Correlations to Key Curriculum Press, Discovering Advanced Algebra: An Investigative Approach

This table shows Sketchpad activities you can use with many of the lessons in your textbook. The activities listed come from these activity books: *Exploring Algebra 1 with The Geometer's Sketchpad* (EA1G) and *Exploring Algebra 2 with The Geometer's Sketchpad* (EA2G).

Textbook Lesson	Related Sketchpad Activity			
	Book	**Unit**	**Title**	**Description**
1.4	EA2G	1	Functions Again and Again	Students define an iterated coordinate transformation on a point, and observe and draw conclusions from the orbit.
2.1	EA2G	8	Box and Whiskers	Students change data and explore the effects on a box-and-whiskers plot.
3.2	EA2G	1	Domain and Range	Students explore domain and range of functions, including those with restricted domain or range, using dynagraphs and Cartesian graphs.
3.2	EA1G	8	The Slope-Intercept Form of a Line	Plot points determined by $y = a + bx$ and construct the resulting line and families of lines. This activity is located in the **Supplemental Activities** folder on the CD.
3.3	EA1G	6	Lines of Fit	Approximate a line of best fit to a number of data points, and use the line to make an estimate.
3.3	EA1G	8	The Point-Slope Form of a Line	Examine the effect of each constant on the graph of an equation in the form $y = y_1 + b(x - x_1)$. This activity is located in the **Supplemental Activities** folder on the CD.
3.4	EA1G	6	Lines of Fit	Approximate a line of best fit to a number of data points, and use the line to make an estimate.
3.6–3.7	EA2G	3	Solving Systems of Equations	Students use rate information from two companies to find out which is cheaper for various moves.
Chapter 3 Review	EA2G	3	Solving Systems of Equations	Students use rate information from two companies to find out which is cheaper for various moves.
4.1	EA2G	1	Introducing Dynagraphs	Students explore dynagraphs to develop a feel for functional relationships.
4.1	EA2G	1	From Dynagraphs to Cartesian Graphs	Students make connections between symbolic, Cartesian, and dynagraph representations of functions.
4.1	EA2G	1	Functions Again and Again	Students define an iterated coordinate transformation on a point, and observe and draw conclusions from the orbit.
4.1	EA2G	2	Relations and Functions	Students explore the definitions of relation and function, and develop a vertical line test for functions.
4.1	EA2G	2	The Circumference Function	Students measure, graph, and analyze the function that connects a circle's diameter and circumference.
4.1	EA2G	2	Radius and Arc Length	Students explore the relationship between the radius of a circle and the arc length of a semicircle.
4.1	EA2G	2	Functions in a Triangle	Students measure constructions in a triangle and investigate the relations and their graphs.
4.1	EA2G	2	Functional Geometry	Students explore relations defined by geometric measurements and create graphs, explaining how they decided on the independent variable.
4.2	EA2G	1	Introducing Dynagraphs	Students explore dynagraphs to develop a feel for functional relationships.

Legend: SA = Supplemental Activity

Textbook Lesson	Related Sketchpad Activity			
	Book	Unit	Title	Description
4.2	EA2G	1	From Dynagraphs to Cartesian Graphs	Students make connections between symbolic, Cartesian, and dynagraph representations of functions.
4.2	EA2G	1	Domain and Range	Students explore domain and range of functions, including those with restricted domain or range, using dynagraphs and Cartesian graphs.
4.2	EA2G	1	Functions Again and Again	Students define an iterated coordinate transformation on a point, and observe and draw conclusions from the orbit.
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4.3	EA2G	2	The Circumference Function	Students measure, graph, and analyze the function that connects a circle's diameter and circumference.
4.3	EA2G	2	Radius and Arc Length	Students explore the relationship between the radius of a circle and the arc length of a semicircle.
4.3	EA2G	5	Translating Coordinates	Students translate points in and make connections between the coordinates of a point and its translated image.
4.3	EA2G	5	Translating Functions	Students translate function graphs vertically and horizontally by adding constants to x- and y-values.
4.3	EA2G	6	Modeling Linear Motion: An Ant's Progress	Students model linear motion using parametric equations.
4.4	EA2G	5	Translating Functions	Students translate function graphs vertically and horizontally by adding constants to x- and y-values.
4.4–4.6	EA2G	SA	Function Transformation Game	Students match the graph of a mystery function by choosing a parent function and applying transformations to it.
4.5	EA2G	1	Domain and Range	Students explore domain and range of functions, including those with restricted domain or range, using dynagraphs and Cartesian graphs.
4.5	EA2G	1	Inverse Functions	Students use linked dynagraphs to investigate inverse functions.
4.5	EA2G	5	Rotating Coordinates	Students explore coordinate rotation of figures about the origin by multiples of 90°.
4.5	EA2G	5	Reflecting in Geometry and Algebra	Students explore algebraic associations between the coordinates of a point and its reflected image.
4.5	EA2G	5	Transforming Coordinates	Students perform elementary transformations in the coordinate plane.
4.5	EA2G	5	Reflecting Function Plots	Students reflect function plots across the axes and explore connections between algebraic and geometric transformations.
Legend: SA = Supplemental Activity				

