

Exploring Structural Engineering Fundamentals

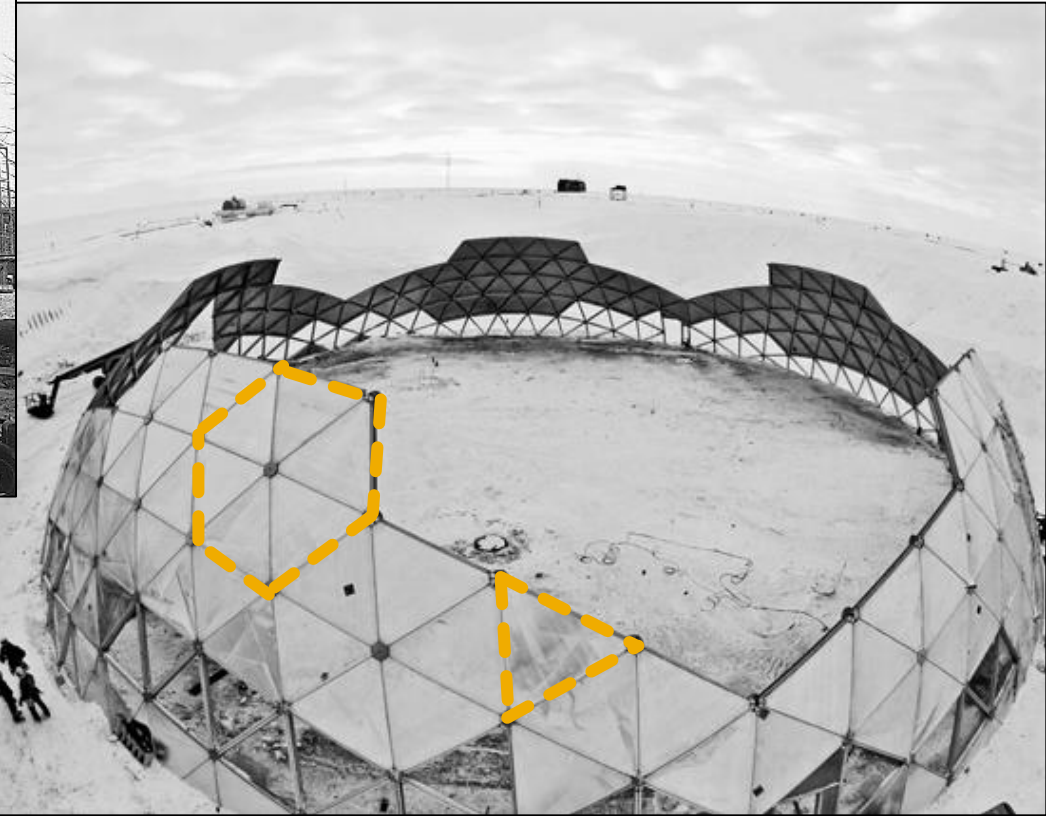
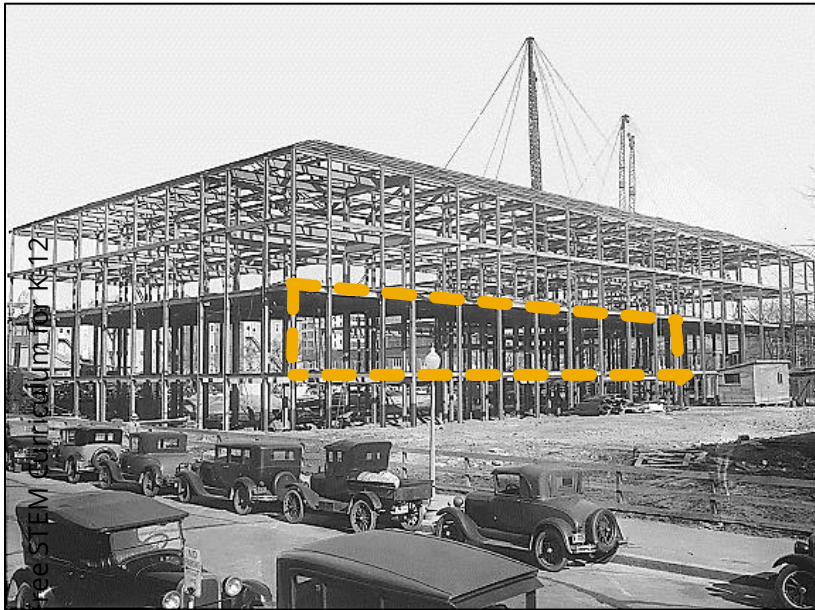
Strength of Shapes

