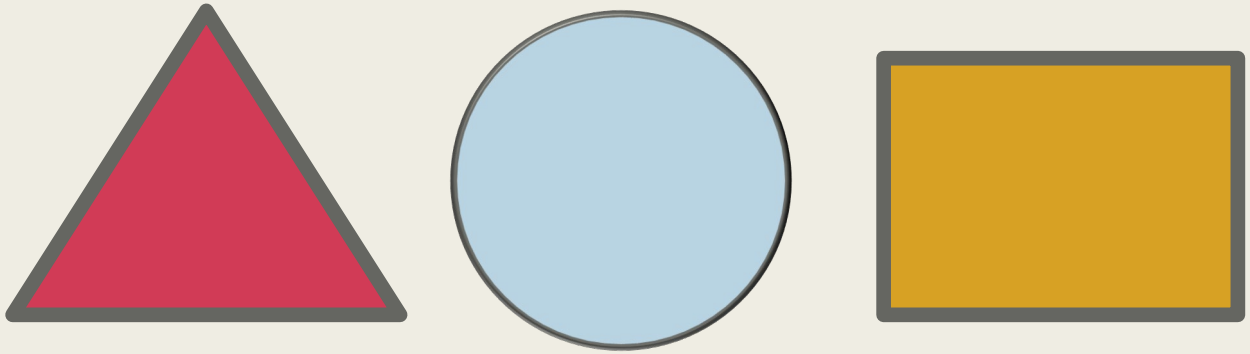
WHAT MAKES A BUILDING STRONG?

THE ENGINEERING DESIGN PROCESS



The Engineering Design Process

STEPS in the Design Process

- Find the need.
- Define the problem.
- Brainstorm to come up with ideas.
- Select the most promising design.
- Plan and manage the project.
- Build-test-refine the design.

Engineering : inventing and building things for the benefit of society.

https://www.khanacademy.org/partner-content/49ers-steam/49ers-gridiron-eng/49ers-innovations-equipment/v/engineering-design-process

The Engineering Design Process

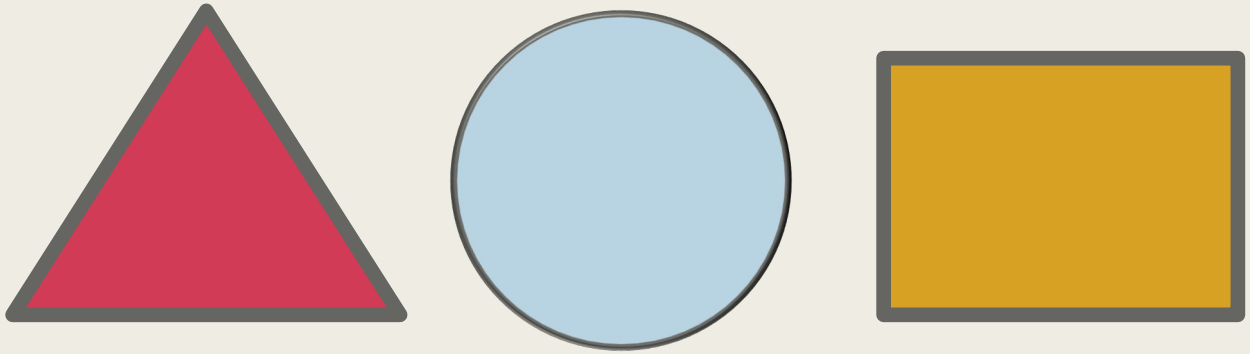
- Do you think the Engineering Design Process is universal?
- Can the same process be used in sports as well as when buildings various buildings around the world?

WHAT HAPPENS WHEN A FORCE IS APPLIED TO A STRUCTURE ?

Brain Storm

- Rule 1: Postpone and withhold your judgment of ideas.
- Rule 2: Encourage wild and exaggerated ideas.
- Rule 3: Quantity of ideas counts at this stage—not quality.
- Rule 4: Build on the ideas put forward by others.
- Rule 5: Every person and every idea has equal worth.

SHAPES IN THE ENGINEERING DESIGN PROCESS



Triangle vs. Column vs. rectangle

- Some shapes are stronger than others and are used more often in building structures.
- Two of the strongest shapes are triangles and columns.
- Rectangles are used more for how they look and fit rather than their strength.
- Columns are often found in all types of buildings (columns are technically stacked circles: Cylinders)
- The use of these shapes is not always visible, as the internal and external finish materials often cover up the structure.

It’s a Challenge

- Using only paper, straws, tape and paper clips create a structure that can support the weight of at least one textbook. Follow the first 5 guidelines of the engineering design process.
- Hint: Think about the application of force and the shapes of your structure
- Remember to get approval for the Lead Engineer!

Explain the reasoning behind your design!

Past vs. Present

Let’s Evaluate

Add a Slide Title - 5