



IDAHO
Mathematics Standards Grade 8
Pre-Algebra © 2003

STANDARDS	PAGE REFERENCES
337. BASIC ARITHMETIC, ESTIMATION, AND ACCURATE COMPUTATIONS.	
01. Understand and use numbers.	
a. Read, write, order, and compare real numbers (integers, fractions, decimals, percents, ratios) and absolute values.	SE: 12-16, 56-61, 68 #53-54, 74 #67, 169-173, 200-204, 205-209, 226-230, 264-268 TWE: OEA 16
b. Understand and use real numbers, both rational and irrational.	SE: 23-27, 56-61, 64-68, 70-74, 169-173, 205-209, 210-214, 215-219, 232-236, 441-445
c. Show a sense of magnitudes and relative magnitudes of real numbers (integers, fractions, decimals) using scientific notation and exponential numbers.	SE: 153-157, 186-190, 204 #52-55, 209 #58-61, 268 #61-64 <i>Algebra Activity</i> 158 TWE: DI 187 OEA 190 TOT 154
d. Develop and apply number theory concepts.	SE: 148-152, 156 #47, 157 #62-64, 162 #13, 337 #34
e. Understand the position of real numbers on a number line.	SE: 56-61, 64-68, 70-74, 75-79, 80-84, 202 Ex 4 & 5, 209 #52
02. Perform computations accurately.	
a. Consistently and accurately add, subtract, multiply, and divide rational numbers.	SE: 175-179, 210-214, 215-219, 220-224, 232-236, 244-248, 270-274, 276-280, 288-292, 293-297
b. Instantly recall common, equivalent fractions, decimals, and percents.	SE: 200-204, 205-209, 281-285, 293-297 TWE: DI 282 OEA 297
c. Evaluate numerical expressions using the order of operations.	SE: 12-16, 17-21, 27 #56-58, 74 #69-70, 114 #61, 153-157
d. Understand and use exponents.	SE: 153-157, 159-163, 175-179, 181-185, 186-190, 204 #58-61 <i>Algebra Activity</i> 180 <i>Reading Mathematics</i> 174 TWE: DI 155 TOT 154
e. Select and use an appropriate method of computation from mental math, paper and pencil, calculator, or a combination of the three.	SE: 70-74, 281-285, 288-292, 293-297, 436-440, 460-464, 466-470, 477-481 <i>Algebra Activity</i> 286-287 <i>Graphing Calculator Investigation</i> 482
f. Use appropriate vocabulary.	SE: 12-16, 23-27, 33-38, 447-451 <i>Reading Mathematics</i> 11, 69, 225, 380, 446, 526

STANDARDS	PAGE REFERENCES
03. Estimate and judge reasonableness of results.	
a. Use estimation to predict computation results.	SE: 5 #19-27, 121 Ex 2, 209 #70-75, 220 Ex 1 & 2, 230 #75-80 <i>Prerequisite Skills</i> 712, 714, 716, 717
b. Recognize when estimation is appropriate and understand the usefulness of an estimate as distinct from an exact answer.	SE: 289 Ex 3, 296 #27-35 <i>Algebra Activity</i> 275 <i>Prerequisite Skills</i> 712, 714, 716, 717
c. Determine whether a given estimate is an overestimate or underestimate.	The following page references can be used in a discussion to meet this objective. SE: 5, 9 #1, #8, 121 Ex 2
d. Use appropriate vocabulary.	The following page references can be used in a discussion to meet this objective. SE: 5, 9 #1, #8, 121 Ex 2
338. MATHEMATICAL REASONING AND PROBLEM SOLVING.	
01. Understand and use a variety of problem-solving skills.	
a. Use a variety of strategies, including common mathematical formulas to compute problems drawn from real-world situations.	SE: 67 #40, 83 #33, 123 #49, 126-130, 131-136, 276-280, 471-475, 477-481 <i>Algebra Activity</i> 275 <i>Reading Mathematics</i> 125
b. Recognize pertinent information for problem solving.	SE: 126-130, 131-136, 156 #49-51, 204 #48, 223 #47, 247 #45, 307 #24, 450 #35, 464 #37, 475 #19
c. Make predictions and decisions based on information.	SE: 40-44, 249-252, 310-314, 395 Ex 4, 409-413 <i>Algebra Activity</i> 253 <i>Graphing Calculator Activity</i> 315 TWE: DI 412 ICE 42 OEA 44
02. Use reasoning skills to recognize problems and express them mathematically.	
a. Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning and concepts.	SE: 89 #51, 99, 103, 119 #49, 120, 157 #58, 210 <i>Algebra Activity</i> 62-63, 108-109, 180
b. Apply solutions and strategies to new problem situations.	SE: 32 #60, 102 #56-63, 168 #61-66, 236 #40-42, 280 #25, 359 #49, 464 #41-42, 531 #38-43, 696 #40-41
c. Formulate conjectures and justify (short of formal proof) why they must be or seem to be true.	SE: 107 #57, 155 #3, 163 #46, 445 #68, 453 <i>Algebra Activity</i> 39, 62-63, 180, 476, 640
03. Apply appropriate technology and models to find solutions to problems.	
a. Understand the purpose and capabilities of appropriate technology use as a tool to solve problems.	SE: 477-481 <i>Graphing Calculator Investigation</i> 45-46, 243, 315, 374, 402-403, 482, 697 <i>Spreadsheet Investigation</i> 137
b. Use computer applications to display and manipulate data.	SE: 477-481 <i>Graphing Calculator Investigation</i> 45-46, 243, 315, 374, 402-403, 482, 629, 697 <i>Spreadsheet Investigation</i> 137
c. Select appropriate models to represent mathematical ideas.	SE: 64-65, 70, 77#1, 80, 98-102, 120, 169, 210 <i>Algebra Activity</i> 62-63

