

## What is the Sierpinski Triangle?

A fractal based on a triangle with four equal triangles inscribed in it. The central triangle is removed and each of the other three treated as the original was, and so on, creating an infinite regression in a finite space.

## How can i make the Sierpinski Triangle?

A fractal based on a triangle with four equal triangles inscribed in it. The central triangle is removed and each of the other three treated as the original was, and so on, creating an infinite regression in a finite space.

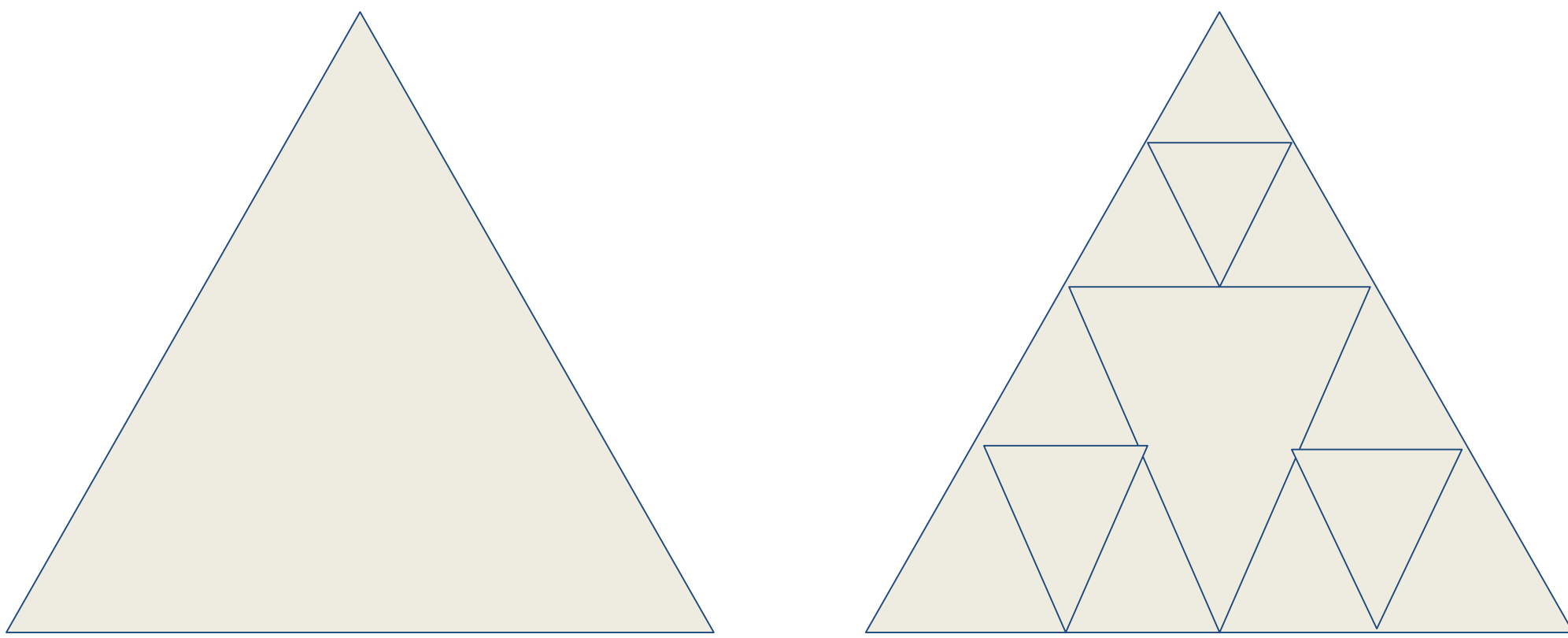
1: Draw a triangle

2: Draw 4 upside-down triangles inside the triangle.

