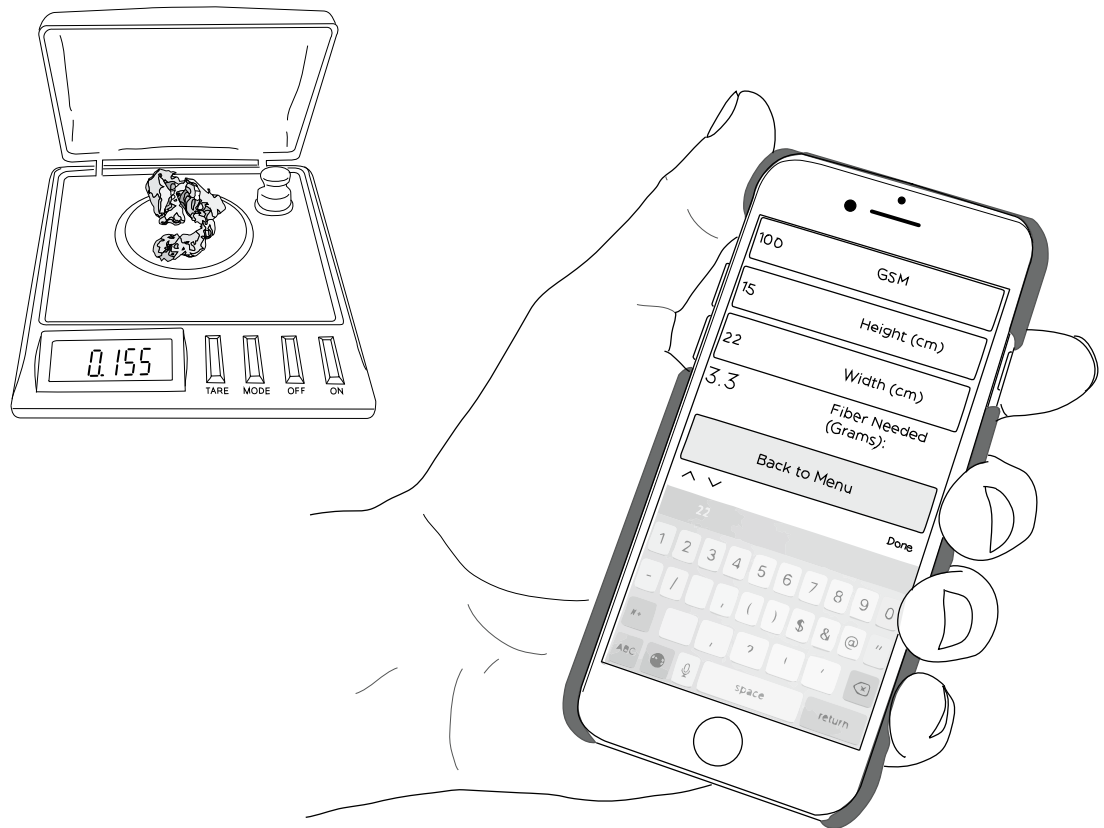


Determinate Hand Papermaking

III

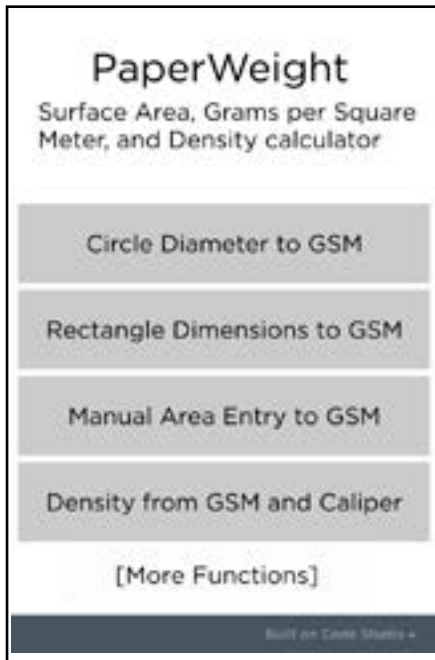
Describing the weight of paper in grams per square meter



*Text and illustrations by
Donald Farnsworth
2017*

Describing the weight of paper in grams per square meter

PaperWeight



Having the ability to determine the “weight” of a sheet of paper gives us the data necessary to calculate the pulp needed for the creation of a paper of the same weight. For example, in the case of a paper conservator wishing to make paper for an infill, knowing the weight of the document to be repaired is critical to determining the quantity of dried fiber necessary to form a matching sheet.