STANDARDS	PAGE REFERENCES
04. Communicate results using appropriate terminology and methods.	
a. Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to communicate mathematical information.	SE: 375-379, 381-385, 393-397, 409-413 <i>Algebra Activity</i> 180, 368, 386, 392 <i>Graphing Calculator Investigation</i> 374 <i>Reading Mathematics</i> 380
b. Use appropriate vocabulary to communicate mathematical information.	SE: 72 #2, 83 #2, 89 #52, 100 #2, 114 #49, 130 #27, 152 #57, 204 #49, 214 #54, 278 #2
c. Use appropriate notation.	The following page references can be used in a discussion to meet this objective. SE: 375-379, 381-385
339. CONCEPTS AND PRINCIPLES OF MEASUREMENT.	
01. Understand and use U.S. customary and metric measurements.	
a. Select and use appropriate units and tools to make formal measurements using both systems.	SE: 447-451, 464 #43 TWE: OEA 136
b. Apply estimation of measurement to real-world and content problems using actual measuring devices.	SE: 496 #27-28, 524 #19-20, 539-543
c. Recognize the differences and relationships among measures of perimeter, area, and volume (capacity) in both systems.	SE: 575 #1 TWE: UM 534
d. Solve problems involving length, perimeter, area, volume (capacity), weight, mass, and temperature.	SE: 460-464, 466-470, 477-481, 533-538, 539-543, 563-567, 568-572, 573-577, 578-582 <i>Geometry Activity</i> 562
e. Convert unit of measurement within each system.	SE: 168 #76-81, 213 #34-37, 263 #1-15, 272 Ex 4, 273 #36-37, 564 #23-25 <i>Prerequisite Skills</i> 718-719, 720-721
f. Use appropriate vocabulary.	TWE: UM 534
02. Apply concepts of rates and other derived or indirect measurements.	
a. Use rates to make indirect measurements.	SE: 460-464, 471-475, 477-481, 584-588 <i>Geometry Activity</i> 583 <i>Graphing Calculator Investigation</i> 482
03. Apply the concepts of ratios and proportions.	
a. Understand and use proportions, ratios, and scales.	SE: 264-268, 270-274, 276-280, 288-292 <i>Algebra Activity</i> 275 <i>Reading Mathematics</i> 269 TWE: DI 266, 273, 278 UM 267
04. Apply dimensional analysis.	
a. Understand units and their relationship to one another and to real-world applications.	SE: 212 Ex 6, 213 #34-37, 217 Ex 6, 218 #47, 266-267, 280 #29-30
340. CONCEPTS AND LANGUAGE OF ALGEBRA.	
01. Use algebraic symbolism as a tool to represent mathematical relationships.	
a. Understand and use variables in expressions, equations, and inequalities.	SE: 17-21, 28-32, 103-107, 110-114, 115-119, 120-124, 126-130, 131-136, 270-274 <i>Reading Mathematics</i> 125
b. Translate simple word statements and story problems into algebraic expressions and equations.	SE: 12-16, 17-21, 28-32, 67 #41, 73 #38, 105 Ex 3, 106 #50-53, 110-114, 115-119 <i>Reading Mathematics</i> 11

