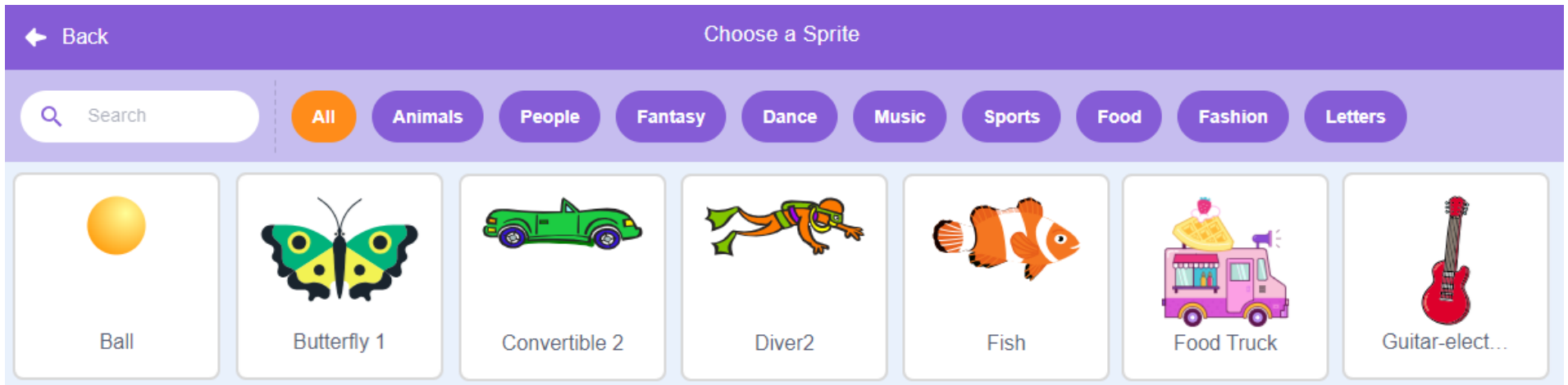


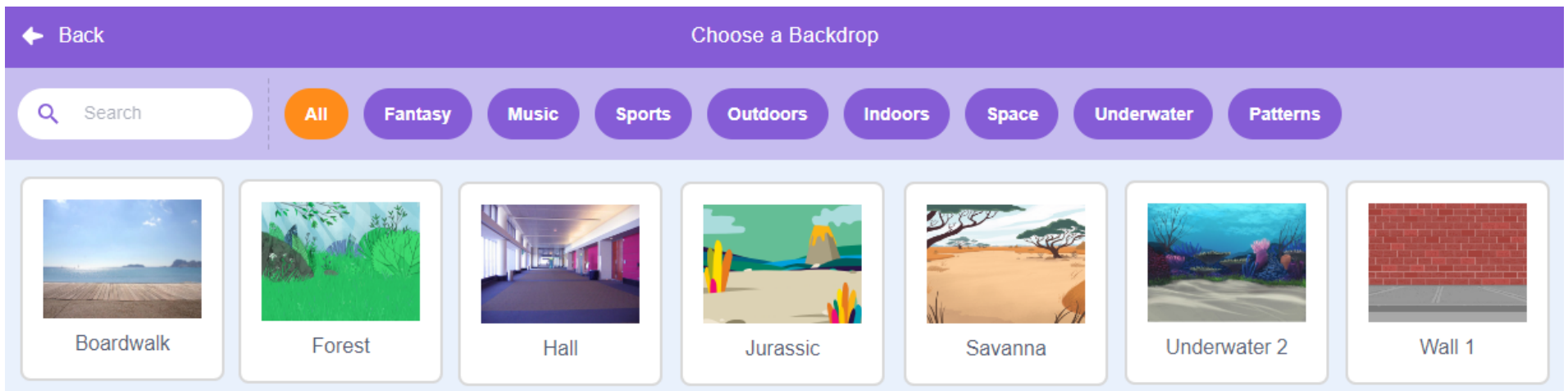
Underwater Scene

1) Start a new project.