GSM: Paper weight in the metric system is expressed in **grams per square meter** (gsm or g/m²): that is, if any given sheet could theoretically be enlarged to a 1 x 1 meter size without changing other variables such as density, what would it weigh?

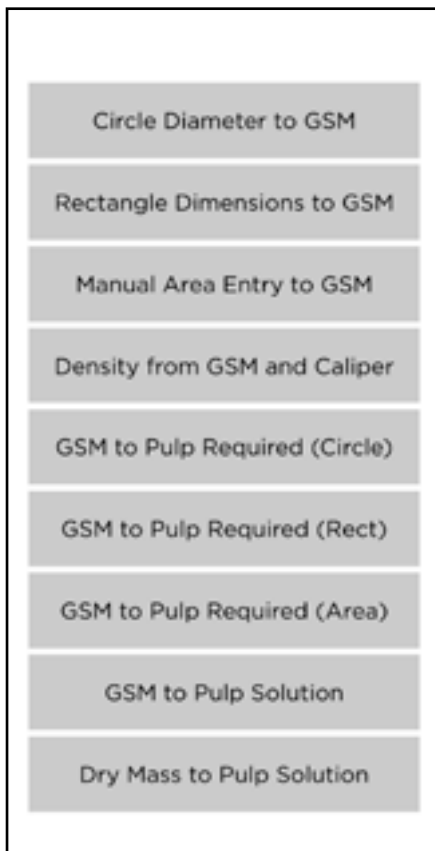
To find the gsm (g/m²) of a rectangular sheet, use this straightforward equation:

$$(\text{mass (g)} \times 10,000) \div \text{sq cm} = \text{gsm}$$

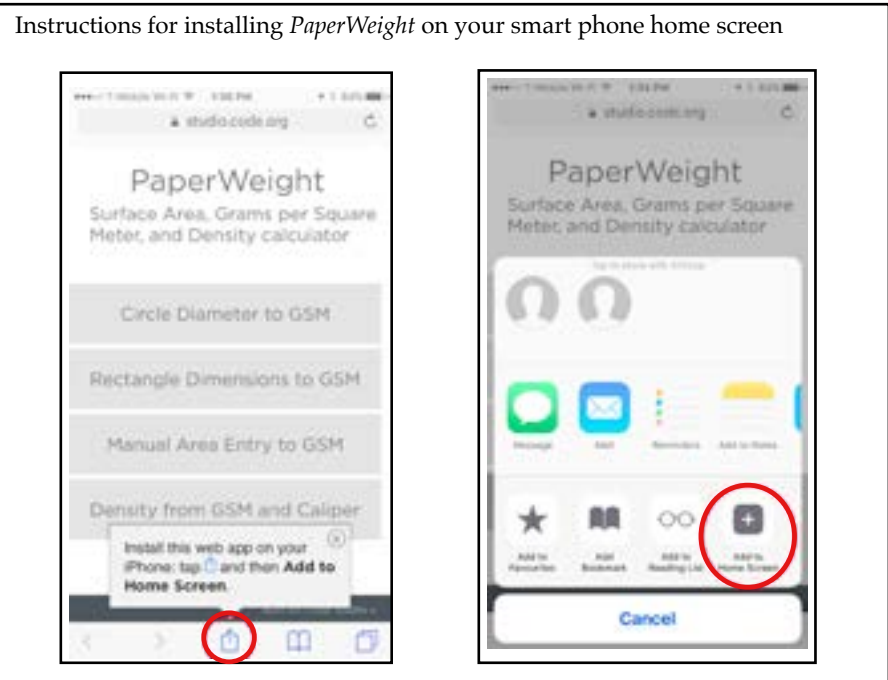
PaperWeight: We have created a free web-based app called *PaperWeight* to make calculation of gsm and density fast and easy. (The app was made using the open-source code.org, with coding help from Jordan Grelling).

