Geometry (continued) . . . . . .

Expressing Geometric Properties with Equations (G-GPE)

Translate between the geometric description and the equation of a conic section (1, 2)

- ☐ derive the equation of a circle of given center and radius using the Pythagorean Theorem
- ☐ complete the square to find the center and radius of a circle given by an equation.
- ☐ Derive the equation of a parabola given a focus and directrix

Use coordinates to prove simple geometric theorems algebraically (4)

- ☐ use coordinates to prove simple geometric theorems algebraically (such as a given figure defined by four coordinate points is a rectangle, etc.)

Geometric measurement and dimension (G-GMD)

Explain volume formulas and use them to solve problems (1, 3)

- ☐ give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments
- ☐ use volume formulas for cylinders, pyramids, cones, and spheres to solve problems

Mathematics Practices . . . . . .

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Layout Design & Collaboration

Janis Heigl
janis@esnorthwest.com

Charlotte Hartman
chartman@iinet.com

March 2016

Source Documents:

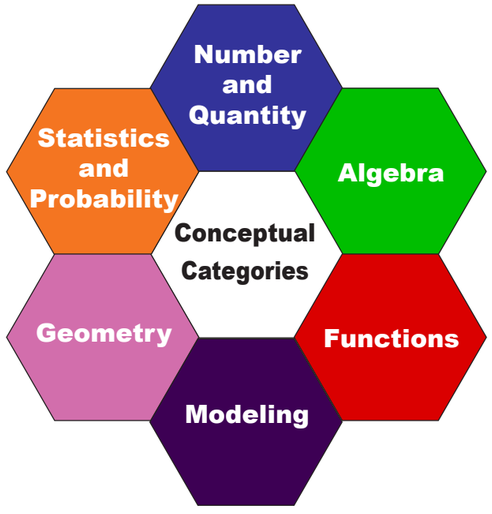
Based on Common Core Standards for Mathematics

Adapted from Escondido Union High School District: "I Can" Statements

Common Core Integrated Math II

Grade 10

Expectations Checklist



COMMON CORE STATE STANDARDS INITIATIVE
PREPARING AMERICA'S STUDENTS FOR COLLEGE & CAREER

Geometry . . . . . .

Congruence (G-CO)

Prove geometric theorems (9, 10, 11)

- ☐ prove theorems about lines and angles
- ☐ prove theorems about triangles
- ☐ prove theorems about parallelograms

Similarity, Right Triangles, and Trigonometry (G-SRT)

Understand similarity in terms of similarity transformations (1a-b, 2, 3)

- ☐ verify experimentally the properties of dilations given by a center and a scale factor:
  - * a dilation takes a line not passing through the center of the dilation to a parallel line, and leaves a line passing through the center unchanged.
  - * the dilation of a line segment is longer or shorter in the ratio given by the scale factor.
- ☐ given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar
- ☐ use the properties of similarity transformations to establish the AA criterion for two triangles to be similar

Prove theorems using similarity (4, 5)

- ☐ prove theorems about triangles
- ☐ use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures

Define trigonometric ratios and solve problems involving right triangles (6, 7, 8)

- ☐ understand similarity in sides of right triangles which leads to definitions of trigonometric ratios for acute angles
- ☐ explain and use the relationship between the sine and cosine of complementary angles
- ☐ use the Pythagorean Theorem to solve right triangles in applied problems

Circles (G-C)

Understand and apply theorems about circles (1, 2, 3, +4)

- ☐ prove that all circles are similar
- ☐ identify and describe relationships among inscribed angles, radii, and chords
- ☐ construct the inscribed and circumscribed circles of a triangle, and prove properties of angles for a quadrilateral inscribed in a circle
- ☐ construct a tangent line from a point outside a given circle to the circle

Find arc lengths and areas of sectors of circles (5)

- ☐ use congruence and similarity criteria for triangles to solve problems and prove relationships in geometric figures

My checklist of what I can do in Integrated Mathematics II – Grade 10 . . . . .

☐ I understand that it is important to apply the mathematical practices (listed on fold-out section) on a regular basis.

Number and Quantity . . . . . .

The Real Number System (N-RN)

Extend the properties of exponents to rational exponents. (1, 2).

- ☐ explain and use definition and properties of rational exponents
- ☐ rewrite expressions involving radicals and rational exponents

Use properties of rational and irrational numbers (3).

- ☐ use properties of rational and irrational numbers

The Complex Number System (N-CN)

Perform arithmetic operations with complex numbers (1, 2)

- ☐ know there is a complex number i such that $i^2 = –1$, and every complex number has the form a + bi with a and b real
- ☐ use the relation $i^2 = –1$ and the commutative, associative, and distributive properties to add, subtract, and multiply complex numbers

Use complex numbers in polynomial identities and equations (7, +8, +9).