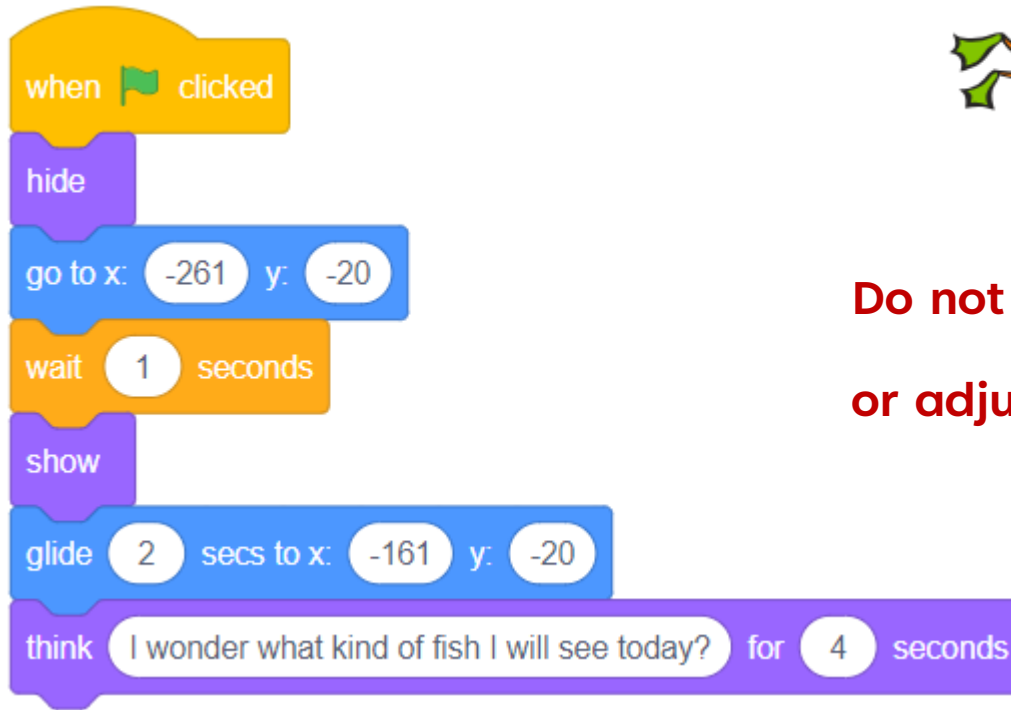
Delete the Cat. Select the sprite characters named Diver2 and Fish.



2) Add the backdrop Underwater 2 as your background image.



3) Click on Diver2. Add the following code blocks for Diver2.



```
when clicked clicked
hide
go to x: -261 y: -20
wait 1 seconds
show
glide 2 secs to x: -161 y: -20
think I wonder what kind of fish I will see today? for 4 seconds
```



Do not use the paint tools to colour or adjust this sprite in any way.

Test the code for Diver2.

- a) What is the purpose of the go to block in the code sequence?
- b) Why does the glide block suit the circumstances of the scene?

Show Mr. Desmond your work.

4) Click on Fish. Add the following code blocks for Fish.



```
when green flag clicked
hide
set size to 50 %
switch costume to fish-a
go to x: 250 y: -10
set rotation style left-right
point in direction -90
wait 8 seconds
show
glide 3 secs to x: -250 y: -10
```

Do not use the paint tools to colour or adjust this sprite and its costumes in any way.

Test your code.

- a) Why hide the fish at the start?
- b) Why set the X position of the go to block to 250?
- c) Why set the point in direction block to -90 ?
- d) Why does the fish wait 8 seconds before starting to glide?
- e) Why glide to X position -250 ?

Show your work to Mr. Desmond.

5) Click on Fish. Switch the costume to fish-b.