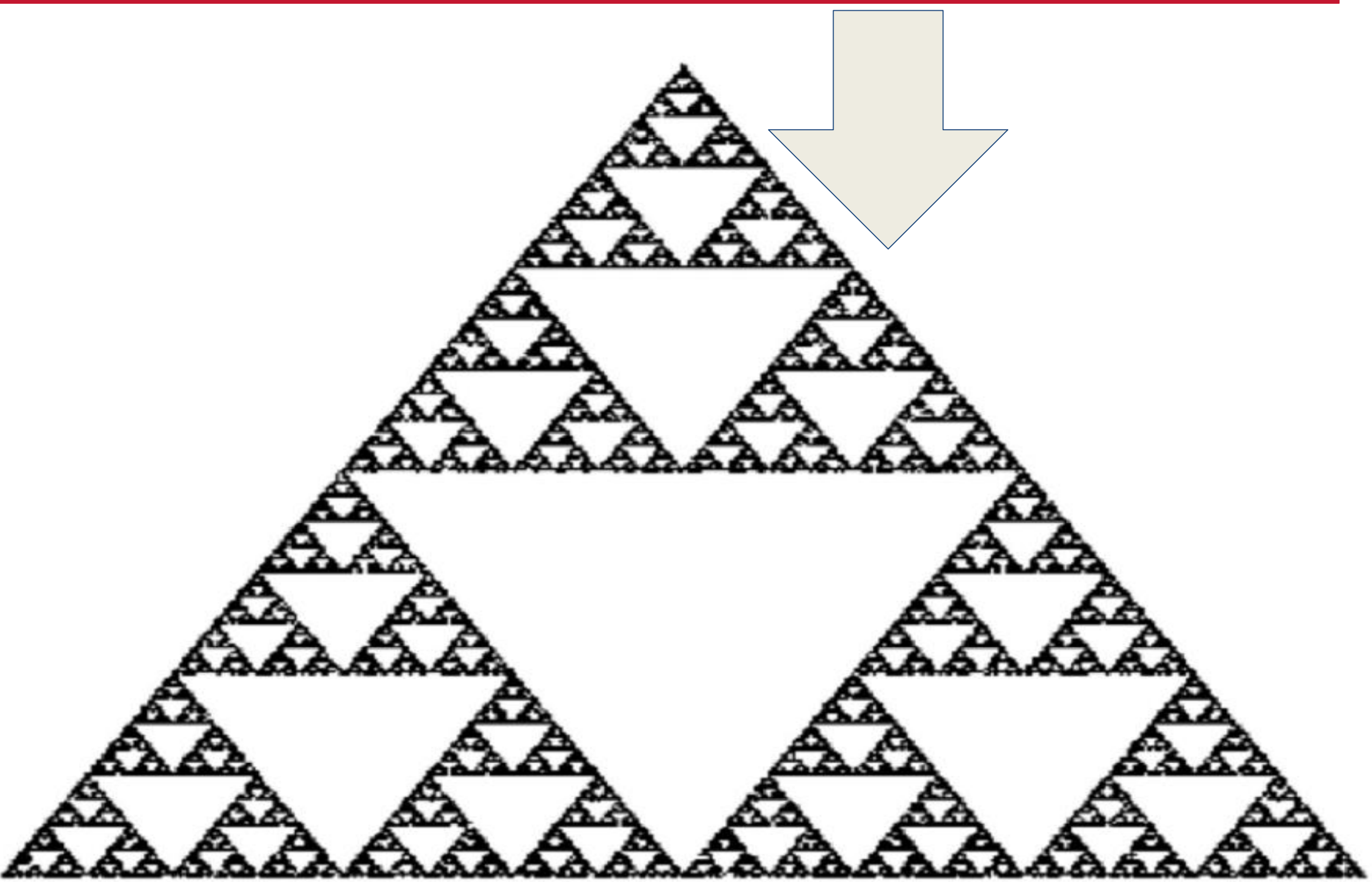
3: Repeat step 2 around the smaller triangles that you drew.

4: Repeat step 3... forever.

Good job! You have successfully completed Sierpinski's Triangle in  $\infty$  years. :)



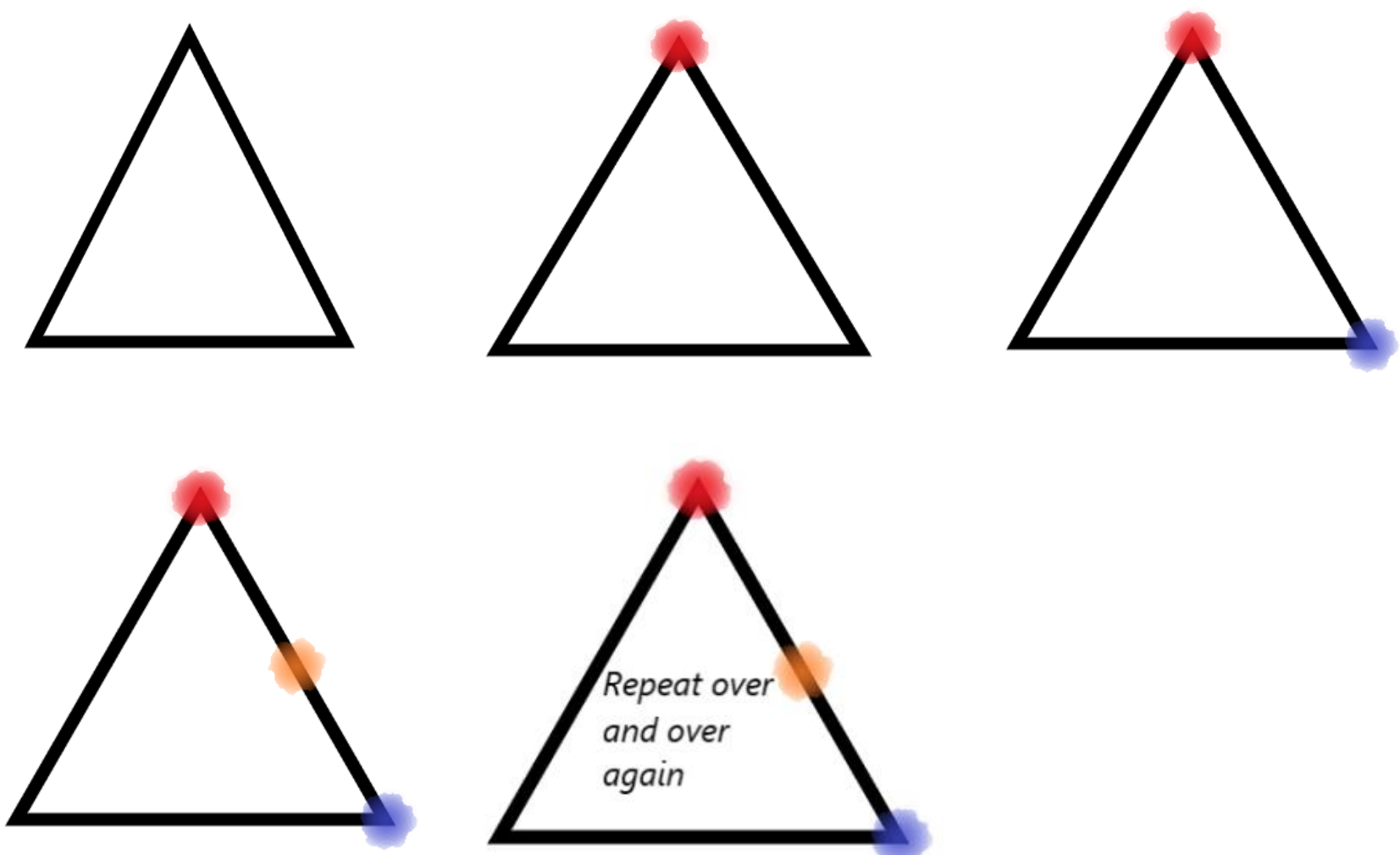
## Picture of the Sierpinski Triangle



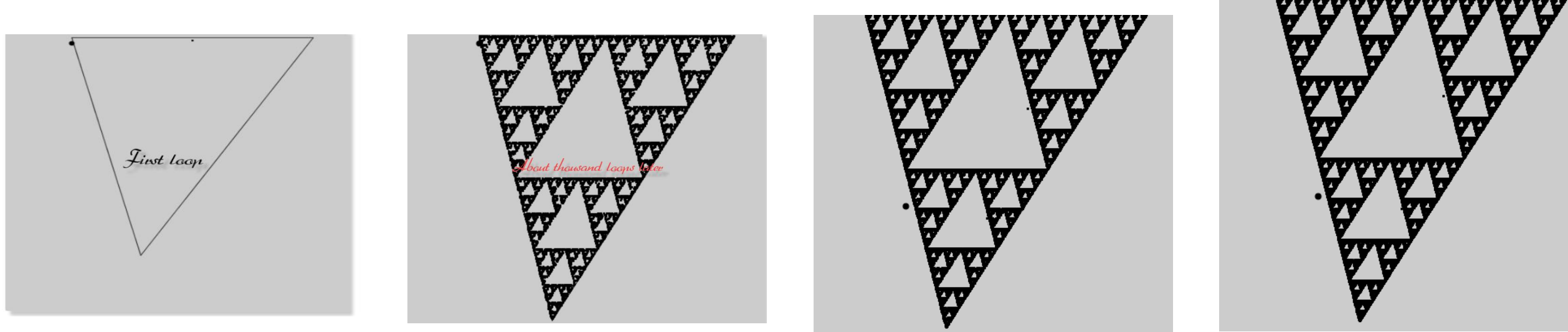
## Algorithm used to create the Sierpinski triangle

1. Start with 3 points on the ABC Triangle. (edited)
2. Pick random a initial Point P which will be one of the vertices of the ABC Triangle
3. Pick a random point Q that's (again) one of the vertices of the Triangle ABC
4. Change point P to be the halfway between P and Q and instead draw only P
5. Repeat everything in a loop from step 3

What each step looks like on MS paint-



How it looks like on Processing-

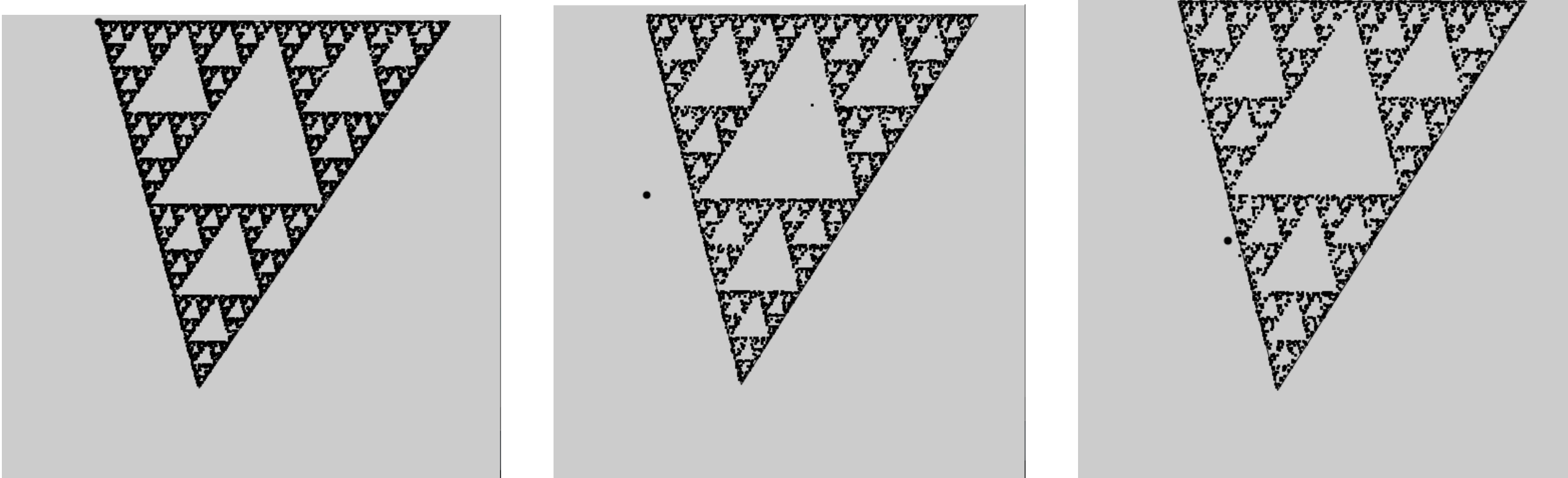


Hypothesis-

If we change the coordinates of the first point p from point a, b, or c to any point inside or on the triangle, then it will not make Sierpinski's Triangle because it like hammering train tracks if it a little from another side or from this side it will not go the right way

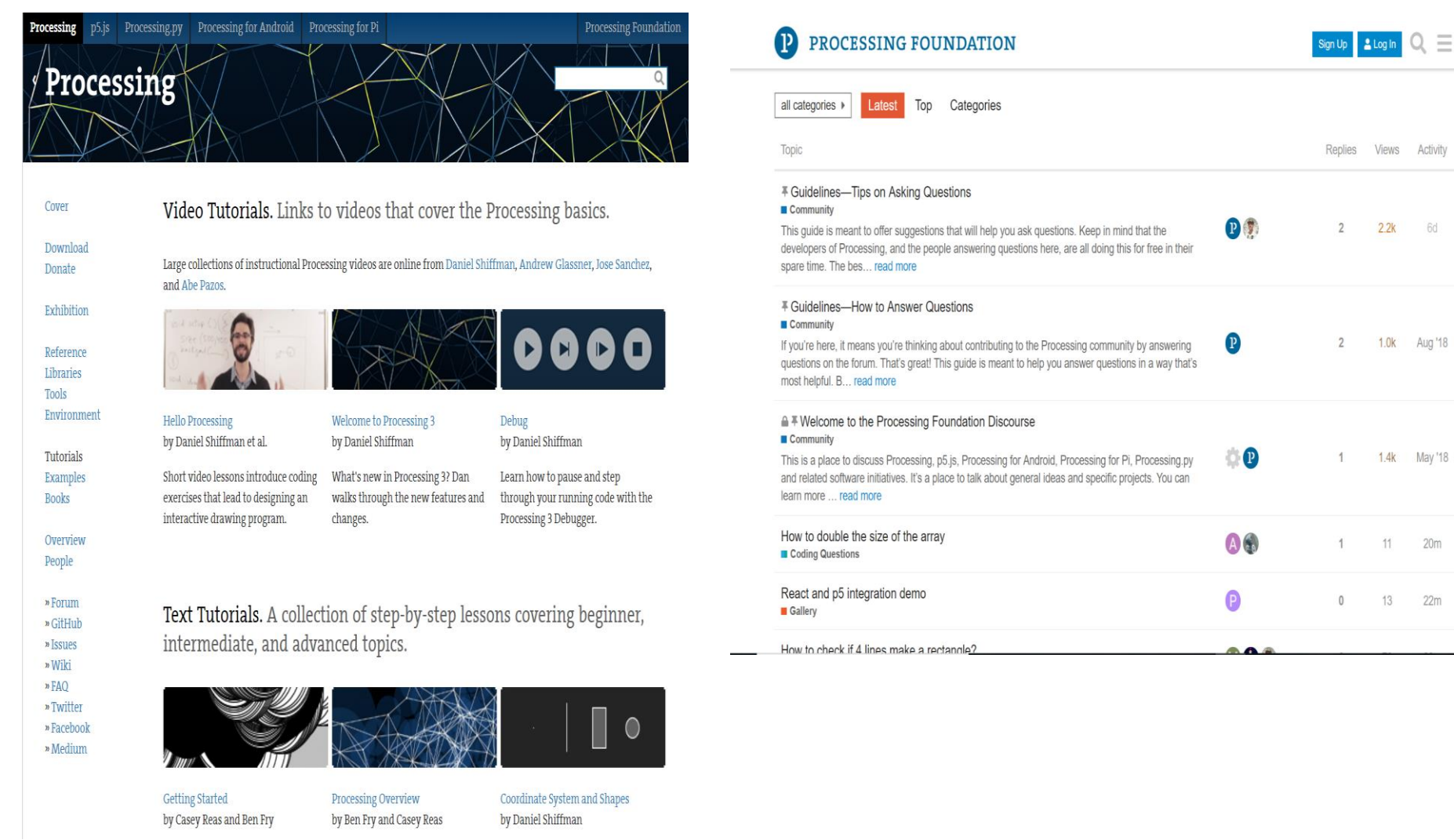
Results of Hypothesis/Trials

*In the results of the hypothesis we found out that it doesn't matter where we set the initial point P as seen on the screenshots below. Another thing the thickest dot is the initial point P and as seen below we ran 3 trials and it still gave us the Sierpinski triangle. Note the longer you run the algorithm the more detailed it gets as seen both below and above.*



## What is Processing?

Well Processing is a flexible software sketchbook and a language for learning how code within the context of visual arts another thing it has very useful tutorials within it homepage which are all free and it own community within (again) it homepage



## What can Processing be used for?

It can be more useful to make computer animations and to learn a simpler version of java which is useful for learning other coding programs such as Python, Php, Html, C++ so if your interested in coding but don't have the money to get on coding lessons check out <https://processing.org/tutorials> it has some helpful tutorials

Here is our processing code that chooses A, B, or C by using random numbers

```
//Sets q to be either a, b, or c randomly.
int i = int(random(3));
//If i is equal to 0, set point q to be point a
if (i == 0) {
  qx=ax;
  qy=ay;
}
//If i is equal to 1, then point q is point b.
if (i == 1) {
  qx = bx;
  qy = by;
}
// if i is equal to 2 set point q to point c
if (i == 2) {
  qx = cx;
  qv = cv;
}
```

Here is our processing code to choose halfway points

```
//Halfway between p & q is to add x and y coords of both variables to get your new p.
strokeWeight(3);
px = (qx + px) / 2;
py = (qy + py) / 2;
```

## Picture of accomplishment ;)

