



Internal security and alerts

For this activity you require access to a Raspberry Pi (plus peripherals) and a Raspberry Pi Camera Module attachment.

A calamity of epic proportions is underway, and you and your team are the only ones who can save us! Can you create something that will protect the world during the apocalypse? What about something to avert the apocalypse altogether? Time to get your survival kits out and your thinking hats on, as you #MakeYourIdeas and save us all!

We've just received this message:



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I need your help: We can't just let anyone come into the base, as they might mean harm or be infectious and in need of quarantining. That door is the only way in and out of here, so we need to be aware of whoever comes through it. I also need to know whether anyone in



Raspberry Pi

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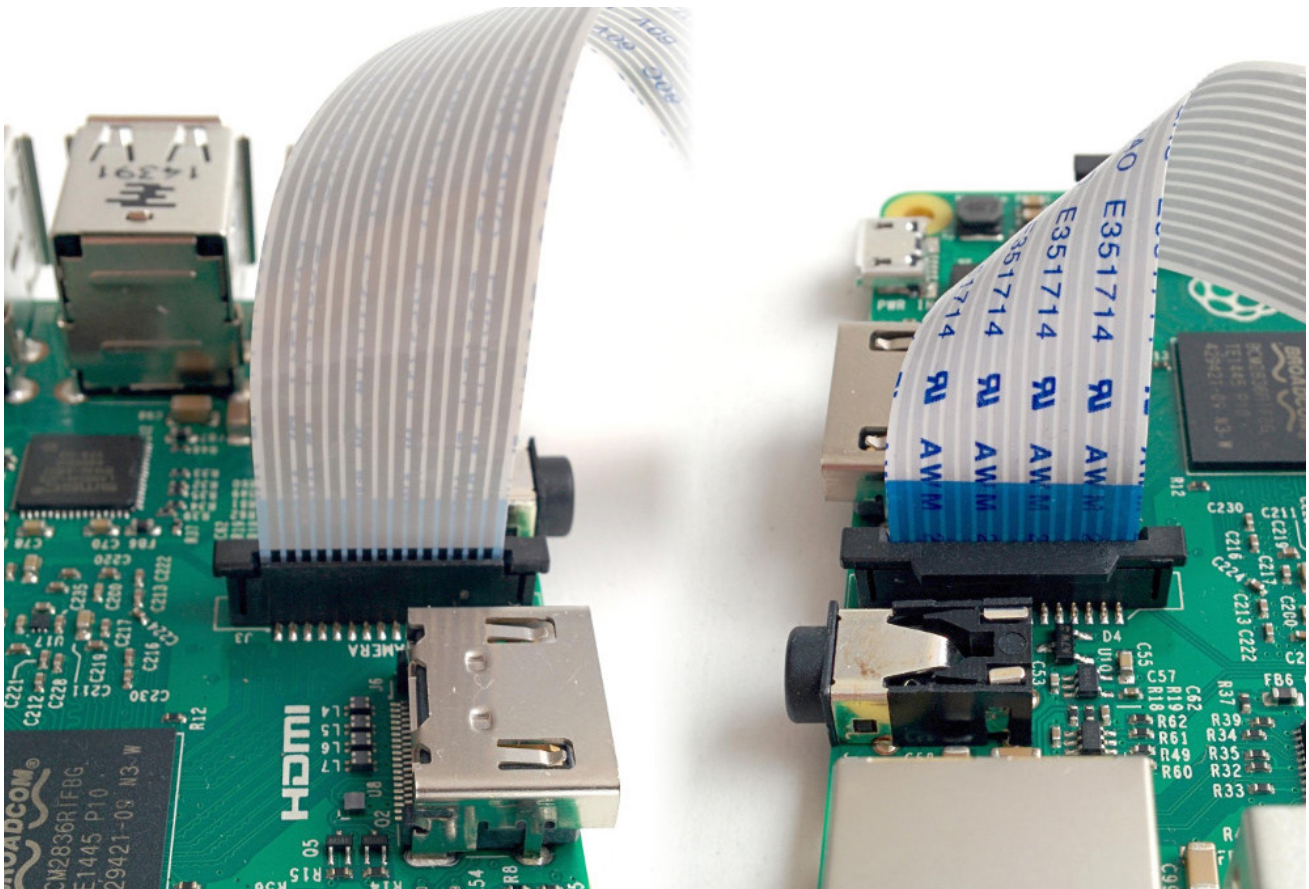
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here is in trouble and needs my help, but I can't be everywhere at once. You have to build something that will monitor the door while I can't be there, in case someone new arrives. We also need to be able to watch back the security footage to see if anyone came in unnoticed.