Shapes in Bridges

TeachEngineering.org - Free STEM Curriculum for K-12

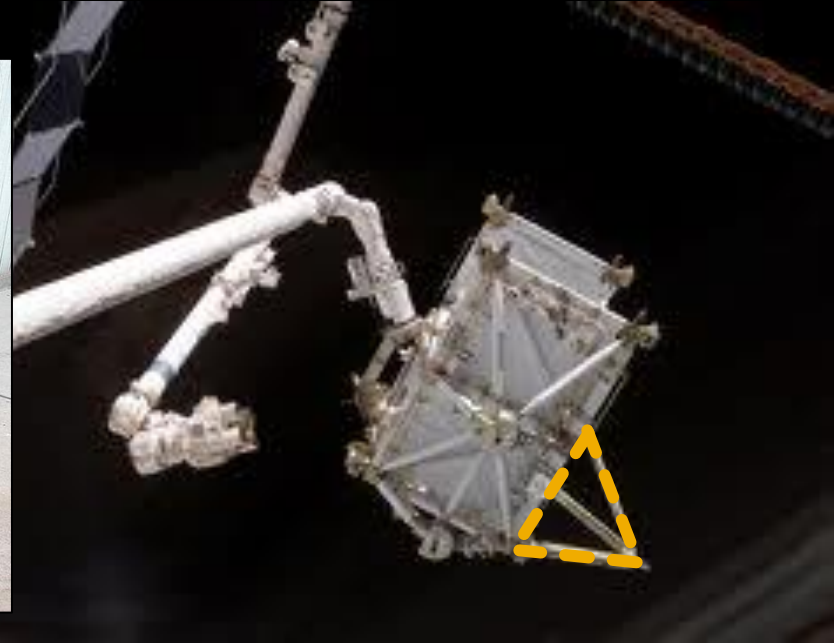
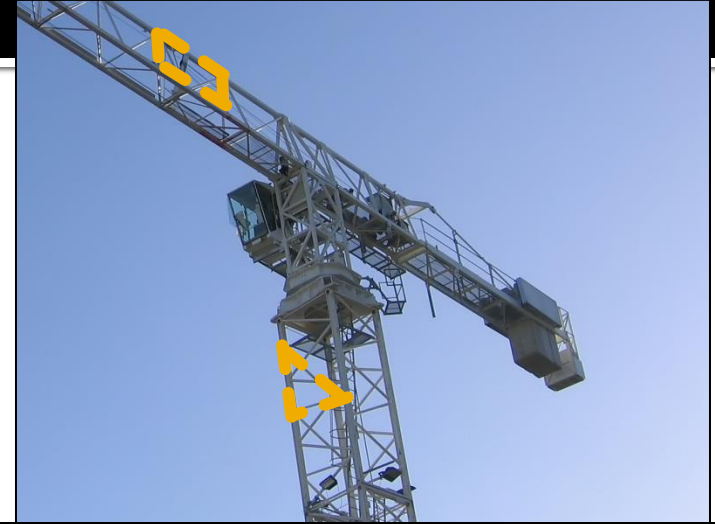


