

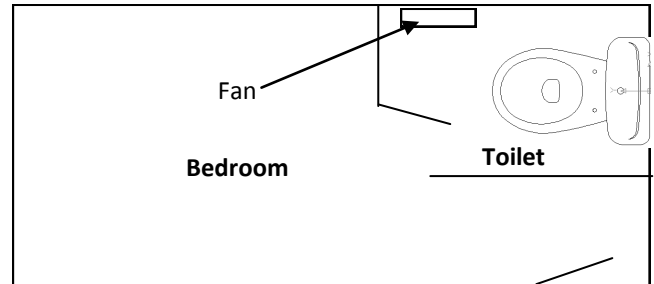


Toilet Fan

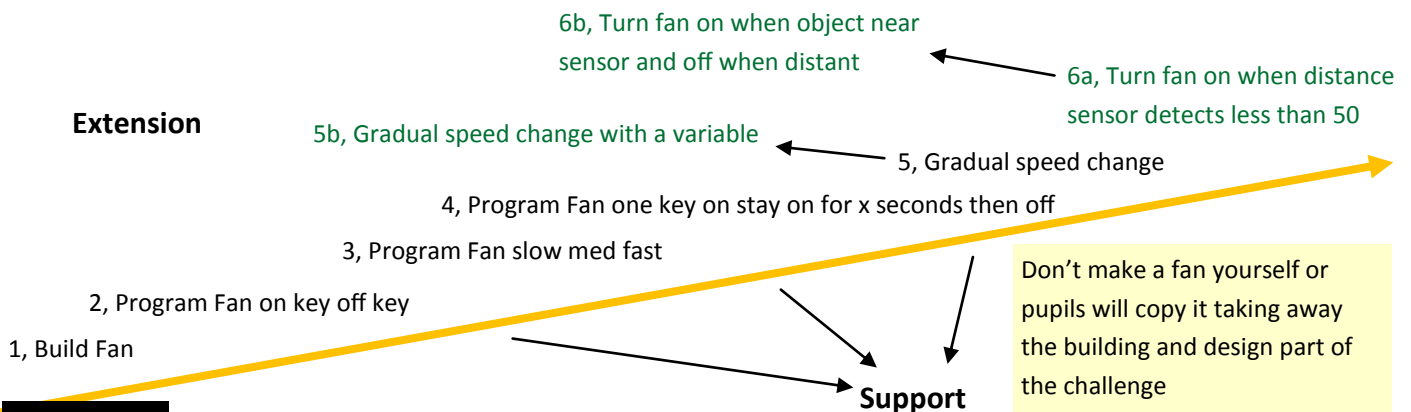
Program Aim Can the users build a simple fan out of [Lego Wedo](#) and then program it in [Scratch 1.4](#) (1.5-2 hours Y5-6)

Scenario

An upstairs bedroom has been converted into a flat with built in bathroom and toilet. The new owner doesn't want nasty smells in their bedroom so has installed a fan. The fan extracts (removes) stale air but is too noisy to remain on all the time.



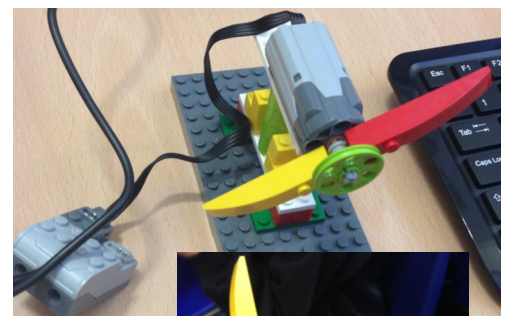
Differentiation and Assessment for Learning At the beginning of each session the *learning intention sheet* is shared and the learning journey expanded through success criteria. Pupils feed their progress back to the teacher through annotating this sheet with faces at the end of the lesson. Teachers can also annotate the sheet to indicate those who need more or less help in future lessons. These extra resources can be found on the code-it.co.uk website.



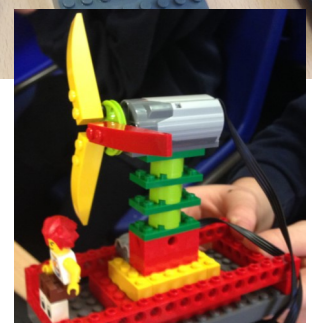
Learning Path

1, Build Fan

Give pupils boxes of Lego Wedo one between two is ideal but one between three would work. Explain the scenario and add restrictions about not swapping Lego between boxes. Show pupils how the USB block, motor and distance sensor blocks fix together. Explain that the fan must be mounted and should not fall off. The fan does not have to have curved blades to draw air as it is a prototype to sort out the programming aspects. Give pupils time to build. Some will need help in seeing that the fan needs to be fixed and not loose or the motor will not drive it. Allow them to move on in groups when you have checked their models are safe.



Fan examples





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Toilet Fan P2

Before pupils plug their models into the USB ports show them the extra blocks that appear once the USB has initiated (often takes 2 minutes)

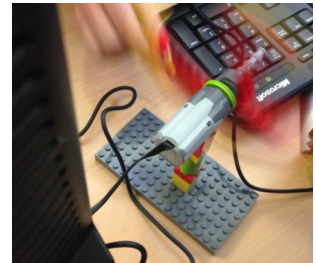
Stress that they must follow the programming challenges found on their Success criteria sheets and that you will be checking these.

Don't show them what to do!

```

motor on for 1 secs
motor on
motor off
motor power 100
motor direction this way

```



Following examples are for your benefit. Please note there are many more possible solutions to some of these challenges

```

when o key pressed
motor on

when x key pressed
motor off

```

2, Program fan on key (o) and off key (x)

```

when clicked
forever if key o pressed?
motor on

when clicked
forever if key x pressed?
motor off

```

```

when clicked
forever if key f pressed?
motor power 100

when clicked
forever if key m pressed?
motor power 70

when clicked
forever if key s pressed?
motor power 40

```

3, Program fast (f) slow (s) and medium (m) keys

```

when f key pressed
motor power 100

when m key pressed
motor power 50

when s key pressed
motor power 30

```

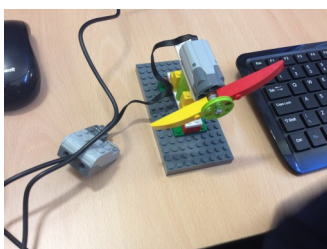


4, Program the fan to start from one key stay on for 5 seconds then turn off

```

when f key pressed
motor on
wait 5 secs
motor off

```





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Toilet Fan P2

5, Program the fan to start slow move to medium speed before spinning at maximum speed before slowing back down to slow again all within a 10-20 second time frame and all triggered by (r) key

```

when r key pressed
motor power 20
wait 1 secs
motor power 30
wait 1 secs
motor power 40
wait 1 secs
motor power 50
wait 1 secs
motor power 60
wait 1 secs
motor power 70
wait 1 secs
motor power 80
wait 1 secs
motor power 90
wait 1 secs
motor power 100
wait 1 secs
motor power 90
wait 1 secs
motor power 80
wait 1 secs
motor power 70
wait 1 secs
motor power 60
wait 1 secs
motor power 50
wait 1 secs
motor power 40
wait 1 secs
motor power 30
wait 1 secs
motor power 20
wait 1 secs
motor off

```

5a, Gradual speed change with a variable

You may wish to give pupils the blocks they may need to carry this out which are on the extension card

```

when clicked
set speed to 20
repeat 80
motor power speed
wait 0.1 secs
change speed by 1
repeat 80
motor power speed
wait 0.1 secs
change speed by -1
motor off

```

6a, Turn fan on when distance sensor detects less than 50

You may wish to give pupils the blocks they may need to carry this out which are on the extension card

```

when clicked
forever if distance sensor value > 50
motor off

when clicked
forever if distance sensor value < 50
motor on

```

```

when clicked
forever
if distance sensor value > 50
motor off
else
motor on

```

6b, Turn fan on when object near sensor and off when distant