

Alabama 8th Grade with CORD Bridges to Algebra and Geometry, 2nd Edition
Eighth Grade

NUMBER SENSE
 NUMBER SYSTEMS
 NUMBER THEORY

CONTENT STANDARDS

Students will:

1. Demonstrate proficiency in performing basic operations on rational numbers. ***Stanford 9***

Page or Location: 140-147, 148-153, 162-167, 168-175, 236-240, 241-246, 254-260, 261-265, 266-272

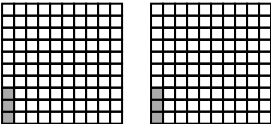
2. Demonstrate proficiency in converting rational numbers between standard notation and scientific notation. ***Stanford 9***

Page or Location: 536-541, 603, 656

3. Demonstrate proficiency in evaluating rational number expressions using the order of operations. ***Stanford 9***

Page or Location: 236-240, 254-260, 261-265, 266-270, 290, 298, 315, 326, 360, 371, 380, 418, 447, 472, 500

4. Identify alternative representations of rational numbers. ***Stanford 9***

Example  $= 1 \frac{3}{100} = \frac{103}{100} = 1.03 = 103\%$

Page or Location: 140-145, 148-153, 154-159, 236-240, 241-246, 247-253, 254-260, 261-266, 267-272

5. Demonstrate proficiency in determining least common multiples and greatest common factors.

Page or Location: 238-240, 247-251, 254-260, 291

6. Apply the laws of exponents to simplify expressions containing integral exponents. ***Stanford 9***

Page or Location: 524-529, 530-534

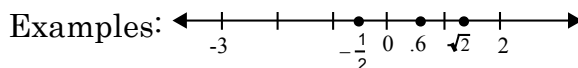
7. Find square roots of rational numbers. ***Stanford 9***

Page or Location: 551-552, 554-556, 557-562, 621

8. Compare and order real numbers. *Stanford 9*

Page or Location: 6-10, 15, 21-23, 33, 48, 56, 75, 79, 83, 90, 107, 133, 134-138, 173, 182, 191, 239, 240, 247-253, 290, 349, 353, 425, 432, 493, 529, 603

9. Graph real numbers on a number line. *Stanford 9*



Page or Location: 6-8, 10, 11-12, 33, 66, 130, 135, 136-137, 154-159, 249-253, 274-277, 278-282, 418, 432, 670

10. Demonstrate proficiency using estimation techniques in problem solving related to real-life situations. *Stanford 9*

- Rounding
- Front-end

Example:

$$\begin{array}{r}
 1\frac{7}{12} \\
 1\frac{5}{8} \\
 +1 \\
 \hline
 \end{array}
 \rightarrow
 \begin{array}{r}
 1 \\
 +1 \\
 \hline
 3
 \end{array}
 \rightarrow
 \begin{array}{r}
 \frac{7}{12} \approx \frac{1}{2} \\
 \frac{5}{8} \approx \frac{1}{2} \\
 \hline
 1
 \end{array}
 \rightarrow
 \begin{array}{r}
 \textcircled{1} \\
 3 + 1 = 4
 \end{array}$$

- Compatible numbers

Examples:

$$\begin{array}{l}
 3.02 \times 7.3 \approx 3 \times 7 \text{ or } \textcircled{21} \\
 6 \overline{)550} \approx 6 \overline{)540} \text{ } \textcircled{90}
 \end{array}$$

- Clustering

Example: \$1.78 + \$1.85 + \$2.12

All of the addends are close to the same dollar amount—\$2.

Therefore, \$2 x 3 = \$6.

Page or Location: 11-15, 29-35, 41, 42-48, 49-58, 59-60, 61-63, 63-65, 66, 75, 83, 97, 114, 139, 145, 173, 202, 257, 260, 263, 362-366, 396, 510 and see also "Problem Solving: Using The Four-Step Plan" pages 53, 103, 165, 200, 258, 306, 377, 422, 476, 546, 609, 652

11. Use problem-solving strategies effectively. *Stanford 9*

- Using objects
- Drawing a picture
- Using guess and check
- Making an organized list
- Writing an equation
- Solving a simpler problem
- Making a table or chart
- Looking for a pattern
- Using logical reasoning
- Working backward

Page or Location: 49-52; also see features “Problem Solving: Using the Four Step Plan” pages 53, 103, 165, 200, 258, 306, 377, 422, 476, 546, 609, 652; “Practice and Apply” exercises at the end of each lesson; “Cumulative Problem Solving” exercises throughout each chapter, and “Chapter Assessment” exercises at the end of each chapter.