Shapes in Buildings



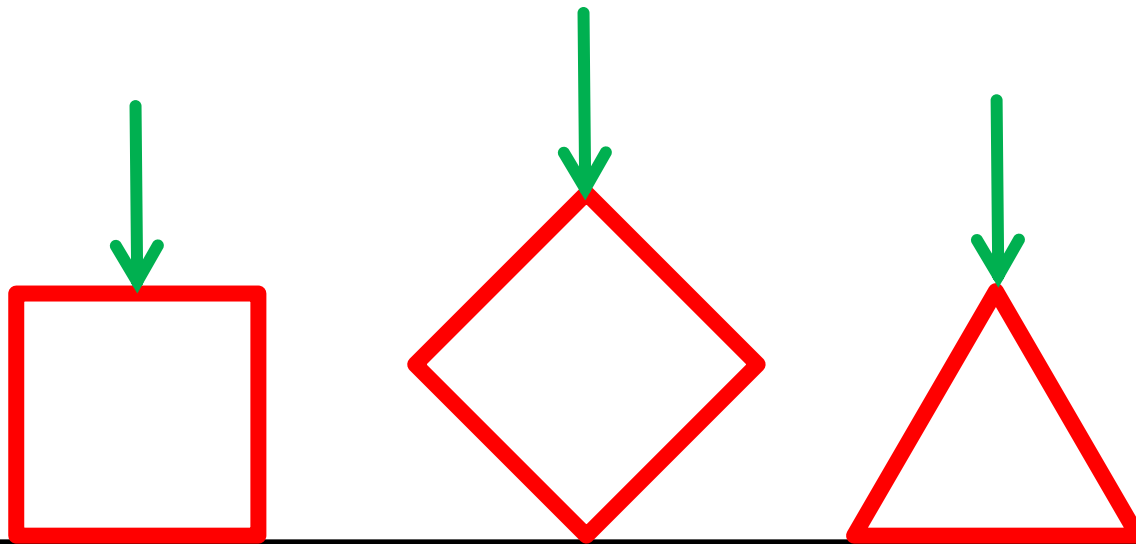
Shapes in Other Things!

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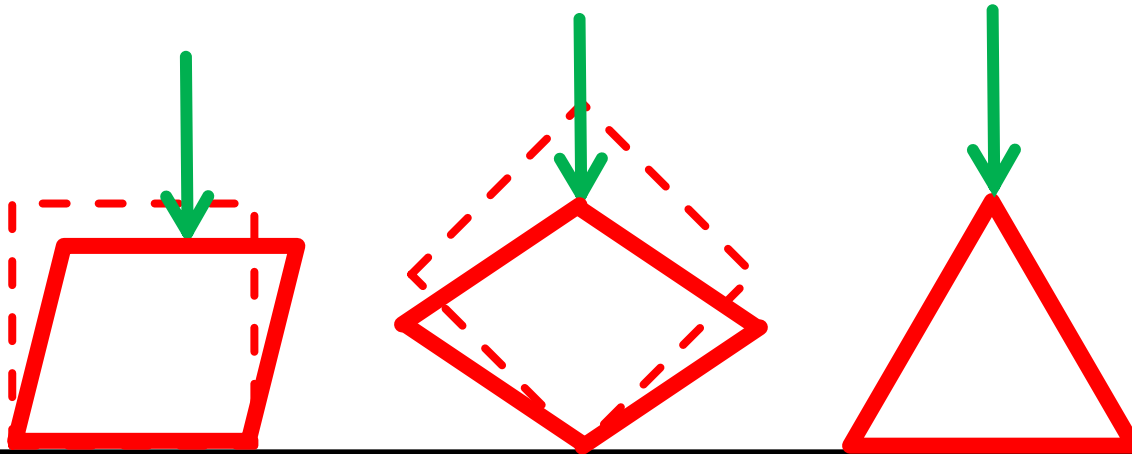
Relative Strength of Shapes

- On your paper, sketch what you think will happen to these shapes if we apply the force shown in **GREEN** (assume the sides are rigid)



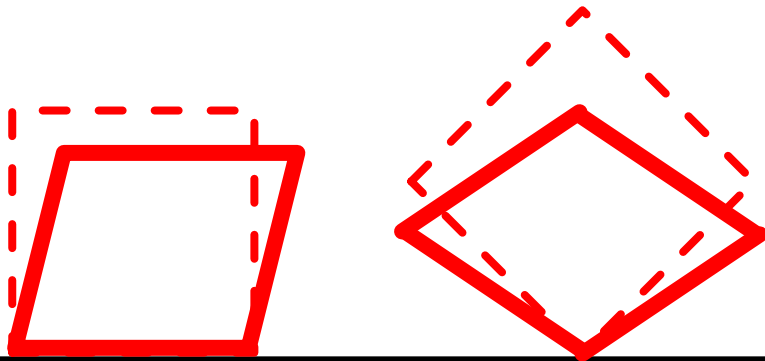
Relative Strength of Shapes

- The TRIANGLE is the only shape that won't collapse!
 - WHY?



