

### 3.2c Evaluate Building Materials & Design Layout

Name: \_\_\_\_\_

In order to create the best macroinvertebrate sampler (Hester Dendy) for our stream, we need to decide:

1. What type of materials to use for our plates
2. How much space to put between the plates
3. How many plates to use

#### Material Evaluation

Your group will rank potential plate materials based upon categories. Engineers often create guidelines to help them compare potential solutions. Remember that even though more than one right answer exists, some answers are better than others! To rank the materials, we will assign points based upon the different material properties. Along the top of the chart below list the desired properties for the plates. In the left column, list the different materials you will be evaluating.

Fill in the points on the table below for the materials you examine. Rank them on a scale of 1 to 5, with one meaning not suitable and 5 meaning very suitable.

Is each characteristic as important as the others? Determine 1-2 characteristics that are the most important, highlight these and double the points you awarded for them.

Total the scores for each material to determine which are most suitable for your project.

Material								Total Score

Which material do you recommend building a Hester-Dendy from? Why?

## Plate Spacing & Number of Plates

The space between the plates is the habitat for your macroinvertebrates.

### Step 1. Determine the surface area of your standard Hester Dendy.

Length X Width X Number of Plates = Surface Area \_\_\_\_\_  
 \_\_\_\_\_ X \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_

**Step 2.** Your design is constrained by the size of the eyebolt you use. Determine how thick your Hester Dendy can be. To do this, measure the distance between the wing nut to the end of the threading, as shown below:



**Maximum Thickness for Hester Dendy layout:**

\_\_\_\_\_

**Step 3. Determine the layout of your Hester Dendy.** If the spacing is large enough for small gravel/pebbles from your stream to attach/fill in some of this area, more insects might be attracted. However, increasing the spaces between plates will decrease the total surface area the insects can attach to. You can refer to your habitat assessment **(1.2a)** to recall the size of the gravel in your streambed. Draw your layout below:

**Step 4. Check your design to make sure it fits your thickness constraint.**

	Thickness of Item	Number Used	Thickness
Plate			
Washer/Spacer			
<b>Design Thickness</b>			

If your thickness exceeds your calculated maximum from Step 2, revise your design to meet your constraints.

**Step 5. Determine surface area of design:**

Length X Width X Number of Plates = Surface Area \_\_\_\_\_  
 \_\_\_\_\_ X \_\_\_\_\_ X \_\_\_\_\_ = \_\_\_\_\_

How does your surface area compare to the standard? How do you think this will impact the number of macroinvertebrates you collect?