



LEARNING INTENTION

I can use an *if-then-else* instruction in my program.

INTRODUCTION

Conditionals are instructions in a program that perform different actions depending on whether something is true or false. They take in information and then depending on its content make a decision to do or not do something. You may be able to think of conditionals that you have encountered in real life. For example. If it is a school day you get up early.

These have a condition and then an action.

If (it is a school day)

Then (you get up early)

Point out that this does not confirm what will happen if it isn't a school day. In other words it doesn't say that you don't get up early. Only that if it is a school day you do!

We are going to program PicoH to run a maths quiz and respond in different ways depending on the answer given. Let's start by programming PicoH to receive an input from the computer keyboard. Show the program below and ask students to predict what will happen when the Green Flag is clicked?

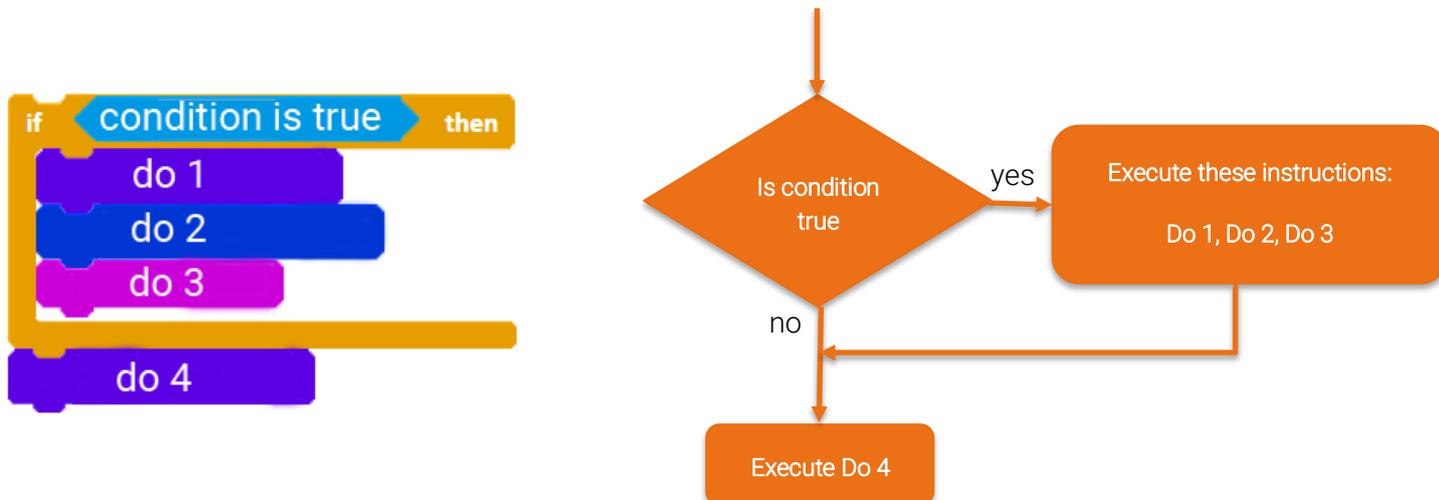


Ask students to try the code themselves. Can they explain how it works? Do they recognise the shape of the reporter block for answer? It is similar to the ones used in the previous lesson on time, but instead of reporting time or date, it reports the text that the user has typed in.

When the green flag is clicked the Ask and wait block will speak the words 'What's your name?', then it will wait for text to be typed into the keyboard (and the enter key pressed). Then PicoH will say 'Hello!'. And then because the 'answer' block has been dropped into the Say block it will speak the text that has been typed in. Each time the ask block runs and text is entered it will be returned as the typed in answer.

Highlight that it doesn't have to be letters. If you type in an integer, it will also speak that. Let's say my name was 11 for example...

Remind children that this code simply enters data from the keyboard into the computer. A conditional is needed to decide what to do with the information that has been entered. We are going to use the If-then block. Show the diagram below that shows how this works.



TEACHER INPUT

Show this. Can they predict what will happen when the green flag is clicked and then the number 4 is entered? How about if the number 10 is entered, or the word cat? Ask children what the green operator block does in this program. Why is it needed?

```
when green flag clicked
ask What is 2 times 2? and wait
if answer = 4 then
say That's spot on, you maths whizz! until done
```

Run the code and try entering different values. Did it do what you expected?