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c. Use symbols (<, >, =, <, >, ≠) to express relationships.	SE: 110-114, 115-119, 121-124, 330-333, 334-338, 340-344, 345-349, 350-354, 355-359 <i>Reading Mathematics</i> 339
02. Evaluate algebraic expressions.	
a. Understand and use the following properties in evaluating algebraic expressions: commutative, associative, identity, zero, inverse, distributive, and substitution.	SE: 23-27, 38 #53, 61 #81-83, 64-68, 79 #77-79, 98-102, 103-107, 114 #58-60 TWE: OEA 27
b. Understand and use the order of operations in evaluating basic algebraic expressions.	SE: 12-16, 17-21, 27 #56-58, 74 #69-70, 114 #61, 153-157
c. Simplify algebraic expressions.	SE: 98-102, 103-107, 114 #52-57, 119 #56-58, 124 #60-65, 136 #50-52, 157 #69, 330-333 TWE: UM 104
03. Solve algebraic equations and inequalities.	
a. Solve one- and two-step equations and inequalities using inverse operations.	SE: 110-114, 115-119, 120-124, 126-130, 131-136, 152 #64-66, 157 #66-68, 163 #54-57 TWE: OEA 114
b. Explore graphical representation to show simple linear equations.	SE: 375-379, 381-385, 387-391, 393-397 <i>Algebra Activity</i> 386-392 <i>Graphing Calculator Investigation</i> 402-403 TWE: DI 385 OEA 379, 385
341. CONCEPTS AND PRINCIPLES OF GEOMETRY.	
01. Apply concepts of size, shape, and spatial relationships.	
a. Precisely describe, classify, and understand relationships among types of one-, two-, and three-dimensional objects using their defining properties.	SE: 556-561
b. Construct and measure various angles and shapes using appropriate tools.	SE: 447-451, 457 #41-44, 464 #47, 497 #46-50 <i>Algebra Activity</i> 498-499, 512 TWE: DI 449 OEA 451
c. Understand and apply fundamental concepts, properties, and relationships among points, lines, planes, angles, and shapes.	SE: 492-497, 500-504, 513-517 TWE: DI 496 OEA 497 UM 493
d. Recognize and apply congruence, similarities, and symmetry of shapes.	SE: 471-475, 477-481, 500-504, 506-511 <i>Algebra Activity</i> 505 TWE: DI 473, 502
e. Apply formulas for perimeter, circumference, and area to polygons and circles.	SE: 132-136, 152 #60-61, 224 #59, 336 #9, 520-525, 533-538, 539-543 <i>Spreadsheet Investigation</i> 137 TWE: DI 540 OEA 538
f. Understand the concept of surface area and volume (capacity).	SE: 563-567, 568-572, 573-577, 578-582, 584-588 <i>Geometry Activity</i> 562 TWE: DI 574 OEA 567 UM 579

