Construct your own secret code

Ever wanted to send a secret message to a friend that no one else can read? Now you can do it on your BBC micro:bit.

When you've got the program on your micro:bit, simply tell your friend the secret code (this will be made up of three numbers, much like in a luggage lock) and pass the micro:bit to them.

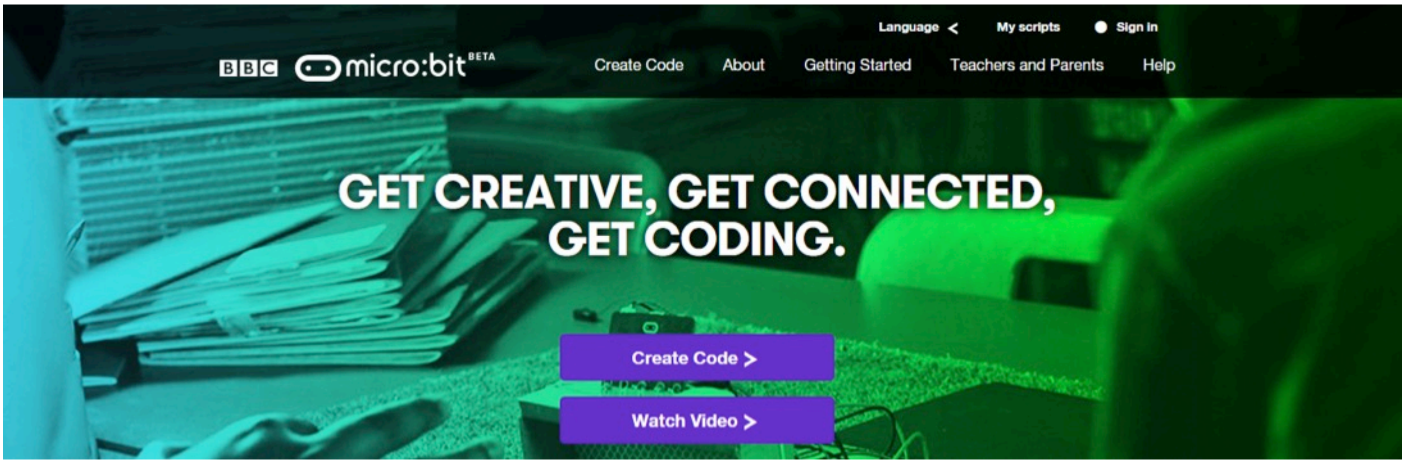
They will have to pinch the micro:bit along the input/output pins **0**, **1** and **2** with the secret code in order to unlock the message. So, for example, if your code is 123, they would have to pinch input/output pin **0** once, pin **1** twice and pin **2** three times.

Then, if they hold down button A and shake the micro:bit, your secret message should display. Ready to give it a go?

