Name: _____

Partner: _____

Thursday, September 14th, 2017
ST 306-08
Centennial Regional High School

LAB 1: MATERIALS TESTING (PART A)

The purpose of this lab is to test various materials for the mechanical properties we discussed in class when you apply a constraint. This table summarizes each of the properties and explains the test you will undertake for each one.

Table 1: Mechanical Properties Tests

	Hardness	Ductility	Elasticity	Malleability	Resilience	Stiffness	Tensile Strength
Definition	Resisting scratching and penetration	Stretching to cause plastic deformation	Returning to original shape (elastic deformation)	Flattening or bending and holding that shape (plastic deformation)	The ability to resist physical impact.	The ability to resist being bent.	Resisting tension (no plastic deformation or fracture).
Test	Hammer a nail into the material. Does it go through?	Pull both ends of the material. Does it stretch? Does it keep the new shape?	Stretch the material. Does it return to its original shape?	Bend the material. Does it bend and remain bent?	Hammer the material. See if this hammering causes any dents.	Try to bend the material. Does it bend?	Pull both ends of the material apart. If it stretches, how well does it stretch before breaking?
Constraint	Compression	Tension	Tension	Bending	Compression	Bending	Tension

Now, use these instructions in the 'test' row to examine the mechanical properties of each material. Write their resistance using a scale of 1 to 5 (1 being low resistance, 5 being high resistance). For example, if a material is very hard, you may give it a 5. If it is somewhat hard, you may choose to give it a 3.

NOTE: Give the table an informative title.

Table 2: _____

	Hardness	Ductility	Elasticity	Malleability	Resilience	Stiffness	Tensile Strength
Foam core							
Foam							
Cardboard							
Bubble wrap							
Grip mat							
Grid mat							
Felt							

Confirm the most and least resistant material for each property below:

- The hardest material is _____. The least hard material is _____.
- The most ductile material is _____. The least ductile material is _____.
- The most elastic material is _____. The least elastic material is _____.
- The most malleable material is _____. The least malleable material is _____.
- The most resilient material is _____. The least resilient material is _____.
- The stiffest material is _____. The least stiff material is _____.
- The material with the greatest tensile strength is _____. The material with the least tensile strength is _____.

Choose any two materials from this lab and give an example of a practical use for this material given its properties.

Material 1: _____

Practical use: _____

_____

Material 2: _____

Practical use: _____

_____

Did you encounter any kind of difficulty with this lab's instructions, or with the interpretation of your results? Explain your answer.

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