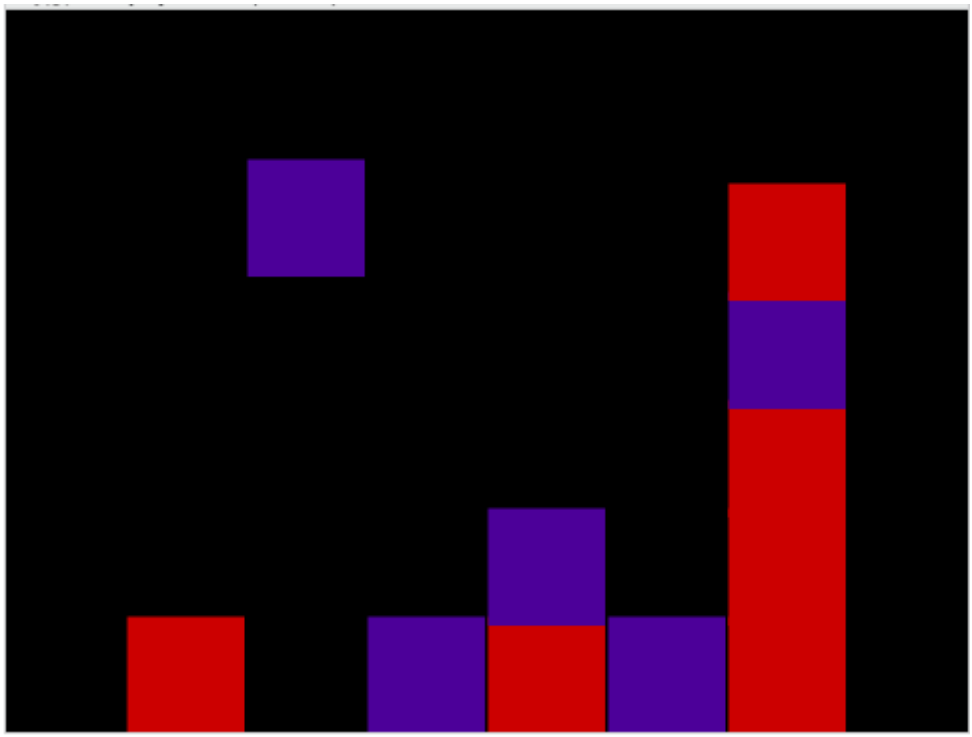
Simplest Tetris

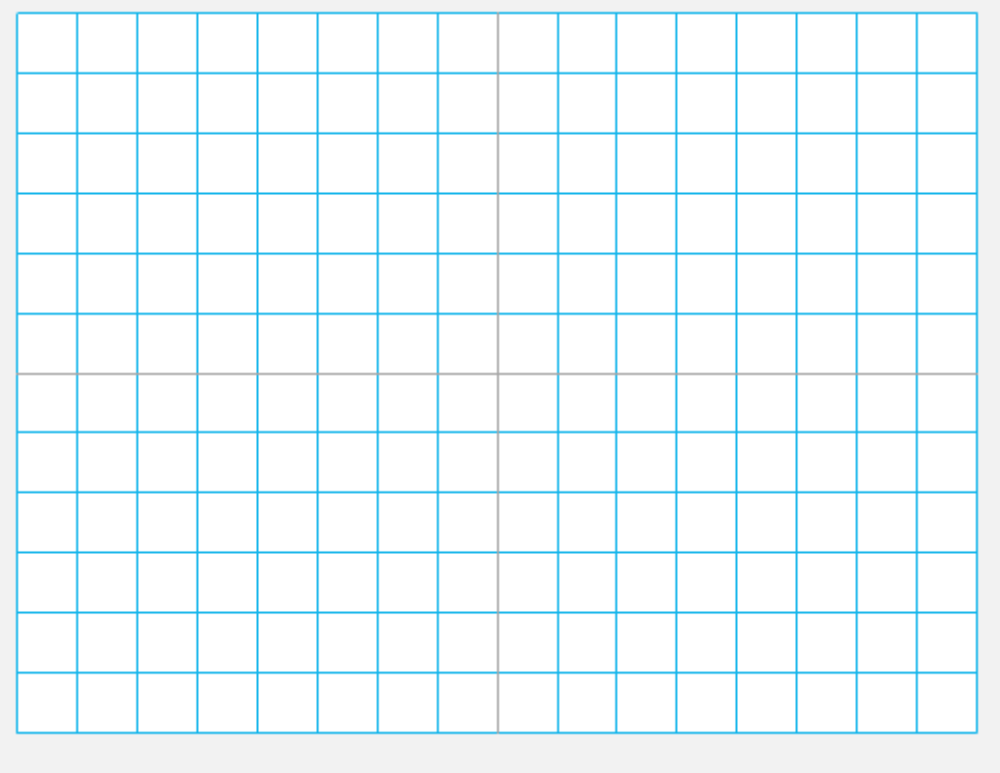
This Scratch project is based on the famous Tetris game, where blocks fall down the screen. This version is very basic!