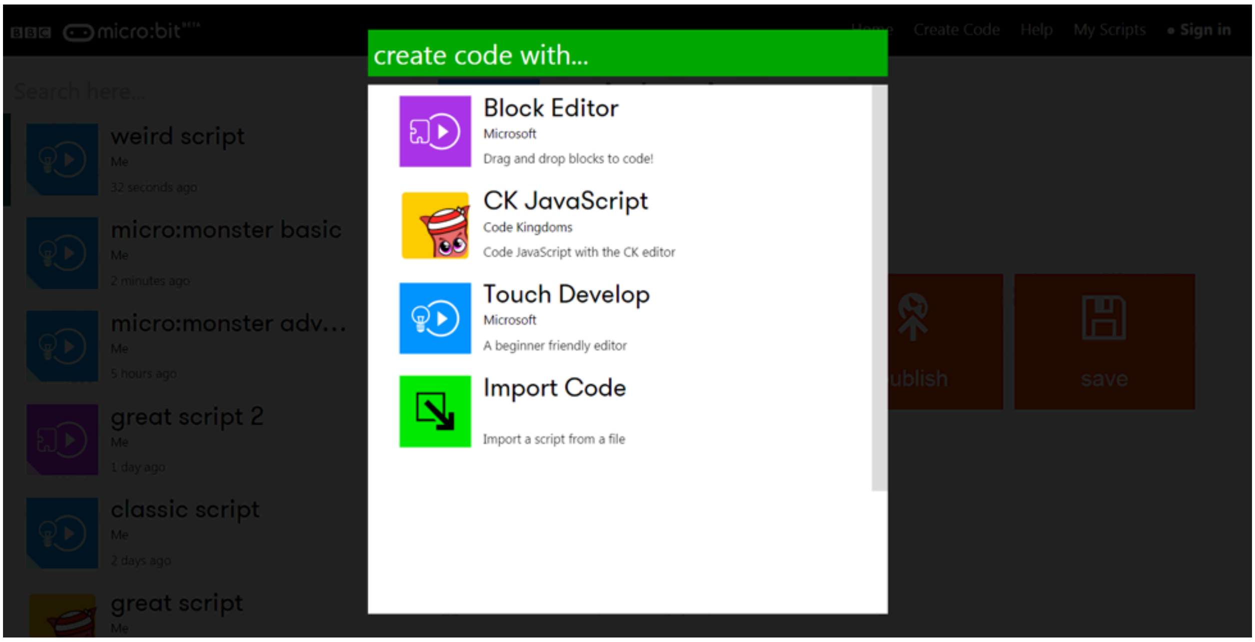
Step 1: Import the code

Download the hex file from our Live Lessons website.

Firstly, select **'My scripts'** on the top navigation on the micro:bit website (**www.microbit.co.uk**), and choose **'Create code'**.



Choose **'Import Code'** and upload the hex file that you've downloaded from the Live Lessons website.



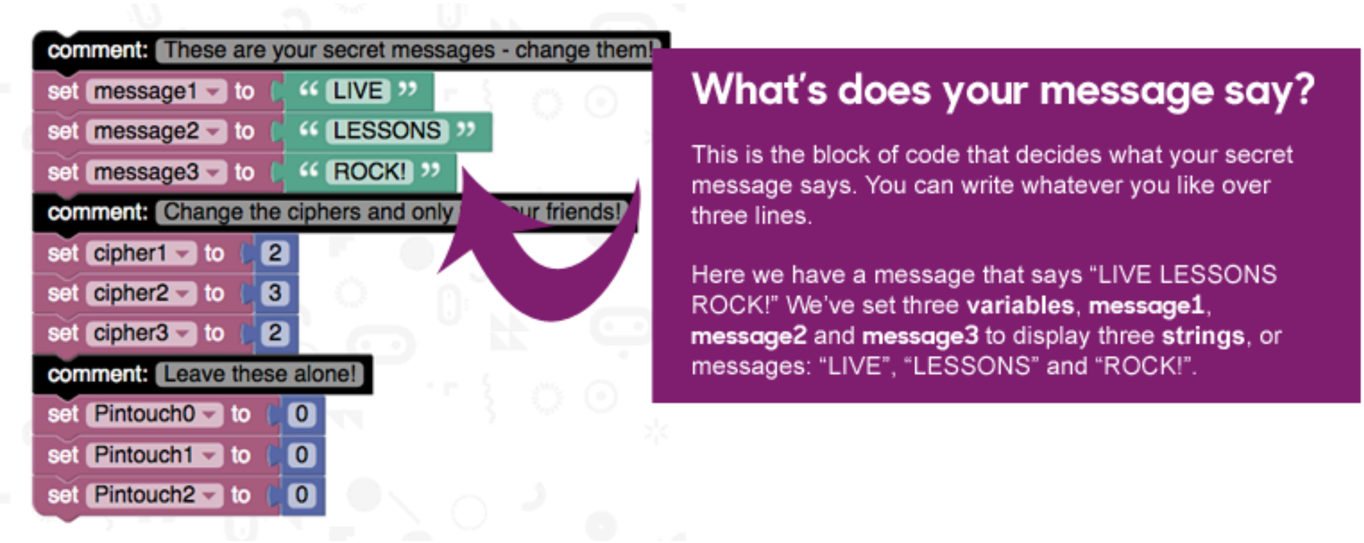
create code with...

- **Block Editor** — Microsoft — Drag and drop blocks to code!
- **CK JavaScript** — Code Kingdoms — Code JavaScript with the CK editor
- **Touch Develop** — Microsoft — A beginner friendly editor
- **Import Code** — Import a script from a file

The script for the secret codes exercise should now appear in your code window.

Hit **'run'** to see it in action on the simulator, or plug in your micro:bit, hit '**compile**' and drag your hex file onto your micro:bit to try out your secret code.

