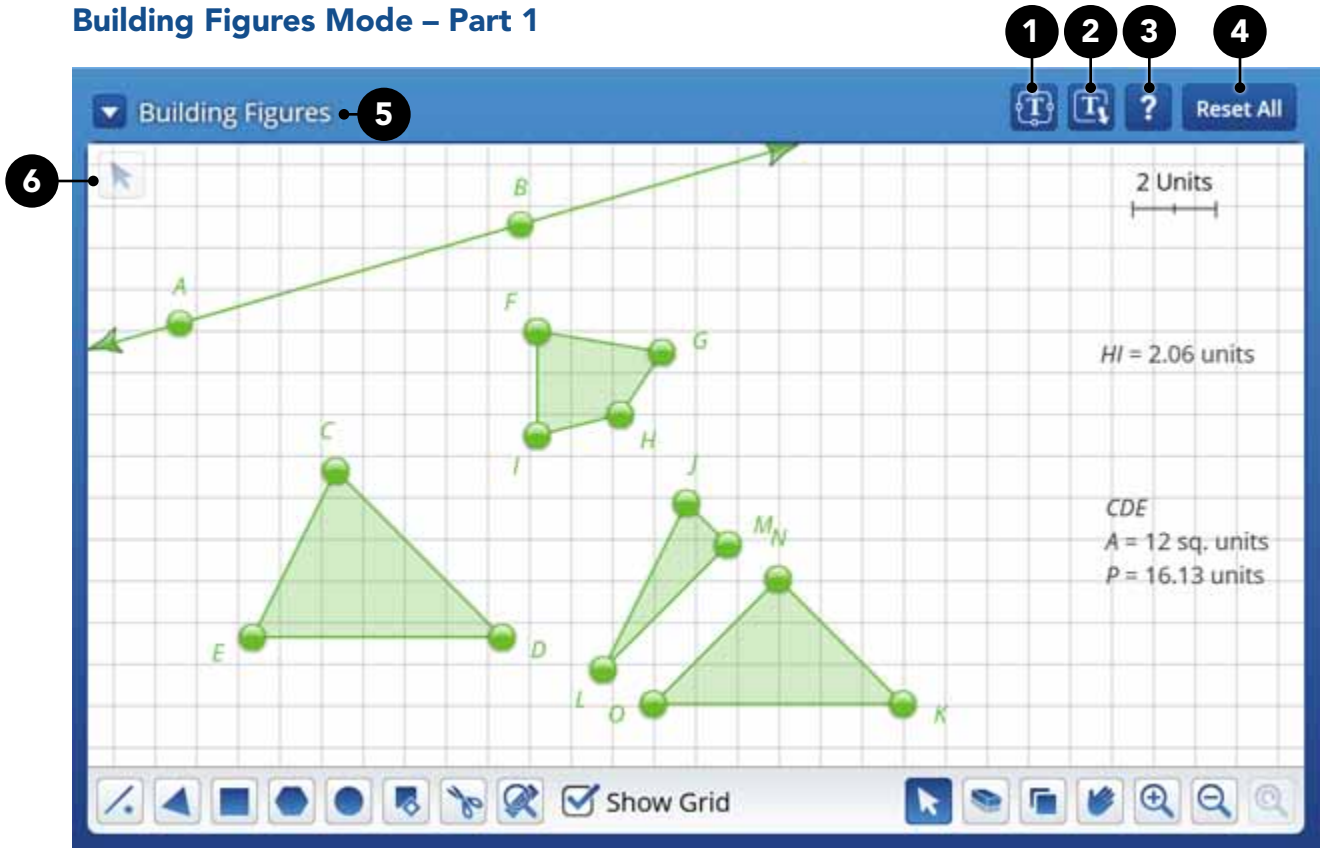
2D Geometry

In this tool, you can construct and manipulate 2-D geometric figures and shapes to discover their properties and help prove theorems and postulates. In addition, you can measure angles, lengths and area of figures and shapes. You can also explore triangles given specific conditions to determine if they are unique.

