



Mathematics

Applications and Concepts

Course 3

© 2006

STANDARDS	PAGE REFERENCES
GRADE 8	
Number and Operations	
1. Understand numbers, ways of representing numbers, relationships among numbers and number systems	
A. Read, write and compare numbers	
<p>compare and order rationals and percents, including finding their approximate locations on a number line ST MA 5 3.3 FR IX.b</p>	<p>Student Edition: 67-70, 109 #21-#25, 111 #25, 121 #1, 125-129, 140 #25, 150 #6 Teacher Wraparound Edition: A 70; B 67; DI 68 Teacher Resources: <i>Practice: Skills 73, 144</i> <i>Practice: Word Problems 74, 145</i> <i>Reading to Learn Mathematics 75</i> <i>Study Guide and Intervention 72, 143</i></p>
B. Represent and use rational numbers	
<p>use fractions, decimals and percents to solve problems ST MA 1 3.4 FR V.d</p>	<p>Student Edition: 217 ex 3, 219 #31-#36, 221 ex 5, 223 #38-#39, 227 #4, 229 ex 7, 233 ex 4, 234 #26-#27, 243 #23-#24, 249 #18-#19 Teacher Resources: <i>Practice: Skills 219</i> <i>Practice: Word Problems 257, 262</i> <i>Reading to Learn Mathematics 258, 263</i></p>

STANDARDS	PAGE REFERENCES
C. Compose and decompose numbers	
<p>recognize equivalent representations for the same number and generate them by <u>decomposing and composing numbers</u>, including scientific notation</p> <p>ST MA 1 3.6 FR V.b</p>	<p>Student Edition: 104-107, 110 #58-#65, 111 #23-#24, 112 #9-#10</p> <p>Teacher Wraparound Edition: A 107; DI 105; NS 106</p> <p>Teacher Resources: <i>Practice: Skills 108</i> <i>Practice: Word Problems 109</i> <i>Reading to Learn Mathematics 110</i> <i>Study Guide and Intervention 107</i></p>
D. Classify and describe numeric relationships	
<p>use <u>factors</u> and <u>multiples</u> to describe relationships between and among numbers and justify characteristics of numbers</p> <p>ST MA 5 1.10 FR IX.c</p>	<p>Student Edition: 124 #8, 227 #7, 411 #27, 489 #4, 609, 610</p>
2. Understand meanings of operations and how they relate to one another	
A. Represent operations	
B. Describe effects of operations	
<p>describe the effects of multiplication and division on integers</p> <p>ST MA 1 3.4, 4.1 FR V.a</p>	<p>Student Edition: 37 #1, 38 #63-#64 <i>Noteables 34, 35, 36</i></p> <p>Teacher Wraparound Edition: A 38; B 34; DI 35; NS 37</p>
C. Apply properties of operations	
<p>apply <u>properties of operations</u> to rational numbers, including order of operations and inverse operations</p> <p>ST MA 5 1.6, 1.10 FR IX.e</p>	<p>Student Edition: 71-75, 76-80, 82-85, 88-91, 95 #37-#40</p> <p>Teacher Wraparound Edition: A 75, 80, 91; DI 77, 83</p> <p>Teacher Resources: <i>Practice: Skills 78, 83, 88</i> <i>Practice: Word Problems 79, 84, 89</i> <i>Reading to Learn Mathematics 80, 85, 90</i> <i>Study Guide and Intervention 77, 82, 87</i></p>

