



## Illinois High School Course Clusters

Updated 4-30-15

The New Illinois Learning Standards have two possible High School pathways (Traditional and Integrated) with three courses each. Each course below lists the appropriate New Illinois Learning Standards Cluster Heading followed by the associated standard(s). These standards have been color coded **Green** = Major Work, **Blue**= Supporting Work, **Yellow**= Additional Work, and aligned with the PARCC Model Content Framework (<http://www.parcconline.org/parcc-model-content-frameworks>). Clarifications, in italics, set expectations when a standard is included in more than one course. The information in each course is not in a specific order and is not intended to be taught in the order provided or in order of color coding.



### Traditional Pathway Algebra 1

In Algebra 1 students will:

- **Use properties of rational and irrational numbers.** (N.RN.3)
- **Reason quantitatively and use units to solve problems.** (N.Q.1,2,3)
- **Interpret the structure of expressions.** (A.SSE.1,2) *Tasks are limited to numerical expressions and polynomial expressions in one variable.*
- **Write expressions in equivalent forms to solve problems.** (A.SSE.3) *For A.SSE.3c tasks are limited to exponential expressions with integer exponents.*
- **Perform arithmetic operations on polynomials.** (A.APR.1)
- **Understand the relationship between zeros and factors of polynomials.** Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial. (A.APR.3) *Tasks are limited to quadratic and cubic polynomials in which linear and quadratic factors are available.*
- **Create equations that describe numbers or relationships.** (A.CED.1,2,3,4) *For A.CED.1 tasks are limited to linear, quadratic, or exponential equations with integer exponents.*
- **Understand solving equations as a process of reasoning and explain the reasoning.** (A.REI.1) *Tasks are limited to quadratic equations.*
- **Solve equations and inequalities in one variable.** (A.REI.3,4)
- **Solve systems of equations.** (A.REI.5,6)
- **Represent and solve equations and inequalities graphically.** (A.REI.10,11,12) *For A.REI.11 tasks will not include exponential and logarithmic functions.*
- **Understand the concepts of a function and use function notation.** (F.IF.1,2,3)
- **Interpret functions that arise in applications in terms of the context.** (F.IF.4,5,6) *Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions, and exponential functions with domains in the integers.*
- **Analyze functions using different representations.** (F.IF.7,8,9) *Tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions, and exponential functions with domains in the integers.*
- **Build a function that models a relationship between two quantities.** (F.BF.1) *Tasks are limited to linear functions, quadratic functions, and exponential functions with domains in the integers.*
- **Build new functions from existing functions.** (F.BF.3) *Tasks are limited to linear and quadratic functions except when experimenting using technology.*
- **Construct and compare linear, quadratic, and exponential models and solve problems.** (F.LE.1,2,3)
- **Interpret expressions for functions in terms of the situation they model.** (F.LE.5) *Exponential functions are limited to those with domains in the integers.*
- **Summarize, represent, and interpret data on a single count or measurement variable.** (S.ID.1,2,3)
- **Summarize, represent, and interpret data on two categorical and quantitative variables.** (S.ID.5,6) *Exponential functions are limited to those with domains in the integers.*
- **Interpret linear models.** (S.ID.7,8,9)



### Traditional Pathway Geometry

In Geometry students will:

- Experiment with transformations in the plane. (G.CO.1,2,3,4,5)
- Understand congruence in terms of rigid motion. (G.CO.6,7,8)
- Prove geometric theorems. (G.CO.9,10,11)
- Make geometric constructions. (G.CO.12,13)
- Understand similarity in terms of similarity transformations. (G.SRT.1,2,3)
- Prove theorems involving similarity. (G.SRT.4,5)
- Define trigonometric ratios and solve problems involving right triangles. (G.SRT.6,7,8)
- Understand and apply theorems about circles. (G.C.1,2,3)
- Find arc lengths and areas of sectors of circles. (G.C.5)
- Translate between the geometric description and the equation for a conic section. (G.GPE.1)
- Use coordinates to prove simple geometric theorems algebraically. (G.GPE.4,5,6,7)
- Explain volume formulas and use them to solve problems. (G.GMD.1,3)
- Visualize relationships between two-dimensional and three-dimensional objects. (G.GMD.4)
- Apply geometric concepts in modeling situations. (G.MG.1,2,3)



