Conceptual Activities

Use these interactive open education and/or Desmos resources to build conceptual understanding of mathematical ideas. (*Note*: Activity links will be monitored and repaired or replaced as necessary.)

Transformations, Congruence, and Proof

- Desmos. "Lines, Transversals, and Angles."

  http://www.walch.com/ca/01033

  In this activity, students explore the relationship of angles formed by a transversal and a system of two lines. In particular, students consider what happens when the two lines are parallel versus when they are not.

- Desmos. "Polygraph: Angle Relationships."

  http://www.walch.com/ca/01034

  This activity is designed to spark vocabulary-rich conversations about angle relationships. Key vocabulary terms that may appear in student questions include *parallel*, *transversal*, *adjacent*, *opposite*, *alternate interior*, *corresponding*, *alternate exterior*, *vertical*, and *right*.

- Desmos. "Polygraph: Figure It Out."

  http://www.walch.com/ca/01035

  This activity is intended as an introduction to geometric notation and vocabulary. Depending on prior knowledge, students could use the following to distinguish figures: points, lines, rays, segments, parallel, perpendicular, angles, congruence, midpoints, bisectors, betweenness, collinearity, and more.

- Desmos. "Polygraph: Transformations."

  http://www.walch.com/ca/01025

  This activity is designed to spark vocabulary-rich conversations about transformations. Key vocabulary terms that may appear in student questions include translation, rotation, reflection, dilation, scale factor, preimage, and image.

- Desmos. "Transformation Golf: Rigid Motion."

  http://www.walch.com/ca/10016

  In this activity, students will use their knowledge of rigid motions to maneuver shapes around obstacles in a coordinate plane.

- Illuminations. "Finding Lines of Symmetry."

  http://www.walch.com/ca/10017

  Students will develop their understanding of symmetry using folded paper cutouts.

Triangle Congruence, Proof, and Constructions

- Desmos. "Create My Constructions."

  http://www.walch.com/ca/10013

  In this activity, students will gain familiarity with geometric constructions that can be made using a ruler and straightedge.

- Desmos. "Parallel Lines and Triangles."

  http://www.walch.com/ca/10014

  In this activity, students will investigate the interior angle sum theorem for triangles.

- Desmos. "Parallelograms in the Coordinate Plane."

  http://www.walch.com/ca/10015

  In this activity, students will connect their understanding of slope with geometric understanding of parallel lines. They will determine whether a set of four points in the coordinate plane forms a parallelogram using rate of change arguments.

Similarity, Proof, and Trigonometry

- Desmos. "Special Right Triangles."

  http://www.walch.com/ca/10018

  In this activity, students work with the side length ratios of 45°–45°–90° and 30°–60°–90° right triangles.

- Desmos. "Working with Dilations."

  http://www.walch.com/ca/10019

  This activity is a basic introduction to dilations.

- Illustrative Mathematics. "Mt. Whitney to Death Valley."

  http://www.walch.com/ca/10020

  In this task, students will apply trigonometric ratios to solve a real-life problem.

- Illuminations. "Trigonometry Square."

  http://www.walch.com/ca/10021

  This activity allows students to practice evaluating trigonometric ratios for specific values.

Extending to Three Dimensions

- Inside Mathematics. "Problem of the Month: Cutting Cubes."

  http://www.walch.com/ca/10002

  In this activity, students explore the attributes of polygons, faces, edges, vertices, spatial visualization, counting strategies, classification, and geometric solids.

- Inside Mathematics. "Problem of the Month: Piece it Together."

  http://www.walch.com/ca/10001

  In this activity, students use two- and three-dimensional geometry to solve problems involving polygons and polyhedra.

Connecting Algebra and Geometry Through Coordinates

- Desmos. "Building Conic Sections."

  http://www.walch.com/ca/10022

  In this activity, students will explore the algebraic representations of conic sections. Note: Some of these activities require the equation of a circle.

- Desmos. "Slopes of Parallel and Perpendicular Lines."

  http://www.walch.com/ca/10023

  In this activity, students will investigate the slopes of parallel and perpendicular lines in the coordinate plane.

- Gizmos. "Distance Formula."

  http://www.walch.com/ca/10024

  This activity relates the distance formula to the Pythagorean Theorem. Students will learn to see any two points in the coordinate plane as the endpoints of the hypotenuse of a right triangle.

- Illustrative Mathematics. "A Midpoint Miracle."

  http://www.walch.com/ca/10003

  Students will prove a theorem about quadrilaterals that is somewhat difficult to prove with a straightedge and ruler but relatively easy to prove using coordinates. This task requires that students be comfortable using the formula for the midpoint of a line segment and the parallel line criterion.

Circles With and Without Coordinates

- Desmos. "Circle Patterns."

  http://www.walch.com/ca/01039

  In this activity, students notice similarities and differences in a set of circles. They then use this information to practice writing equations of circles that extend a given pattern or match a given set of conditions.

- Desmos. "Equations of Circles."

  http://www.walch.com/ca/01040

  In this activity, students write equations of circles with different given information. The activity involves writing equations in both standard and general form.

- Desmos. "Sector Area."

  http://www.walch.com/ca/01041

  In this proportional reasoning activity, students explore the relationship between circle area, sector area, and sector angle.