STANDARDS	PAGE REFERENCES
D. Apply operations on real and complex numbers	
apply the relationship between squares and square roots and cubes and cube roots to solve a problem ST MA 5 1.6, 3.4 FR IX.f	Student Edition: 116-119, 120-122, 126 ex 2-ex 3, 128 #31-#38, 130 #4-#9, 146 #9-#14, 149 #3-#5 Teacher Resources: <i>Practice: Skills 134, 139</i> <i>Practice: Word Problems 135, 140</i> <i>Reading to Learn Mathematics 136, 141</i> <i>Study Guide and Intervention 133, 138</i>
3. Compute fluently and make reasonable estimates	
A. Describe or represent mental strategies	
B. Develop and demonstrate fluency	
C. Compute problems	
apply all operations on rational numbers ST MA 1 1.10, 3.3 FR V.a	Student Edition: 71-75, 76-80, 82-85, 86 #11-#16, 88-91, 95 #37-#40, 101 #49-#52, 109 #26-#38 Teacher Wraparound Edition: A 75; B 76 Teacher Resources: <i>Practice: Skills 78, 83, 88</i> <i>Practice: Word Problems 79, 84, 89</i> <i>Reading to Learn Mathematics 80, 85, 90</i> <i>Study Guide and Intervention 77, 82, 87</i>
D. Estimate and justify solutions	
estimate and justify the results of all operations on rational numbers ST MA 1 3.3, 4.1 FR V.e & h	Student Edition: 121 #4, 172 #2, 226-227, 230 #3, 488-489, 600-601

STANDARDS	PAGE REFERENCES
E. Use proportional reasoning	
<p>solve problems involving proportions, such as scaling and finding equivalent ratios</p> <p>ST MA 1 3.3 FR V.c &f</p>	<p>Student Edition: 156-159, 170-173, 182 #26-#27, 184-187, 191 #21-#24, 197 #29, 199 #16-#20, 200 #24-#27</p> <p>Teacher Wraparound Edition: A 187; DI 185</p> <p>Teacher Resources: <i>Practice: Skills</i> 186, 201, 211 <i>Practice: Word Problems</i> 187, 202, 212 <i>Reading to Learn Mathematics</i> 188, 203, 213 <i>Study Guide and Intervention</i> 185, 200, 210</p>
Algebraic Relationships	
1. Understand patterns, relations and functions	
A. Recognize and extend patterns	
B. Create and analyze patterns	
<p>generalize patterns represented <u>graphically</u> or <u>numerically</u> using words or <u>symbolic rules</u>, including <u>recursive notation</u></p> <p>ST MA 4 1.6, 3.6 FR VIII.4.b</p>	<p>Student Edition: 512-515, 520 #29-#31, 525 #32, 530 #4-#6, 552 #9-#13 <i>Hands-On Lab</i> 516, 521 <i>Problem-Solving Strategy</i> 537</p> <p>Teacher Wraparound Edition: A 515; B 512</p> <p>Teacher Resources: <i>Practice: Skills</i> 620 <i>Practice: Word Problems</i> 621 <i>Reading to Learn Mathematics</i> 622 <i>Study Guide and Intervention</i> 619</p>
C. Classify objects and representations	
<p>compare and contrast various forms of <u>representations</u> of patterns</p> <p>ST MA 4 1.6 FR VIII.3.b</p>	<p>Student Edition: 166-169, 522-525, 529 #27-#29, 533-536, 547 #39-#41 <i>Spreadsheet Investigation</i> 165</p> <p>Teacher Wraparound Edition: A 536; B 166; DI 167, 523</p> <p>Teacher Resources: <i>Practice: Skills</i> 630, 640 <i>Practice: Word Problems</i> 631, 641 <i>Reading to Learn Mathematics</i> 632, 642 <i>Study Guide and Intervention</i> 629, 639</p>

