



Coding a Mask in SVG on a 400 by 400 grid

To get started copy the code from: <http://steamcoded.org/lessons/grid400x400.svg.txt> and save the file as mask.svg and open the file in a browser.

In the editor, add the SVG elements (per instructions below) where indicated in the SVG code, i.e. inside the second grouping (<g> element). **Important:** Save the file and refresh the browser after each step.

- 1: Create a grouping with id="top"
- 2: Create a grouping with id="left" inside the "top" grouping style: fill:none;stroke:black;
- 3: Add these elements in the "left" grouping
Create a path from starting point (0,0) to control point (0,200) to ending point (200,100)
Create a path from (0,10) to (10,195)
Create a path from (0,20) to (20,190)
Create a path from (0,30) to (30,185)
Create a path from (0,40) to (40,180)
Create a path from (0,50) to (50,175)
Create a path from (0,60) to (60,170)
Create a path from (0,70) to (70,165)
Create a path from (0,80) to (80,160)
Create a path from (0,90) to (90,155)
Create a path from (0,100) to (100,150)
Create a path from (0,110) to (110,145)
Create a path from (0,120) to (120,140)
Create a path from (0,130) to (130,135)
Create a path from (0,140) to (140,130)
Create a path from (0,150) to (150,125)
Create a path from (0,160) to (160,120)
Create a path from (0,170) to (170,115)
Create a path from (0,180) to (180,110)
Create a path from (0,190) to (190,105)
Create a path from (0,200) to (200,100)
- 4: After the <svg> element, create a <defs> </defs> element
- 5: Inside the <defs> element, create a <symbol> </symbol> element
- 6: Give the <symbol> element these attributes:
id="s2" viewBox="0 0 200 200" overflow="visible"
- 7: Move the <path> elements from the "left" grouping (step 3) to inside the symbol element

- 8: Add a <use> element in the "left" grouping with attributes:
width="200" height="200" xlink:href="#s2"
- 9: Add a <path> element inside the "left" grouping with the following commands:
moveto (M) start (0,0) - curve (Q) control (0,200), end (200,100) -
lineto (L) (0,200) - closePath (z) The closePath command
draws a line to the starting point of the path, in this case, same as lineto (0,0).

Note how this object encloses the curve created by the lines of the symbol so that when it is filled in, it will mask off the part above the curve. Steps 12 & 13 will demonstrate that visually.

- 10: In the <defs> element, add a <clipPath> </clipPath> element with attribute id="cp2"
- 11: Move the path command from step 9 as a child element of the <clipPath> element
- 12: Change the style attribute of the "left" grouping from fill:none; to fill:red;
- 13: Add a style to the <use> element from step 8 with style: clip-path:url(#cp2);
- 14: Inside the "left" grouping add another <use> element like step 8,
then add a transform attribute to rotate it 180 degrees about point (100,100)
- 15: Add a transform command in front of the rotate command to move the rotated object,
i.e. translate(0,100) which will move the object down 100 pixels. A space separates
the transform commands. The commands are executed from right to left.
- 16: Inside the "top" grouping, but outside the "left" grouping add a <use> element to
reference the "left" grouping, i.e. xlink:href="#left", add a transform attribute to flip it
horizontally, then shift it right 400 pixels, i.e. transform="translate(400,0) scale(-1,1)"

Note: The scale transform multiplies all x,y values by -1,1, so all x values are multiplied by -1 which creates a mirror image about the y axis. To see that, change the viewBox of the SVG element to "-200 0 600 400" and only use the scale transform. The translate transform shifts the mirrored image 400 pixels along the x-axis.

- 17: Outside the "top" grouping, add a <use> element referencing the "top" grouping, then
flip it vertically and shift it down 400 pixels, i.e. transform="translate(0,400)
scale(1,-1)" The same explanation of step 16 applies here except the image is
mirrored along the x-axis.
- 18: Move step 17 <use> element before the "top" grouping, so that it is drawn first, and
behind the top grouping
- 19: Add a rectangle, x:0, y:150, width:400, height:100 style fill:yellow;
It needs drawn first so the other objects paint over it.

When complete, change the style attribute of the first element from "display:initial" to "display:none" which hides the grid. Then change the style style attribute of the second element from "opacity:0.5" to "opacity:1"