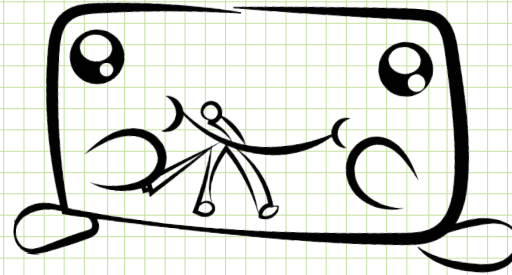
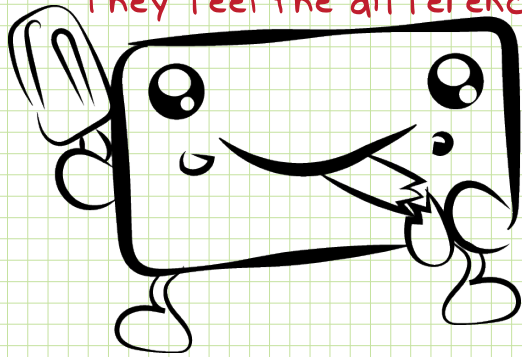


# Help Blocky Bend Stuff

How much effort will it take to bend metal and break wood?  
 Students experiment with bending long and short materials with Blocky.  
 They feel the difference in effort and record their results.




Explore and Discover  
**Engineering**

**STEMTaught**

Name: \_\_\_\_\_  
**Teacher Edition**

Draw yourself experimenting with Blocky

 Draw an arrow on the force meter to show how easy or hard it was to break the wood and bend the metal.

**Thinking and Discussion:**

**Note:** Observations are relative to the student's perspective. Lab to be graded for completion and participation, not accuracy.

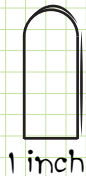
Scientists measure and observe forces and materials to design and predict how things break. This is very important to understand when designing important things like airplane wings so they don't break off. Emphasize to your students that they have gained engineering intuition with forces and that they can now take this knowledge to look at the world differently.

Engineers can turn everyday situations into mathematical models. Bending force happens to be the simplest mathematical model in engineering. Predicting bending force is as easy as  $4 \times 2 = 8$  (Length x Pushing Force = Bending Force). Please refer to Additional Teacher Information if you would like to discuss this applied multiplication problem in your lesson.

**Thinking and Discussion:**

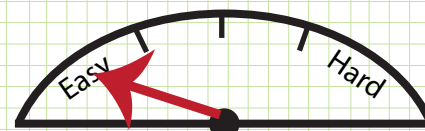
Scientists measure and observe forces and materials to design and predict how things break. This is very important to understand when designing buildings or airplanes. Are you strong enough to bend metal? What would make bending the metal even easier?

Short Stick Force Meter



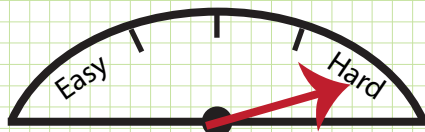
Short Stick

Long Stick Force Meter



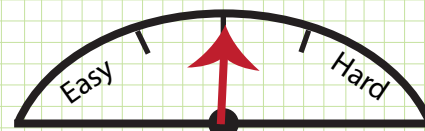
Long Stick

Short Wire Force Meter



Short Metal

Long Wire Force Meter



Long Metal

An even longer handle would make bending the metal even easier.

