Phoenix

You will need:

Access to the [Scratch](#) website, from a computer or laptop.
(It might also work from an ipad or tablet)

This tutorial is best for people who have used Scratch a little bit before.

Setup:

If you haven't used Scratch before, click **join scratch** at the top and create an account. **You might need your parent's email to do this, so ask for help.** If you can't make an account, you can follow along, but you won't be able to save your work.

Once you've made an account follow the Phoenix Scratch studio [here](#). This is where you can find the template versions of all the workshops we create. Feel free to remix them and post the new things you create.

Wait, what is Scratch?

Scratch is a free, online, ==block-based== code editor. You might have used it in school. If you've been to one of our family workshops, you've probably seen us using it there.

There are lots of different tutorials available for using Scratch. Here we are going to focus on showing you ways of using Scratch that link to the work we do at Phoenix. This will include things like animation and drawing.

Motion Canvas

This project let's you play with capturing different kinds of video data and create exciting interactive images from them.

This project builds on the techniques we covered in the Virtual Pet tutorial.

Below is the finished project. Open it up and start remixing:
https://scratch.mit.edu/projects/391681337/

If you want to follow through the steps below, it might be easier to remix this version of the project:
https://scratch.mit.edu/projects/391766388/

Step 1

In these steps we are going to break down some of the different elements that make up the project. This will explain the things you would need to think about if you wanted to create a new version (without remixing our project) and also help you to understand how our project is working.

So, first of all make sure you have the Video Sensing extension included in the project.
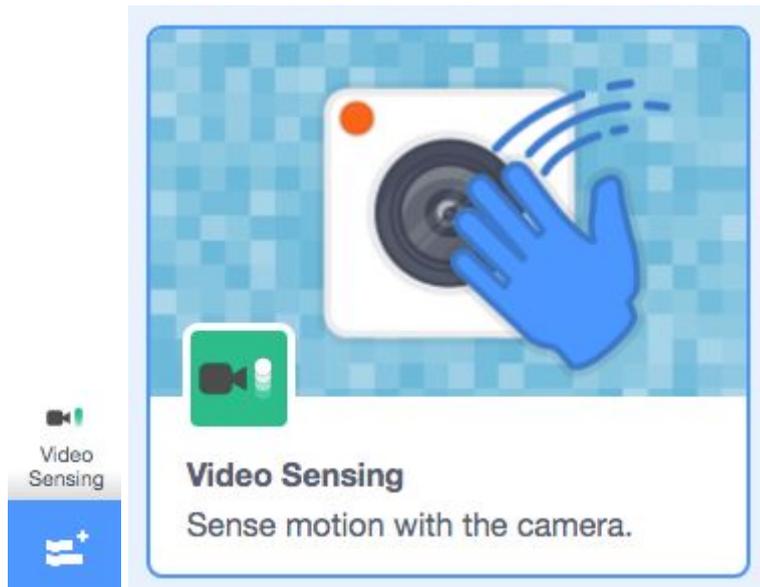
Step 2

Open up the Stage code and add the following blocks.
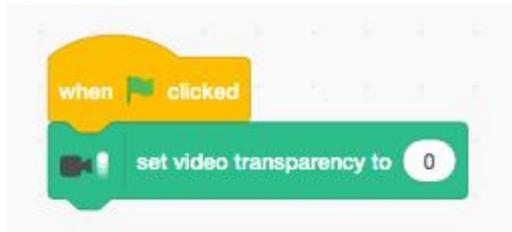
This will allow us to see what is happening as we build our project.

Step 3

Now let's test how we want our video to control the scene.

Create a new Sprite. We've called ours Pixel.

Pixels make up the individual dots of light or data in the screen.

In this project that is what we are doing, except that our pixels are quite big!

Create the following code block in the Pixel to test the sensing.
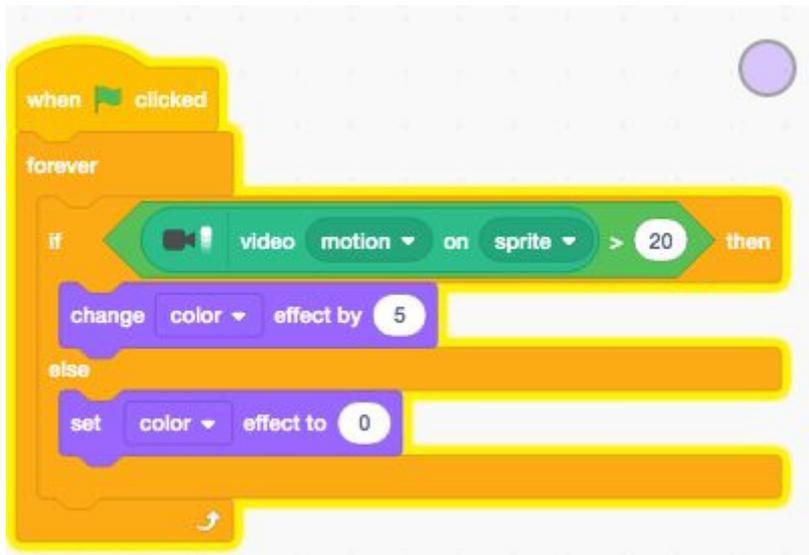
Step 4

Click the green flag and check it's working. Now you should be seeing a sprite that changes colour when you move something over it.

We have used the change color effect by 5 block but you can experiment with whatever you like.

Using the if else block we have made sure that we reset the colour when the movement stops. Doing this makes the interaction of the project a bit easier to follow later on.

When you have an effect that you are happy with move on to the next step.

Step 5

Now we know how one pixel is going to work, but we want to fill the whole stage.

We are going to do this using the create clone block. Using this makes the creation of our pixels really simple. We just have to clone our original one.