ACTIVITY 1

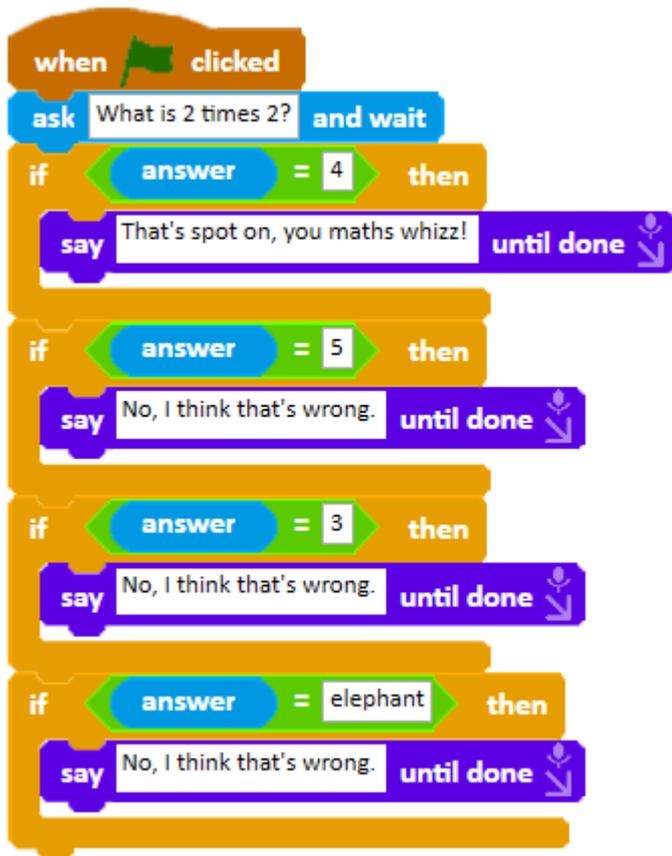
Ask children to modify the code to make PicoH ask a different question and give a different response?

TEACHER INPUT 2

Currently any answer that is not 4 will get no response.

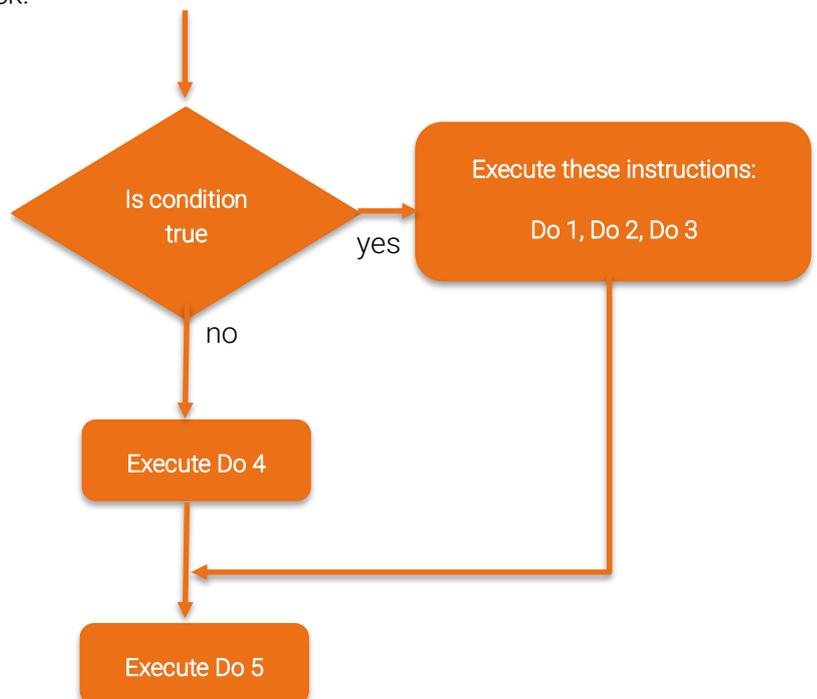
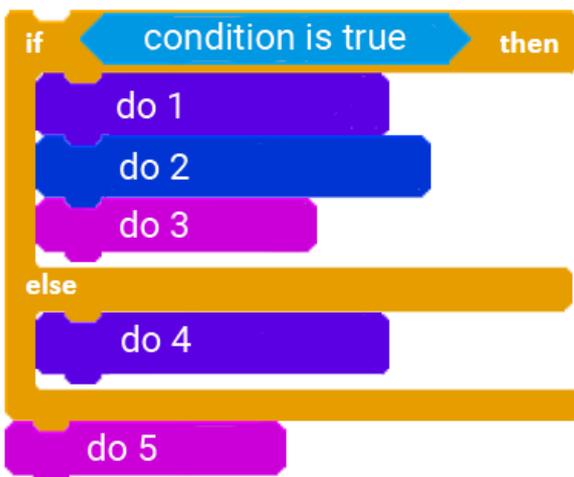
One way to give a response when a wrong answer is entered would be to have an if statement for every possible other answer.