12. Identify missing information in problem-solving situations. *Stanford 9*

Page or Location: 49-52; also see features “Problem Solving: Using the Four Step Plan” pages 53, 103, 165, 200, 258, 306, 377, 422, 476, 546, 609, 652

13. Solve problems with ratios and proportions. *Stanford 9*

Page or Location: 304-310, 336, 338-339, 344, 354-360, 367-371, 376, 380, 386, 410, 493, 563, 614, 661, 685

14. Recognize and use absolute value of real numbers.

Page or Location: 131-133, 136, 137, 176-178, 182, 221, 251, 339-341, 432

GEOMETRY
SPATIAL SENSE
MEASUREMENT

15. Identify the relationships between two- and three-dimensional geometric figures.
- Examples: Rectangular prisms are composed of rectangles.
 Pyramids are composed of triangles and a rectangle.
- Page or Location:** 642-648, 650-656, 657-663, 664-670, 671-679,
 680-686, 687-689, 689-690, 691-692, 693-694
16. Demonstrate proficiency in converting from one measurement to another within the same system. *Stanford 9*
- Customary
 - Metric
- Page or Location:** 272, 299-303, 304-307, 309, 338-339, 500, 543-548,
 556
17. Solve measurement problems by using mental math, paper and pencil, and estimation techniques as well as appropriate units of measure. *Stanford 9*
- Time
 - Distance and length
 - Rate
 - Money
 - Weight and mass
 - Perimeter and circumference
 - Temperature
 - Area and surface area
 - Volume
- Page or Location:** 217-223, 367-371, 381-388, 488-493, 543-551,
 557-565, 584-592, 593-598, 599-604, 605-614,
 615-621, 622-629, 650-656, 657-663, 664-670,
 671-679, 680-686 and many other opportunities are
 provided for solving measurement problems in other
 “Practice and Apply” exercises at the end of each
 lesson; “Cumulative Problem Solving” exercises
 throughout each chapter, and "Chapter Assessment"
 exercises at the end of each chapter not included on
 the pages listed.

18. Demonstrate proficiency in measuring to find perimeter, area, and volume using customary and metric units. ***Stanford 9***
Page or Location: 50-51, 217-218, 221, 224-226, 233, 605-614, 615-621, 622-629, 638-639, 650-656, 657-663, 664-670, 671-678, 680-687, 687-689, 689-690, 691-692, 693-694
19. Produce measurements indirectly from similar geometric figures and drawings. ***Stanford 9***
Page or Location: 305, 338-339, 557-565, 584-592, 593-598, 599-604, 680-686
20. Demonstrate proficiency in classifying angles according to their characteristics.
 - Right, acute, obtuse, straight
 - Adjacent, vertical
 - Complementary, supplementary**Page or Location:** 466-472, 488-489, 670
21. Estimate measures of angles and verify results. ***Stanford 9***
Page or Location: 471
22. Recognize the relationship of angles formed by two parallel lines cut by a transversal.
 - Alternate interior
 - Corresponding
 - Alternate exterior**Page or Location:** 517; Note: alternate interior angles and alternate exterior angles not covered

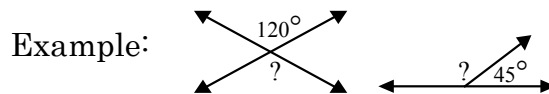
23. Apply properties of plane and solid geometric figures to solve problems.

Stanford 9

- Triangles
- Quadrilaterals
- Regular polygons
- Parallel and perpendicular lines
- Circles
- Rectangular prisms
- Pyramids
- Cones
- Spheres

Page or Location: 217, 221, 233, 336, 388, 473-479, 480-487, 488-494, 584-592, 605-608, 609, 649, 650-656, 657-663, 664-670, 671-679, 680-686

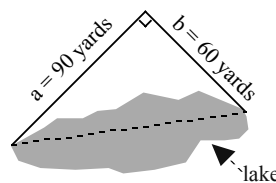
24. Solve problems using relationships between angles.



Page or Location: 466-472, 478-479, 492

25. Recognize and use the Pythagorean Theorem.

Example:



Find the distance across the widest part of the lake as depicted by the dotted segment.

Page or Location: 557-565, 570-573, 574-575, 598, 670, 685

26. Construct geometric figures using a compass and straightedge.
- Perpendicular bisector of a given line segment
 - Angle congruent to a given angle
 - Line segment congruent to a given line segment
 - Congruent triangles
 - A line parallel to a given line through a given point not on the line

Page or Location: 515-517, 521

27. Determine measures associated with plane and solid geometric figures using given formulas. *Stanford 9*
- Perimeter of polygons and irregular figures
 - Circumference of circles
 - Area of circles, polygons, and irregular figures
 - Volume of spheres, prisms, pyramids, cylinders, and cones
 - Surface area of spheres, prisms, pyramids, cylinders, and cones

