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.

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:

   - [ ] ___________________________________________________________________________
   - [ ] ___________________________________________________________________________
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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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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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Lending a Hand: Teaching Forces through Assistive Device Design Activity – Reflecting on the Engineering Design Process Worksheet
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.*

<table>
<thead>
<tr>
<th>Type of Force</th>
<th>Description of how the force acted on the prototype during final test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravity</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td></td>
</tr>
<tr>
<td>Tension</td>
<td></td>
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<tr>
<td>Compression</td>
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<tr>
<td>Shear</td>
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<tr>
<td>Bending</td>
<td></td>
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<tr>
<td>Applied</td>
<td></td>
</tr>
<tr>
<td>Friction</td>
<td></td>
</tr>
<tr>
<td>Air Resistance</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

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