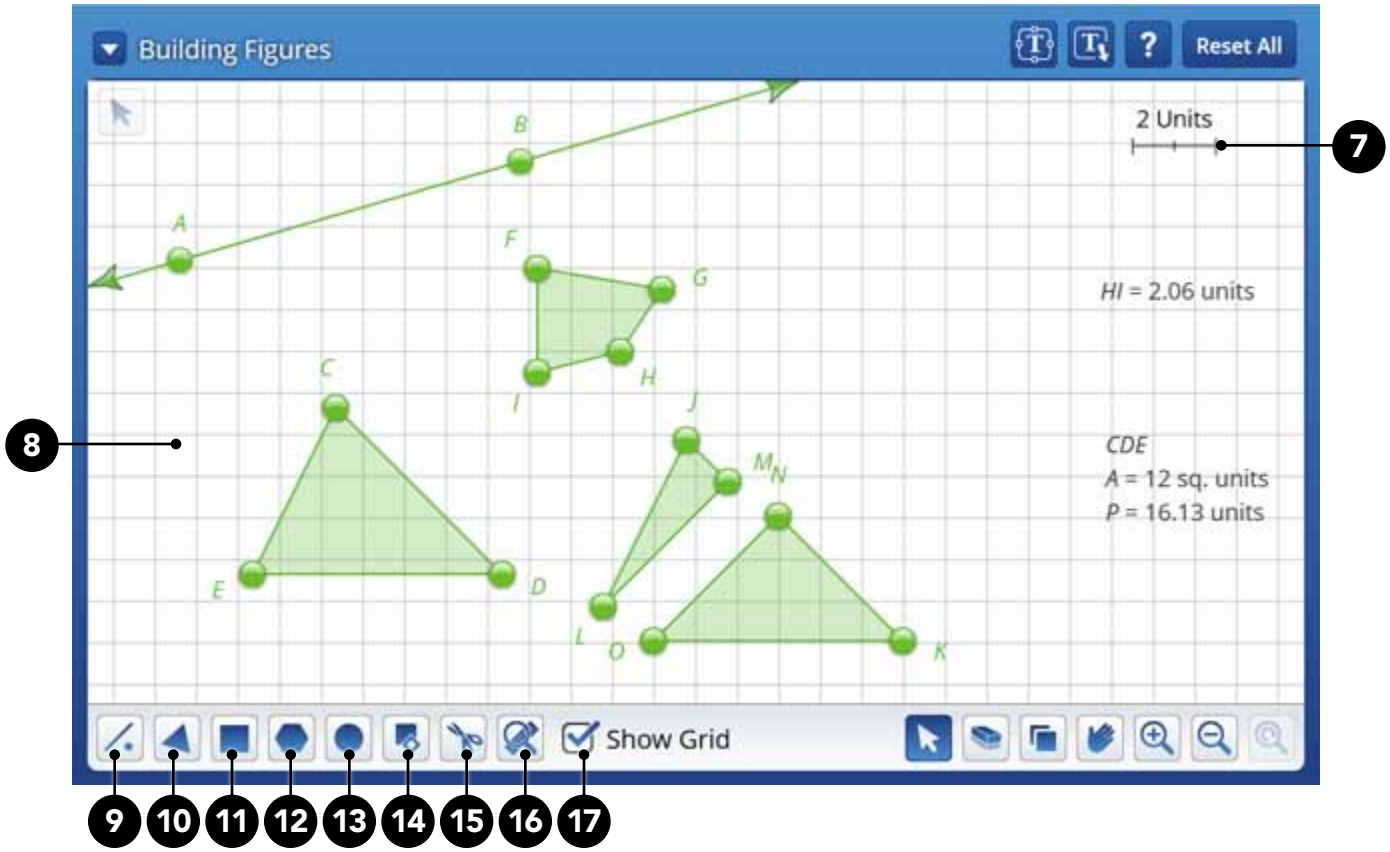
Building Figures Mode – Part 1



1. **Textbox** Add comments to the activity area.
2. **Textbox with Arrow** Add comments to the activity area, using the arrow to focus attention on a particular area.
3. **Help** Launch a help file PDF for the tool.
4. **Reset All** Reset all current work in the activity area for the tool back to the default settings.
5. **Mode Drop-down** Shows all the available modes of the 2-D Geometry tool. Selecting a mode will open the tool to that mode, and save any current work in the mode you were previously working in. There are two modes in the 2-D Geometry tool: Building Figures and Triangle Conditions.
6. **Active Button Display** Shows which of the buttons at the bottom of the tool is currently in use. The next press in the activity area without choosing another button will be represented by the button currently in the display.