Page or Location: 50-51, 217-218, 221, 224-226, 233, 605-614, 615-621, 622-629, 638-639, 650-656, 657-663, 664-670, 671-678, 680-687, 687-689, 689-690, 691-692, 693-694

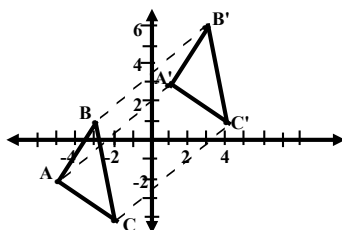
28. Identify components of the Cartesian plane. *Stanford 9*
- x- and y-axes
 - Origin
 - Coordinates of points (abscissa and ordinate)
 - Quadrants

Page or Location: 400-404, 410, 456, 493, 621, 649

29. Explore geometric transformations on the Cartesian plane. *Stanford 9*

- Translations
- Rotations
- Reflections

Example:



Translation of $\triangle ABC$ into $\triangle A'B'C'$

A(-5, -2)
B(-3, 1)
C(-2, -4)

Find coordinates of the vertices of $\triangle A'B'C'$.

Page or Location: 495-500, 501-505, 506-512, 520-521, 649, 678, 685

30. Use computers and graphing calculators to facilitate understanding of coordinate geometry.

Page or Location: 407, 408, 421, 430, 431, 453-455, 457

31. Identify and graph functions on the Cartesian plane.

Examples: $y = 2x + 1$; $f(x) = x^2$

Page or Location: 439-446

**PATTERNS
FUNCTIONS
ALGEBRA**

32. Develop an understanding of rules that represent patterns or relationships that are functions. *Stanford 9*

Example:

RULE $y = 3x$	
x	y
1	3
2	6
3	9

Page or Location: 439-446

33. Develop an understanding of algebraic terms.

- Variable
- Term
- Coefficient
- Constant
- Exponent
- Sentence, equation, inequality
- Phrase, expression

Page or Location: 16-21, 186, 203-206, 273

34. Simplify and evaluate linear algebraic expressions. *Stanford 9*

- Combining like terms
- Using laws of exponents restricted to positive integral exponents
- Using the distributive property
- Using order of operations

Page or Location: 16-21, 24, 25, 28, 33, 36-41, 56, 66, 75, 79, 90, 113, 114, 139, 145, 151, 164, 166, 169, 172, 196, 208, 216, 246, 254-260, 261-265, 266-270, 282, 298, 315, 320, 326, 360, 371, 380, 418, 447, 472, 500, 524-529, 530-534, 549

35. Translate verbal phrases and sentences into symbolic notation. *Stanford 9*

Page or Location: 4-10, 19--21, 33, 57, 66, 79, 138, 139, 144-145, 151, 152, 166-167, 172-173, 174-175, 182-183, 186-191, 192-197, 198-202, 203-210, 211-216, 232-233, 273-277, 278-284, 367-373, 374-380, 381-388, 428-432, 433-438, 487, 505, 510, 511, 534, 563, 583, 614, 649, 677

36. Solve linear equations and inequalities. *Stanford 9*

Page or Location: 186-191, 192-197, 198-202, 203-210, 211-216, 232-233, 240, 257, 259, 264, 265, 269, 270, 273-277, 278-284, 288-289, 290-291, 298, 304-310, 315, 320, 336, 344, 353, 366, 371, 380, 410, 418, 425, 432, 447, 456, 478, 529, 556, 590, 598, 603, 614, 649, 670, 677

37. Use linear equations and inequalities to solve problems. *Stanford 9*

Examples: proportion problems, percent problems, absolute value problems

Page or Location: 186-191, 192-197, 198-202, 203-210, 211-216, 232-233, 260, 264, 265, 270, 273-277, 278-284, 290-291, 294-297, 298, 304-310, 315, 342, 354-361, 367-371, 374-380, 384-386, 397, 487, 505, 510-511, 534, 563 583, 614, 649

38. Demonstrate proficiency in recognizing the commutative, associative, and identity properties.

Page or Location: 24-28, 33, 36-41, 48, 96, 186-191, 192-196

39. Use the properties of rational numbers.

- Distributive Property
- Closure Property
- Associative Property
- Commutative Property
- Identity Property
- Inverse Property

Page or Location: 24-28, 33, 36-41, 48, 58, 96, 114, 140-145, 152, 157, 186-191, 192-196, 199, 206

40. Solve algebraic problems using calculators and computers when appropriate.

Page or Location: 30, 42, 151, 118-120, 124, 226-228, 241, 250, 257, 288-289, 291, 407, 421, 453-455, 527, 539, 553, 570-573, 623, 691-692

