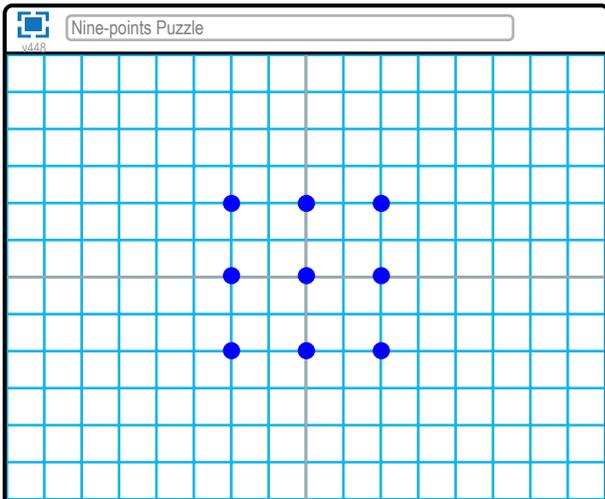


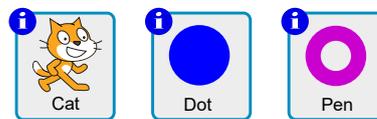
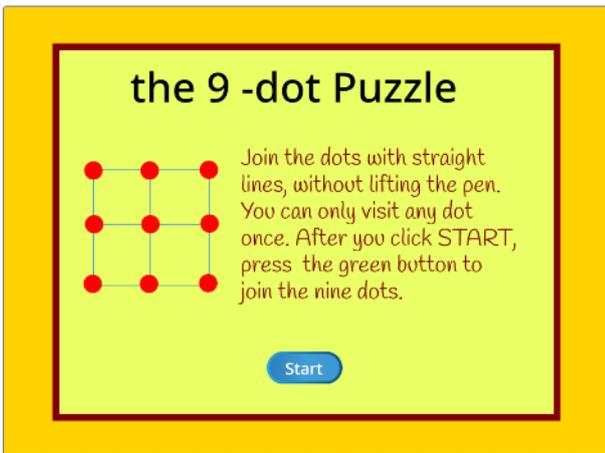
## Exercise 68: Puzzle Challenges

### Use Grids to Layout the Nine-dot Challenge



It is usual to try out solutions to this puzzle with pencil and paper. It is also possible to use your Scratch coding skills to animate your solution when you have found one. Discuss with a friend how you might arrange the 9 dots using code, to make 3 rows of 3, rather than draw the dots on the stage. You then need to instruct the Scratch pen to move and draw the path using a path through coordinates (using the 30px grid squares). You have to decide how to convey the instructions to the user. You need a pen to draw the line without using the pen up command, until the end.

#### 1 A sprite gives the instructions

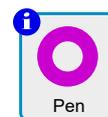


#### 2 Arrange the dots

```
when green flag clicked
  clear
  hide
  go to x: -60 y: 60
  repeat 3
    repeat 3
      stamp
      change x by 60
    change y by -60
  set x to -60
```

#### 3 Code and draw the solution

based on the *xy-grid-30px*



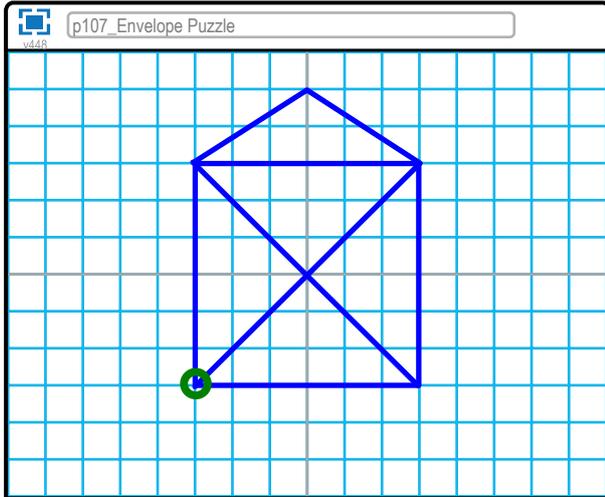
There are several coding styles *e.g.* use a variable for *squareSize* or use blocks of 30 to designate points.

Find the solution at  
[... projects/90149237](https://projects.ck12.org/projects/90149237)

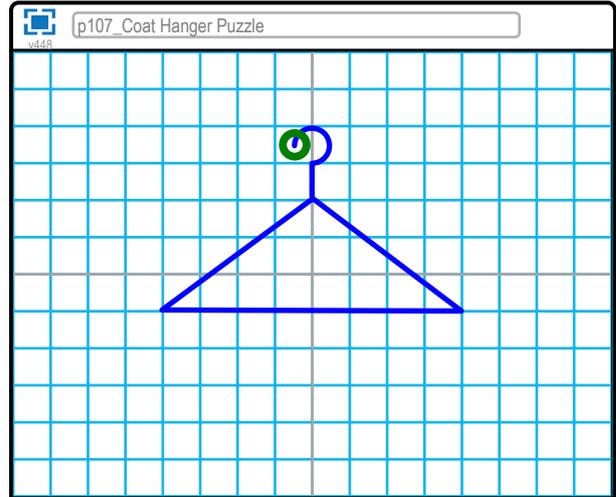
continued from opposite page

Visit each project. Look inside and see if you have found a better solution.

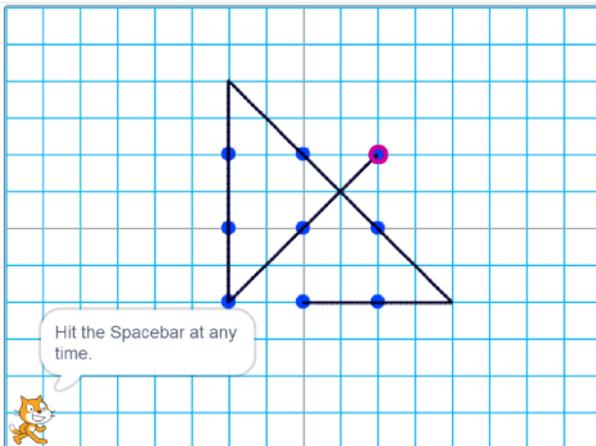
The donut-shaped pen sprite marks the starting position.



Try drawing it without lifting the pen  
(solution) . . [projects/172295927](https://scratch.mit.edu/projects/172295927)



Try drawing it without lifting the pen  
(solution) . . [projects/172296990](https://scratch.mit.edu/projects/172296990)



There are probably several ways to draw each of these pictures. Some ways better than others. Check your solutions against the online examples and perhaps you have found a better solution. To improve your computational thinking ability, in *the Envelope* and *Coat Hanger*, puzzles, try drawing the shape without lifting the pen once you put the pen down.

There is much trial-and-error in constructing the script, especially when deciding angles of direction, distances, fixed points etc. The *comment\** feature in Scratch is useful to take note of a point on the stage that you might need to return to as an absolute value, without the need to calculate difficult angles or distances. Before attempting the drawings on this page, consider the following questions about the coat hanger picture:

- What is the starting point of the picture?
- Does the picture finish where it started?
- Which part of the picture draws first?
- How is the hook drawn?
- Once the pen is down, is the picture completed without lifting the pen?
- Could you use a New Block procedure to shorten the script?

\*To use the comment feature, right click on any block and choose *add comment*. Type where you see **add comment here**