STANDARDS	PAGE REFERENCES
D. Identify and compare functions	
<p>compare <u>properties of linear functions</u> between or among tables, graphs and equations</p> <p>ST MA 4 1.6, 3.6 FR VIII.b & c</p>	<p>Student Edition: 166-169, 522-525, 529 #27-#29, 533-536, 547 #39-#41</p> <p><i>Spreadsheet Investigation</i> 165</p> <p>Teacher Wraparound Edition: A 536; B 166; DI 167, 523</p> <p>Teacher Resources: <i>Practice: Skills</i> 630, 640 <i>Practice: Word Problems</i> 631, 641 <i>Reading to Learn Mathematics</i> 632, 642 <i>Study Guide and Intervention</i> 629, 639</p>
E. Describe the effects of parameter changes	
2. Represent and analyze mathematical situations and structures using algebraic symbols	
A. Represent mathematical situations	
<p>use <u>symbolic algebra</u> to represent and solve problems that involve linear relationships, including <u>recursive</u> relationships</p> <p>ST MA 4 1.6, 3.1 FR VIII.2.e</p>	<p>Student Edition: 45-49, 50-53, 56 #46-#58, 57 #23-#28, 92-95, 107 #47-#50</p> <p>Teacher Wraparound Edition: A 49, 53, 95; B 50</p> <p>Teacher Resources: <i>Practice: Skills</i> 37, 42, 98 <i>Practice: Word Problems</i> 38, 43, 99 <i>Reading to Learn Mathematics</i> 39, 44, 100 <i>Study Guide and Intervention</i> 36, 41, 97</p>
B. Describe and use mathematical manipulation	
<p>generate equivalent forms for linear expressions</p> <p>ST MA 4 3.6 FR VIII.a</p>	<p>Student Edition: 45-49, 50-53, 56 #46-#58, 57 #23-#28, 92-95, 107 #47-#50</p> <p>Teacher Wraparound Edition: A 49, 53, 95; B 50</p> <p>Teacher Resources: <i>Practice: Skills</i> 37, 42, 98 <i>Practice: Word Problems</i> 38, 43, 99 <i>Reading to Learn Mathematics</i> 39, 44, 100 <i>Study Guide and Intervention</i> 36, 41, 97</p>
C. Utilize equivalent forms	
D. Utilize systems	

STANDARDS	PAGE REFERENCES
3. Use mathematical models to represent and understand quantitative relationships	
A. Use mathematical models	
<p>model and solve problems, using multiple representations such as graphs, tables, equations or inequalities</p> <p>ST MA 4 1.6, 3.6 FR VIII.b</p>	<p>Student Edition: 7 ex 1, 10 #16, 40 ex 4, 53 #42-#44, 184-187, 188-191, 518 ex 4-ex 5, 520 #21-#24, 549 ex 2 <i>Hands-On Lab</i> 569</p> <p>Teacher Resources: <i>Practice: Skills</i> 211, 216 <i>Practice: Word Problems</i> 212, 217 <i>Reading to Learn Mathematics</i> 213, 218 <i>Study Guide and Intervention</i> 210, 215</p>
4. Analyze change in various contexts	
A. Analyze change	
<p>analyze the nature of changes (including slope and intercepts) in quantities in linear relationships</p> <p>ST MA 2, 4 1.6, 4.1 FR VI.i, VIII.c</p>	<p>Student Edition: 166-169, 522-525, 529 #27-#29, 533-536, 547 #39-#41 <i>Spreadsheet Investigation</i> 165</p> <p>Teacher Wraparound Edition: A 536; B 166; DI 167, 523</p> <p>Teacher Resources: <i>Practice: Skills</i> 196, 630 <i>Practice: Word Problems</i> 197, 631 <i>Reading to Learn Mathematics</i> 198, 632 <i>Study Guide and Intervention</i> 195, 629</p>
Geometric and Spatial Relationships	
1. Analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships	
A. Describe and use geometric relationships	
<p>describe, classify and generalize relationships between and among types of a) 2-dimensional objects and b) 3-dimensional objects using their defining <u>properties</u> including</p> <ul style="list-style-type: none"> ▶ Pythagorean Theorem ▶ <u>cross-section</u> of a 3-dimensional object results in what 2-dimensional shape <p>ST MA 2 1.6, 3.6 FR VI.c</p>	<p>Student Edition: 132-136, 137-140, 142-145, 331, 351 #29-#32</p> <p>Teacher Wraparound Edition: A 136, 145; B 137; DI 138</p> <p>Teacher Resources: <i>Practice: Skills</i> 149, 154, 159 <i>Practice: Word Problems</i> 150, 155, 160 <i>Reading to Learn Mathematics</i> 151, 156, 161 <i>Study Guide and Intervention</i> 148, 153, 158</p>