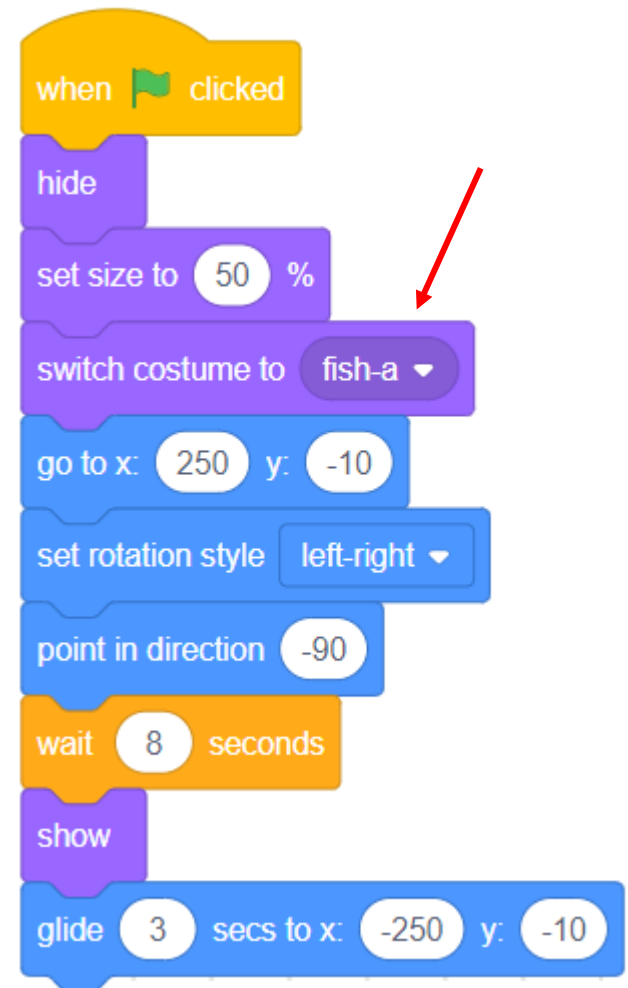
Test your code.

Repeat that again, but this time switch the costume to fish-c.

Repeat that again, but this time switch the costume to fish-d.

6) Having to manually switch the costume is not the best way to code.

a) What would be a better way to code this?



7) Click on Fish.

Change your code sequence.

Add the code blocks as shown.

Test your code.

a) How does the switch costume block work in this code sequence?

b) What is the purpose of the if touching edge block?

c) Why use the forever repeat block?

Show Mr. Desmond your work.



```
when green flag clicked
  hide
  set size to 50 %
  wait 8 seconds
  forever loop
    show
    go to x: 250 y: -10
    set rotation style left-right
    point in direction -90
    glide 3 secs to x: -250 y: -10
    if touching edge? then
      hide
      wait 2 seconds
      switch costume to pick random 1 to 4
```

8) Click on Fish. Add the code blocks as shown.



Do not delete the code sequences you have already created.

```
when space key pressed
wait until touching edge ?
hide
stop other scripts in sprite
wait 2 seconds
broadcast end
```

9) Click on Diver2. Add the following code blocks for Diver2.

```
when I receive end
say That was really cool! for 3 seconds
glide 5 secs to x: 300 y: -20
hide
stop all
```



Test your code.

10) Explain what these two new code sequences do.

11) You have finished creating the scene.