PROBABILITY

STATISTICS

DISCRETE MATHEMATICS

41. Analyze and/or extrapolate data from frequency tables, stem-and-leaf plots, histograms, scattergrams, tally charts, single- and multiple-bar graphs, single- and multiple-line graphs, circle graphs, and published studies. *Stanford 9*

Page or Location: 84, 91-99, 100-107, 114-116, 120-121, 122, 125, 128, 129, 133, 138, 159, 160, 191, 221, 246, 627

42. Use mean, median, mode, and range to analyze statistical data. **Stanford 9**

Page or Location: 70-75, 76-79, 80-84, 94-95, 106-107, 118-120, 122-123, 133, 145, 167, 170-171, 172, 176-178, 178-180, 183, 191, 221, 246, 265, 277, 326, 332, 556, 583, 602, 685

43. Identify uses and misuses of statistics in everyday life.

Page or Location: 108-116, 124, 614

44. Conduct a statistical study and use a statistical sampling to make a prediction. **Stanford 9**

Page or Location: 333-337

45. Determine possible outcome(s) of an event and compare with experimental outcomes. **Stanford 9**

Page or Location: 327-332, 337, 339-341, 341-343, 389-390

46. Exhibit an understanding of permutations and combinations. **Stanford 9**

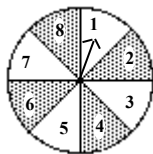
Examples:

<p><u>Combinations</u></p> <p>Mrs. Kyser must choose two students to attend a meeting. Her choices are Sam, Joe, and Karen. In how many ways can she choose two of the three? List them.</p> <p>Answer: 3 ways - Sam, Joe Sam, Karen Joe, Karen</p> <p><u>Permutations</u></p> <p>John, Sue, and Bob are racing. How many different possibilities are there for first, second, and third place winners? List them.</p> <p>Answer: 6 possibilities</p> <table> <thead> <tr> <th><u>1st place</u></th> <th><u>2nd place</u></th> <th><u>3rd place</u></th> </tr> </thead> <tbody> <tr> <td>John</td> <td>Sue</td> <td>Bob</td> </tr> <tr> <td>John</td> <td>Bob</td> <td>Sue</td> </tr> <tr> <td>Sue</td> <td>John</td> <td>Bob</td> </tr> <tr> <td>Sue</td> <td>Bob</td> <td>John</td> </tr> <tr> <td>Bob</td> <td>Sue</td> <td>John</td> </tr> <tr> <td>Bob</td> <td>John</td> <td>Sue</td> </tr> </tbody> </table>	<u>1st place</u>	<u>2nd place</u>	<u>3rd place</u>	John	Sue	Bob	John	Bob	Sue	Sue	John	Bob	Sue	Bob	John	Bob	Sue	John	Bob	John	Sue
<u>1st place</u>	<u>2nd place</u>	<u>3rd place</u>																			
John	Sue	Bob																			
John	Bob	Sue																			
Sue	John	Bob																			
Sue	Bob	John																			
Bob	Sue	John																			
Bob	John	Sue																			

Page or Location: 316-321, 322-326

47. Determine the probability of simple events, complementary events, and mutually exclusive events. **Stanford 9**

Example



Simple event - Pointer stops on 7. The probability is $\frac{1}{8}$.

Mutually exclusive events - Pointer stops on 5 or a shaded wedge. The probability is $\frac{1}{8} + \frac{4}{8} = \frac{5}{8}$.

Complementary events - Pointer stops on 2 on the first spin. Pointer does not stop on 2 on the next spin. The probability that the pointer does not stop on 2 is $\frac{7}{8}$.

Page or Location: 311-315, 322-326, 336-338, 339-341, 344-345, 360, 389-390, 432, 447, 465, 478, 583, 590, 656, 685

48. Recognize and use inductive and deductive reasoning.

Page or Location: See Lesson 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 5.2, 5.4, 5.5, 5.6, 5.7, 7.4

49. Represent a given set in various ways.

- Roster
- Rule

Page or Location: 439-446

50. Use the vocabulary and symbols of set theory.

- Element
- Subset
- Finite set
- Infinite set
- Null (or empty) set
- Equal set
- Intersection
- Union
- Venn diagrams

Page or Location: 439-446

Stanford Achievement, Ninth Edition Advanced 2 objectives not included in this course:

- NUMBER - Distinguish between prime and composite. (addressed in sixth grade)
- Identify the place value of a digit in a decimal. (addressed in sixth grade)
- PATTERNS - Identify missing elements in numeric patterns. (addressed in sixth grade)
- GEOMETRY - Classify polyhedrons. (addressed in seventh grade)
- Identify radius and diameter. (addressed in sixth grade)
- Identify parallel and perpendicular lines. (addressed in fourth grade)
- ROUNDING - Rounding. (addressed in seventh grade)
- ESTIMATION - Identify reasonableness. (addressed in sixth grade)