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g. Explore and model the effects of reflections, translations, and rotations on various shapes.	SE: 506-511 TWE: ICE 508
h. Use appropriate vocabulary.	SE: 447-451, 453-457, 471-475, 477-481, 492-497, 500-504, 506-511 <i>Algebra Activity</i> 476, 505 <i>Reading Mathematics</i> 446
02. Apply the geometry of right triangles.	
a. Investigate right triangle geometry using the Pythagorean Theorem.	SE: 460-464, 470 #35-37, 475 #26-27 <i>Algebra Activity</i> 458-459
03. Apply graphing in two dimensions.	
a. Use the coordinate plane as it relates to real-world applications.	SE: 40-44, 369-373, 375-379, 381-385, 387-391, 393-397, 398-401 <i>Graphing Calculator Investigation</i> 45-46 TWE: DI 385 OEA 44
342. DATA ANALYSIS, PROBABILITY AND STATISTICS.	
01. Understand data analysis.	
a. Analyze and interpret tables, charts, and graphs (scatter plots, line graphs, bar graphs, pie charts).	SE: 40-44, 409-413, 450 #32-34 <i>Algebra Activity</i> 39 <i>Prerequisite Skills</i> 722-723 <i>Spreadsheet Investigation</i> 452 TWE: DI 412
b. Explain and justify conclusions drawn from tables, charts, and graphs.	SE: 40-44, 409-413, 450 #32-34 <i>Algebra Activity</i> 39 <i>Prerequisite Skills</i> 722-723 <i>Spreadsheet Investigation</i> 452 TWE: DI 412
c. Understand and use appropriate vocabulary.	The following page references can be used in a discussion to meet this objective. SE: 40-44, 409-413
02. Collect, organize, and display data.	
a. Collect, organize, and display data with appropriate notation in tables, charts, and graphs (scatter plots, line graphs, bar graphs, pie charts).	SE: 40-44, 409-413, 606-611, 612-616, 617-621, 623-628, 630-633 <i>Algebra Activity</i> 39 <i>Graphing Calculator Investigation</i> 622, 629 TWE: DI 412
03. Apply simple statistical measurements.	
a. Choose and calculate the appropriate measure of central tendency – mean, median, and mode.	SE: 82 Ex 4, 238-242, 248 #50-53, 252 #40-41, 617-621 <i>Graphing Calculator Investigation</i> 243 TWE: DI 242 OEA 242
b. Explore the significance of range, frequency, and informal distribution.	SE: 606-611, 612-616, 617-621, 623-628 <i>Graphing Calculator Investigation</i> 622 TWE: DI 613
04. Understand basic concepts of probability.	
a. Model situations of probability using simulations.	SE: 310-314, 635-639 <i>Algebra Activity</i> 640, 656-657 <i>Graphing Calculator Investigation</i> 315 TWE: OEA 314

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b. Understand and use the language of probability.	SE: 310-314, 635-639 <i>Algebra Activity 640</i> TWE: OEA 314
c. Recognize equally likely outcomes.	SE: 310-314, 635-639 <i>Algebra Activity 640</i>
05. Make predictions or decisions based on data.	
a. Make predictions based on simple experimental and theoretical probabilities.	SE: 310-314
b. Understand and use appropriate vocabulary.	SE: 310-314, 641-645, 646-649, 650-655
c. Conduct statistical experiments and interpret results using tables, charts, or graphs.	SE: 635-639, 656-657 <i>Graphing Calculator Investigation 315</i>
343. FUNCTIONS AND MATHEMATICAL MODELS.	
01. Understand the concept of functions.	
a. Extend patterns and identify a rule (function) that generates the pattern using real numbers.	SE: 6-10, 16 #55-58, 74 #57, 84 #46, 102 #69-71, 167 #53, 249-252 <i>Algebra Activity 62, 253</i> TWE: DI 8
b. Use functional relationships to explain how a change in one quantity results in a change in another.	SE: 369-373, 393-397 <i>Algebra Activity 368, 386, 392</i> <i>Graphing Calculator Investigation 374</i>
c. Understand and use appropriate vocabulary.	SE: 369-373, 387-391, 409-413, 414-418, 419-422 <i>Algebra Activity 368, 392</i> <i>Graphing Calculator Investigation 374, 402-403</i> <i>Reading Mathematics 380</i>
02. Represent equations, inequalities, and functions in a variety of formats.	
a. Represent a set of data in a table, as a graph, and as a mathematical relationship.	SE: 369-373, 375-379, 381-385, 393-397, 404-408, 409-413 <i>Algebra Activity 368, 386</i> <i>Graphing Calculator Investigation 374</i>
03. Apply functions to a variety of problems.	
a. Use patterns and functions to represent and solve problems.	SE: 6-10, 16 #55-58, 74 #57, 84 #46, 102 #69-71, 167 #53, 249-252, 404-408, 409-413, 414-418 <i>Algebra Activity 62, 253</i> TWE: DI 8

Codes Used for TWE Pages

DI	Differentiated Instruction
ICE	In-Class Example
OEA	Open-Ended Assessment
TOT	Teacher to Teacher
UM	Unlocking Misconceptions