Step 2: Understanding the code

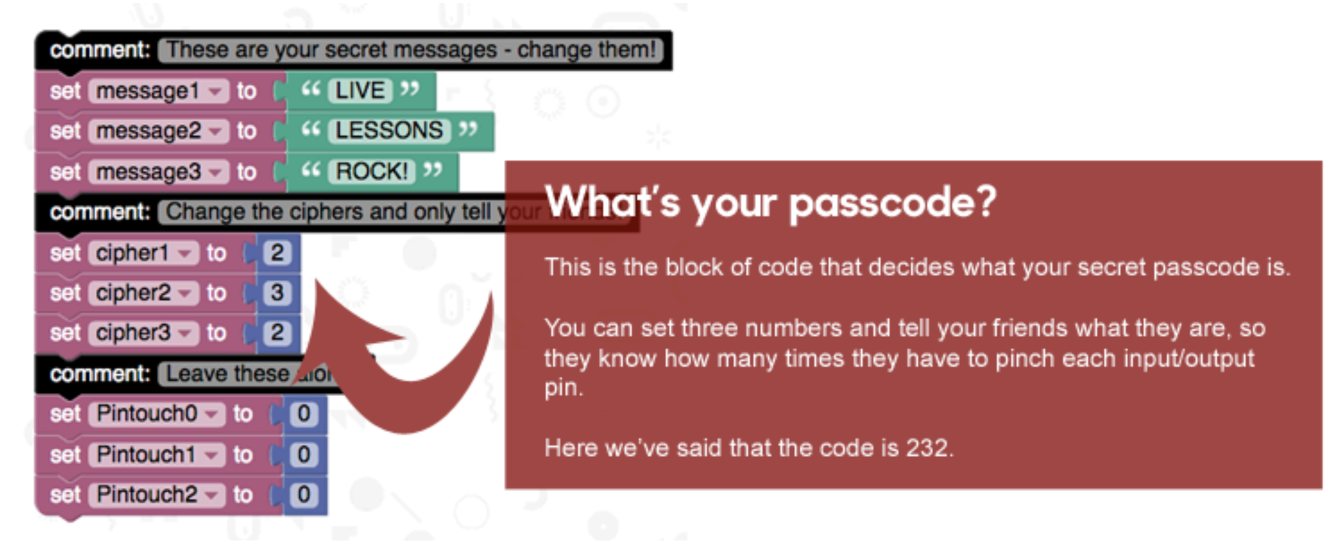


```
comment: These are your secret messages - change them!
set message1 to "LIVE"
set message2 to "LESSONS"
set message3 to "ROCK!"
comment: Change the ciphers and only tell your friends!
set cipher1 to 2
set cipher2 to 3
set cipher3 to 2
comment: Leave these alone!
set Pintouch0 to 0
set Pintouch1 to 0
set Pintouch2 to 0
```

What's does your message say?

This is the block of code that decides what your secret message says. You can write whatever you like over three lines.

Here we have a message that says "LIVE LESSONS ROCK!" We've set three **variables**, **message1**, **message2** and **message3** to display three **strings**, or messages: "LIVE", "LESSONS" and "ROCK!".



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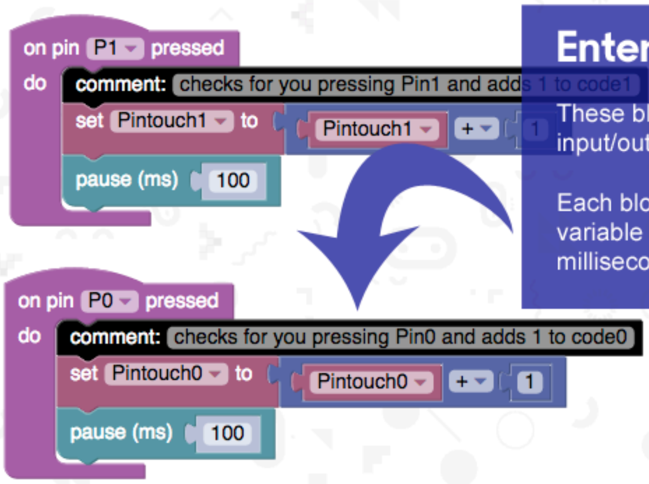
```

What's your passcode?

This is the block of code that decides what your secret passcode is.

You can set three numbers and tell your friends what they are, so they know how many times they have to pinch each input/output pin.

Here we've said that the code is 232.