Traditional Pathway Algebra 2

In Algebra 2 students will:

- **Extend the properties of exponents to rational exponents.** (N.RN.1,2)
- **Reason quantitatively and use units to solve problems.** (N.Q.2)
- **Perform arithmetic operations with complex numbers.** (N.CN.1,2)
- **Use complex numbers in polynomial identities and equations.** (N.CN.7)
- **Interpret the structure of expressions.** (A.SSE.2) *Tasks are limited to polynomial, rational, or exponential expressions.*
- **Write expressions in equivalent forms to solve problems.** (A.SSE.3,4) *Tasks may include exponential expressions with rational or real exponents.*
- **Understand the relationship between zeros and factors of polynomials.** (A.APR.2,3) *Tasks include quadratic, cubic, and quartic polynomials and polynomials for which factors are not provided.*
- **Use polynomial identities to solve problems.** (A.APR.4)
- **Rewrite rational expressions.** (A.APR.6)
- **Create equations that describe numbers or relationships.** (A.CED.1) *Tasks are limited to exponential equations with rational or real exponents and rational functions.*
- **Understand solving equations as a process of reasoning and explain the reasoning.** (A.REI.1,2) *For A.REI.1 tasks are limited to simple rational or radical equations.*
- **Solve equations and inequalities in one variable.** (A.REI.4)
- **Solve systems of equations.** (A.REI.6, 7) *Tasks are limited to 3x3 systems.*
- **Represent and solve equations and inequalities graphically.** (A.REI.11)
- **Understand the concepts of a function and use function notation.** (F.IF.3)
- **Interpret functions that arise in application on terms of the context.** (F.IF.4,6) *Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.*
- **Analyze functions using different representations.** (F.IF.7,8,9) *Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions.*
- **Build a function that models a relationship between two quantities.** (F.BF.1,2) *For F.BF.1a tasks may involve linear, quadratic, and exponential functions.*
- **Build new functions from existing functions.** (F.BF.3, 4a) *Tasks may involve polynomial, exponential, logarithmic, and trigonometric functions and ability to recognize even and odd functions.*
- **Construct and compare linear, quadratic, and exponential models and solve problems.** (F.LE.2,4) *For F.LE.2 tasks will include solving multi-step problems by constructing linear and exponential functions.*
- **Interpret expressions for functions in terms of the situation they model.** (F.LE.5) *Tasks are limited to exponential functions with domains not in the integers.*
- **Extend the domain of trigonometric functions using the unit circle.** (F.TF.1,2)
- **Model periodic phenomena with trigonometric functions.** (F.TF.5)
- **Prove and apply trigonometric identities.** (F.TF.8)
- **Translate between the geometric description and the equation for a conic section.** (G.GPE.2)
- **Summarize, represent, and interpret data on a single count or measurement variable.** (S.ID.4)
- **Summarize, represent, and interpret data on two categorical and quantitative variables.** (S.ID.6) *Tasks are limited to exponential functions with domains not in the integers and trigonometric functions.*
- **Understand and evaluate random processes underlying statistical experiments.** (S.IC.1,2)
- **Make inferences and justify conclusions from sample surveys, experiments, and observational studies.** (S.IC.3,4,5,6)
- **Understand independence and conditional probability and use them to interpret data.** (S.CP.1,2,3,4,5)
- **Use the rules of probability to compute probabilities of compound events in a uniform probability model.** (S.CP.6,7)



### Integrated Pathway Math 1

In Math 1 students will:

- **Reason quantitatively and use units to solve problems.** (N.Q.1,2,3)
- **Interpret the structure of expressions.** (A.SSE.1) *For A.SSE.1b tasks are limited to exponential expressions, including related numerical expressions.*
- **Write expressions in equivalent forms to solve problems.** (A.SSE.3)
- **Create equations that describe numbers or relationships.** (A.CED.1,2,3,4) *For A.CED.1 tasks are limited to linear or exponential equations with integer exponents. For A.CED.2 & 4 tasks are limited to linear equations.*
- **Solve equations and inequalities in one variable.** (A.REI.3)
- **Solve systems of equations.** (A.REI.5,6)
- **Represent and solve equations and inequalities graphically.** (A.REI.10,11,12) *For A.REI.11 tasks may include linear, polynomial, rational, and absolute value functions.*
- **Understand the concept of a function and use function notation.** (F.IF.1,2,3)
- **Interpret functions that arise in applications in terms of the context.** (F.IF.4,5,6) *Tasks are limited to linear functions, square root functions, cube root functions, piecewise-defined functions, and exponential functions with domains in the integers.*
- **Analyze functions using different representations.** (F.IF.7,9) *For F.IF.7a tasks are limited to linear functions. For F.IF.9 tasks are limited to linear functions, square root functions, cube root functions, piecewise-defined functions, and exponential functions with domains in the integers.*
- **Build a function that models a relationship between two quantities.** (F.BF.1,2) *For F.BF.1a tasks are limited to linear and exponential functions with domains on the integers.*
- **Build new functions from existing functions.** (F.BF.3)
- **Construct and compare linear, quadratic, and exponential models to solve problems.** (F.LE.1,2,3)
- **Interpret expressions for functions in terms of the situation they model.** (F.LE.5)
- **Experiment with transformations in the plane.** (G.CO.1,2,3,4,5)
- **Understand congruence in terms of rigid motions.** (G.CO.6,7,8)
- **Prove geometric theorems.** (G.CO.9.10.11)
- **Summarize, represent, and interpret data on a single count or measurement variable.** (S.ID.1,2,3)
- **Summarize, represent, and interpret data on two categorical and quantitative variables.** (S.ID.5,6) *For S.ID.6a tasks are limited to linear functions and exponential functions with domains in the integers.*
- **Interpret linear models.** (S.ID.7,8,9)



**Integrated Pathway Math 2**

In Math 2 students will:

- **Extend the properties of exponents to rational exponents.** (N.RN.1,2)
- **Use properties of rational and irrational numbers.** (N.RN.3)
- **Reason quantitatively and use units to solve problems.** (N.Q.2)
- **Perform arithmetic operations with complex numbers.** (N.CN.1,2)
- **Use complex numbers in polynomial identities and equations.** (N.CN.7)
- **Interpret the structure of expressions.** (A.SSE.1,2) *For A.SSE.1b tasks are limited to quadratic expressions. For A.SSE.2 tasks are limited to quadratic and exponential expressions, including related numerical expressions.*
- **Write expressions in equivalent forms to solve problems.** (A.SSE.3)
- **Perform arithmetic operations on polynomials.** (A.APR.1)
- **Create equations that describe numbers or relationships.** (A.CED.1,2,4) *For A.CED.1 tasks are limited to quadratic and exponential equations. For A.CED.2 & 4 tasks are limited to quadratic equations.*
- **Understand solving equations as a process of reasoning and explain the reasoning.** (A.REI.1) *Tasks are limited to quadratic equations.*
- **Solve equations and inequalities in one variable.** (A.REI.4)
- **Solve systems of equations.** (A.REI.7)
- **Interpret functions that arise in applications in terms of the context.** (F.IF.4,5,6) *For F.IF.4 & 6 tasks are limited to quadratic and exponential equations. For F.IF.5 tasks are limited to quadratic equations.*
- **Analyze functions using different representations.** (F.IF.7,8,9) *For F.IF.7a tasks are limited to quadratic functions. For F.IF.7e tasks are limited to exponential functions. For F.IF.9 tasks are limited to quadratic and exponential equations.*
- **Build a function that models a relationship between two quantities.** (F.BF.1) *For F.BF.1a tasks may involve linear functions, quadratic functions, and exponential functions.*
- **Build new functions from existing functions.** (F.BF.3) *Tasks are limited to linear and quadratic functions unless experimenting with technology, in which case, tasks are limited to linear functions, quadratic functions, square root functions, cube root functions, piecewise-defined functions, and exponential functions.*
- **Understand similarity in terms of similarity transformations.** (G.SRT.1,2,3)
- **Prove theorems involving similarity.** (G.SRT.4,5)
- **Define trigonometric ratios and solve problems involving right triangles.** (G.SRT.6,7,8)
- **Explain volume formulas and use them to solve problems.** (G.GMD.1,3)
- **Summarize, represent, and interpret data on two categorical and quantitative variables.** (S.ID.6) *For S.ID.6a tasks are limited to quadratic functions. For S.ID.6b tasks are limited to linear functions, quadratic functions, and exponential functions with domains in the integer.*
- **Understand independence and conditional probability and use them to interpret data.** (S.CP.1,2,3,4,5)
- **Use the rules of probability to compute probabilities of compound events in a uniform probability model.** (S.CP.6,7)



