# 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 at rest stays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, unless acted upon by an unbalanced force.

An object in motion stays \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, unless acted upon by an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The Third Law

For every action, there is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_action.

1. **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:**

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1. **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*

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

1. **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).

1. **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*

1. **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 |  |

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

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

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