STANDARDS	PAGE REFERENCES
B. Apply geometric relationships	
<p>apply relationships between the <u>corresponding sides</u> and <u>corresponding areas</u> of <u>similar polygons</u> to solve problems</p> <p>ST MA 2 1.6, 3.6 FR VI.c</p>	<p>Student Edition: 178-182, 187 #25, 191 #25, 199 #21-#23, 201 #11-#12, 203 #13 <i>Hands-On Lab</i> 183</p> <p>Teacher Wraparound Edition: A 182, 183; B 178; DI 179; T 183</p> <p>Teacher Resources: <i>Practice: Skills</i> 206 <i>Practice: Word Problems</i> 207 <i>Reading to Learn Mathematics</i> 208 <i>Study Guide and Intervention</i> 205</p>
C. Compose and decompose shapes	
2. Specify locations and describe spatial relationships using coordinate geometry and other representational systems	
A. Use coordinate systems	
<p>use coordinate geometry to analyze <u>properties of right triangles</u> and quadrilaterals</p> <p>ST MA 2 3.6 FR VI.f</p>	<p>Student Edition: 143 ex 1, 144 #4-#21, 529 #24-#25</p> <p>Teacher Wraparound Edition: A 145</p> <p>Teacher Resources: <i>Practice: Word Problems</i> 160 <i>Reading to Learn Mathematics</i> 142 <i>Study Guide and Intervention</i> 158</p>
3. Apply transformations and use symmetry to analyze mathematical situations	
A. Use transformations on objects	
<p>reposition shapes under <u>formal</u> transformations, such as reflection, rotation and translation</p> <p>ST MA 2 3.6 FR VI.b</p>	<p>Student Edition: 290-294, 296-299, 300-303, 308 #29-#34, 309 #17-#19, 310 #7, 311 #16</p> <p>Teacher Wraparound Edition: A 294, 299, 303; DI 300</p> <p>Teacher Resources: <i>Practice: Skills</i> 338, 343 <i>Practice: Word Problems</i> 339, 344 <i>Reading to Learn Mathematics</i> 340, 345 <i>Study Guide and Intervention</i> 337, 342</p>

STANDARDS	PAGE REFERENCES
B. Use transformations on functions	
describe the relationship between the scale factor and the area of the image using a <u>dilation</u> (stretching/shrinking) ST MA 2 3.6 FR VI.b & g	Student Edition: 194-197, 200 #30-#31, 201 #13, 203 #17, 209 #50-#51, 214 #78 Teacher Wraparound Edition: A 197; B 194; DI 195; P 196 Teacher Resources: <i>Practice: Skills 221</i> <i>Practice: Word Problems 222</i> <i>Reading to Learn Mathematics 223</i> <i>Study Guide and Intervention 221</i>
C. Use symmetry	
identify the number of rotational symmetries of regular polygons ST MA 2 1.6 FR VI.b	Student Edition: 287 ex 2-ex 3, #21-#22, 299 #19-#20 Teacher Wraparound Edition: DI 287 Teacher Resources: <i>Practice: Skills 333</i> <i>Practice: Word Problems 334</i> <i>Reading to Learn Mathematics 335</i> <i>Study Guide and Intervention 332</i>
4. Use visualization, spatial reasoning and geometric modeling to solve problems	
A. Recognize and draw three-dimensional representations	
create <u>isometric drawings</u> from a given <u>net</u> ST MA 2 3.3 FR VI.a	Student Edition: 332 ex 3, 333 #11-#12 <i>Hands-On Lab 330</i> Teacher Wraparound Edition: A 330, 334; T 330; TT 330 Teacher Resources: <i>Practice: Word Problems 394</i> <i>Study Guide and Intervention 392</i>