(continued on the next page)

Building Figures Mode - Part 2



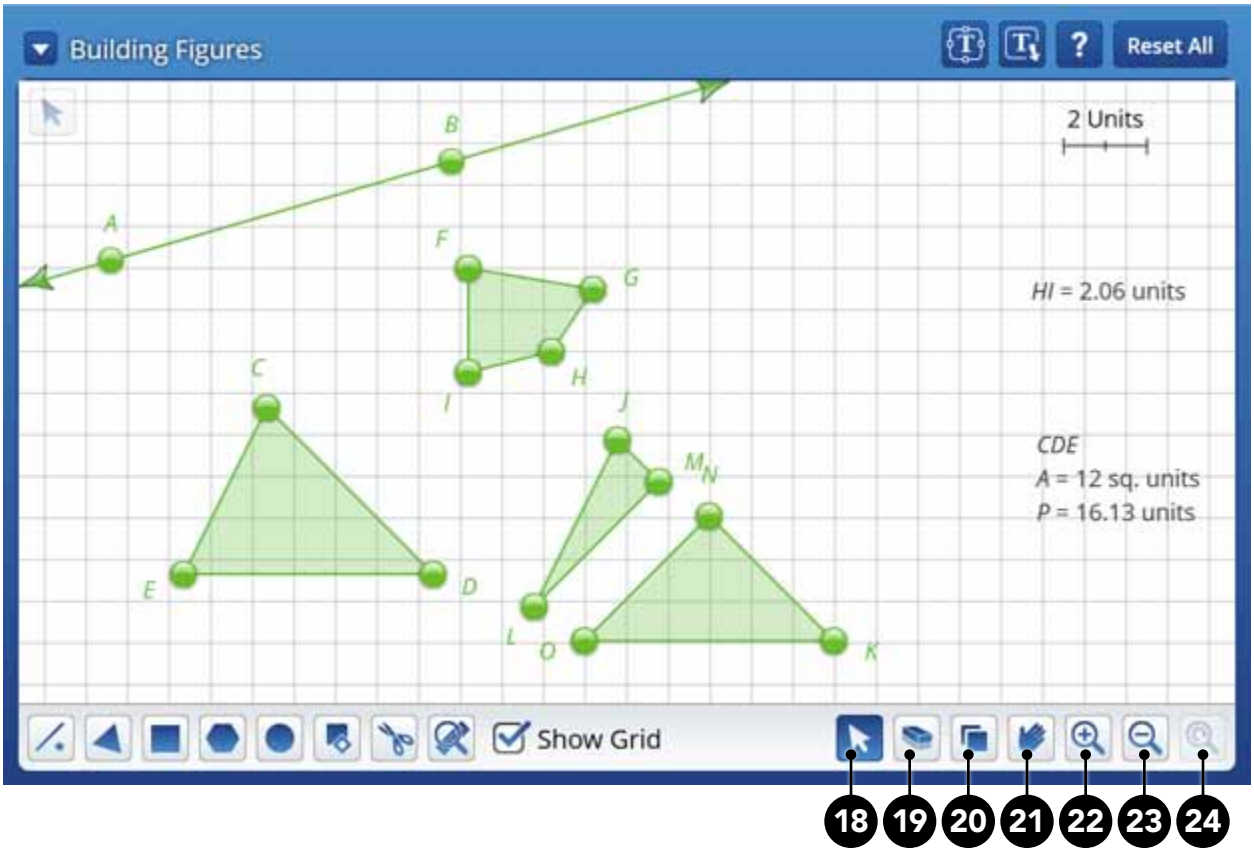
7. **Graph Scale** Shows the relative scale in units currently of the activity area. The scale will update as you zoom-in or zoom-out.
8. **Activity Area** The area of the tool where you can add and manipulate 2-D Figures. There is a limit of 26 points in the activity area from any combination of figures.
9. **Points and Lines Menu Button** When you press the points and lines menu button, a menu appears above the button where you can choose a figure to add to the activity area. Using the menu, you can add lines, rays, segments, angles, points, parallel lines, perpendicular lines, and perpendicular bisectors to the activity area.
10. **Triangle Menu Button** When you press the triangle menu button, a menu appears above the button where you can choose a triangle type to add to the activity area. Using the menu, you can add free-form triangles, right triangles, isosceles triangles, and equilateral triangles to the activity area.
11. **Quadrilateral Menu Button** When you press the quadrilateral menu button, a menu appears above the button where you can choose a quadrilateral type to add to the activity area. Using the menu, you can add free-form quadrilaterals, parallelograms, rhombuses, rectangles, squares, trapezoids, isosceles trapezoids, and kites to the activity area.

