

# WALDORF SCHOOL OF CAPE COD

## English and Math Skill Goals

Note to Parents:

The attached skill goal summaries for math and English are the result of much study, discussion, and hard work on the part of our grades teachers. These documents were created out of our need and desire to form a common vision of our objectives. It is our purpose to ensure consistency in the presentation and mastery of the foundation skills outlined here while preserving the freedom of teachers to create lessons and activities tailored to the needs and character of their individual classes. Because of this, there has been no attempt here to define teaching tools or methods, or to set a specific time line for the introduction of skills. These guidelines, especially those for the upper grades, have also been written with the intention of maintaining overall parity with other programs, public and private, insofar as this is not inconsistent with our educational philosophy. This document is available in the office and on the school's web site for your review.

There are a few things which must be considered when reading these documents. First of all, they are guidelines, not hard and fast rules. An individual teacher, due to the nature of his or her class, may choose to introduce certain skills or concepts earlier or later than is indicated here. Second, concepts may be, and frequently are, introduced prior to terminology. A third grader, when asked if the class has studied nouns, may answer in the negative because s/he knows of them as naming words. Third, not all children master a skill in the same amount of time, and not all skills are expected to be mastered even in the course of a year. Many, like multiplication facts and grammatical writing, are an ongoing study throughout all the years of elementary education. Fourth, there is often a distinction between what a child can do and what s/he does consistently. Inconsistent application of a skill is not always an indication of lack of understanding; it frequently means simply that additional practice is needed for it to be considered mastered. Additionally, mastery does not always mean perfection. Finally, it must be remembered that it is the nature of Waldorf education that every teacher recreates the curriculum out of his or her own being for the children of a particular class. There will be variations in the manner and sequence of introduction, in the methods and activities used for skill practice and evaluation, and in the content of Main Lesson Books and individual projects and assignments.

We hope that you find this document to be helpful, and would welcome feedback. Please address any comments or questions to the chairperson of the Grades Committee.

The Grades Teachers

**Document History:** First draft by Education committee (Kim Allsup, David Gable, Susan Joslin), 1996; Revisions by Education Committee (David Gable, Jeanne Ionata, Bob Mendenhall), 1998; Revisions by Grades Committee (David Gable, Charlene Haney, Amy Hilbert (chair), Jeanne Ionata, Bev Johnson, Bob Mendenhall, Chris O’Gara), 1999.

**Purpose:** This document is primarily intended to serve as a general guideline for teachers, outlining in broad terms the English skills which should be mastered by the typical student by the end of each year. It is understood that in any class there will be some children who can not master these skills according to this schedule, and others whose innate gifts may carry them beyond these guidelines. It is also understood that an individual typical student may well master the majority of the skills outlined, but still be working on some others at the year’s end, especially if the introduction of the unmastered skills came late in the year. Because of this, this document is not intended to be a hard and fast rule. However, because it is expected that most of the children in a class will have mastered most, if not all of these skills, teachers must plan to introduce the skills during the course of each year and allow time for sufficient skills practice to achieve this goal. It is understood that some of the skills included in this document, such as “follows directions” or “expresses ideas clearly in speech” are not taught in a single lesson, but rather are developed continually throughout the school day and year. It is also understood that some of the included skills relate as much to child development as to teacher performance. This document can be used to give parents an outline of the skills their children should be learning in each grade, and provides a basic standard for the evaluation of student progress and teacher performance. There has been no attempt here to define teaching tools or methods, or methods of evaluation, nor are skills necessarily given in sequential order within a grade level. Further definition of these points and of subskills (e.g., spelling, dictionary use), if deemed necessary, will be attached as addenda to this document.

**Application:** As a standard for student progress, this document serves as a guide for identifying areas of individual weakness and students who may require remedial or tutorial support. If a student falls below mastery in one or two skill areas, there is not necessarily cause for concern. However, if a student falls below mastery in many skill areas, or is sufficiently far below mastery in one or two areas as to indicate severe lack of comprehension, the student should be monitored to determine whether remedial work or tutoring may be required. This document is also intended for use in evaluating teacher performance. It gives advisors and Core faculty a measure by which to assess whether a teacher has planned sufficient lesson time, whether the appropriate skills have been introduced, and whether the scheduling of blocks allows for sufficient skills practice time by the end of the year.

