



CONNECTICUT
Second Generation CAPT Mathematics
Content Specifications
***Algebra: Concepts and Applications* © 2004**

OBJECTIVES	PAGE REFERENCES
<p>All CAPT mathematics items will be in a context and require students to solve a problem. In addition, all open-ended CAPT items will require students to show their work and explain their reasoning, thereby communicating their understanding of the relevant mathematics.</p> <p>All CAPT items will be devised to measure one or more of the following aspects of mathematical content:</p>	
The Number and Quantity Strand	
1. Number Sense	
<ul style="list-style-type: none"> Use integers, fractions, decimals, percents and scientific notation in real-world situations to count, measure, compare, order, scale, locate and label. 	SE: 22 #38-39, 52-57, 69 #60, 74 #48, 78 #47, 85 #42, 99 #38-43, 103 #33, 145 #47, 158 #48
<ul style="list-style-type: none"> Use a variety of representations (including graphs, tables, words, number lines, pictures, etc.) to present, interpret and communicate various kinds of numerical information. 	SE: 32-37, 38-43, 54 Ex5, 60 Ex8, 64-67, 75, 104-109, 504-508, 524-529 TWE: OEA 43
<ul style="list-style-type: none"> Demonstrate an understanding of order, magnitude and equivalent forms of numbers. 	SE: 52-57, 64-69, 70-74, 94-99, 100-103 TWE: OEA 57, 99 RA 55, 97
2. Operations	
<ul style="list-style-type: none"> Identify appropriate operations (including addition, subtraction, multiplication, division, exponentiation and square roots) and use these operations in a variety of contexts. 	SE: 67 Ex5, 74 #47, 79 #48, 103 #35, 131 #34, 145 #46, 157 #17, 164 #36, 345 #47, 366-371
<ul style="list-style-type: none"> Select and use appropriate methods for computing (including mental mathematics, paper-and-pencil and calculator methods). 	SE: 64-69, 70-74, 75-79, 82-85, 96 Ex6, 122-127, 140-145, 154-159, 200 Ex5, 466 #10-12
3. Estimation and Approximation	
<ul style="list-style-type: none"> Select and use estimation strategies in problem situations. 	SE: 302-307, 315 #39, 340 #43, 363, 365 #37, 370 #32, 371 #37-40 <i>Hands-On Algebra</i> 362 <i>Enrichment</i> 44
<ul style="list-style-type: none"> Assess the reasonableness of answers to problems. 	SE: 24-25 Ex1, 161 Ex4, 191 Ex6, 253 Ex8, 292 Ex9, 368-369 Ex9, 480 Ex3, 521-522 Ex5, 532 Ex3, 573-574 Ex3
4. Ratios, Proportions and Percents	
<ul style="list-style-type: none"> Use ratios, proportions and percents to solve problems. 	SE: 188-193, 194-197, 198-203, 204-209, 212-217, 223 #29, 229 #26 <i>Hands-On Algebra</i> 220 TWE: FA 213 RA 196

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Use dimensional analysis to determine equivalent rates (for example, converting inches-per-minute to feet-per-hour). 	SE: 190-191, 192 #39-47, 217 #42-43
<ul style="list-style-type: none"> Use direct and inverse variation to solve numerical, geometric and algebraic problems. 	SE: 264-269, 270-275, 289 #31, 356 #60, 444 #50-51 <i>Graphing Calculator Exploration</i> 272 TWE: RA 273
The Measurement and Geometry Strand	
5. Measurement	
<ul style="list-style-type: none"> Use the concepts of length, perimeter, area, volume, angle measure, capacity, weight and mass to solve problems, using both metric and customary units. 	SE: 23 #41, 27 #6, 29 #16, 115 #38, 117 Ex3, 345 #48, 606-611, 619 #43 <i>Hands-On Algebra</i> 606 <i>Preparation for Standardized Tests</i> 596-597
<ul style="list-style-type: none"> Identify appropriate metric and customary measurement units and use appropriate measurement tools (including rulers and protractors). 	SE: <i>Investigation</i> 262-263, 372-373 TWE: RA 196
<ul style="list-style-type: none"> Estimate, make and use measurements in realistic situations. 	SE: <i>Investigation</i> 262-263, 372-373 TWE: RA 196
<ul style="list-style-type: none"> Use formulas and scales to determine measures. 	SE: 109 #42, 115 #38, 164 #38, 177 Ex3, 194-197, 235 Ex5, 247 Ex5, 402 Ex7 <i>Hands-On Algebra</i> 197
6. Spatial Relationships and Geometry	
<ul style="list-style-type: none"> Interpret, describe and draw two- and three-dimensional objects. 	SE: 371 #36, 394, 399, 405 <i>Hands-On Algebra</i> 25, 388, 400 TWE: RA 369
<ul style="list-style-type: none"> Use the concepts of rotation, reflection and translation to transform geometric figures. 	SE: 69 #61, 77 Ex9, 78 #13, 79 #49, 88 #62 <i>Hands-On Algebra</i> 324 <i>Enrichment</i> 47
<ul style="list-style-type: none"> Describe and use fundamental concepts and properties of, and relationships among, points, lines, planes, angles and shapes (including incidence, parallelism, perpendicularity and the Pythagorean Theorem). 	SE: 322-327, 366-371, 508 #50, 605 #58, 606-607, 609 #2, 619 #40, 623 #37 <i>Hands-On Algebra</i> 324 TWE: EC 327
<ul style="list-style-type: none"> Use the concepts of congruence and similarity to solve realistic problems. 	SE: 194-197, 261 #54 <i>Hands-On Algebra</i> 194
<ul style="list-style-type: none"> Use coordinate representations of geometric figures. 	SE: 69 #61, 77 Ex9, 78 #13, 79 #49, 88 #62, 607-608 Ex2, 610 #28
<ul style="list-style-type: none"> Solve problems using geometric models. 	SE: 64-65, 70, 117-120, 122, 388, 394, 399-400 <i>Hands-On Algebra</i> 66, 141 TWE: RA 102
The Statistics, Probability and Discrete Mathematics Strand	
7. Probability and Statistics	
<ul style="list-style-type: none"> Demonstrate an understanding of sampling and its role in statistical assertions. 	SE: 32-37 TWE: FTC 42
<ul style="list-style-type: none"> Describe, calculate and apply the concepts of mean, median, mode and range. 	SE: 104-109, 116 #41-42, 121 #42, 127 #49, 131 #41, 158 #53-55, 209 #38 <i>Graphing Calculator Exploration</i> 105 <i>Investigation</i> 210-211 <i>Preparation for Standardized Tests</i> 185 #5