(continued on the next page)

12. **Polygon Menu Button** When you press the polygon menu button, a menu appears above the button where you can choose a polygon to add to the activity area. Using the menu, you can add equilateral triangles, squares, regular pentagons, regular hexagons, regular heptagons, regular octagons, and free-form polygons (up to 26 sides) to the activity area.
13. **Circle Button** When you press the circle button, you can add circles to the activity area.
14. **Transformations Menu Button** When you press the transformations menu button, a menu appears above the button where you can choose a transformation to act upon a figure. Using the menu, you can rotate, reflect, scale and translate figures. You can only transform one figure at a time, but you can transform each figure up to three times.
15. **Scissor Button** Using the scissor button, you can cut any polygon into smaller parts. To cut a polygon, you must first select a vertex to cut from, then drag the cut line across the interior of the polygon to another vertex or side. The polygon will then be split in two figures, with any new vertices labeled as appropriate.
16. **Measurement Button** Using the measurement button, you can find several types of measures depending on the figure type and what part of the figure you select. If you select the side of a polygon or the connected part of a segment, you will get a segment length measurement with the labels next to the figure. If you select the interior of a polygon, you will get perimeter and area measures of the figure that will appear next to the figure. If you select a vertex or vertices of a figure, you will get the angle measures for each vertex, labeled as appropriate and displayed near the vertex angle.
17. **Show Grid Checkbox** Using the show grid checkbox, you can choose to show or hide a coordinate grid in the activity area. The coordinate grid will update to match the scale as you change the zoom level of the activity area.

(continued on the next page)