It also provides a guideline for assessing teacher performance on the basis of student progress. If a large number of students fall below mastery in one or more skill areas, this might indicate that the material was not introduced clearly or practiced sufficiently. As stated above, it is understood that in any class there will be students who, because of learning difficulties or special gifts, fall outside the range of typical skills mastery, and this is necessarily taken into account when evaluating teacher performance. However, it is part of a teacher’s responsibility to identify children whose skills are far outside the norm, especially those below the norm, and to make provision, by remedial referral, recommendation of tutoring, or enrichment, for meeting the needs of these children inasmuch as is possible within the scope of the Waldorf School program.

**Skills Mastery:** Education is work in progress. Consequently, mastery of a skill does not mean perfection. For the purposes of this document, mastery is understood to mean that the student consistently uses the skill correctly or appropriately in most contexts, and that s/he can understand when a teacher points out a problem and is able to make corrections appropriately. While many of the skills listed in this document cannot be precisely quantified, a good benchmark for determining mastery is 80% accuracy. Similarly, mastery of a skill by 80% of the students in a class may be taken as an indication that the class has been given an appropriate introduction to and practice of the skill, although some individuals may need additional practice and/or remedial or tutorial support. It is understood that mastery of a skill does not

necessarily include memorization of terminology. For example, while fourth graders are expected to consistently apply correct spelling rules for gerund endings, it is not assumed that they understand what a gerund is or can identify one by name.

**Addenda:** The faculty may, from time to time, determine criteria and methods for student English skills evaluation, define appropriate teaching tools or methods, or define more specifically any of the goals for skill areas which are indicated here in a general way. These will be attached as addenda to this document.

# WALDORF SCHOOL OF CAPE COD

## ENGLISH SKILLS GOALS

### ENGLISH SKILLS GOALS, CLASS 1

- Recognizes and can print all upper case letters
- Knows vowel sounds
- Knows sounds of all consonants except: digraphs, hard/soft letters, initial x, silent consonants (e.g. knife), some medial consonants (e.g. judge), blends.
- Expresses ideas clearly in speech
- Can retell parts of stories heard
- Can retell stories in own words
- Can imitate pronunciation
- Can ask questions for clarification
- Follows directions
- Can verbally describe things and events
- Can read and write own first name

### ENGLISH SKILL GOALS, CLASS 2

- Recognizes and can write all upper and lower case letters in print
- Knows sounds of initial, medial and final consonants
- Knows hard and soft sounds (g, c, y)
- Knows variations in vowel sounds, makes logical choices of vowels and sounds in reading and spelling
- Recognizes: digraphs (ch, sh, th, etc.)  
consonant blends (br, fl, str, etc.)  
vowel digraphs (ea, ie, oa, etc.)  
vowel blends (au, ao, ou, etc.)
- Recognizes common letter groupings, initial and final (st..., str..., ...est, ...ard, ...old, ...ill, ...ick, ...ed, ...ing, etc.)
- Sounds out short unfamiliar words and letter patterns logically
- Recognizes short familiar words and letter patterns in and out of context
- Recognizes short common words at sight (the, and, to, etc.)
- Can speak in complete sentences
- Expresses ideas clearly in speech
- Reads printed words

### ENGLISH SKILL GOALS, CLASS 3

- Recognizes and correctly uses:
  - all upper and lower case letters, letter groupings, consonant and vowel blends, digraphs, diphthongs
  - rhymes
  - cursive writing for lower case letters
  - words with same meaning (e.g. dirt, soil), opposite meaning (e.g. light, dark), and same sound but different meaning (e.g. led, lead)
  - main parts of speech (called naming words, doing words, etc.): nouns, verbs, adjectives, adverbs, conjunctions
  - capitalizations and end punctuation