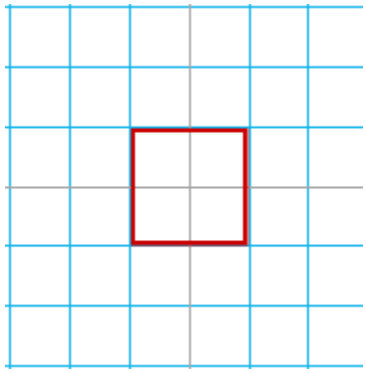
You can see the finished project at https://scratch.mit.edu/projects/230976589/.

Step 1: Draw the backdrop and sprite

- The background to Tetris is usually black, so that's what I chose, but it can be any colour (as long as you don't use the same colour on a sprite!). Colour it with the paint can.
- Next, we want to draw a very accurate square for our sprite – it needs to be accurate so the blocks look like they are fitting together. To help us do this we will first choose the Scratch backdrop called xy-grid-30px, which is in the Other category on the left. It looks like this.



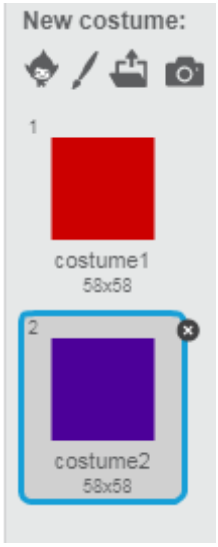
- We will not use this grid in the game, but it allows us to be super-accurate when we draw our sprite, which is important so that the Tetris blocks fit together.
- With this grid selected, click the paint brush to draw a new sprite. We will use the grid lines to help us make it exactly the size we want.
- Choose a colour you haven't used yet, and Hold down the Shift key and use the rectangle tool to create a square that is the size of four squares of the grid. You may have to guess a bit, and then adjust it but you are aiming for something like this:



- Move the sprite against the grid backdrop to measure it, and use the select tool to resize it if necessary (but only drag the corners to resize it, or it will stop being square!). Use the paint tool to fill it with colour.

- Make sure the costume is centered – we need to know exactly where it is!

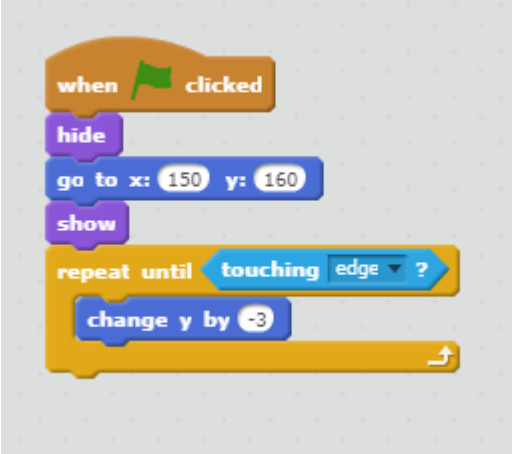
- This means each block should be 60 pixels square. If it is easier, Use the grow and shrink tools to get this exact.
- Make one more costumes for this sprite, by duplicating the first one. That way they will all be the same shape and size. Use the paint tool to colour them different colours, like this:



Save your project

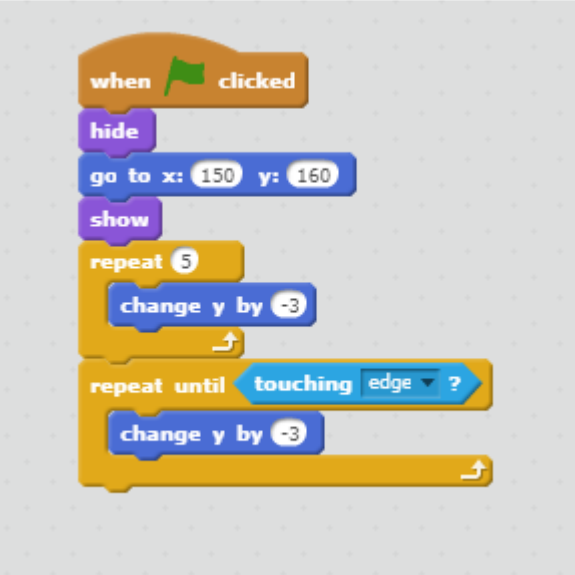
Step 2: Make the block fall

- Add this code to make your block fall down to the bottom of the screen:



- Test your code – it doesn't work! :'(

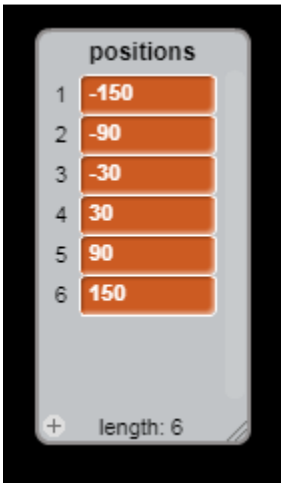
- The reason it doesn't work, is that the block is already touching the edge, so the repeat loop never runs! Add an extra repeat to your code so the block falls away from the top edge, and then runs the rest of the script – it should now look like this:



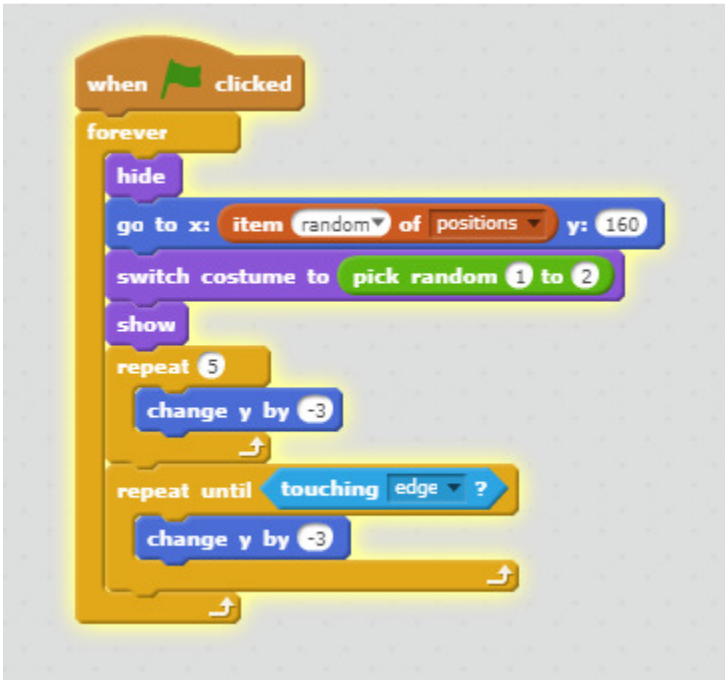
- If you want the block to fall faster or slower, try out different numbers in the change y block. If you choose -1, it will fall very slowly, while -10 will be very fast!

- Your block should now fall and stop at the bottom of the screen. But…
- …it always falls from the same place – we want it to fall from a lot of different positions along the top of the screen. Often we would use pick random for this, do you know why that wouldn't work here? (Turn to the end for the answer).
- Instead we will create the following list to set the possible starting x positions of our block. The code will clear the list and rebuild it each time we run the program. (If you are changing this project to use a different size block, you will have to work out your own numbers to use ;-))

- Run your project again, and check your list looks like this:



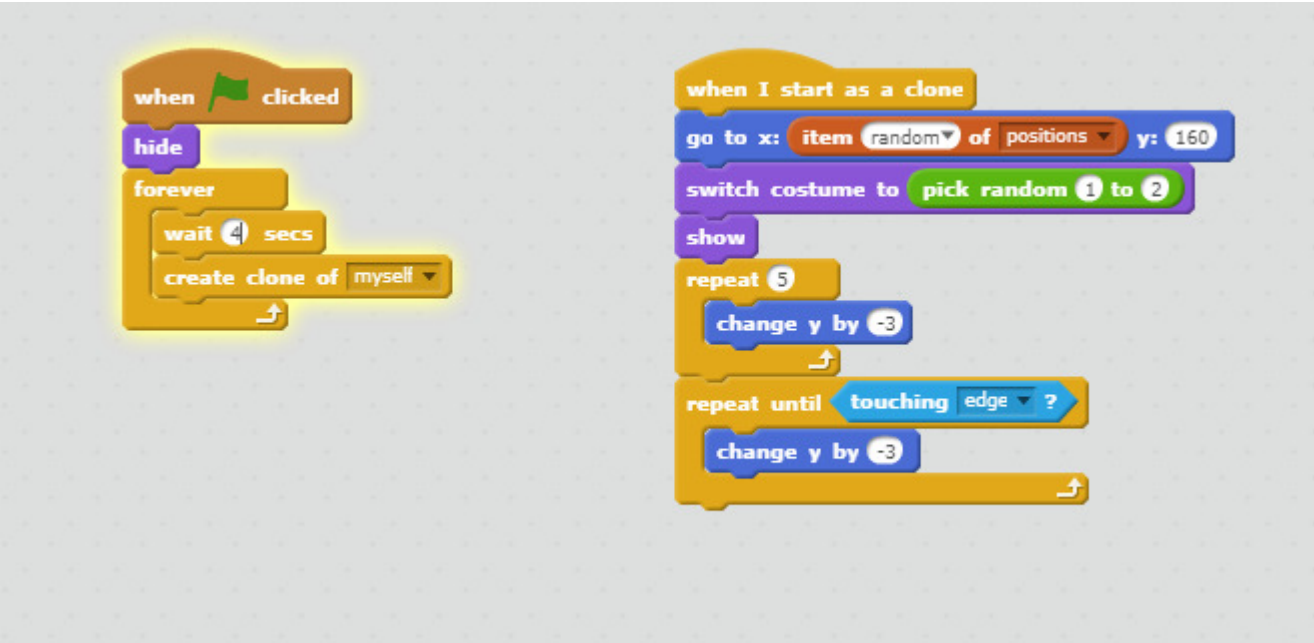
- Now clear the checkbox next to your list, as we don't need to see it on the screen.
- Once we have set up our list, we will pick a random x position from the values in it. Replace 150 with item random of positions, and put a forever loop around all your code so we don't have to keep clicking to start it.
- Also, add pick random costume so we see both colours.
- It should now look like this:



- Test your code!
- This is a big part of the code we want, but one block is not enough – we need to use clones.

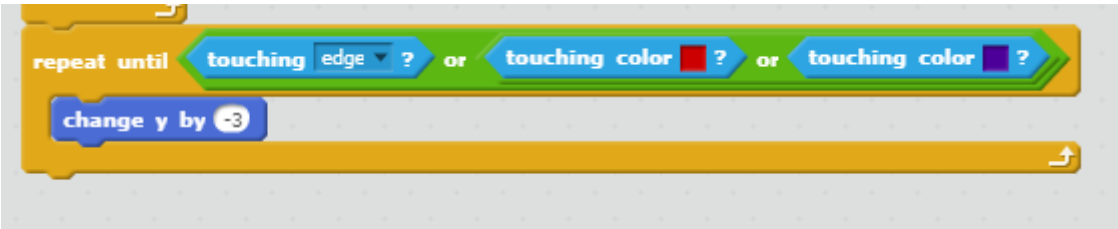
Step 3: Using clones

We need to make a few changes to our code, so we can have lots of blocks on the screen at the same time.