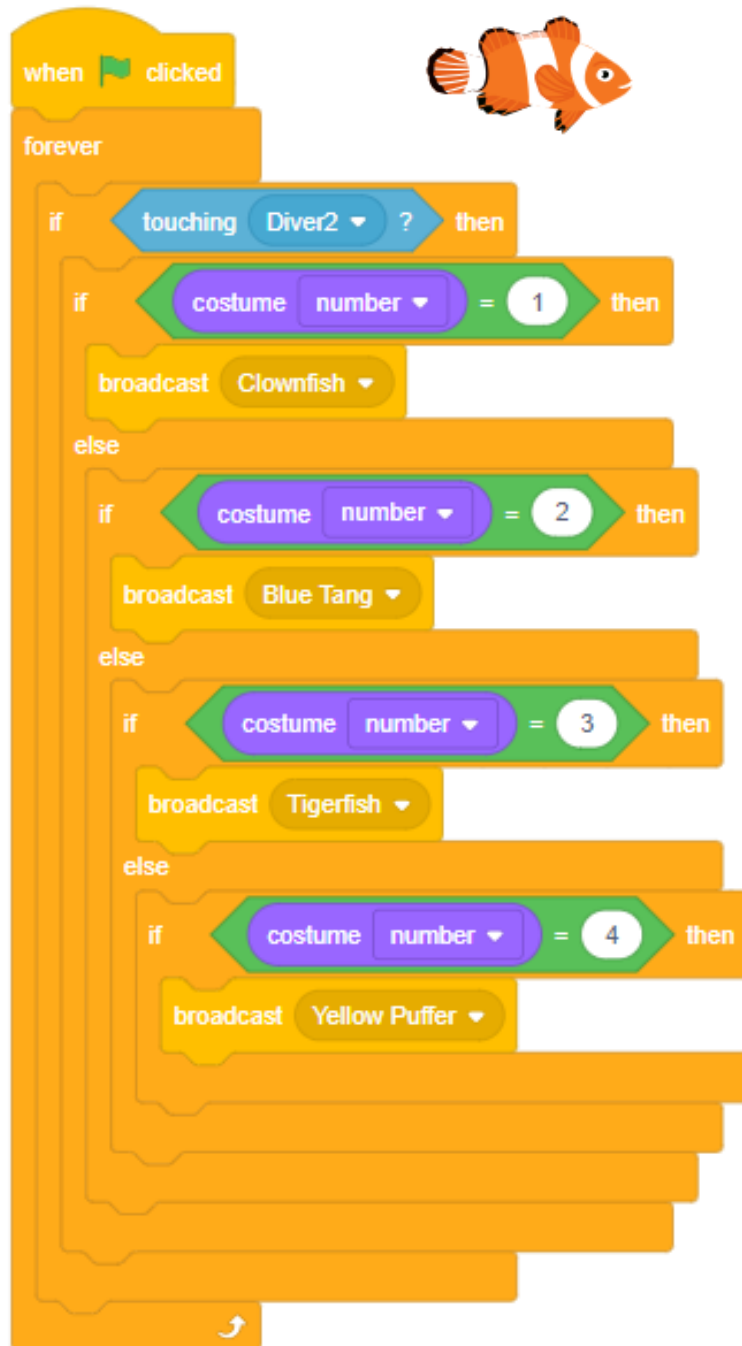
Your code should make it appear as if the diver is able to see numerous types of fish at random before swimming off.

Show Mr. Desmond what you have done.



In the steps that follow you will add code to identify and count the fish.

12) Click on Fish. Add the code blocks as shown.



**Do not delete the code sequences
you have already created.**

Notice how the “if then else” blocks are embedded within each other.