- simple spelling rules and letter patterns
  - poetic rhythms (by pattern, not by name)
- Recognizes common letter groupings, initial, medial and final
- Sounds out unfamiliar words
- Invents logical spelling for unfamiliar words
- Recognizes and self-corrects errors in oral reading
- Reads for meaning
- Can paraphrase verbally
- Has established a sight vocabulary of key words (the, and, of, for, from, we, us, them, they, he, she, I, me, do, will, can, fly, walk, sit, sat, etc.)
- Reads from printed text
- Knows common words with unusual letter combinations (...ght, sch..., etc.)
- Expresses ideas clearly in writing (sentence length)
- Can alphabetize by first letter

#### **ENGLISH SKILL GOALS, CLASS 4**

- Recognizes and correctly uses:
  - basic punctuation and capitalization (period, comma, apostrophe, question mark, exclamation point, capital letters)
  - proper and common nouns
  - simple tenses
  - contractions
  - syllabification
  - basic spelling rules (gerund endings, use of hyphen, contractions, doubled consonants, dropping silent e, silent letters, etc.)
  - letter form (salutation, address, envelope, etc.)
  - alliterations
  - rhymes
  - synonyms, antonyms, homonyms (homophones), homographs
  - cursive writing for upper and lower case letters
- Has a basic understanding of the principle parts of speech
- Reads for meaning and with appropriate level of expression (smoothly, with attention to punctuation)
- Can paraphrase verbally (oral book reports, etc.)
- Can use participles, helping verbs, and verb phrases appropriately in speaking and writing
- Can express ideas clearly in speaking (e.g. recall of lesson material, oral reports)
- Uses complete sentences in speaking
- Speaks with appropriate expression
- Can define words from context
- Takes simple dictation
- Maintains understanding and continuity in reading
- Can make simple inferences about material read (e.g. How would you feel if this happened to you? How do you think the character would feel?)
- Alphabetizes by second and third letters
- Has basic dictionary skills (find word, read definition)

#### **ENGLISH SKILL GOALS, CLASS 5**

- Recognizes and and correctly uses:
  - all seven parts of speech
  - complete sentences

- prepositions and prepositional phrases
- nouns and pronouns as subject and object
- possessives
- paragraph structure (main idea, topic sentence)
- regular and irregular verbs
- spelling and usage rules
- basic punctuation (period, comma, apostrophe, exclamation point, question mark, capitalization, quotation marks) participles, helping verbs, verb phrases
- Expresses ideas clearly in speech and writing
- Reads for meaning and with expression
- Distinguishes between narrative and dialogue in reading
- Recognizes plot and subplot
- Reads for information
- Organizes information into provided paragraph/essay structure (e.g. written reports)
- Takes dictation
- Can discuss material read, making logical inferences and drawing logical conclusions

### ENGLISH SKILL GOALS, CLASS 6

- Recognizes and correctly uses:
  - first person, second person, third person
  - subjunctive mood
  - poetic meters, rhyme, alliteration simile, metaphor
  - narrative, expository and descriptive writing
  - prepositional phrase functions (adjective, adverb)
  - noun functions (subject, direct and indirect object, object of preposition)
  - transitive and intransitive verbs
  - conjunctions
  - complete sentences
  - basic punctuation (period, comma, apostrophe, exclamation point, question mark, capitalization, quotation marks, semicolon)
  - all parts of speech
  - state of being verbs
- Recognizes run-ons and fragments
- Reads for meaning and with expression
- Expresses ideas clearly in speech and writing
- Can paraphrase verbally and in writing
- Reads for information
- Takes notes from text
- Takes extensive dictation (several paragraphs)
- Uses simple report format (cover, report, biblio)
- Can write reports using a provided structure
- Can read and follow an outline
- Can make logical plot inferences on the basis of plot/character analyses
- Can discuss basic elements of style (e.g. Why did the author choose this wording? Why might this description be more/less detailed than another?)
- Can understand and complete simple word analogies