```
on pin P1 pressed
do  comment: checks for you pressing Pin1 and adds 1 to code1
    set Pintouch1 to Pintouch1 + 1
    pause (ms) 100

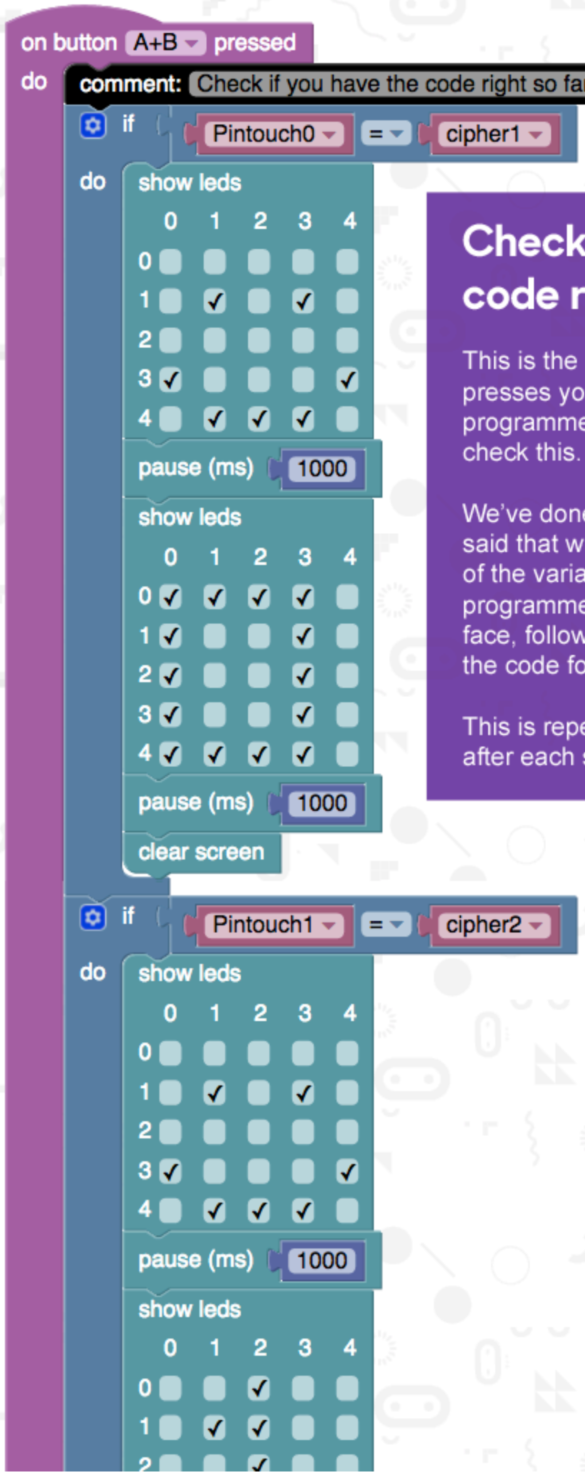
on pin P0 pressed
do  comment: checks for you pressing Pin0 and adds 1 to code0
    set Pintouch0 to Pintouch0 + 1
    pause (ms) 100

