**Tools and Equipment, Part II Activity –**

**Pulley Worksheet**

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| **Instruction/Questions** |
| 1. MA1What is the measured weight of your object? Load = \_\_\_\_\_\_\_\_\_\_\_ 2. How is the Mechanical Advantage of a pulley system calculated? 3. **Set up your pulley, weight and rope as shown at right.** 4. What is the theoretical Mechanical Advantage of this system?   MA = \_\_\_\_\_\_\_\_\_\_\_   1. What is the required force to raise object higher?   Effort = \_\_\_\_\_\_\_\_\_\_\_   1. Calculate the actual Mechanical Advantage of the pulley system using the following equation:      1. How does this compare to the theoretical MA from above?     **MA2**   1. **Support your load according to the pulley setup shown at right.** 2. What is the theoretical Mechanical Advantage of this system?   MA = \_\_\_\_\_\_\_\_\_\_\_   1. What is the required force to raise object higher?   Effort = \_\_\_\_\_\_\_\_\_\_\_   1. Calculate the actual Mechanical Advantage of the pulley system using the following equation:      1. How does this compare to the theoretical MA from above?     **MA3**   1. **Add another pulley to your system as shown to the right.** 2. What is the theoretical Mechanical Advantage of this system?   MA = \_\_\_\_\_\_\_\_\_\_\_   1. What is the required force to raise object higher?   Effort = \_\_\_\_\_\_\_\_\_\_\_   1. Calculate the actual Mechanical Advantage of the pulley system using the following equation:      1. How does this compare to the theoretical MA from above? |

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| **Results** |
| In general, were the theoretical mechanical advantages similar to the actual ones?  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

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| **Discussion** |
| 1. What were some sources of error in your experimental procedure?   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. What recommendations would you make as engineers trying to move the gray whale back to the ocean? Would you use pulleys? Why or why not?   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. What are some constraints that you as engineers might consider while designing a pulley system for the whale?   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. What impacts to the whale might you need to consider for moving it back to the ocean?   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. Calculate the percent error in the mechanical advantage of the actual pulleys compared to the theoretical pulleys.   **Pulley Setup A:**  **Pulley Setup B:**  **Pulley Setup C:** |