## ENGLISH SKILL GOALS, CLASS 7

- Recognizes and correctly uses:
  - conjunctions (coordinating, correlative and subordinating)
  - subject/verb agreement
  - clauses and phrases
  - colon, semicolon and hyphen
  - all basic punctuation and capitalization introduced through grade 6
  - sentence and paragraph structure
  - essay form ( main idea, thesis statement, concluding paragraph)
  - complete sentences
  - pronouns, relative pronouns, and pronoun cases
  - poetic rhythms, meter, rhyme and alliteration
  - linking verbs
  - nouns and pronouns and their main functions (subject, direct object, indirect object, object of preposition)
  - prepositional phrases and their functions (adjective and adverb)
- Recognizes and corrects errors in grammar, usage, spelling and mechanics
- Recognizes and corrects run-ons and fragments
- Uses writing to express feeling, moods and aspirations
- Reads for meaning and with expression
- Expresses ideas clearly in speech and writing
- Recognizes plot and theme
- Can distinguish between fact and opinion
- Can cite examples from text to support own ideas and conclusions regarding material read
- Can understand and complete word analogies of intermediate difficulty

## ENGLISH SKILL GOALS, CLASS 8

- Recognizes and correctly uses:
  - gerunds
  - infinitives
  - predicate noun, predicate adjective
  - appositives
  - all punctuation and capitalization
  - problem homophones (their, they're, there), homographs, etc.
  - metaphor, simile
  - active and passive voice
  - direct and indirect speech
- Reads for meaning
- Can interpret and paraphrase verbally and in writing
- Can infer author's point of view from contextual clues
- Can recognize and distinguish between plot and theme
- Can recognize and discuss the use of stylistic devices: simile and metaphor, foreshadowing, personification, et ali
- Familiar with life and work of Shakespeare
- Recognizes literary genres:
  - drama: comedy, tragedy, tragicomedy, history
  - fiction, non-fiction, history, biography
  - short story, novel
  - poetic forms: sonnet, haiku, etc.

- Can recognize and complete word analogies
- Can take notes while listening
- Can research and write reports
- Can write and use a simple outline
- Can do teacher guided editing and revising
- Can write simple footnotes or cite sources in text
- In writing, can appropriately use: dependent clauses, complex sentences, perfect tenses, participle phrases, simple similes and metaphors, personification

# WALDORF SCHOOL OF CAPE COD

## MATH SKILL GOALS

### MATH SKILL GOALS, CLASS 1

*TO BE INTRODUCED DURING FIRST GRADE:*

- Recognition of groups as numerical quantities, through 12
- Recognition of all numerals
- Writing of all numerals
- Number concept- whole numbers through 100
- Recognition of written numbers, 1 to 100
- Concrete computation (with manipulatives):
  - Addition, sums through 24
  - Subtraction, minuends through 24
  - Division, dividends through 24
  - Multiplication, products through 24
- Rhythmic counting by ones to 100
- Counting by 2, 5 and 10 to 100
- Counting backward by 2, 5 and 10 from 100
- The four operations as concepts

*TO BE MASTERED BY THE END OF FIRST GRADE:*

- Number concept- whole numbers through 100
- Recognition of groups as numerical quantities through 12
- Numeral recognition- all numerals
- Addition and subtraction facts through 20
- Counting by ones to 100
- Counting backward by ones from 20
- Counting by 5 and 10 to 100
- Counting by 2 to 24
- Basic understanding of four operations

### MATH SKILL GOALS, CLASS 2

*TO BE INTRODUCED BY THE END OF SECOND GRADE:*

- \*Concrete computation (with manipulatives):
  - Addition, sums through 144
  - Subtraction, minuends through 144
  - Multiplication, products through 144
  - Division, dividends through 144
  - Grouping by tens
- Sums of ten (1+9, 2+8, etc.)
- Counting by 3, 6, 9 and 11, forward and backward
- Odd and even numbers
- Zero
- Place value through thousands
- Column addition and subtraction without carrying and borrowing

- Time: natural cycles of the year, seasons, day and night, moon and month, weeks, calendars, analog clock, hours and minutes
- Mental math:
  - Addition, sums through 24
  - Subtraction, minuends through 24
  - Multiplication, products through 24
  - Division, dividends through 24