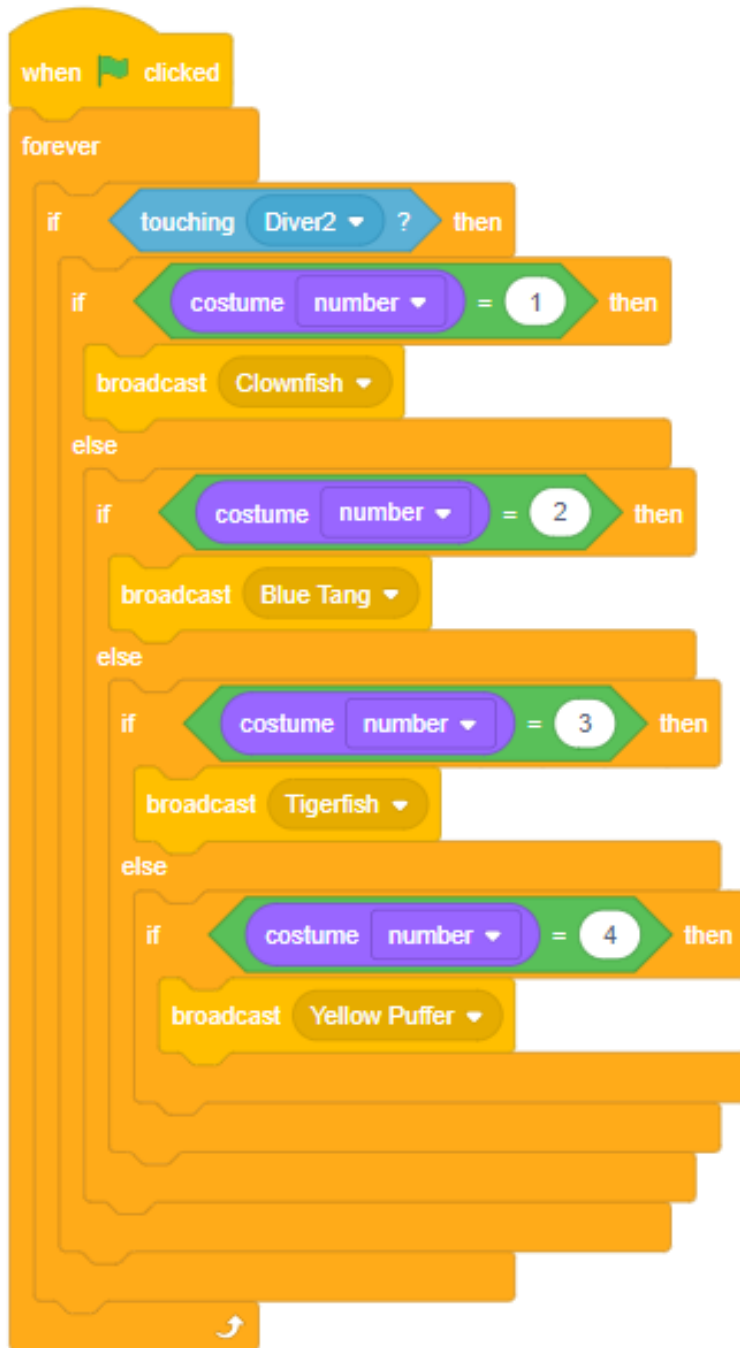
If costume one is true then broadcast Clownfish or else do the next code.

If costume two is true then broadcast Blue Tang or else do the next code.

If costume three is true then broadcast Tigerfish or else do the next code.

If costume four is true then broadcast Yellow Puffer.

12) Think about this code sequence.