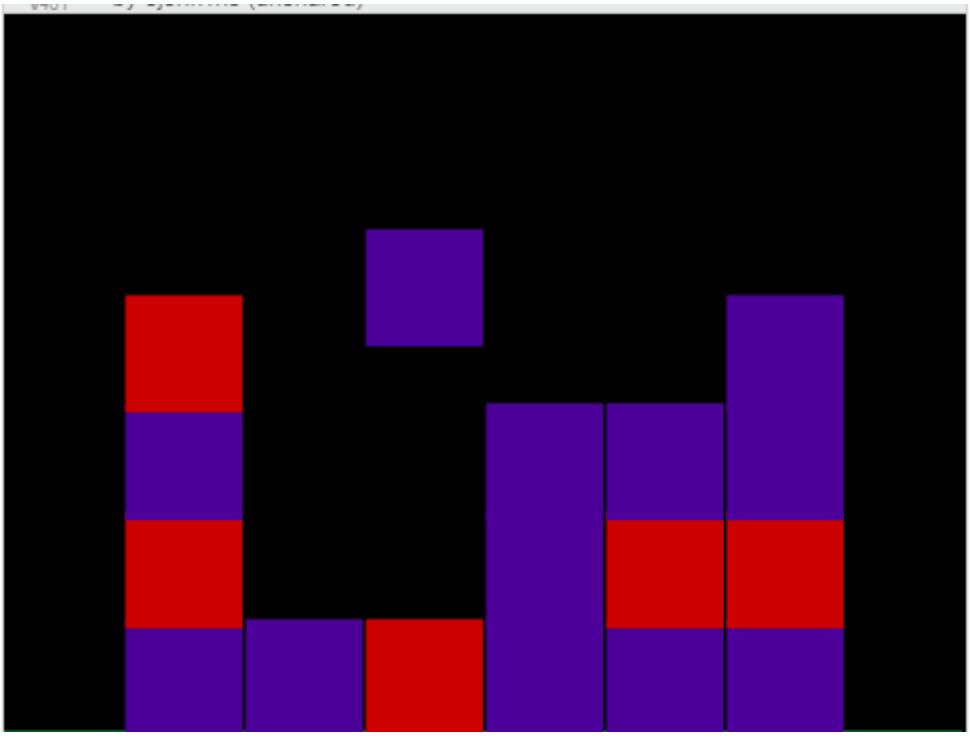


- Drag most of the code to the When I start as a clone hat block, and add the wait and create clone blocks. I also moved the hide outside of the forever loop, so everything will start hidden.
- Our blocks are not stacking up like we would like, so change the condition on the repeat until loop to also test for touching colour, using the following:

- Can you work out how to put them together? We want to stop the repeat loop if touching the edge, or touching the first colour, or touching the second colour. The finished code looks like this:

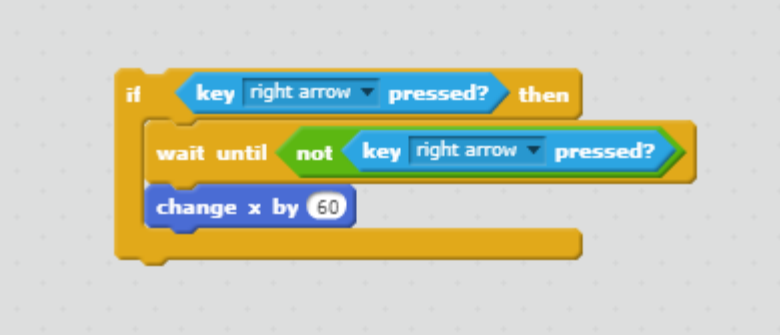


- Adjust the time between clones and the rate they fall so that you only have one block falling at any time. I used wait 4 seconds, and change y by -3.
- You may find your blocks get stuck touching the edge of another one, instead of falling all the way down. To fix this, use the shrink tool until there is a tiny amount of black between each block (and double-check your costumes are all centered!).



- We now need to code how to move the falling block left and right, using the arrow keys. But we want our block to 'jump' sideways to the next position, not to move slowly, as then it could get stuck halfway.
- We also only want the blocks to move if they are falling – once they stop, they should stay where they are. This means we add the code for the arrow code inside the loop that changes the y position, not anywhere else.
- The code below will move right in jumps of one block width. It does this by checking if the arrow key has been pressed, waiting until the arrow key STOPS

being pressed, and then changing the x position by 60. (if you look back at our list of x-positions, you will see that there is a difference of 60 between each one, as this is the size of one block).



- The reason we need to wait until the key stops being pressed, is because Scratch is much faster than a computer keyboard! If we don't include the wait block, then even if we just tap the arrow key very quickly, the block will still move too far (try it without the block and you will see).
- We also need to add some very similar code for the left arrow key…
- The code must also test for the end positions, and not jump too far left or right.

Save your project

More ideas

- Pick random won't work to set the x position of our block because we want the blocks to appear in very specific places, otherwise they won't fit together well. If you are not sure about this, change your code to use pick random, and see the difference.
- How could we 'zap' a row once it is complete?
- There is a bug in this program, in that you can hold down the arrow key, and the current block will stop falling. However the next block will still fall, although you won't be able to move it without letting go of the first one. Is there a way to fix this? If I find it, I will update these instructions!

- Cross-reference these instructions with Scratch, github and the other project, and vice versa.
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