**Helping Hands Worksheet**

**Instructions:** Biomedical engineers design tools to help people with their daily activities. Your challenge is to design a device that can help someone with MS hold a pencil and write.

**Criteria**

1. Must hold a pencil securely.
2. Must be easy to use (i.e., can be put on and taken off easily).

**Constraints**

1. Cost – device must cost less than $5 worth of materials.
2. Time – device must be built in 20 minutes.
3. Size – device must be sized to work for middle school students to adults.

**Available Materials:**

|  |  |
| --- | --- |
| **Material** | **Cost/item** |
| craft stick | $1.00 |
| straw | $1.00 |
| string (30cm) | $1.00 |
| rubber band | $0.50 |
| pipe cleaner | $1.00 |
| note card | $0.50 |
| paper clip | $0.50 |
| masking tape (30cm) | $0.50 |
| cotton balls | $0.25 |
| playdoh  | $2.00 |

**IMAGINE:** In the box below, brainstorm by sketching your design ideas.

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**PLAN:** Choose the materials for your design. List the material and cost for each.

|  |  |  |  |
| --- | --- | --- | --- |
| **Material** | **Cost** | **#** | **Total Cost** |
| (Example) Craft Sticks | 1.00 | 3 | $3.00 |
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**TOTAL:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**BUILD:** Build your device. (You will have 20 minutes to build.)

Describe your design:

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**ANALYZE YOUR DEVICE**

**Design Successes**: Which parts of your design worked? Why do you think they worked?

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**Design Failures:** Which parts of your design did not work? Why do you think they did not work?

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**What will you change?**

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