Lesson Title:	Triangles in Architecture
Length of Lesson	1 Days
Created By	Michael Andre Hamilton
Subject	Geometry
Grade Level	10^{th}-12^{th} 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 – 12^{th} Math Standards
Graduate Research Element	Human Factors and Work Physiology

Student Learning Goal:

National Standards for Geometry for 9-12^{th}

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 – 12^{th} Geometry

A: Apply problem solving skills to solve and verify the solutions for unknown measures in similar polygons.

Materials Needed (supplies, hand-outs, resources):

- photographs of bridges or other structures which illustrate the polygons—and especially the triangles—of their supporting structure.
- colored strips of card stock (as from manila folders), one inch wide and of varying lengths (from 6" to 10" long); each end of each strip should be hole punched(five per student.)
- round-head paper fasteners (the type with "legs" that fold back, to be used to fasten the ends of the colored strips together) (five per student)
- plastic drinking straws (30 for each team of two students)
- masking tape (one roll for each two students.

Lesson Performance Task/Assessment:

- The students will be able to identify different types of polygons
- They will be able to understand how shape creates rigidity

Lesson Relevance to Performance Task and Students:

The relevance of this lesson is to get the student to understand how the shape of an object creates strength to the object.

Anticipatory Set/Capture Interest:
At the beginning of class, I will show them photograph of different buildings and ask them to tell me the shapes.

Guided Practice:

Show the photographs of the structures to the students and ask what they observe. Lead discussion to the use of polygons, and particularly to the use of triangles.

Ask students to tell you what they know about polygons, leading to review of the definition of the types of polygons.

Tell students you would like each of them to make a polygon with the colored strips and fasteners, and give them a short time (a few minutes) to do so.

Have several students show you the polygons they made and describe them. Get the students to use terms such as "regular," "isosceles," "irregular" as well as the names of the types of polygons.

Select two students who made triangles and two who made other polygons. Have them come to the front of the room and hold up their shapes by one corner. Ask the class what they observe, and lead the discussion to the realization that the triangles are the only shape that doesn't collapse.

Arrange students in teams of two, and make sure the straws and tape are distributed evenly to all teams.

Tell students that each team will have 10 minutes to build a structure with their straws and tape.

After the structures are built, discuss the advantages of using triangles to make structures

Independent Practice:
The students and the instructor will work together in making the shapes. The only independent practice is the 10 minutes they use creating a structure on there own.

Remediation and/or Enrichment:

Remediation

Individual IEP; partner help throughout lesson; shorten parts of assignment; focus on few process

Enrichment:
None

Check(s) for Understanding:
Day 1:

1. Why or triangular structures are strong?
2. What other structures have amount the same rigidity of a triangular structure?

Closure:
Have a end of the class discussion

Possible Alternate Subject Integrations:
*None.

Teacher Notes: