**Smart bulb**

1. Go to **https://machinelearningforkids.co.uk/** in a web browser
2. Click on “**Get started**”
3. Click on “**Log In”** and type in your **username** and password

If you can’t remember your username or password, ask your teacher or group leader to reset it for you.

1. Click on “**Projects**” on the top menu bar
2. Click the **“+ Add a new project**” button.
3. Name your project “ **smart bulb**” and set it to learn how to recognise “ **sounds**”. Click **Create**

A screenshot of a computer

Description automatically generated

7. You should see “smart bulb” in your project list. Click it. Graphical user interface, text, application

Description automatically generated

8. We will start by training the voice model. Click “Train”

Graphical user interface, application

Description automatically generated

9. Click on “ + Add new label”

Graphical user interface, text, application, chat or text message

Description automatically generated

10. Enter “On” and create another label “ Off”

11. Click on “+Add Example” in the “background noise”bucket”

Shape, rectangle

Description automatically generated

12. Click on the **microphone button** to record a sound clip, then click “**Add**” to add the recording to your training bucket

Graphical user interface, application

Description automatically generated

13. Repeat until you’ve got at least eight examples of background noise. Try and include a mixture of recordings of quiet, and recordings of you saying anything apart from “on” and “off”

Graphical user interface

Description automatically generated with low confidence

14. Click the “+ Add example” button in the “On” bucket.

15. Click on the microphone and record yourself saying “On”

Use the graphic of your recording to check that you’ve recorded all of it. If you look very carefully, you can sometimes tell where the word is.

Graphical user interface, application, Teams

Description automatically generated

Use the graphic of your recording to check that you’ve recorded all of it. An empty section at the start might mean you waited too long to start talking after clicking the microphone. Try to avoid that!

Graphical user interface, application

Description automatically generated

16. Collect at least eight examples in each buckets. The more examples you collect, the better your project should work.

Graphical user interface, application

Description automatically generated

17. Click the **“< Back to project**” link in the top left.

18. Click the “**Learn & Test**” button

Graphical user interface, application

Description automatically generated

19. Click on the “Train new machine learning model” button

Graphical user interface, text, application

Description automatically generated

20. Click on the “Start Listening” button. Try saying “On” and “Off”. If your machine learning model recognises it, it will be displayed below.

Graphical user interface, text, application

Description automatically generated

21.Decide if you need to do more training.

If your machine learning model thinks you’ve said “laser eyes” when you didn’t say it, that’s called a “false positive”. If your machine learning model doesn’t recognize when you say “laser eyes”, that’s called a “false negative”. If you see either of those problems, go back to the “Train” page and collect more training examples in both buckets. I found that my model worked okay after 15 examples in each bucket, and really well after 30 examples. Your results will be different! Test and see! When you think it’s working well enough, carry on to step 22.

22. Click on “<Back to Project“ and click on the “Make” button.

23. Click the “Scratch 3” button

24. Click the “Open in Scratch” button

25. Click on the “paint” button to create a new Sprite name “bulb”

Graphical user interface, application, Word

Description automatically generated

26 Create a new costume for the bulb named “ On”

Graphical user interface

Description automatically generated

27. Create a second costume of a dark bulb name “ off”. You can duplicate “On” and rename it “Off”

A screenshot of a computer

Description automatically generated

Graphical user interface, application

Description automatically generated with medium confidence28. Once the costume are done, build the following Script.

A screenshot of a chat

Description automatically generated

29. You have a simple working smart bulb.

Advanced Session:

30. Now challenge your self to build a smart bulb that is has 3 brightness setting, and is dimmable by voice! Open to all creative ideas using NLP on *Scratch 3*.