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Construct, read and interpret tables, charts and graphs of real-world data. 	SE: 32-37, 38-43, 238-243, 302-307 <i>Graphing Calculator Exploration 491</i> <i>Investigation 210-211, 308-309</i> TWE: FTC 109 <i>Enrichment 44</i>
<ul style="list-style-type: none"> Make and evaluate inferences from tables, charts, graphs and other representations of data. 	SE: 38-43, 57 #49, 74 #48, 79 #60, 104-109, 175 #47, 208 #27, 215 Ex5 <i>Investigation 210-211</i> <i>Preparation for Standardized Tests 90-91</i>
<ul style="list-style-type: none"> Use probability to make predictions and evaluate the likelihood of simple and compound events. 	SE: 224-229 <i>Hands-On Algebra 220</i> TWE: HOA 220 <i>Enrichment 34</i>
<ul style="list-style-type: none"> Use simulations to determine experimental probabilities. 	SE: <i>Hands-On Algebra 220, 224</i> TWE: HOA 220
<ul style="list-style-type: none"> Compare experimental and theoretical probabilities and make predictions based on these probabilities. 	SE: <i>Hands-On Algebra 220, 224</i> TWE: MTL 219, 224
10. Discrete Mathematics*	
<ul style="list-style-type: none"> Use systematic listing and counting strategies, including simple combinations and permutations, to solve problems. 	SE: 224-229 <i>Investigation 152-153</i> <i>Enrichment 34</i>
<ul style="list-style-type: none"> Use recursive processes, including iteration, to solve problems. 	SE: <i>Investigation 110-111</i>
The Algebra and Functions Strand	
8. Patterns	
<ul style="list-style-type: none"> Construct, describe, extend and analyze a variety of numerical, geometric and statistical patterns. 	SE: 69 #73, 170 #49, 302-307, 315 #40, 341-343, 489 <i>Investigation 30-31, 110-111, 308-309</i> <i>Preparation for Standardized Tests 332</i>
<ul style="list-style-type: none"> Describe, analyze and generalize patterns using tables, rules, algebraic expressions and equations and graphs. 	SE: 69 #73, 170 #49, 302-307, 315 #40, 341-343, 489 <i>Investigation 30-31, 110-111, 308-309</i> <i>Preparation for Standardized Tests 332</i>
<ul style="list-style-type: none"> Make and justify predictions based on patterns. 	SE: 69 #73, 170 #49, 302-307, 315 #40, 341-343, 489 <i>Investigation 30-31, 110-111, 308-309</i> <i>Preparation for Standardized Tests 332</i>
9. Algebra and Functions	
<ul style="list-style-type: none"> Represent and analyze situations involving variable quantities with tables, graphs, verbal rules and equations, and translate among representations. 	SE: 117-121, 122-127, 128-131, 160-164, 165-170, 171-175, 188-193, 198-203, 204-209, 250-255
<ul style="list-style-type: none"> Use variables, expressions, equations and inequalities, including formulas, to model situations and solve problems. 	SE: 117-121, 128-131, 160-164, 165-170, 188-193, 204-209, 366-371, 483-487, 519-523 <i>Hands-On Algebra 388-389</i>

OBJECTIVES	PAGE REFERENCES
<ul style="list-style-type: none"> Construct and use linear functions to model and solve real-world situations. 	SE: 250-255, 259 Ex9, 264-269, 302-307, 311-312 Ex 3, 315 #39 <i>Investigation 262-263, 308-309</i> <i>Enrichment 44</i>
<ul style="list-style-type: none"> Use the coordinate plane to represent functions. 	SE: 256-261, 264-269, 270-275, 284-289, 302-307, 458-463, 489-493 <i>Investigation 262-263, 308-309</i>

Codes Used for TWE Pages

EC	Extra Credit
FA	Family Activity
FTC	From the Classroom of...
HOA	Hands-On Algebra
MTL	Motivating the Lesson
OEA	Open-Ended Assessment
RA	Reteaching Activity