### Integrated Pathway Math 3

In Math 3 students will:

- Reason quantitatively and use units to solve problems. (N.Q.2)
- Interpret the structure of expressions. (A.SSE.2) *Tasks are limited to polynomial and rational expressions.*
- Write expressions in equivalent forms to solve problems. (A.SSE.4)
- Understand the relationship between zeros and factors of polynomials. (A.APR.2,3)
- Use polynomial identities to solve problems. (A.APR.4)
- Rewrite rational expressions. (A.APR.6)
- Create equations that describe numbers or relationships. (A.CED.1,2) *For A.CED.1 tasks are limited to rational or exponential equations. For A.CED.2 tasks are limited to simple polynomial, rational or exponential equations.*
- Understand solving equations as a process of reasoning and explain the reasoning. (A.REI.1,2) *For A.REI.1 tasks are limited to simple rational or radical equations.*
- Represent and solve equations and inequalities graphically. (A.REI.11) *Tasks may involve any of the functions listed in the standards.*
- Interpret functions that arise in applications in terms of the context. (F.IF.4,6) *Tasks may involve polynomial, logarithmic, and trigonometric functions.*
- Analyze functions using different representations. (F.IF.7,9) *For F.IF.7e tasks are limited to logarithmic and trigonometric functions. For F.IF.9 tasks may involve polynomial, logarithmic, and trigonometric functions.*
- Build new functions from existing functions. (F.BF.3, 4a) *For F.BF.3 tasks are limited to exponential, polynomial, logarithmic, and trigonometric functions.*
- Construct and compare linear, quadratic, and exponential models and solve problems. (F.LE.4)
- Extend the domain of trigonometric functions using the unit circle. (F.TF.1,2)
- Model periodic phenomena with trigonometric functions. (F.TF.5)
- Prove and apply trigonometric identities. (F.TF.8)
- Make geometric constructions. (G.CO.12, 13)
- Understand and apply theorems about circles. (G.C.1,2,3)
- Find arc lengths and areas of sectors and circles. (G.C.5)
- Translate between the geometric description and the equation for a conic section. (G.GPE.1,2)
- Use coordinates to prove simple geometric theorems algebraically. (G.GPE.4,5,6,7)
- Visualize relationships between two-dimensional and three-dimensional objects. (G.GMD.4)
- Apply geometric concepts in modeling situations. (G.MG.1,2,3)
- Summarize, represent, and interpret data on a single count or measurement variable. (S.ID.4)
- Summarize, represent, and interpret data on two categorical and quantitative variables. (S.ID.6) *Tasks are limited to exponential functions with domains not in the integers and trigonometric functions.*
- Understand and evaluate random processes underlying statistical experiments. (S.IC.1,2)
- Make inferences and justify conclusions from sample surveys, experiments, and observational studies. (S.IC.3,4,5,6)