You could end up with something like this:



As you can see trying to cover even a few possible answers (including the rather unlikely ones) makes the program very long and it would be impossible to cover every answer this way.

Instead we can use an *if-then-else* conditional so that any answer other than the one that is true will result in running the instructions in the else part of the block.



Show the example.

```
when clicked
ask "What is 2 times 2?" and wait
if answer = 4 then
say "That's spot on, you maths whizz!" until done
else
say "No, I think that's wrong." until done
```

ACTIVITY 2

Can you modify the program created in Activity 1 to use an **if-then-else** conditional so that it gives a different response when the wrong answer is entered?

ACTIVITY 3

Can you write a program that makes PicoH ask a sequence of questions and give a response to each based on the answer entered?

Here's an example:

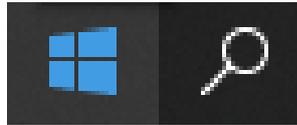
```
when clicked
ask "What is 9 times 5?" and wait
if answer = 45 then
say "Yippee! You've got it!" until done
else
say "Okay, not quite right. It is 45!" until done

ask "In what year was Martin Luther King born?" and wait
if answer = 1929 then
say "That's right." until done
else
say "Not quite. It was 1929!" until done

ask "A cube has a side of 5cm what is its volume in cubic centimetres?" and wait
if answer = 125 then
say "Great. That's it." until done
else
say "Oh, I don't think so. It is 125 cubic centimetres." until done
```

Note:

Pico8 can also be made to listen for answers using the Ask and Listen block. You will need to have Speech Recognition switched on. To do this click on the Search icon (magnifying glass). Type in Speech Privacy Settings and then move the toggle switch to on.



EXTENSION 1:

What if we wanted to ask a question with a different type of answer? How about one that had a number of possible correct answers?

For example:

'Can you name one of Bart Simpson's sisters?'

The answer could be either Lisa or Marge. We could use the OR operator block as the condition.



The OR operator block gives a True response if the answer is EITHER Lisa or Marge.

Can you add a question that has several possible answers?

EXTENSION 2:

How about a question with an answer that must include a number of different answers.

For example:

'Can you name all of Bart Simpson's sisters?'

The answer must include both Maggie and Lisa.

The Contains operator block can be used here. This gives a true if the answer has the word Maggie anywhere in it. When combined with the AND operator block as shown below it will give a True responses if the answer contains Maggie and Lisa.



Can you use the Contains and AND operator blocks to create a program where you check whether the answer includes both names?

PLENARY

Share the following program either on a screen or in the PicoH app. Challenge children to predict what it will do when different answers are entered. Run the program and enter different answers. Can they identify the bug and how to correct it.

The program uses AND rather than OR so will only give the correct response when all three country names are entered.

Solution below:

```
when clicked
ask Name a country with a name that begins with an F and wait
if answer contains France or answer contains Finland or answer contains Fiji then
say Yes, that's right. until done
set eyes to green
else
say No, that's not right. until done
set eyes to blue
```

The image shows a Scratch script starting with a 'when clicked' event. It asks the user 'Name a country with a name that begins with an F' and waits for an answer. An 'if' block follows, with a condition 'answer contains France or answer contains Finland or answer contains Fiji'. The 'then' branch contains 'say Yes, that's right. until done' and 'set eyes to green'. The 'else' branch contains 'say No, that's not right. until done' and 'set eyes to blue'.