STANDARDS	PAGE REFERENCES
B. Draw and use visual models	
draw or use <u>visual models</u> to represent and solve problems ST MA 2 3.1 FR VI.d	Student Edition: 156-159, 332 ex 3, 337 ex 5, 345 #32, 348 ex 2, 651 #1-#2 Teacher Wraparound Edition: A 350; B 342; DI 157, 336 Teacher Resources: <i>Practice: Word Problems 399, 404, 409, 414</i>
Measurement	
1. Understand measurable attributes of objects and the units, systems and processes of measurement	
A. Determine unit of measurement	
B. Identify equivalent measures	
identify the equivalent volume measures within a system of measurement (e.g., m^3 to cm^3) ST MA 2 1.6 FR VI.i	Student Edition: 604 ex 6-ex 7, 605 ex 8, 606 ex 4-ex 5, 607 #33
C. Tell and use units of time	
D. Count and compute money	
2. Apply appropriate techniques, tools and formulas to determine measurements	
A. Use standard or non-standard measurement	
B. Use angle measurement	
use tools to determine the measure of <u>reflex</u> angles to the nearest degree ST MA 2 1.4, 3.2 FR VI.f	Student Edition: <i>Hands-On Mini Lab 256</i>

STANDARDS	PAGE REFERENCES
C. Apply geometric measurements	
<p>describe how to solve problems involving surface area and/or volume of a rectangular or triangular prism, or cylinder</p> <p>ST MA 2 3.4, 4.1 FR VI.i & g</p>	<p>Student Edition: 342-345, 347-351, 352-355, 365 #24-#25, 366 #34-#35, 367 #9-#10 <i>Spreadsheet Investigation</i> 356-357</p> <p>Teacher Wraparound Edition: A 350; B 357; DI 348</p> <p>Teacher Resources: <i>Practice: Skills</i> 408, 413 <i>Practice: Word Problems</i> 409, 414 <i>Study Guide and Intervention</i> 407, 412</p>
D. Analyze precision	
<p>analyze <u>precision</u> and accuracy in measurement situations and determine number of significant digits</p> <p>ST MA 2 1.7, 3.8 FR VI.f</p>	<p>Student Edition: 358-362, 366 #38-#45, 367 #13-#15, 377 #33-#36, 383 #31 <i>Extra Practice Lesson</i> 7-9 635</p> <p>Teacher Wraparound Edition: A 359; B 358</p> <p>Teacher Resources: <i>Chapter 7 Resource Masters</i> 423 #10-#11, 425 #11, 426 #20 <i>Practice: Skills</i> 418 <i>Practice: Word Problems</i> 419 <i>Reading to Learn Mathematics</i> 420 <i>Study Guide and Intervention</i> 417</p>
E. Use relationships within a measurement system	
<p>convert square or cubic units to equivalent square or cubic units within the same system of measurement</p> <p>ST MA 2 1.6, 1.10 FR VI.e & f</p>	<p>Student Edition: 606 ex 4-ex 5, 607 #33</p>