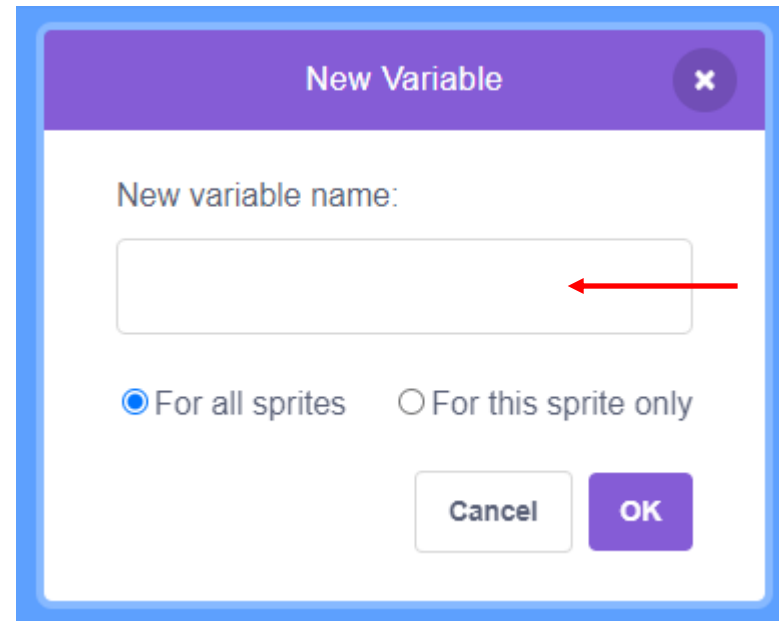
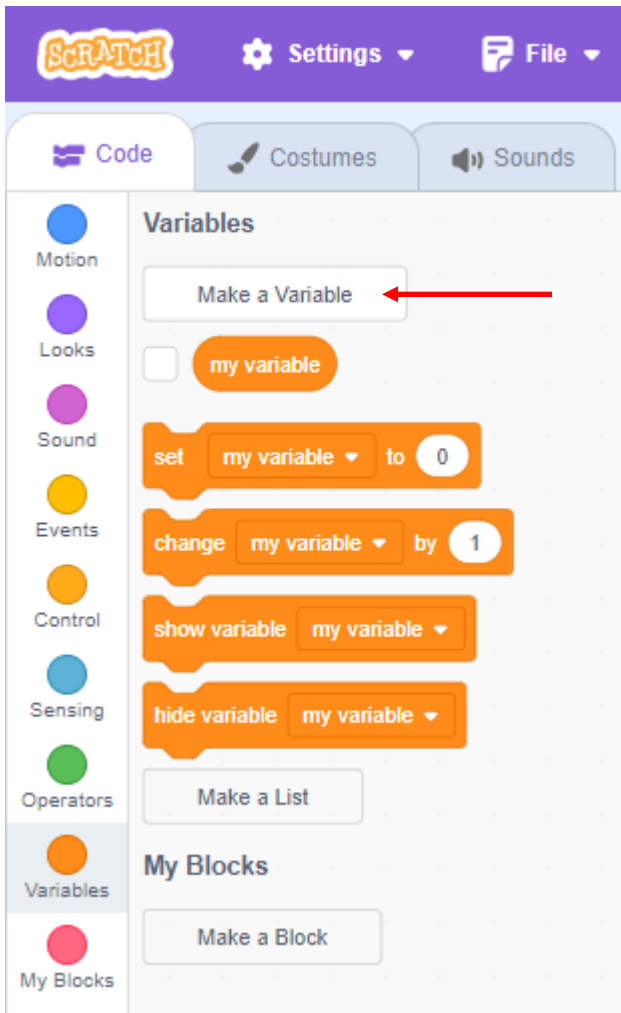
a) If Fish is touching Diver2 then a message will be broadcast.

Which sprites (characters) will be able to receive this broadcast message?

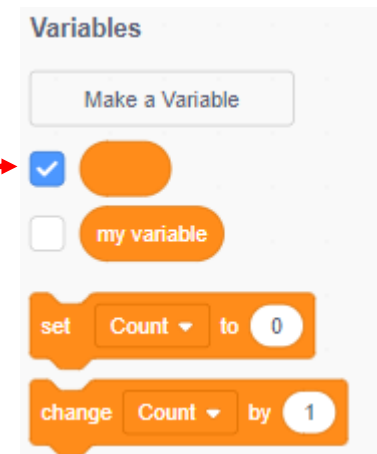
b) Why have a broadcast for each of the costumes?

c) What possible reasons could there be for sending these broadcast messages?

13) Create four variables: Clownfish, Blue Tang, Tigerfish, and Yellow Puffer.



