

# Essentials of SVG

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The following short note explains the most useful things to know when writing vector graphics to SVG.

First, we start with a skeleton of an SVG file (which uses the XML data format):

```
<svg width='300px' height='300px' viewBox='0 0 100 100'  
  xmlns='http://www.w3.org/2000/svg'>  
  <circle style='stroke:none;fill:red' cx='10' cy='10' r='2' />  
  <path style='stroke:black;fill:none' d='M10 10L20 20 L30 10Z' />  
</svg>
```

In this very simple example, there are already several useful things we can see here:

- width and height give the size of the SVG in pixels relative to the host document.
- viewBox gives the size of the shape in SVG units (not pixels). It has four numbers giving the left side, right side, width, and height. Y coordinates run downwards.
- circle draws a circle. cx, cy, and r gives the center's X coordinate, its Y coordinate, and its radius, all in SVG units.
- path gives the shape of the path in a compact form specified as the d attribute. Each path is broken up into commands, which are [detailed further in the SVG specification](#). The most important of these are perhaps M, L, and Z: the M command moves the pen; the L command draws with the pen, moving it to a new position; and the Z command closes the shape. In general, numbers given in the path specification is in SVG units, relative to the SVG document itself.
- style gives styling instructions for the path or circle. Perhaps the most important style rules are stroke, fill, and stroke-width, and the following are examples of the style attribute, which are mostly self-explanatory: style='stroke:red;stroke-width:1px', style='stroke:none;', style='fill:blue;', style='fill:none;' (here px means an SVG unit, relative to the SVG document itself).
- An SVG document can have any number of path and/or circle elements, and each one is a separate shape.

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