Are All Constructions Created Equal?		
Description	**Instructor Notes**	**Slides/Handouts/Files**
In this exploration, students will become familiar with the Circle, Compass and line tools in the Plane Geometry view of the Graphs & Geometry Application. They will investigate sketches that appear to be the same, but are constructed differently.	Using a dynamic geometry program opens the door to multiple approaches to problems. This activity is designed to familiarize preservice teachers with the circle, compass & line tools and how to identify the different ways these can be used in constructions. The set of four investigations are designed to provide preservice teachers with ways to assess geometric constructions. Sketches include intersecting circles, families of similar triangles, tangent lines and squares. Students look at both how the sketches are constructed and what that construction can tell you about student understanding. The last problem leads directly into the assigned reading from the **2005 NCTM Yearbook, Technology Supported Mathematics Learning Environments**, (pages 113 – 124) by Daniel Scher, "Square or Not? Assessing Constructions in an Interactive Geometry Software Environment." Each student should work through the activity using their own NSpire handheld and discuss the results of each problem in a small group setting. A good extension of this lesson would be to have students construct their own family of similar polygons such as a right triangle or pentagon. The sketches could be compiled and assessed by the students. To complete these constructions, students would need to know how to measure and calculate. (not included in this lesson.)	Students will need a copy of EqualConstructions.tns loaded onto their TI NSpire or TI NSpire CAS and a copy of the student activity.

Participant Discussion

Questions for discussion after activity is completed:

1. What difficulties did you have in determining how the sketches were constructed?
2. What are the similarities between the sketches? Differences?
3. In each of the problems, was one sketch more right than another? What determines the correctness of a sketch?
4. Use the results of this investigation to create a rubric for evaluating the sketches.
  a. Are there commonalities between the rubrics?
  b. How does the rubric for the tangent line problem compare with your analysis of student learning?
5. Classify the sketches in the tangent line (problem 3) according the classification system in the Scher article.

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