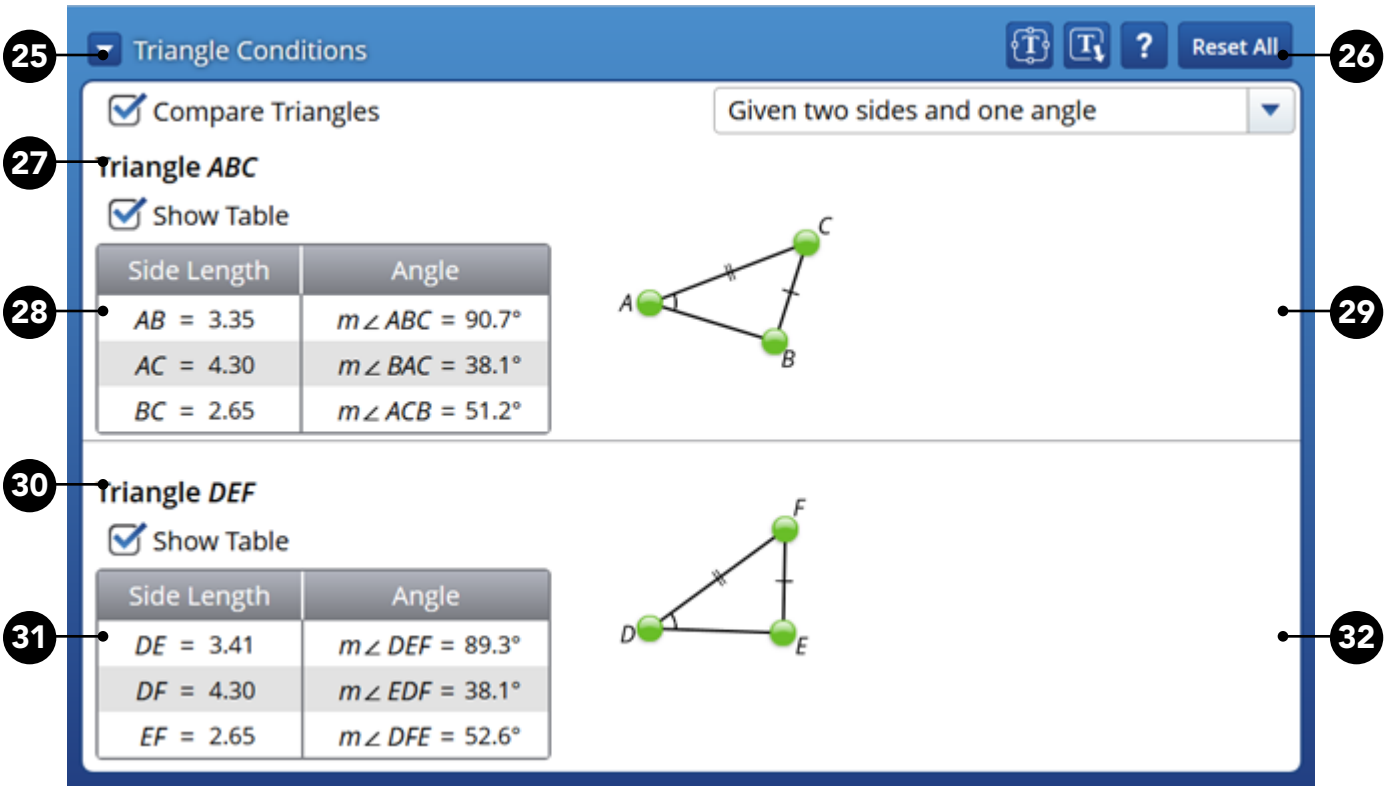
Building Figures Mode – Part 3



18. **Pointer** You can use the pointer to select and manipulate figures in the activity area. Pressing on the interior of a polygon, you can view and change several measurements of that figure. For common polygons, you can also show the height, and center of the figure in the activity area. You can also select to rotate each figure. When you rotate the figure, you cannot change its dimensions.
19. **Eraser** Using the eraser, you can remove figures from the activity area.
20. **Clone** Using the clone button, you can press on any figure in the activity area to create a duplicate. You can use the clone feature until the point limit is achieved in the activity area.
21. **Pan Button** Using the pan button, you can change the area of the graph you are viewing within the current zoom level by dragging the graph.
22. **Zoom-In Button** Using the zoom-in button, you can zoom in to view a smaller portion of the graph. The maximum zoom-in has a scale of 1 units.
23. **Zoom-Out Button** Using the zoom-out button, you can zoom out to view a larger portion of the graph. The maximum zoom out has a scale of 10 units.
24. **Reset-Zoom Button** Using the reset zoom button, you can restore the default zoom level in the tool. The default zoom has a scale of 2 units.

(continued on the next page)

Triangle Conditions Mode



25. Compare Triangles Checkbox When you select the checkbox, you can show triangle *DEF* to compare the corresponding measurements of triangle *ABC*.

26. Triangle Conditions Menu Using the drop-down menu, you can select the triangle conditions for a single triangle, or compare the same conditions to a second triangle. The corresponding sides and angles of the triangle(s) are marked for easy viewing.

27. Show Table Checkbox Triangle *ABC* You can show or hide the table of measurements for all of the angles and sides in triangle *ABC*.

28. Triangle *ABC* Table Shows the values of the measurements of the sides and vertex angles of triangle *ABC*. As you manipulate the triangle, the values in the table update to match.

29. Triangle *ABC* Activity Area Where you can manipulate the vertices of triangle *ABC* to change the measurements of the sides and angles. If you select the interior of the triangle, a menu will appear to allow you to rotate the triangle using its current measurements. You cannot manipulate a vertex of triangle *ABC* so that it will go outside the activity area. If you select compare triangles, you cannot manipulate triangle *ABC* so that a vertex of triangle *DEF* will go outside the activity area.

30. Show Table Checkbox Triangle *DEF* You can show or hide the table of measurements for all of the angles and sides in triangle *DEF*.

(continued on the next page)

31. **Triangle *DEF* Table** Shows the values of the measurements of the sides and vertex angles of triangle *DEF*. As you manipulate the triangle, the values in the table update to match.

32. **Triangle *DEF* Activity Area** Where you can manipulate the vertices of triangle *DEF* to change the measurements of the sides and angles. If you select the interior of the triangle, a menu will appear to allow you to rotate the triangle using its current measurements. You cannot manipulate a vertex of triangle *DEF* so that it will go outside the activity area. If you select compare triangles, you cannot manipulate triangle *DEF* so that a vertex of triangle *ABC* will go outside the activity area.