*TO BE MASTERED BY THE END OF SECOND GRADE:*

- Concrete computation:
  - Addition, sums through 24
  - Subtraction, minuends through 24
  - Multiplication, products through 24
  - Division, dividends through 24
- Counting by 2, 5 and 10 to 100
- Counting backward by 2, 5 and 10 from 100
- Mental math:
  - Addition, sums through 24
  - Subtraction, minuends through 24
  - Multiplication, products through 12
  - Division, dividends through 12
- Sums of ten
- Place value through hundreds

### **MATH SKILL GOALS, CLASS 3**

*TO BE INTRODUCED BY THE END OF THIRD GRADE:*

- Place value through millions
- Carrying and borrowing in addition and subtraction
- Simple bar graphs
- Measurement: linear, volume (tsp, cup, etc.), weight, time, money
  - Time: telling time, division of time into hours, minutes and seconds, simple word problems involving time
  - Money: values of currency, adding quantities concretely and on paper, making change, simple word problems involving money
- \* Borrowing from zero e.g. 
$$\begin{array}{r} 302 \\ - 75 \\ \hline \end{array}$$
- \* Simple word problems

*TO BE MASTERED BY THE END OF THIRD GRADE:*

- Place value through thousands
- Math facts: Times tables through  $n \times 12$  except for 6, 7, and 8; the reciprocal facts in division; adding or subtracting a single digit number from any other number
- Counting by 2, 3, 4, 5, 9, 10 and 11 to 100
- Counting backward by 2, 3, 4, 5, 9, 10 and 11
- Odd and even numbers and zero
- Carrying and borrowing
- Column addition and subtraction

- All time skills to the quarter hour
- All money skills except making change
- Simple money changing (e.g. 5 nickles = 1 quarter)

### MATH SKILL GOALS, CLASS 4

#### TO BE INTRODUCED BY THE END OF FOURTH GRADE:

- Multiplication with carrying
- Fractions: concept introduced
- Addition and subtraction of fractions with common denominators
- Expanding and reducing fractions
- Equivalent fractions (e.g.  $1/2$ ,  $2/4$ ,  $3/6$ )
- Improper fractions: concept introduced
- Mixed numbers: concept introduced
- Factoring
- Finding a common denominator
- Adding and subtracting fractions by finding the common denominator
- Adding and subtracting of mixed numbers
- Graphing: reading simple bar and line graphs
- Simple ratios and reciprocals
- Borrowing from more than one zero e.g. 
$$\begin{array}{r} 1,007 \\ - 69 \\ \hline \end{array}$$
- Averaging with whole numbers, average being a whole number
- Multiplication of 2-or-more digit numbers by 2 digit numbers, e.g. 
$$\begin{array}{r} 247 \\ \times 42 \\ \hline \end{array}$$
- Short division
- Long division with one digit divisor
- Long division with remainder

#### TO BE MASTERED BY THE END OF FOURTH GRADE:

- Place value through thousands
- All times tables learned, able to recite in order
- Multiplication with multiple digit multiplier
- Carrying and borrowing
- Borrowing from zero
- Short division
- Long division with one digit divisor
- Long division with remainder
- Recognize and read proper fractions and mixed numbers
- Recognize common equivalent fractions ( $1/2$ ,  $2/4$ ,  $3/6$ ,  $4/8$ ;  $1/4$ ,  $2/4$ ;  $1/3$ ,  $2/6$ ;  $2/3$ ,  $4/6$ ;  $3/4$ ,  $6/8$ )
- Simple expanding and reducing of fractions
- Adding and subtracting fractions with common denominators

## MATH SKILL GOALS, CLASS 5

*TO BE INTRODUCED BY THE END OF FIFTH GRADE:*

- Short division with 2 digit divisor
- Long division with 2 digit divisor
- Decimal notation
- Decimal/fraction equivalents
- Changing fractions to decimal form
- Changing decimals to fraction form
- Ratios: concept introduced, expanding and reducing
- All four operations applied to numbers with decimals, fractions and mixed numbers
- Reciprocals
- Prime factorization
- Least common multiples
- Highest common factors
- Prime numbers
- Square numbers and cubes
- Raising numbers to the 2nd and 3rd power
- Dividing fractions
- Percents:
  - finding a given percent of a whole number ( $\text{part} = \text{whole} \times \%$ )
  - finding the percent given the whole and the part ( $\% = \text{part} \times 100 / \text{whole}$ )
- Equivalence of fractions, decimals and percents
- Decimal/fraction/percent conversions
- Averaging with whole numbers, average being a fraction or mixed number