on pin P2 pressed
do  comment: checks for you pressing Pin2 and adds 1 to code2
    set Pintouch2 to
    pause (ms) 100
```

Entering the secret code

These blocks let the program know what to do when you pinch the input/output pins.

Each block states that each time you press the pin, it adds **1** to the variable **Pintouch0**, **Pintouch1** or **Pintouch2**, before pausing for 100 milliseconds.



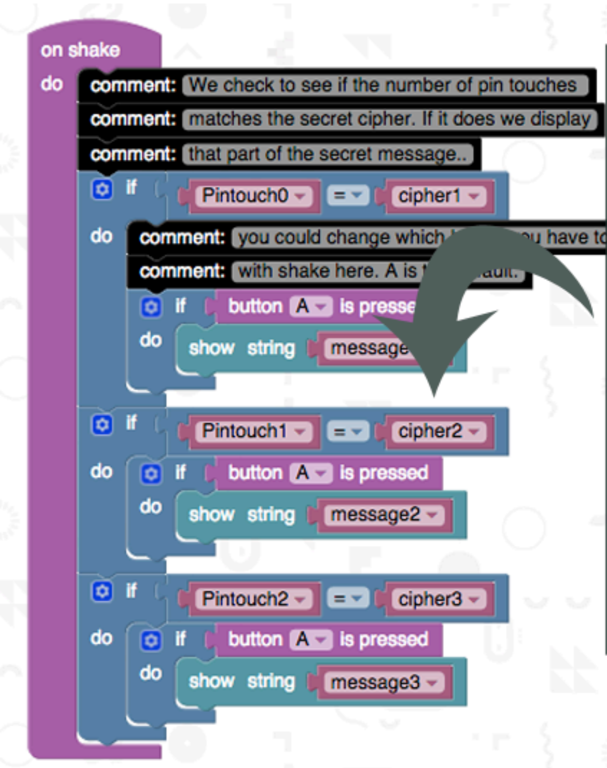
```
on button A+B pressed
do  comment: Check if you have the code right so far:
    if Pintouch0 = cipher1
    do  show leds
              0 1 2 3 4
            0 □ □ □ □ □
            1 □ ☑ □ ☑ □
            2 □ □ □ □ □
            3 ☑ □ □ □ ☑
            4 □ ☑ ☑ ☑ □
        pause (ms) 1000
        show leds
              0 1 2 3 4
            0 ☑ ☑ ☑ ☑ □
            1 ☑ □ □ ☑ □
            2 ☑ □ □ ☑ □
            3 ☑ □ □ ☑ □
            4 ☑ ☑ ☑ ☑ □
        pause (ms) 1000
        clear screen
    if Pintouch1 = cipher2
    do  show leds
              0 1 2 3 4
            0 □ □ □ □ □
            1 □ ☑ □ ☑ □
            2 □ □ □ □ □
            3 ☑ □ □ □ ☑
            4 □ ☑ ☑ ☑ □
        pause (ms) 1000
        show leds
              0 1 2 3 4
            0 □ □ ☑ □ □
            1 □ ☑ ☑ □ □
            2 □ □ ☑ □ □
```

Checking to see if you have the code right so far

This is the block that checks to see if the number of pin presses you've made so far matches the secret code that was programmed in. You can press **button A and B together** to check this.

We've done this using **conditional statements**. Here we've said that when you press button A and B together, IF the value of the variable **Pintouch0** is equals to the value you've programmed into variable **cipher1**, then it displays a smiley face, followed by the number **0**, which tells you that you've got the code for input/output pin 0 correct.

This is repeated for each pin, making sure to **clear the screen** after each smiley face and number is displayed.



```
on shake
do  comment: We check to see if the number of pin touches
    comment: matches the secret cipher. If it does we display
    comment: that part of the secret message..
    if  Pintouch0 = cipher1
    do  comment: you could change which        u have to press
        comment: with shake here. A is         ault.
        if  button A is presse
        do  show string message
    if  Pintouch1 = cipher2
    do  if  button A is pressed
        do  show string message2
    if  Pintouch2 = cipher3
    do  if  button A is pressed
        do  show string message3
```

Checking to see if your code is correct and displaying the message

This is the block that checks to see if the number of pin presses you've made matches the secret code that was programmed in. If it does, it displays the secret message.

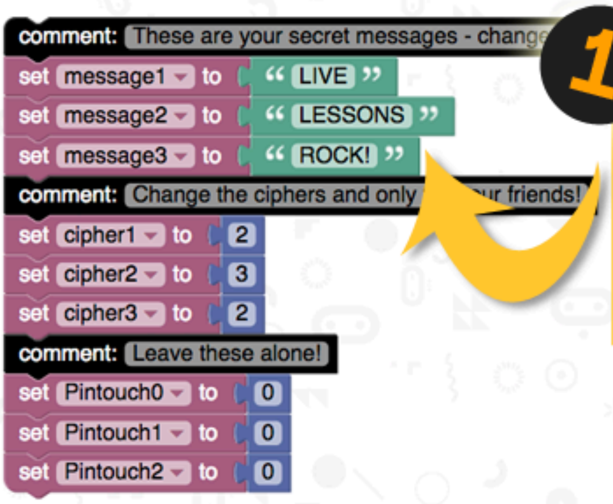
Here we've introduced **conditional statements** for each part of the message.

We've said that IF the number value of the variable **Pintouch0** is equal to the number programmed as your secret code for the input/output pin 0 (**cipher0**), then the first message (**message1**) is displayed IF you **press button A** and **shake** your micro:bit.

This is repeated for all three parts of the messages.

Step 3: Changing the code

You can do several things to change your secret coded message and make it your own.



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comment: Change the ciphers and only         ur friends!
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comment: Leave these alone!
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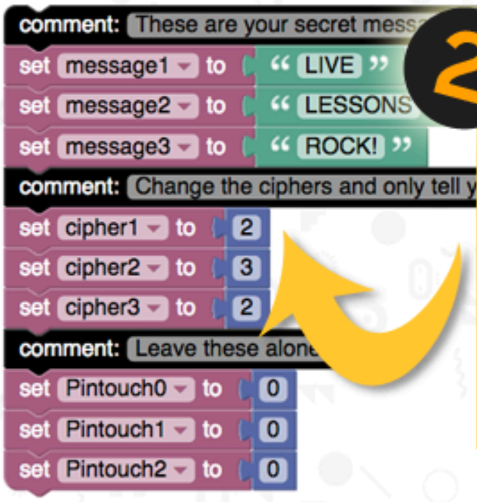
set Pintouch1 to 0
set Pintouch2 to 0
```

