Understanding A Complex Model: Termites

DECOMPOSE into smaller parts

DEFINE each part as a block

CALL the blocks in correct order

Remember, the key thing about handling complexity is breaking things down into smaller parts, then creating procedures for each small sequence.

Once defined, procedures can be called at runtime

In the termites exercise you devised the rules for building mounds. Your rules could only use a set of commands given in the handout.

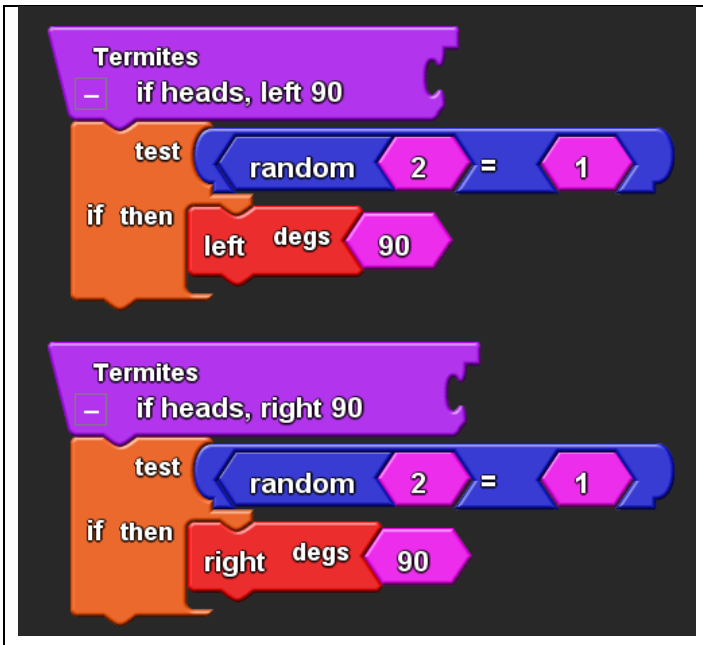
When you implemented your solution in StarLogo, these 'custom' commands were all available in the Subsets drawers.

Your task is to explain how each procedure works.

Let's start with the movement procedures.

How does the **forward (roll dice)** procedure represent the behaviour of throwing a dice?

Study the **if heads, left 90** and **if heads, right 90** procedures:



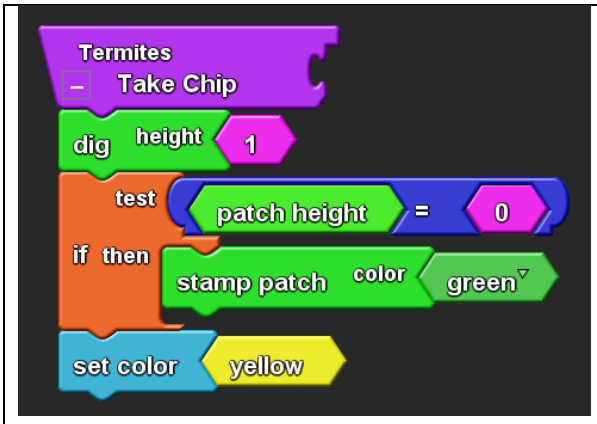
Explain how the random function represents a coin toss in the **if heads, left 90** procedure?

The **if heads, right 90** procedure is identical to the one above, apart from the turn.

Why do we need this procedure as well?

Can you redefine this so the outcome of both could be achieved in one procedure?

Look now in the Take / Drop drawer. This contains two procedures



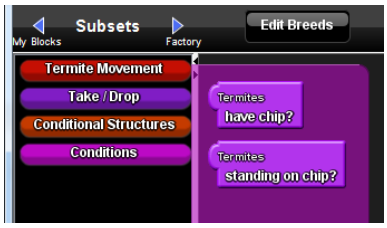
The **Take Chip** procedure allows a termite to simulate picking up a woodchip. Explain in your own words what happens here.

Why is there a test for patch height?

Now look at the **Drop Chip** procedure

This procedure allows a termite to simulate putting down a woodchip. Explain in your own words what happens here.

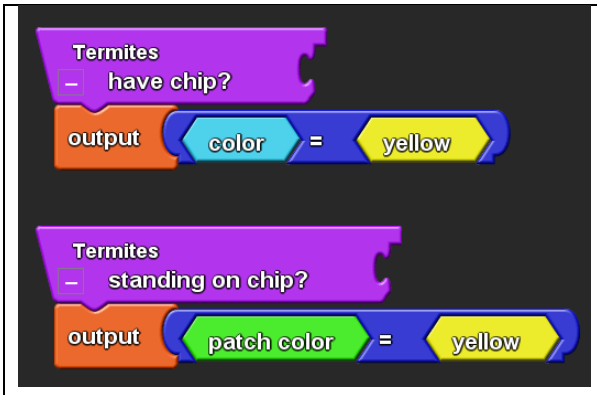
What is the purpose of changing the termites colour in each of these procedures?

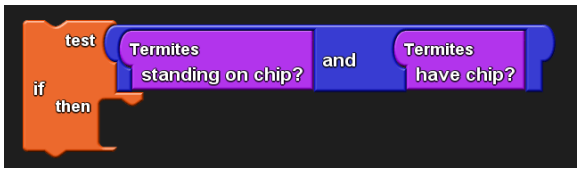


There are two more blocks in the Conditions drawer.

They have a different shape to the other procedures. This is because they output a value.

That value is will be either True or False. They are known as Boolean functions and can be used in conditional (IF) statements.





What would the output be from **have a chip?** if a green termite is standing on a yellow patch?

What would the output of **standing on a chip?** be if a green termite is standing on a yellow patch?

Look at the test condition in the IF statement. Would this be true or false if a green termite is standing on a yellow patch?