Access the app on your desktop or mobile browser: <http://bit.do/paperweight>








PaperWeight Menus



Simply enter the variables of mass, height & width (or in the case of circular paper, mass & diameter) and the *PaperWeight* app calculates the corresponding gsm. In the **GSM to Pulp Required** menu, enter the variables of gsm and dimensions to calculate the required quantity (mass) of raw material (fiber) needed to make the specified weight sheet.



PaperWeight examples:

<p>Circle Diameter to GSM</p> <p>.83 Mass (grams)</p> <p>5.7 Diameter (cm)</p> <p>71.715 Grams per Square Meter</p> <p>Back to Menu</p> 	<p>Rectangle Dimensions to GSM</p> <p>16 Mass (grams)</p> <p>15 Height (cm)</p> <p>30 Width (cm)</p> <p>106.667 Grams per Square Meter</p> <p>Back to Menu</p> 	<p>Manual Area Entry to GSM</p> <p>18 Mass (grams)</p> <p>144 Surface Area (sq. cm)</p> <p>125 Grams per Square Meter</p> <p>Back to Menu</p> 	<p>Density from GSM and Caliper</p> <p>89 Calculated GSM</p> <p>22 Caliper Reading (microns)</p> <p>Submit Value Values: 22</p> <p>4.045 Density (g/L)</p> <p>Back to Menu</p>
<p>Enter mass, diameter to find gsm</p>	<p>Enter mass, height & width to find gsm</p>	<p>Enter mass & surface area to find gsm</p>	<p>Enter gsm & caliper to find density</p>
<p>GSM to Pulp Required (Circle)</p> <p>82 GSM</p> <p>5.7 Diameter (cm)</p> <p>0.209 Fiber Needed (grams)</p> <p>Back to Menu</p> 	<p>GSM to Pulp Required (Rect)</p> <p>85 GSM</p> <p>14 Height (cm)</p> <p>30 Width (cm)</p> <p>1.19 Fiber Needed (Grams)</p> <p>Back to Menu</p> 	<p>GSM to Pulp Required (Area)</p> <p>90 GSM</p> <p>180 Surface Area (sq. cm)</p> <p>1.62 Fiber Needed (grams)</p> <p>Back to Menu</p> 	<p>GSM to Pulp Solution</p> <p>120 GSM</p> <p>1 Deckle Depth (cm)</p> <p>12 Pulp Solution Concentration (g/L)</p> <p>Back to Menu</p> 
<p>Enter gsm, diameter to find grams of dry pulp required for the given gsm</p>	<p>Enter gsm, height & width to find grams of dry pulp required for the given gsm</p>	<p>Enter gsm & surface area to find pulp needed</p>	<p>Enter gsm & deckle depth to find pulp concentration</p>

<http://bit.do/paperweight>

Series links:

- No. I: [Introduction: fibers, hydration, fibrillation & freeness and suppliers](#)
- No. II: [Retting: lignin removal using mycelium](#)
- No. III: [Calculating paper weight with a smartphone app](#)
- No. IV: (Next:)[Finding the surface area of an irregular sheet](#)
- No. V: [Blender processing paper fiber](#)
- No. VI: [Formulating pulp for color and content](#)
- No. VII: [Making small paper with 3D printed deckle box and an AeroPress](#)
- No. VIII: [Techniques for forming laid and wove paper without a vat](#)
- No. IX: [Drying handmade paper](#)
- No. X: [Sizing and burnishing](#)

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