

## Heat Treating Steel Pre Lab Questions

Name(s) \_\_\_\_\_  
Block # \_\_\_\_\_

Use these videos to answer the questions below:

<https://www.youtube.com/watch?v=VBzmGyWeNzo> – Types of Steel video (3:40 min)

<https://www.youtube.com/watch?v=JTU-Zz5jalC> – Types of Carbon Steel (2:57 min)

<https://www.youtube.com/watch?v=6jQ4y0LK1kY> – Heat Treating Steel (11:22 min)

1. What does the acronym C. A. S. T. stand for? \_\_\_\_\_
2. Steel is an alloy, a homogeneous mixture of metals. Explain how the numbering system 4140 is used to define the type of alloy steel is made of? \_\_\_\_\_
3. What is the percent range of carbon in low carbon steel? \_\_\_\_\_
4. Which element is added for drawing quality steel (more ductile)? \_\_\_\_\_
5. Which element is added for structural quality steel (harder and more brittle)? \_\_\_\_\_
6. Which type of heat treating technique is used to make medium steels more useful? \_\_\_\_\_
7. What is the percent range of carbon in high carbon steel? \_\_\_\_\_
8. Explain why high carbon steel is difficult to work with. \_\_\_\_\_
9. According to the heat treating video, what is the ideal material for a blade? \_\_\_\_\_
10. What crystalline structure does pure iron form? \_\_\_\_\_
11. Why do small and more numerous crystal grains result in a stronger material? \_\_\_\_\_  
\_\_\_\_\_
12. What crystalline structure does austenite form? \_\_\_\_\_
13. What affects does tempering have on the steel? \_\_\_\_\_  
\_\_\_\_\_

Heat Treatment	Bobby Pin Properties (0.7% High Carbon Steel)	Paper Clip Properties (0.2% Low Carbon Steel)
<b>Control –</b> <i>Untreated metal for comparison purposes</i>		
<b>Annealed –</b> <i>Heat red hot, slowly remove from flame and allow to air cool.</i>		
<b>Quenched –</b> <i>Heat red hot, quickly remove and dunk in ice water to cool.</i>		
<b>Tempered –</b> <i>Heat red hot, quickly remove and dunk in ice water to cool. Now heat again until a blue color appears in metal. DO NOT let it get red hot!!! Dunk in water to cool.</i>		