Lesson Title: Compass Designs
Length of Lesson 1 Days
Created By Michael Andre Hamilton
Subject Geometry
Grade Level 10th-12th grade
State Standards Geometry 2a
DOK Level DOK 2
DOK Application Graph, Compare, Estimate Infer, Predict, Interpret, Make Observation, Summarize
National Standards Geometry for 9 – 12th Math Standards
Graduate Research Element Human Factors and Work Physiology

Student Learning Goal:
National Standards for Geometry for 9-12th
A: analyze properties and determine attributes of two- and three-dimensional objects;
B: explore relationships (including congruence and similarity) among classes of two- and three-dimensional geometric objects, make and test conjectures about them, and solve problems involving them;
C: establish the validity of geometric conjectures using deduction, prove theorems, and critique arguments made by others;
D: use trigonometric relationships to determine lengths and angle measures.
State Standards for 9 – 12th Geometry
A: Apply problem solving skills to solve and verify the solutions for unknown measures in similar polygons.

Materials Needed (supplies, hand-outs, resources):
Writing utensils; Notebook paper; White board; Pencil Compasses; Inspiring Minds;

Lesson Performance Task/Assessment:
The students will use pencil compasses to construct geometric figures.

Lesson Relevance to Performance Task and Students:
While constructing figures, they will be able to discover different geometric relationships or suggest new relationships between different shapes. They will also learn how to creating nice geometric designs using the compass. I plan to explain the important of the compass and how civil engineering use this technique in drafting buildings.

Anticipatory Set/Capture Interest:
At the beginning of class, I plan on bring some drawing of common items that the student will recognize. I want to see if they can figure out what the drawings are for before I have to tell them. Second, I plan to show a PowerPoint of different building and the geometric it took to build the buildings.

Guided Practice:
The instructor will guide the student how to create a daisy flower with the compass in 5 steps. The student will complete one step at a time. The steps are listed below:

Step 1: Open your compass to about 2 inches. Make a circle and mark the point at the center of the circle

Step 2: Keep the opening of your compass fixed. Place the compass point on the circle. With the pencil end, make a small arc to intersect the circle

Step 3: Place the compass point on the circle at the arc. Mark another arc. Continue around the circle this way to draw four more arcs – six in all.

Step 4: Place your compass point on an arc you marked on the circle. Place the pencil end at the next arc. Draw a large arc that passes through the circle's center and continues to another point on the circle.

Step 5: Draw six large arcs in this manner, each centered at one of the six points marked on the circle. The final design looks like a daisy.

Independent Practice:

The student will perform each step with the instructor.

Remediation and/or Enrichment:
Remediation
Individual IEP; partner help throughout lesson; shorten parts of assignment; focus on few process

Enrichment:
The lesson can be expanded by providing other drawing for the class to drawing on there own. You could also make a completion were they are given a reward for the best design.

Check(s) for Understanding:

1. In Step 3, did your sixth mark on the circle land precisely on the point where you first placed your compass on the circle? (This is very are to do, but if they succeed it would be perfect)
2. Why accurate geometric designs are important when building structures?

Closure:
Talk about the importance of good geometric drawings and there important in our society.
Possible Alternate Subject Integrations:
*None.
Teacher Notes:
None