The tricky part is deciding how many to make.

Scratch has a limit of about 300 clones in a project.

Now move the code block from Step 4 so that it matches this,
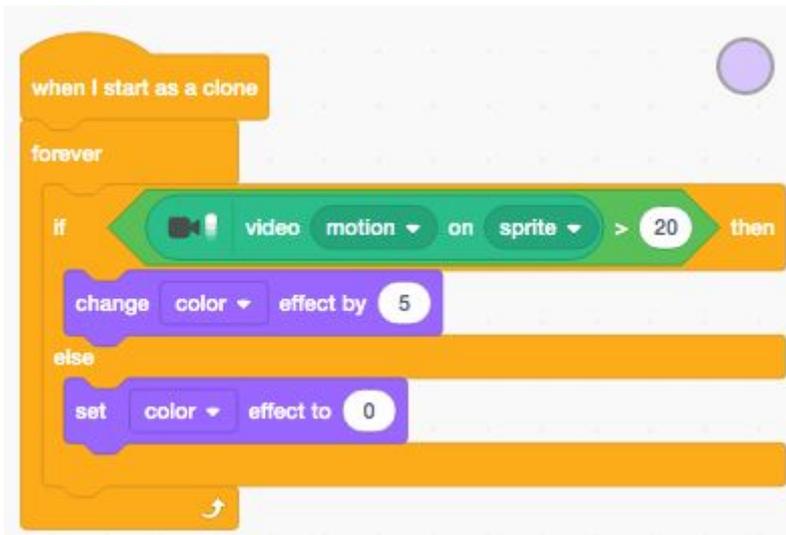
In our project you will see that there are two sprites. Pixel and Pixel Small. Pixel Small, uses smaller steps to create a grid of clones that is closer together. Use whichever you like.

This is the code for the normal Pixel. See if you can understand what it is doing.
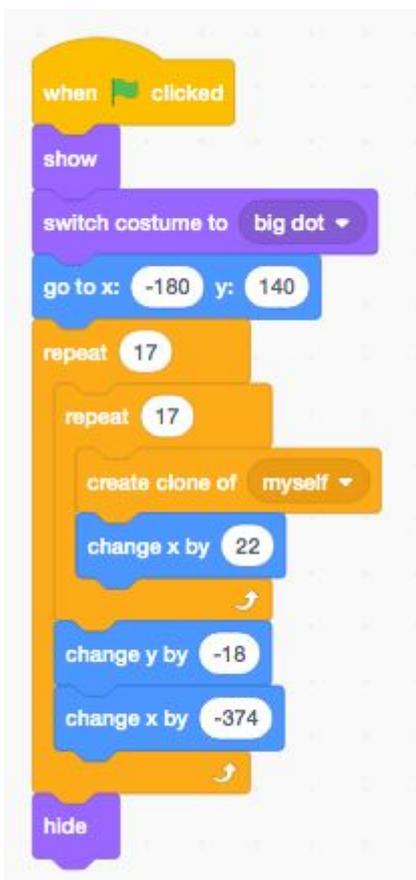
Step 6

So let's discuss this code block. We make the sprite visible. Next we select which costume to use. You might want to set up lots of different costumes to experiment with.

Then, the sprite is moved to the start of our grid. Now we can start making our clones.

It creates 17 clones, moving along the x axis 22 steps each time.

At this point we know it is the end of the row so we change the y and the x axis to place the sprite in the right place. This process will then repeat through 17 times.

We've chosen these numbers because 17x17=289 . This means we can create a square grid without going over the 300 clone limit.

Step 7

And that's the whole process!

Simple, right.

You might want to reset the video transparency to 0 now.

Our project should now be working quite well.

Step 8

Finally, we'll move on to the slightly more advanced version that we have used in the image at the top.

To make the effect more visible, make sure you set you first block of code to switch the costume to 'pointer'.
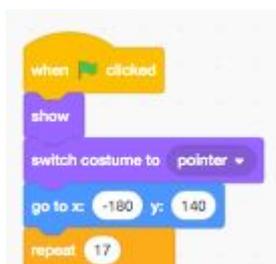
Now, we said it was more advanced… but really it is just one block extra. Edit your clone block so that it looks like this.
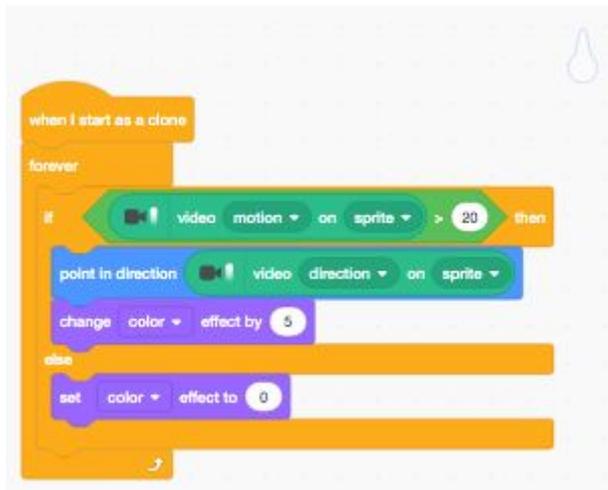
We are simply making the Pixel point in the direction of the movement in the video.

Adding this is quite simple, but starts to add a more interesting effect to the project!

Step 9

You should be able to find some alternative clone effect blocks that we have prepared in the Sprites. Have a play with them and see if you can remix your own creations.

Here are some ideas for you to have a go at:

- Can you make some new costumes?
- Can you add sounds?
- How about pixels that change size?
- How about pixels that move?

Remember to share your project to the Phoenix Scratch studio!

Hopefully you found this exercise interesting! We can't wait to see what you create.

Phoenix.org.uk
@PhoenixLeic