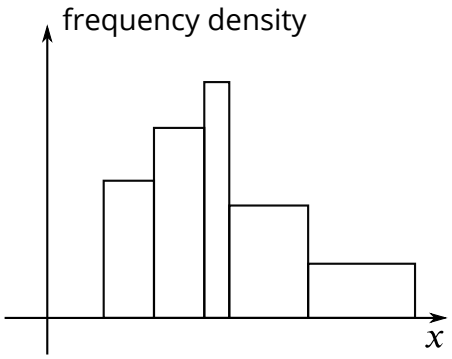
Frequency density

For a set of grouped data, the *frequency density* of a class is defined by

$$\text{frequency density} = \frac{\text{frequency}}{\text{class width}}.$$

It gives the frequency per unit for the data in this class, where the unit is the unit of measurement of the data. This allows for a meaningful comparison of different classes where the class widths may not be equal.

When drawing a histogram, the axes are the measurement and the frequency density:



A related idea is the *relative frequency density*. This is the relative frequency of the item divided by its class width, or alternatively, the frequency density divided by the total number of data items:

$$\text{relative frequency density} = \frac{\text{relative frequency}}{\text{class width}} = \frac{\text{frequency density}}{\text{total number of data}}$$

If a histogram is drawn with relative frequency density instead of frequency density, then its total area will be 1.