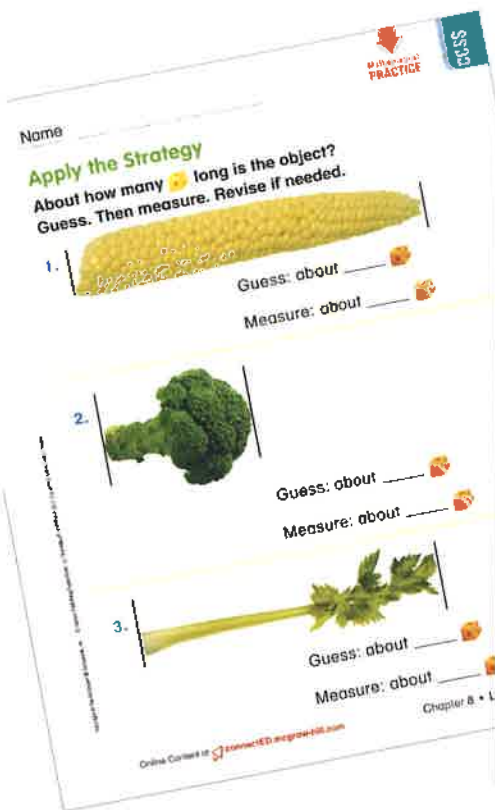
What does it mean?
Recognizing a pattern can lead to results more quickly and efficiently.

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...?

Grade 1 Apply the Strategy, page 583

Grade 3 Problem-Solving Investigation, page 327

Course 2 Problem-Solving Investigation, page 225

8 Look for and express regularity in repeated reasoning

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

Primary: *McGraw-Hill My Math*	Grade K	Grade 1	Grade 2
Core Lessons: See and Show/On My Own	TE: 111-112, 363-364, 421-422, 443-444, 521-522, 693-694 / 45-46, 159-160, 309-310, 511-512, 631-632	TE: 29-30, 115-116 / 283-284, 449-450	24-25, 108-109, 698-699
Core Lessons: Modeling the Math	69B, 273B, 521B, 705B	TE: 127B, 347B, 635B	TE: 139B, 229B, 765B
Core Lessons	TE: 185-185, 307-308, 565-566	TE: 185-185, 249-250, 255-256, 319-320, 647-648	23-28, 69-74, 101-156, 327-332, 363-368, 771-776
Problem-Solving Strategy lessons	359-360, 417-418, 545-546, 605-606	TE: 381-382, *583-584	119-124, 315-320, 395-400, 605-610
H.O.T. Problems	N/A	182, 432, 684, 690, 696	84, 226, 310, 360, 486
Core Lessons: Fluency Practice	TE: 369-370, 427-428	TE: 93-94, 267-268, 331-332	93-94, 209-210, 279-280

Intermediate: *McGraw-Hill My Math*	Grade 3	Grade 4	Grade 5
Core Lessons	TE: 87-92, 257-262, 409-414, 569-574, 665-670	67-72, 197-202, 247-252, 329-334, 407-474	99-104, 175-180, 411-416, 513-518
Problem-Solving Investigation lessons	TE: *327-332, 469-474, 671-676	255-260, 431-436, 675-680, 831-836	417-422, 813-818, 973-978
Look for a Pattern exercises	32, 76, 329, 342, 776	72, 144, 316, 416, 500, 834	40, 92, 110, 422, 450, 509, 815

Middle School: *Glencoe Math*	Course 1	Course 2	Course 3
Core Lessons	379-386, 587-594	263-270, 357-364, 613-620	7-14, 181-188
Problem-Solving Investigations	211-213	225-227	405-407
H.O.T. Problems Identify Repeated Reasoning	12, 678	*225, 238, 619	13, 20, 405, 459

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