- ☐ solve quadratic equations with real coefficients that have complex solutions
- ☐ extend polynomial identities to the complex numbers
- ☐ know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials

Algebra . . . . . .

Seeing Structure in Expressions (A-SSE)

Interpret the structure of expressions (1a-b, 2).

- ☐ interpret parts of an expression such as terms, factors, and coefficients
- ☐ interpret expressions by viewing one part as a single entity
- ☐ use the structure of an expression to identify ways to rewrite it

Write expressions in equivalent forms to solve problems (3a-c).

- ☐ factor a quadratic expression to reveal the zeros of the function it defines
- ☐ complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines
- ☐ use the properties of exponents to transform expressions for exponential functions

Arithmetic with Polynomials and Rational Expressions (A-APR)

Perform arithmetic operations on polynomials (1).

- ☐ understand that polynomials form a system that is closed under addition, subtraction, and multiplication

Creating Equations★ (A-CED)

Create equations that describe numbers or relationships (1, 2, 4).

- ☐ create equations and inequalities in one variable and use them to solve problems
- ☐ create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales
- ☐ rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations

Reasoning with Equations and Inequalities (A-REI)

Solve equations and inequalities in one variable (4a-b)

- ☐ use completing the square to get a quadratic equation into the form $(x – p)^2 = q$ and derive the quadratic formula from this form
- ☐ solve quadratic equations by various methods as appropriate with the original equation; write complex solutions in a ± bi form

Solve systems of equations (7).

- ☐ solve a simple system of linear and quadratic equations algebraically and graphically

Functions . . . . . .

Interpreting Functions (F-IF)

Interpret functions that arise in applications in terms of the context (4, 5, 6)

- ☐ interpret key features of functions such as intercepts, extrema, intervals for increasing and decreasing, etc. in graphs and tables
- ☐ relate the domain of a function to its graph and quantitative relationship in context
- ☐ calculate and interpret the average rate of change of a function over a specific interval using graphs, tables, or symbolic methods

Analyze functions using different representations (7a-b, 8a-b, 9)

- ☐ graph linear and quadratic functions and show intercepts, maxima, and minima
- ☐ graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions
- ☐ use factoring and completing the square in a quadratic function to show zeros, extrema, and symmetry; interpret in context
- ☐ use the properties of exponents to interpret expressions for exponential functions
- ☐ compare properties of two functions given different representations

Building Functions (F-BF)

Build a function that models a relationship between two quantities (1a-b)

- ☐ determine an explicit expression, a recursive process, or steps for calculation from a context
- ☐ build new functions by combining standard function types using arithmetic operations

Build new functions from existing functions (3, 4a)

- ☐ identify the effect on the graph by replacing f(x) with f(x) +k, kf(x), f(kx), and f(x+k) and find values of k given graphs
- ☐ solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse

Linear, Quadratic, and Exponential Models★ (F-LE)

Construct and compare linear, quadratic, and exponential models and solve problems (3)

- ☐ observe using graphs and tables that an exponential function eventually exceeds linear, quadratic, or polynomial functions

Trigonometric Functions (F-TF)

Prove and apply trigonometric identities (8)

- ☐ prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle

How to use checklist:

- Show the date of when you were able to do the math expectation.
- Show an example of what you did in a journal.

Statistics and Probability . . . . . .

Conditional Probability and the Rules of Probability (S-CP)

Understand independence and conditional probability and use them to interpret data (1, 2, 3, 4, 5)

- ☐ describe events as subsets of a sample space using characteristics of the outcomes, or as unions, intersections, or complements of other events
- ☐ understand that two events A and B are independent if and only if P(A and B) = P(A)P(B) and use to determine independence
- ☐ understand and interpret independence of A and B as saying P(A) is the same as the conditional probability when A, B are independent
- ☐ construct and interpret two-way frequency tables of data; use the table as a sample space to decide independence and approximate conditional probabilities
- ☐ recognize and explain the concepts of conditional probability and independence in everyday language and situations

Use the rules of probability to compute probabilities of compound events in a uniform probability model (6, 7, +8, +9)

- ☐ find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret answers in terms of the model
- ☐ apply the Addition Rule P(A or B) = P(A) + P(B) –P(A and B), and interpret the answer in terms of the model
- ☐ apply the general Multiplication Rule in a uniform probability model, P(A and B)=P(A)P(B|A)=P(B)P(A|B)
- ☐ use permutations and combinations to compute probabilities of compound events and solve problems.

Using Probability to Make Decisions (S-MD)

Use probability to evaluate outcomes of decisions (+) (6, 7)

- ☐ Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).
- ☐ Analyze decisions and strategies using probability concepts

Geometry . . . . . .

(Continued on fold-out section of this bookmark)