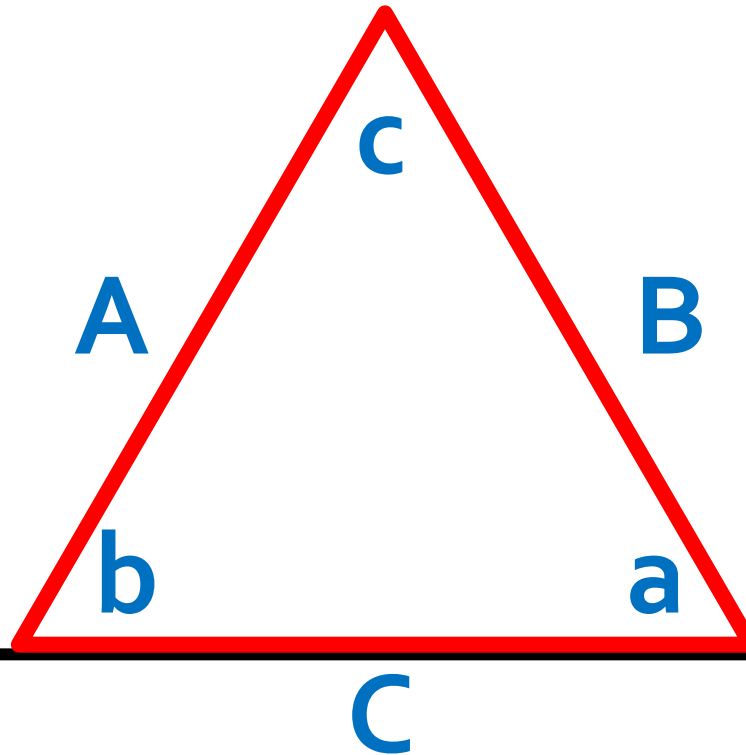
Relative Strength of Shapes

- The other shapes collapse because the **angles** between the structural members change.



