

Tic-Tac-Toe in Scratch

Tic-Tac-Toe is a great game to write in Scratch, because it's simple enough and we are all familiar with the rules. Let's review the rules of a typical Tic-Tac-Toe game:

Before delving into the scripts, let's look at the rules of our Tic-Tac-Toe game.

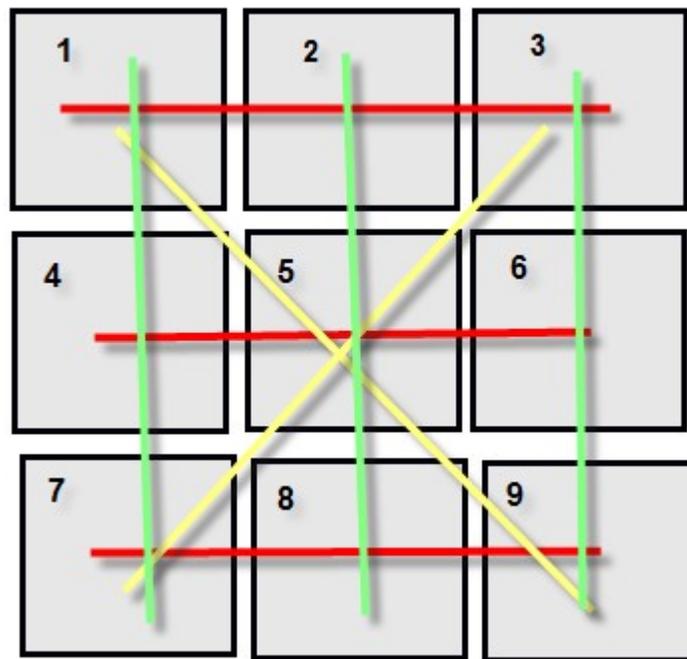
Rule 1: There are nine slots (boxes) on the game board

Rule 2: The first symbol is always CIRCLE

Rule 3: When clicked for the first time, the slot is filled with the current symbol

Rule 4: After each mouse click, the symbol changes from CIRCLE to X, or from X to CIRCLE

Rule 5: If the same symbol are on these eight possible lines, then a win is marked

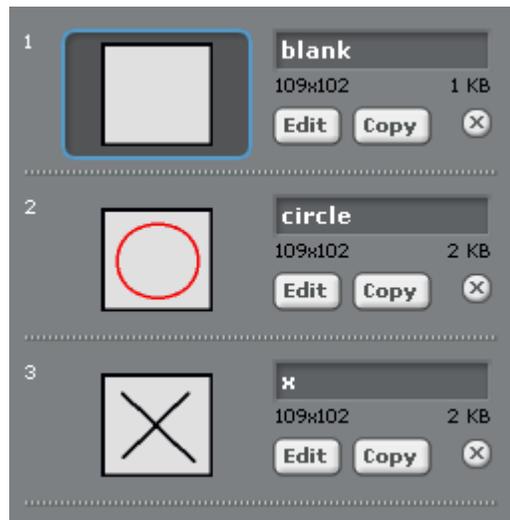


HORIZONTAL		
Box1	Box2	Box3
Box4	Box5	Box6
Box7	Box8	Box9

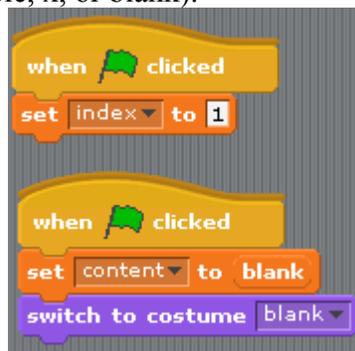
VERTICAL		
Box1	Box4	Box7
Box2	Box5	Box8
Box3	Box6	Box9

DIAGONAL		
Box1	Box5	Box9
Box3	Box5	Box7

To create a Tic-Tac-Toe game in Scratch, I first create a sprite called “Box1”. Box1 contains three costumes: blank, x, and circle.



Box1 contains two local variables (variables for Box1 only): index and content. The index variable specifies which position is Box1 on the game board. The index of Box1 is set to 1. The content variable specifies what value Box1 holds (circle, x, or blank).



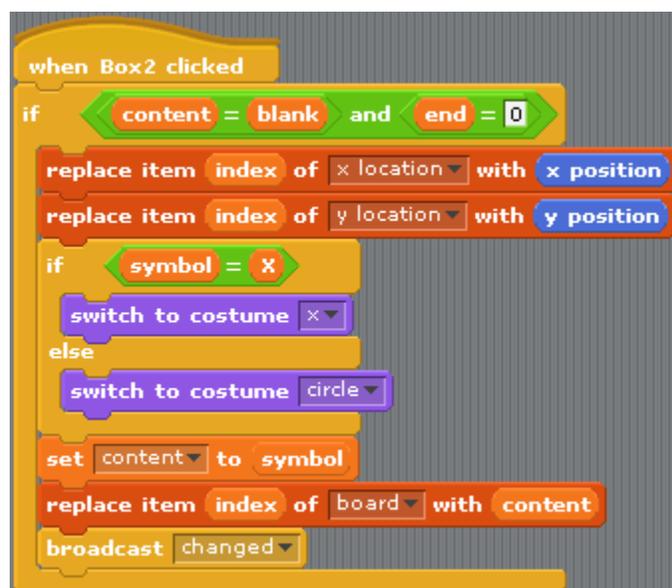
Then I create the following global variables, or variables for all sprites:

- X: id of X symbol (fixed)
- blank: id of blank symbol (fixed)
- circle: id of circle symbol (fixed)
- end: Boolean (1 for true or 0 for false) value to indicate whether the game has ended
- symbol: holds the current symbol value (X, blank, or circle)
- win1: holds the position id of the first winning box
- win2: holds the position id of the second winning box
- win3: holds the position id of the third winning box

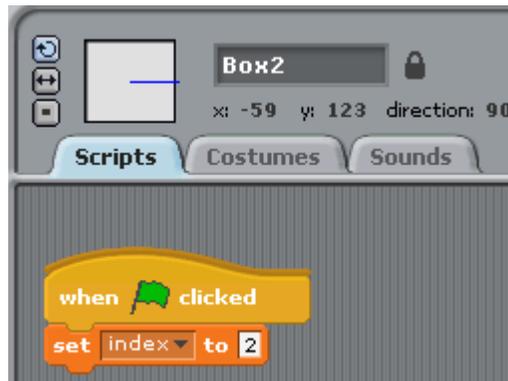


Next, we will add scripts to Box1 to handle user click.

When Box1 is clicked, it first checks whether its content is blank, if not, then it ignores the click. If its content is blank, Box1 saves its x-location and y-location to two lists: “x position” and “y position”. Then it broadcasts a “changed” message. Then it sets its content to the current symbol (circle or x) and set the corresponding item in the board list to its content.



To create the other 8 boxes (9 boxes needed for the game board), just duplicate Box1 and name the new boxes as Box2, Box3, Box4, and so on. The only thing we need to change is the index value of the box. For Box2, set the index to 2; for Box3, set the index to 3; for Box4, set the index to 4, and so on.



The Stage sprite catches the “changed” broadcast message and checks whether there is a win. When there is a win, Stage sends out “game over” broadcast message which is caught and processed by the sprites that represent winning marks. The sprites that mark the winning boxes are win1 sprite, win2 sprite, and win3 sprite.

