Name: _____   **Date:** _____

Lending a Hand Activity – Reflecting on the Engineering Design Process Worksheet

1. **Do Now:** Complete Newton's laws of motion by filling in the blanks.

   The First Law of Inertia

       An object <u>at rest</u> stays _____, unless acted upon by an unbalanced force.
       An object <u>in motion</u> stays _____, unless acted upon by an _____.

   The Third Law

       For every action, there is an _____and _____action.

2. **List of Criteria**: Next to each box, provide the expectations of your design. These are the requirements as set
   by the client (the doctor).

Your design must:

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

☐ _____

3. **Choose a Solution**: Describe how your group decided upon the first design idea.
   In your answer, circle your use of the vocabulary: *criteria   constraint   prototype*

   _____

   _____

   _____

   _____

   _____

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   _____

Name: _____ **Date:** _____

4. **Constraints – Approved Materials**: Explain how the construction of your prototype was affected by the types of materials available to you.

_____

_____

_____

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_____

5. **Constraints – Budget**: Explain how the construction of your prototype was affected by the cost of the materials. Discuss the challenges created by a set budget ($50).

_____

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6. **Building & Testing**: Explain how designing, building, and testing of your prototype was an iterative process. In your answer, circle your use of the vocabulary: *iterative   communicate   redesign*

_____

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Name: _____ **Date:** _____

7. **Record Data**: In the table provided record qualitative data on how the different types of forces affected the performance of your prototype. *Full sentences are not required.*

Type of Force	Description of how the force acted on the prototype during final test
Gravity	
Normal	
Tension	
Compression	
Shear	
Bending	
Applied	
Friction	
Air Resistance	

8. **Applying Newton's Laws**: Describe how Newton's first law of inertia was observed in the final test of your prototype.

   _____

   _____

   _____

   _____

   _____

9. **Applying Newton's Laws**: Describe how Newton's third law was observed in the final test of your prototype.

   _____

   _____

   _____

   _____

   _____

   _____

Name: _____ **Date:** _____

10. Redesign: Explain how you would change your design. If you could redesign, what would you do differently?

_____

_____

_____

_____

_____

_____

_____