Textbook Lesson	Related Sketchpad Activity			
	Book	**Unit**	**Title**	**Description**
4.5	EA2G	6	Square Root Functions	Students explore the square root function and think about the conditions under which inverse relations are also inverse functions.
4.5 Exploration	EA2G	5	Rotating Coordinates	Students explore coordinate rotation of figures about the origin by multiples of 90°.
4.6	EA2G	5	Reflecting in Geometry and Algebra	Students explore algebraic associations between the coordinates of a point and its reflected image.
4.6	EA2G	5	Transforming Coordinates	Students perform elementary transformations in the coordinate plane.
4.6	EA2G	6	Absolute Value Functions	Students graph and explore the absolute value function, reviewing the point-slope form of linear functions.
4.6–4.7	EA2G	5	Stretching and Shrinking Coordinates	Students investigate the behavior of polygons when the x- or y-values of the vertices are multiplied by various constants.
4.6–4.7	EA2G	5	Stretching and Shrinking Functions	Students stretch and shrink function graphs vertically and horizontally.
4.7	EA2G	5	Reflecting Function Plots	Students reflect function plots across the axes and explore connections between algebraic and geometric transformations.
4.8	EA2G	1	Function Composition with Dynagraphs	Students use dynagraphs to model composite functions.
Chapter 4 Review	EA2G	5	Transforming Odd and Even Functions	Students explore the symmetry in odd and even functions.
Chapter 4 Review	EA2G	1	Odd and Even Functions	Students explore odd and even functions using dynagraphs and transformations.
5.1–5.2	EA2G	6	Exponential Functions	Students graph exponential functions, examine their properties, and use them to model real-world applications.
5.2	EA1G	2	Exponents	Learn principles of exponents by experimenting with repeated multiplication.
5.2	EA1G	2	Zero and Negative Exponents	Use a visual model to understand the behavior of negative exponents.
5.4	EA2G	6	Exponential Functions	Students graph exponential functions, examine their properties, and use them to model real-world applications.
5.5–5.6	EA2G	1	Inverse Functions	Students use linked dynagraphs to investigate inverse functions.
5.5–5.8	EA2G	6	Logarithmic Functions	Students explore the relationships between exponential and logarithmic functions.
5.8 Exploration	EA2G	6	Exponential Functions	Students graph exponential functions, examine their properties, and use them to model real-world applications.
5.8 Exploration	EA2G	6	Logarithmic Functions	Students explore the relationships between exponential and logarithmic functions.
6.2	EA2G	3	Solving Systems of Equations	Students use rate information from two companies to find out which is cheaper for various moves.
6.2	EA2G	5	Translating Coordinates	Students translate points in and make connections between the coordinates of a point and its translated image.
6.2	EA2G	5	Rotating Coordinates	Students explore coordinate rotation of figures about the origin by multiples of 90°.
Legend: SA = Supplemental Activity				