*TO BE MASTERED BY THE END OF FIFTH GRADE:*

- All skills introduced by the end of fourth grade
- Recognize common fraction/decimal equivalents
- Recognize prime numbers, squares
- Averaging
- Changing improper fractions to mixed numbers and visa versa
- Simple expanding and reducing of ratios
- Simple computations with decimals

## MATH SKILL GOALS, CLASS 6

*TO BE INTRODUCED BY THE END OF SIXTH GRADE:*

- Unit Pricing:
  - Finding price given cost and units ( $\$/u = \$ \div u$ )
  - Finding cost given unit price and units ( $\$ = \$/u \times u$ )
  - Finding units given unit price and cost ( $u = \$ \div \$/u$ )
- Discounting:
  - Finding Discount from Rate of discount and Price ( $D = R \times P$ )
  - Finding Sale price from Discount and Price, etc.
    - $S = P/D$
    - $P = S + D$
    - $D = P - S$

- Finding Rate of discount from Discount and Price ( $R = D/P$ )
  - Finding Price from Discount and Rate of discount
  - Finding Price from Discount and Rate of discount ( $P = D/R$ )
- Ratios:
  - Comparing ratios
  - Expressing word problems in ratio form
  - Ratios with three or more elements
  - Expressing ratios in fraction form
- Taxes and tips:
  - mentally calculating 5% and 15%
- Simple Interest and compound interest
- Percents expressed as fractions or decimals
- Graphs and charts (bar graphs, line graphs, pictographs, pie charts):
  - Understanding what type of graph best represents certain data
  - drawing and interpreting graphs and charts
  - problem solving with graphs and charts
- Percents:
  - Finding whole from percent and part ( $W = \frac{P}{\%}$  [in decimal form])
  - Solving word problems involving percents
- Metric System

*TO BE MASTERED BY THE END OF SIXTH GRADE:*

- All arithmetic skills introduced before the end of fifth grade
- Ratios:
  - expanding and reducing
  - expressing word problems in ratio form
- Computations involving simple percents
- Solving word problems involving simple percents
- Decimal/fraction equivalents
- All operations using decimals, fractions and mixed numbers
- Fraction/decimal/percent conversions
- Drawing, interpretation and use of charts and graphs

### **GEOMETRY SKILL GOALS, CLASS 6**

- Use of compass and straight edge
- Nature of circles
  - Radius, diameter and circumference
  - Division of a circle into 3, 4, 6, 8, 12 and 24 parts
    - Hexagons and hexagrams
    - Octagons and octagrams
    - Dodecagons and dodecagrams
- Parallel lines, concept and construction
- Perpendicular lines, concept and construction
- Nature, classes and construction of angles
  - Acute
  - Right
  - Obtuse
  - Congruency
  - Bisecting angles

- Alternate and corresponding angles
  - Sum of angles created by intersecting lines
- Nature, classes and construction of triangles
  - Equilateral
  - Right-angled
  - Isosceles
  - Scalene
  - Sum of angles
  - Congruency
- Nature, classes and construction of parallelograms
  - Square
  - Rectangle
  - Area and perimeter