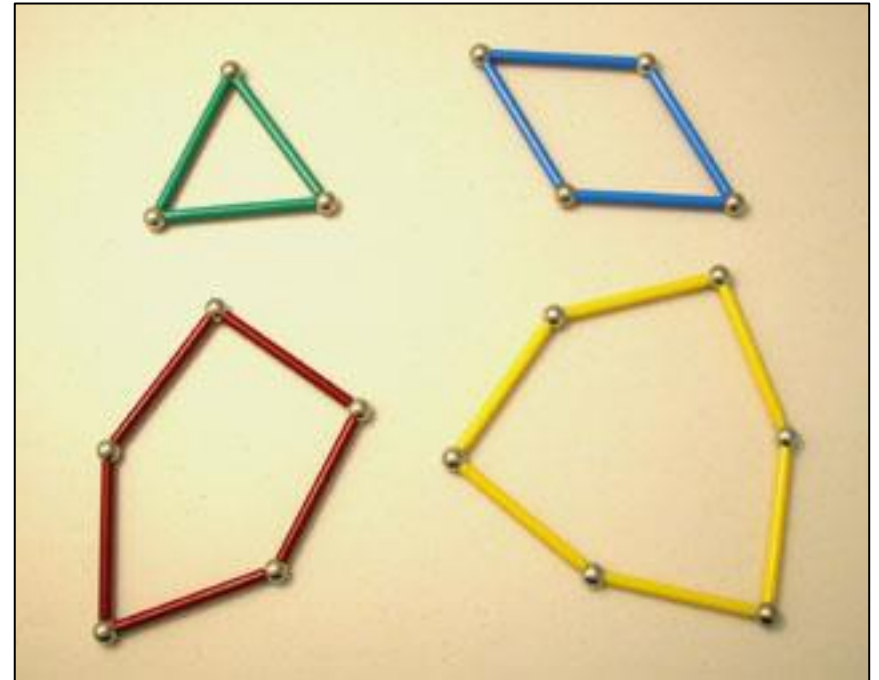
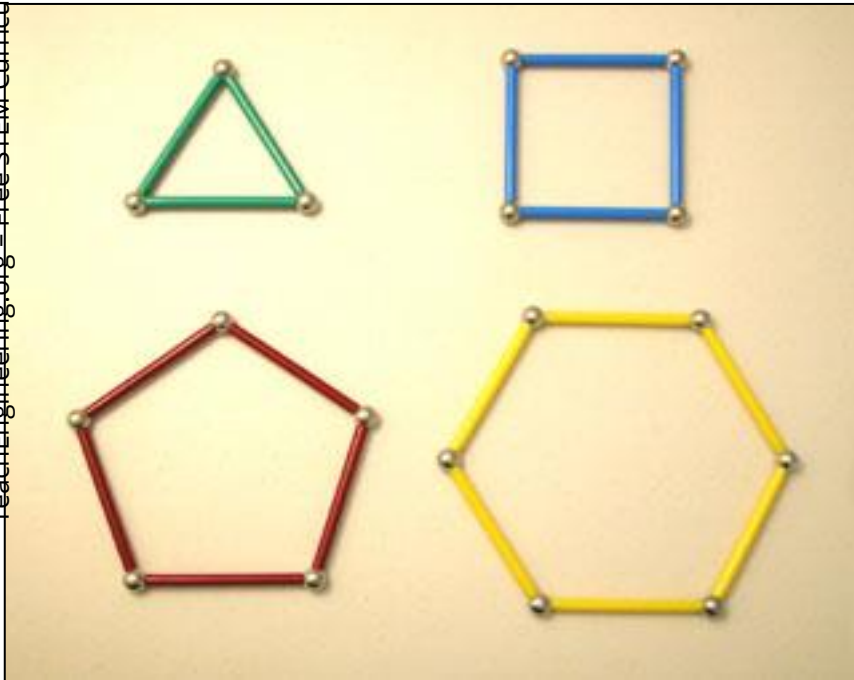
Triangles

- The **TRIANGLE** cannot collapse because the **angles** are fixed based on the opposite side length.