Textbook Lesson	Related Sketchpad Activity			
	Book	Unit	Title	Description
6.2	EA2G	5	Stretching and Shrinking Coordinates	Students investigate the behavior of polygons when the x- or y-values of the vertices are multiplied by various constants.
6.2	EA2G	5	Transforming Coordinates	Students perform elementary transformations in the coordinate plane.
6.3–6.4	EA2G	9	Solving Systems Using Matrices	Students solve a system of equations expressed as a single matrix equation.
6.5	EA2G	3	Graphing Inequalities in Two Variables	Students use a prepared sketch to graph various inequalities in x and y.
6.5	EA2G	3	Graphing Systems of Inequalities	Students use a prepared sketch to solve systems of two and three inequalities.
6.5	EA2G	3	Linear Programming: Swans and Giraffes	Students explore a linear programming problem, writing constraint equations, defining the feasible region, and maximizing a quantity.
6.6	EA2G	3	Graphing Systems of Inequalities	Students use a prepared sketch to solve systems of two and three inequalities.
6.6	EA2G	3	Linear Programming: Swans and Giraffes	Students explore a linear programming problem, writing constraint equations, defining the feasible region, and maximizing a quantity.
Chapter 7	EA2G	4	Parabolas in Vertex Form	Students graph parabolas using the vertex form.
Chapter 7	EA2G	4	Exploring Parabolas in Vertex Form	Students graph parabolas using the vertex form (open-ended).
Chapter 7	EA2G	4	Parabolas in Factored Form	Students investigate the relationship between the factored form of a quadratic function and its graph.
Chapter 7	EA2G	4	Parabolas in Standard Form	Students use the standard form to identify the behavior of the graph when a, b, and c are changed.
Chapter 7	EA2G	4	Changing Quadratic Function Forms	Students change quadratic functions between standard, vertex, and factored forms.
Chapter 7	EA2G	4	The Discriminant	Students calculate and explore the discriminant of a quadratic function.
Chapter 7	EA2G	4	Parabolas: A Geometric Approach	Students construct a parabola geometrically.
Chapter 7	EA2G	4	Parabolas in Headlights and Satellite Dishes	Students construct and explore a two-dimensional model of a parabolic reflector.
Chapter 7	EA2G	4	Conic Reflections	Students explore reflective properties of ellipses and hyperbolas.
Chapter 7	EA2G	4	Modeling Projectile Motion	Students make a Sketchpad model of a basketball's flight, and make the ball go through a basket.
7.1–7.3	EA2G	SA	Quadratic Intercepts	Students derive a quadratic function from the y-intercept and the two x-intercepts.
7.2	EA2G	4	Parabolas in Vertex Form	Students graph parabolas using the vertex form.
7.2	EA2G	4	Exploring Parabolas in Vertex Form	Students graph parabolas using the vertex form (open-ended).
7.2	EA2G	4	Parabolas in Factored Form	Students investigate the relationship between the factored form of a quadratic function and its graph.
Legend: SA = Supplemental Activity				

Textbook Lesson	Related Sketchpad Activity			
	Book	**Unit**	**Title**	**Description**
7.2	EA2G	4	Parabolas in Standard Form	Students use the standard form to identify the behavior of the graph when a, b, and c are changed.
7.2	EA2G	4	Changing Quadratic Function Forms	Students change quadratic functions between standard, vertex, and factored forms.
7.2	EA1G	7	Modeling with Quadratic Equations: Where Are the Giant Ants?	Explore issues of scale to better understand quadratic and linear relationships.
7.3	EA2G	4	Parabolas in Vertex Form	Students graph parabolas using the vertex form.
7.3	EA2G	4	Exploring Parabolas in Vertex Form	Students graph parabolas using the vertex form (open-ended).
7.3	EA2G	4	Changing Quadratic Function Forms	Students change quadratic functions between standard, vertex, and factored forms.
7.3	EA2G	4	Modeling Projectile Motion	Students make a Sketchpad model of a basketball's flight, and make the ball go through a basket.
7.4	EA2G	4	The Discriminant	Students calculate and explore the discriminant of a quadratic function.
7.6	EA1G	7	Factoring Trinomials	Factor trinomials using algebra tiles and investigate the role of the coefficients.
7.7	EA2G	5	Transforming Odd and Even Functions	Students explore the symmetry in odd and even functions.
7.7	EA2G	SA	Function Transformation Game	Students match the graph of a mystery function by choosing a parent function and applying transformations to it.
8.1–8.2	EA2G	6	Modeling Linear Motion: An Ant's Progress	Students model linear motion using parametric equations.
8.3	EA2G	2	Functions in a Triangle	Students measure constructions in a triangle and investigate the relations and their graphs.
8.3	EA2G	7	Right Triangle Functions	Students calculate ratios for right triangles, plotting the values to reveal the graphs of the trigonometric functions.
8.3	EA2G	7	Unit Circle and Right Triangle Functions	Students compare the unit circle definitions and right triangle definitions of trigonometric functions.
8.4	EA2G	2	Functions in a Triangle	Students measure constructions in a triangle and investigate the relations and their graphs.
8.4	EA2G	7	Right Triangle Functions	Students calculate ratios for right triangles, plotting the values to reveal the graphs of the trigonometric functions.
8.4	EA2G	7	Unit Circle and Right Triangle Functions	Students compare the unit circle definitions and right triangle definitions of trigonometric functions.
8.4	EA2G	9	Introduction to Vectors: Walking Rex	Students explore vectors, learning the connection between two ways to describe vectors.
8.4	EA2G	9	Vector Addition and Subtraction	Students add and subtract vectors and explore the commutativity of these operations.
8.5	EA2G	4	Modeling Projectile Motion	Students make a Sketchpad model of a basketball's flight, and make the ball go through a basket.
Legend: SA = Supplemental Activity				