Luckily, you have a low-power solution with a 1080p HD camera on board which can record video. It's part of any essential apocalypse survival kit: a Raspberry Pi. Yours has a Camera Module, which you need to turn into a CCTV camera. To do that, you'll need to first connect it to your Raspberry Pi:

1. Disconnect your Raspberry Pi from its power source before starting.
2. Insert the flex cable of the camera into the connector between the Ethernet and HDMI ports, with the silver connectors facing the HDMI port.
3. Open the flex cable connector by pulling the tab on the top of the connector upwards and then towards the Ethernet port — remember that the tab **will not** come off, it will only come loose, like a wobbly tooth.
4. Firmly insert the flex cable into the connector, taking care not to bend the cable at too sharp an angle.
5. Push the clip of the connector down while holding the flex cable in place, making sure it is straight and level.

It should look like this:



Reboot your Raspberry Pi, and then confirm that the camera is enabled: click on the **Menu > Preferences > Raspberry Pi Configuration**, go to the Interfaces tab, and ensure that the radio button for Camera has been checked.

To test that the camera is working, open a terminal window and type the following:

```
raspistill -k
```

Then press **Enter**. You'll see a preview image on the screen, which means your camera is set up properly. You can exit the `raspistill` program by typing **x** and then pressing **Enter**.

Now you need to be able to get the camera to record the things it sees. Type the following command into the terminal window, and then press **Enter**.

```
raspistill -o cam.jpg
```

You have just made the camera take a picture, and saved that picture as a file called `cam.jpg` in the folder `/home/pi`. Go see whether you can find the file.

Type the following command into the terminal window, and then press **Enter**.

```
raspivid -o vid.mp4
```

You have just made the camera record five seconds of video to a file called `vid.mp4`. You can watch your video by typing `omxplayer vid.mp4` into the terminal window, and then pressing **Enter**.

You have just learnt to **record videos and take photos** via the terminal using your Pi's Camera Module. Find some more ideas on how to use the Camera Module in your project at the bottom of the worksheet!

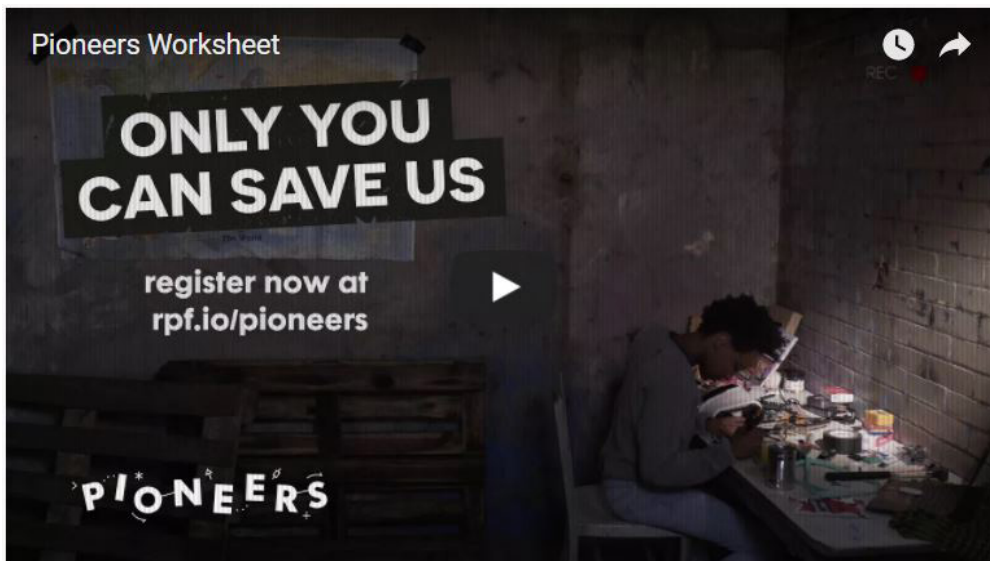
Excellent! This place is well on the way to being apocalypse-proof. Stretch out for a minute and take a break — you're no good to anyone if you fall apart, and the whole world is relying on you.



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You've done it! This message has just come through:



Visit rpf.io/pioneers to find out more about how only **you** can save us!

Take it further

To conserve power and storage space, the best move is to have the camera only begin recording when something triggers it. Depending on the resources you have in your survival pack, there are a few ways in which you can rig up your CCTV-Pi. Three examples are, in order of trickiness and level of security: using a [physical trigger](#), setting up an [infrared \(motion sensor\) trigger](#), or installing a [laser tripwire](#).



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