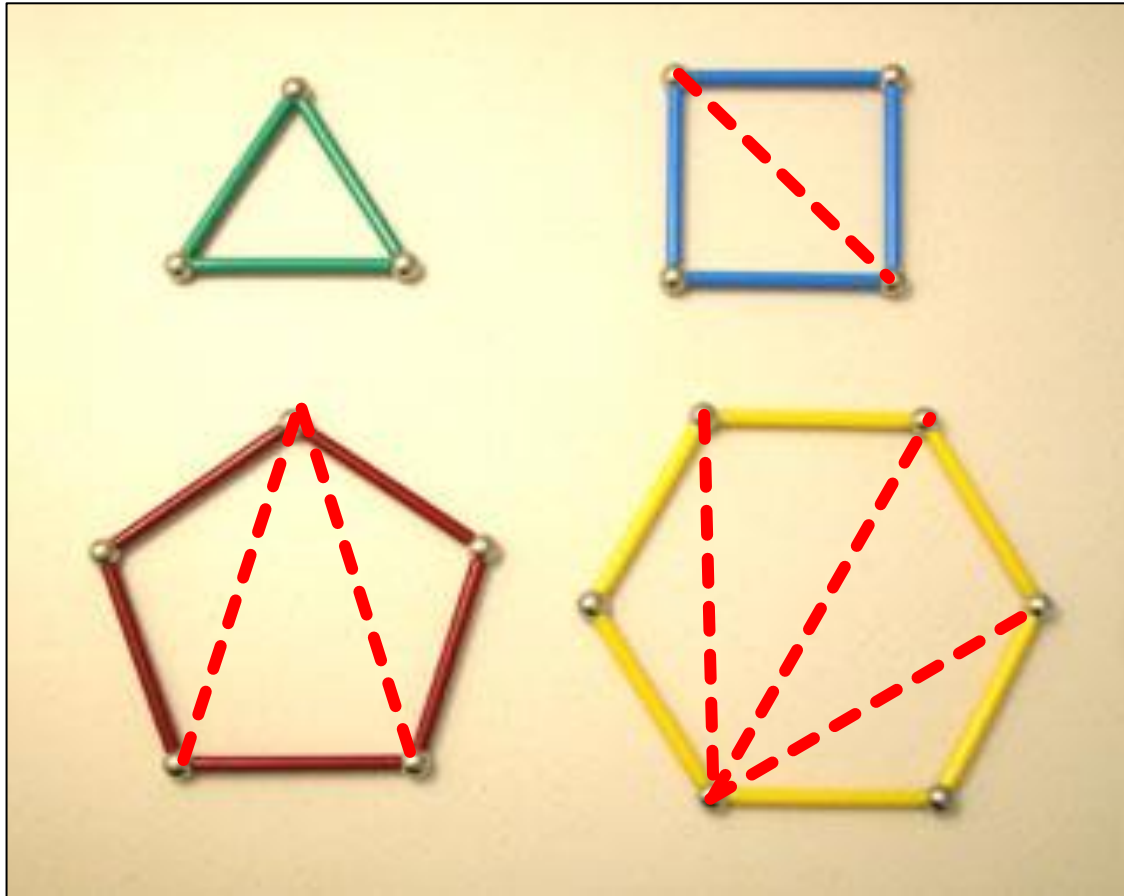
Relative Strength of Shapes

- All other shapes can be **deformed** because the angles are not fixed. **Draw** these shapes in a way that will keep them from collapsing.



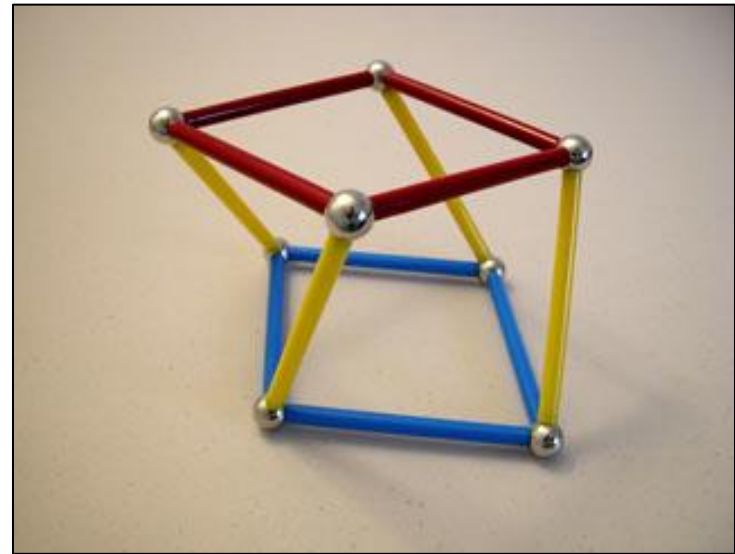
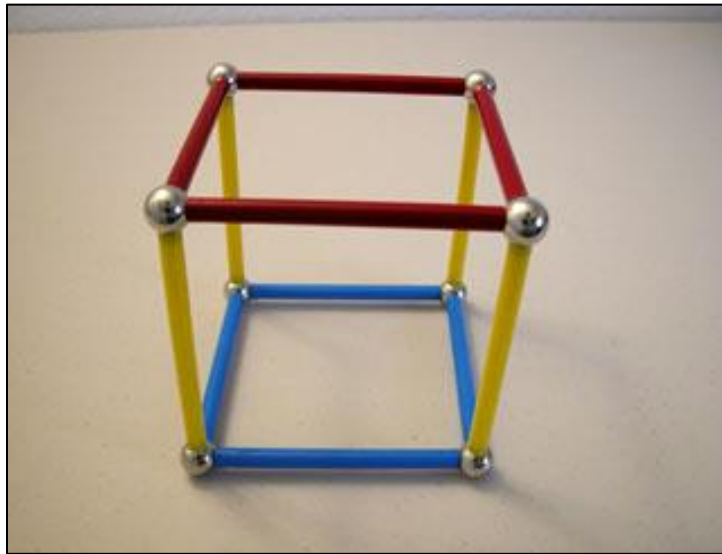
Relative Strength of Shapes