STANDARDS	PAGE REFERENCES
Data and Probability	
1. Formulate questions that can be addressed with data and collect, organize and display relevant data to answer them	
A. Formulate questions	
formulate questions, design studies and collect data about a characteristic ST MA 3 1.2 FR VII.a	Student Edition: 406-409, 412 #46-#49, 413 #20, 414 #7, 424 #26, 429 #16 <i>Extra Practice Lesson 8-7 637</i> Teacher Resources: <i>Practice: Skills 476</i> <i>Practice: Word Problems 477</i> <i>Reading to Learn Mathematics 478</i> <i>Study Guide and Intervention 475</i>
B. Classify and organize data	
C. Represent and interpret data	
select, create and use appropriate graphical representation of data (including <u>scatter plots</u>) ST MA 3 1.8, 3.6	Student Edition: 420-424, 426-429, 430-433, 446-449, 450-453, 539-542 <i>Graphing Calculator Investigation 425, 543</i> <i>Hands-On Lab 434</i> Teacher Wraparound Edition: A 429 Teacher Resources: <i>Practice: Skills 502, 507</i> <i>Practice: Word Problems 503, 508</i> <i>Reading to Learn Mathematics 504, 509</i> <i>Study Guide and Intervention 501, 506</i>

STANDARDS	PAGE REFERENCES
2. Select and use appropriate statistical methods to analyze data	
A. Describe and analyze data	
<p>find, use and interpret <u>measures of center</u>, <u>outliers</u> and <u>spread</u>, including <u>range</u> and <u>interquartile range</u></p> <p>ST MA 3 3.4 FR VII.c</p>	<p>Student Edition: 435-438, 442-445, 449 #24, 459 #15-#21, 461 #7-#9, 656 #6-#8 <i>Spreadsheet Investigation</i> 439</p> <p>Teacher Wraparound Edition: A 437; B 435; DI 436</p> <p>Teacher Resources: <i>Practice: Skills</i> 517, 522 <i>Practice: Word Problems</i> 518, 523 <i>Reading to Learn Mathematics</i> 519, 524 <i>Study Guide and Intervention</i> 516, 521</p>
B. Compare data representations	
<p>compare different representations of the same data and evaluate how well each representation shows important aspects of the data</p> <p>ST MA 3 3.6 FR VII.d</p>	<p>Student Edition: 436 ex 3, 437 #7, 438 #8, 439 #3, 450-453, 460 #26-#30, 461 #13</p> <p>Teacher Wraparound Edition: DI 436, 451</p> <p>Teacher Resources: <i>Practice: Skills</i> 532 <i>Practice: Word Problems</i> 518, 533 <i>Reading to Learn Mathematics</i> 534 <i>Study Guide and Intervention</i> 531</p>
C. Represent data algebraically	

STANDARDS	PAGE REFERENCES
3. Develop and evaluate inferences and predictions that are based on data	
A. Develop and evaluate inferences	
<p>make <u>conjectures</u> about possible relationships between 2 characteristics of a sample on the basis of scatter plots of the data and approximate lines to fit</p> <p>ST MA 3 3.5 FR VII.e</p>	<p>Student Edition: 539-542, 547 #38, 551 #33, 554 #35-#38, 555 #19, 557 #17 <i>Graphing Calculator Investigation</i> 543</p> <p>Teacher Wraparound Edition: A 542, 543; B 539; DI 540</p> <p>Teacher Resources: <i>Practice: Skills</i> 645 <i>Practice: Word Problems</i> 646 <i>Reading to Learn Mathematics</i> 647 <i>Study Guide and Intervention</i> 644</p>
B. Analyze basic statistical techniques	
4. Understand and apply basic concepts of probability	
A. Apply basic concepts of probability	
<p>make <u>conjectures</u> (based on theoretical probability) about the results of experiments</p> <p>ST MA 3 3.5 FR VII.g</p>	<p>Student Edition: 400-403, 409 #24, 412 #42-#45, 413 #17-#19, 414 #5, 424 #27, 655 #13-#14 <i>Extra Practice Lesson</i> 8-6 637 <i>Graphing Calculator Investigation</i> 404-405</p> <p>Teacher Wraparound Edition: A 403; DI 400</p> <p>Teacher Resources: <i>Practice: Skills</i> 471 <i>Practice: Word Problems</i> 472 <i>Reading to Learn Mathematics</i> 473 <i>Study Guide and Intervention</i> 470</p>
B. Use and describe compound events	