In *Natural Colorants*, the authors surveyed hundreds of historical recipes from the early modern period. Looking at the great variety of ingredient amounts and ratios provided in those historical sources, they also considered the chemistry of natural dyes. They then created standardized protocols for a number of different mordants and dyes so that you can make comparisons across the dyes you produce.

In this handout, each recipe from *Natural Colorants* has been normalized to 1g of textile so that each ingredient of the mordant bath and dye baths can be calculated by the weight of the textiles you will dye.

To use this worksheet to calculate the amounts needed for a mordant or dye bath:

1. Weigh textiles in grams and enter in the outlined cell
2. Enter in Column C: multiply the weight of the textile by the number in Column A (the normalized recipe)
3. For example, if dyeing with madder and weight of textile is 2g:
   1. Textile amount is 2 x 1 = 2g
   2. Madder amount is 2 x 2 = 4g
   3. Water amount is 2 x 100 = 300g

**MORDANT RECIPES**

| **Alum** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| alum | 0.2 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 50 |  |

| **Iron sulfate** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| iron sulfate | 0.1 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 50 |  |

| **Copper sulfate** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| copper sulfate | 0.2 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 50 |  |

| **Tin** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| tin(II) chloride | 0.025 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| Oxalic acid | 0.025 |  |
| water | 50 |  |

| **Gall nuts - mordant** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| gall nuts | 0.1 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 50 |  |

**DYE RECIPES**

| **Madder** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| madder | 2 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Sappanwood (Brazilwood)** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| sappanwood | 10 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Logwood** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| logwood | 10 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Cochineal** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| cochineal | 0.125 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 62.5 |  |

| **Kermes** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| kermes | 0.5 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 62.5 |  |

| **Dyer’s Broom** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| dyer’s broom | 0.125 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 62.5 |  |

| **Weld** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| weld | 1 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Sawwort** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| sawwort | 1 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Fustic** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| fustic | 10 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Buckthorn berries** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| buckthorn berries | 2 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Gall nuts - dye** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| gall nuts | 2 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Annatto seeds** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| annatto | 2 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

| **Turmeric** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| annatto | 3.75 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 100 |  |

**ADDITIVE TO DYE BATHS (OPTIONAL)**

Some dye recipes add potash (potassium carbonate) as a way to adjust the acidity/alkalinity of the bath to alter the resulting color.

| **Potash** | **Normalized amount (g)** | **Weigh textile (g)** | **Amount (g)** |
| --- | --- | --- | --- |
|  | Column A | Column B | Column C |
| textile | 1 |  |  |
| potash | 0.0625 | *Multiply weight of textile by number in Column A (normalized recipe)* |  |
| water | 62.5 |  |