- Make **TRIANGLES!**



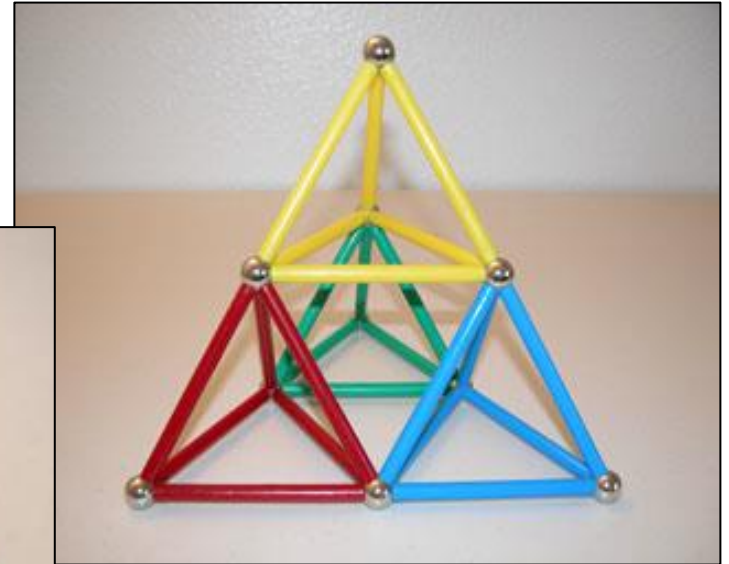
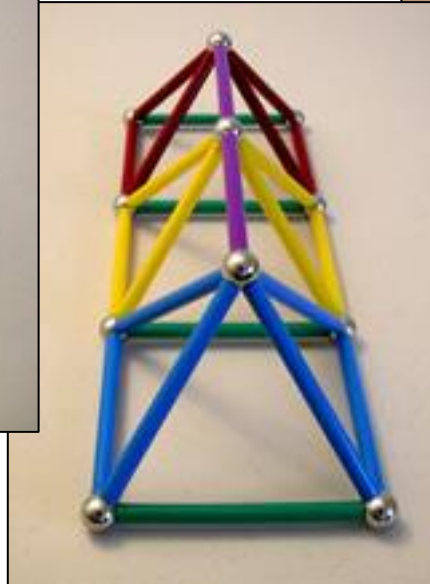
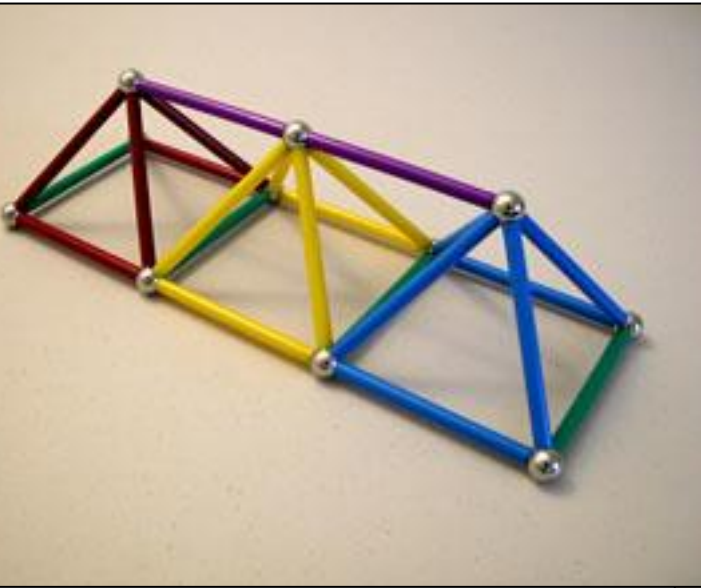
3D Shapes

- The same thing applies in 3D



3D Trusses

- The same thing applies in 3D



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Strength of Shapes