Modeling the Engineering Design Process in a STEM Design

The Data Dilemma© can be used to model how engineers improve a design based on testing.

1. In this scenario, piece “A” represents the design challenge. Ideas for STEM design challenges can be found at the PBS Kids Design Squad website (*pbskids.org/designsquad*).

2. Piece “B” represents three different design sketches based on the information that the class has at the beginning of the challenge. Instruct students to combine pieces “A” and “B” to form a common, two-dimensional geometric shape (triangle, parallelogram, rectangle or square). NOTE: Make sure your students understand that the shapes they make are only *representations* of the design challenge in your scenario. Take this opportunity to guide them in a discussion about how engineers must factor into their designs what materials are available to them. They may choose to design a triangle frame (or a square etc.) because the materials it requires most closely match the materials available.

3. Pieces “C”, “D”, and “E” represent the materials, building and test of the design. Instruct students to integrate all five pieces into a common, two-dimensional geometric shape.

4. Introduce piece “F.” This piece represents the **results** of the initial design test. This test phase is very important because it reveals flaws or weaknesses that require improvements to be made. Students must now incorporate all six pieces into a common two-dimensional geometric shape. This step represents engineers being forced to redesign their initial plan because of failed test results.