1

Changing your message

You can change your message simply by replacing the words between the quotation marks " ".

You can write anything you like. It could be a simple three word message like we've done here, or a full poem, split into three lines.



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comment: Change the ciphers and only tell y
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set cipher3 to 2
comment: Leave these alone
set Pintouch0 to 0
set Pintouch1 to 0
set Pintouch2 to 0
```

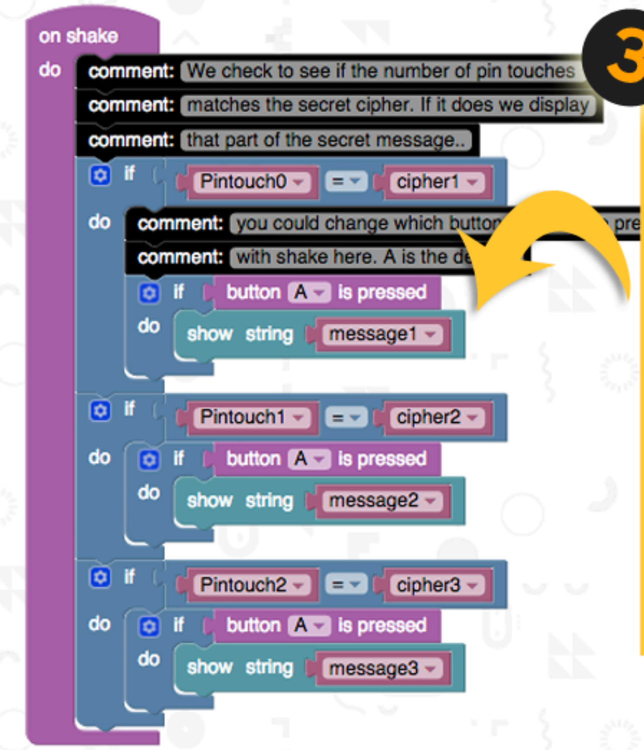
2

Changing your secret code

You can change the code number for your message by replacing the numbers for the variables **cipher1**, **cipher2** and **cipher3**.

This will then become the number of times your friend will have to pinch input/output pins **0**, **1** and **2** respectively in order to unlock the secret message.

You can put in any number you like, although you might not want your friend to have to pinch the pins hundreds of times!



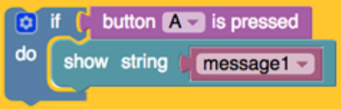
```
on shake
do  comment: We check to see if the number of pin touches
    comment: matches the secret cipher. If it does we display
    comment: that part of the secret message..
    if  Pintouch0 = cipher1
    do  comment: you could change which button        pre
        comment: with shake here. A is the de
        if  button A is pressed
        do  show string message1
    if  Pintouch1 = cipher2
    do  if  button A is pressed
        do  show string message2
    if  Pintouch2 = cipher3
    do  if  button A is pressed
        do  show string message3
```

3

Change what you need to do in order to see the message

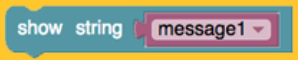
You can change the button you want to press while shaking the micro:bit in order to see the message. Simply click on **A** and use the dropdown to select **B**.

Or you could get rid of the need for pressing buttons altogether, by removing the conditional statement:



```
if  button A is pressed
do  show string message1
```

And replacing it with a block of code to simply show the string.



```
show string message1
```

Remember to do this for all three of the conditional statements. If you do, you'll find that just shaking the micro:bit will reveal your message if you have pinched the pins the correct number of times.

Test, play and show us what you've done

Now that you've made your very own secret code, click '**run**' to test it on the simulator and '**compile**' to see it working on your micro:bit.

Click '**export**' to save off your code and send it to us at live.lessons@bbc.co.uk. You could see your codes featured on our **micro:bit Live Lesson** in February.