Textbook Lesson	Related Sketchpad Activity			
	Book	Unit	Title	Description
8.6	EA2G	7	Law of Sines	Students explore the Law of Sines and develop a proof.
8.7	EA2G	7	Law of Cosines	Students develop the Law of Cosines by exploring how the Pythagorean theorem fails for triangles without a right angle.
9.1–9.2	EA2G	4	Conic Reflections	Students explore reflective properties of ellipses and hyperbolas.
9.3	EA2G	4	Parabolas in Vertex Form	Students graph parabolas using the vertex form.
9.3	EA2G	4	Exploring Parabolas in Vertex Form	Students graph parabolas using the vertex form (open-ended).
9.3	EA2G	4	Parabolas in Factored Form	Students investigate the relationship between the factored form of a quadratic function and its graph.
9.3	EA2G	4	Parabolas in Standard Form	Students use the standard form to identify the behavior of the graph when a, b, and c are changed.
9.3	EA2G	4	Changing Quadratic Function Forms	Students change quadratic functions between standard, vertex, and factored forms.
9.3	EA2G	4	The Discriminant	Students calculate and explore the discriminant of a quadratic function.
9.3	EA2G	4	Parabolas: A Geometric Approach	Students construct a parabola geometrically.
9.3	EA2G	4	Parabolas in Headlights and Satellite Dishes	Students construct and explore a two-dimensional model of a parabolic reflector.
9.3–9.4	EA2G	4	Conic Reflections	Students explore reflective properties of ellipses and hyperbolas.
9.5	EA2G	3	Solving Systems of Equations	Students use rate information from two companies to find out which is cheaper for various moves.
9.5	EA2G	4	Parabolas in Vertex Form	Students graph parabolas using the vertex form.
9.5	EA2G	4	Exploring Parabolas in Vertex Form	Students graph parabolas using the vertex form (open-ended).
9.5	EA2G	4	Parabolas in Factored Form	Students investigate the relationship between the factored form of a quadratic function and its graph.
9.5	EA2G	4	Parabolas in Standard Form	Students use the standard form to identify the behavior of the graph when a, b, and c are changed.
9.5	EA2G	4	Changing Quadratic Function Forms	Students change quadratic functions between standard, vertex, and factored forms.
9.5	EA2G	4	The Discriminant	Students calculate and explore the discriminant of a quadratic function.
9.5	EA2G	4	Parabolas: A Geometric Approach	Students construct a parabola geometrically.
9.5	EA2G	4	Parabolas in Headlights and Satellite Dishes	Students construct and explore a two-dimensional model of a parabolic reflector.
9.5 Exploration	EA2G	5	Rotating Coordinates	Students explore coordinate rotation of figures about the origin by multiples of 90°.
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Textbook Lesson	Related Sketchpad Activity			
	Book	**Unit**	**Title**	**Description**
9.6–9.8	EA2G	6	Rational Functions	Students explore rational functions as transformations of $y = 1/x$.
10.1	EA2G	2	Radius and Arc Length	Students explore the relationship between the radius of a circle and the arc length of a semicircle.
10.1	EA2G	7	Unit Circle Functions	Students use a unit circle to define the trigonometric functions.
10.1	EA2G	7	Unit Circle and Right Triangle Functions	Students compare the unit circle definitions and right triangle definitions of trigonometric functions.
10.2	EA2G	7	Radian Measure	Students explore the relationship between the length, radius, and central angle of an arc.
10.3	EA2G	5	Translating Functions	Students translate function graphs vertically and horizontally by adding constants to x- and y-values.
10.3–10.5	EA2G	7	Unit Circle Functions	Students use a unit circle to define the trigonometric functions.
10.3–10.5	EA2G	7	Unit Circle and Right Triangle Functions	Students compare the unit circle definitions and right triangle definitions of trigonometric functions.
10.4	EA2G	1	Inverse Functions	Students use linked dynagraphs to investigate inverse functions.
10.6	EA2G	7	Trigonometric Identities	Students use geometric relationships to justify trigonometric identities.
10.7	EA2G	7	Unit Circle Functions	Students use a unit circle to define the trigonometric functions.
10.7	EA2G	7	Unit Circle and Right Triangle Functions	Students compare the unit circle definitions and right triangle definitions of trigonometric functions.
12.5–12.7	EA2G	8	Permutation and Combination	Students explore permutations and combinations of given set of objects.
13.2	EA2G	8	Normal Distribution	Students use a random distribution to explore the normal density curve.
13.6–13.7	EA2G	8	Fitting Functions to Data	Students transform functions to fit data and use a least-squares calculation to judge how good the fit is.
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