**PRE-ALGEBRA SKILL GOALS, CLASS 7 AND 8  
CLASS 7, ADVANCED STUDENTS**

- Positive and negative integers, number line
- Four operations with positive and negative integers
  - Rules for multiplying and dividing pos x pos, pos x neg, and neg x neg
- Absolute value
- Inequalities
- Use of parentheses
- Powers and exponents
  - multiplying and dividing empowered terms:  $nx \times ny = n(x+y)$
  - adding and subtracting terms with like exponents
- Order of operations
- Combining like terms
- Variable expressions
  - Writing
  - Interpreting
  - Simplifying
- Simple variable equations
  - One step (e.g.  $6n = 42$ )
  - Two step (e.g.  $6n + 5 = 47$ )
  - Writing
  - Solving
- Properties of addition and multiplication (associative and commutative)
- Identity properties of multiplication and addition ( $1n = n$ ;  $n + 0 = n$ )
  - Additive identity and multiplicative identity
- Distributive property:  $(nxa) + (nxb) = n(a+ b)$
- Properties of zero
- Comparison property: if  $a > b$  and  $b > c$ , then  $a > c$
- Simple scientific notation
- Graphing
  - Drawing and interpreting bar, line and pictographs
    - selecting appropriate graphs to express data
  - Graphing inequalities on a number line
  - Co-ordinate plane (Cartesian graph)
    - quadrants
    - plotting points and lines

- Functions
  - Function rule
  - Function table
  - Use of functions in problem solving
- Bases other than ten

### **GEOMETRY SKILLS, CLASS 7**

- Properties of lines
  - parallel
  - perpendicular
  - intersecting
  - sum of corresponding angles
  - congruency of alternate angles
  - bisection
- Nature, classes and construction of triangles
  - Equilateral
  - Right
  - Isosceles
  - Scalene
  - Area and perimeter
  - Relationship of angles and sides
  - Pythagorean theorem
- Nature, classes and construction of quadrilaterals
  - Square
  - Rectangle
  - Rhombus
  - Trapezoid
  - Kite
  - Sum of angles
  - Area and perimeter of quadrilaterals
- Division of a circle into 5 and 10 parts
- Nature of pentagons and pentagrams
- The golden section
  - Geometric forms in plant growth
  - Fibonacci numbers
- Congruent angles
- Similar and congruent polygons

### **ALGEBRA SKILL GOALS, CLASS 8 ADVANCED STUDENTS ONLY**

- Classes of numbers
  - Real numbers
  - Whole numbers
  - Natural numbers
  - Rational numbers
  - Irrational numbers
  - Imaginary numbers
- Sets and Subsets, Venn diagrams
- Positive and negative real numbers

- Simplifying expressions and solving equations
  - Combining like terms
  - Distributing
  - Isolating variable
  - Canceling
- Writing and solving variable equations using real numbers
  - Two step (e.g.  $5n - 4 = 21$ )
  - Multistep (e.g.  $\frac{5n - 4}{3} = 7$ )
- Order of operations applied to multistep variable equations
- Absolute value
- Inequalities
- Problem solving involving inequalities and absolute value
- Functions
  - Function rule
  - Using a function table
  - Use of functions in problem solving
- Polynomials
  - Monomials
  - Binomials
  - Trinomials (depth of mastery will depend on the class)
  - Simplifying polynomials
  - Solving polynomial equations
  - Using polynomials to solve word problems
- Quadratic equations
- Co-ordinate plane (Cartesian graphing)
  - Graphing inequalities
  - Use of graphing formulas (point/slope, slope/intersect, etc.)
  - Using co-ordinate planes in problem solving
  - Solving systems (optional)
- Powers and exponents
  - Negative exponents
- Scientific notation
- Linear equations
  - Solving
  - Graphing on a co-ordinate plane (optional)
- Formulas (eg. volume, area, acceleration)
- Solving word problems using scientific notation, linear equations and formulas
- Radicals, square and cube roots (optional)
  - Simple radical expressions
  - Simple radical equations

### **GEOMETRY SKILL GOALS, CLASS VIII**

- Inscribed Polygons, formed by connecting midpoints of sides
- Nature of circles
  - Methods for determining Pi
  - Finding area and circumference

- Solid Geometry
  - Nature and construction of Platonic solids
    - Tetrahedron
    - Hexahedron (cube)
    - Octahedron
    - Dodecahedron
    - Icosahedron
  - Inscribed solids
  - Surface area and volume of right angled solids
  - Spheres
  - Surface area and volume of spheres
- Conic sections
  - Circle
  - Ellipse
  - Parabola
  - Hyperbola
- The Golden Section
- Logarithmic spirals