Uncheck the boxes. →



14) Click on Fish. Add the code blocks as shown.



```
when green flag clicked
  set Blue Tang to 0
  set Yellow Puffer to 0
  set Clownfish to 0
  set Tigerfish to 0
```

15) Click on Diver2. Add the following code blocks for Diver2.



```
when I receive Tigerfish
  say Tigerfish for 1 seconds
  change Tigerfish by 1
```

```
when I receive Yellow Puffer
  say Yellow Puffer for 1 seconds
  change Yellow Puffer by 1
```

```
when I receive Clownfish
  say Clownfish for 1 seconds
  change Clownfish by 1
```

```
when I receive Blue Tang
  say Blue Tang for 1 seconds
  change Blue Tang by 1
```

15) Test your code. Think about these code sequences.

```
when I receive Tigerfish
say Tigerfish for 1 seconds
change Tigerfish by 1
```

```
when I receive Yellow Puffer
say Yellow Puffer for 1 seconds
change Yellow Puffer by 1
```



```
when I receive Clownfish
say Clownfish for 1 seconds
change Clownfish by 1
```

```
when I receive Blue Tang
say Blue Tang for 1 seconds
change Blue Tang by 1
```

a) Why is Diver2 receiving these messages?

b) What is Diver2 doing with the broadcast information that they are receiving?

Show Mr. Desmond your answers for this part 12 and part 15.

16) Click on Diver2.

Change your “end” code sequence for Diver2.

Add the code blocks as shown.

Make sure to add appropriate spaces in your text when using the join blocks.

Test your program.

a) What are the orange coloured oval code pieces for?

What do they do?

Show Mr. Desmond how your program works.



The image shows a Scratch script for a diver character. The script starts with a 'when I receive end' block. It then has a 'say' block with the text 'That was really cool!' for 3 seconds. This is followed by an 'if' block that checks if 'Yellow Puffer' is greater than 0. If true, it says 'Today I saw Yellow Puffer Yellow Puffer fish.' for 2 seconds, then waits 1 second. Next is another 'if' block for 'Blue Tang', which says 'Today I saw Blue Tang Blue Tang fish.' for 2 seconds and waits 1 second. This is followed by an 'if' block for 'Tigerfish', which says 'Today I saw Tigerfish Tigerfish.' for 2 seconds and waits 1 second. Then another 'if' block for 'Clownfish', which says 'Today I saw Clownfish Clownfish.' for 2 seconds and waits 1 second. The script ends with a 'glide' block (5 secs to x: 300 y: -20), a 'hide' block, and a 'stop all' block. A small cartoon diver is shown in the top right corner.

```
when I receive end
say That was really cool! for 3 seconds
if Yellow Puffer > 0 then
  say join Today I saw join Yellow Puffer Yellow Puffer fish. for 2 seconds
  wait 1 seconds
if Blue Tang > 0 then
  say join Today I saw join Blue Tang Blue Tang fish. for 2 seconds
  wait 1 seconds
if Tigerfish > 0 then
  say join Today I saw join Tigerfish Tigerfish. for 2 seconds
  wait 1 seconds
if Clownfish > 0 then
  say join Today I saw join Clownfish Clownfish. for 2 seconds
  wait 1 seconds
glide 5 secs to x: 300 y: -20
hide
stop all
```

17) You will now complete some data recording and graphing.

a) Add new code for your fish. Have your fish silently count 90 seconds.

Use this time code to end your program rather than using the spacebar to end the program.

b) Run your program again. After ninety seconds the program will end.

On a piece of paper record how many of each type of fish the diver saw.

This is your data from day 1 of the diver's underwater explorations.

c) Change your code. Have your fish silently count 120 seconds.

d) Run your program again. After two minutes the program will end.

On your paper record how many of each type of fish the diver saw.

This is your data from day 2 of the diver's underwater explorations.

e) Create a spreadsheet using Google Sheets to record your data from day 1 and day 2.

Show Mr. Desmond your code and your spreadsheet data for day 1 and day 2.

18) Using the data you collected for day 1 and day 2 complete the following.

a) Make a vertical bar graph showing the total number of each type of fish seen in the two days of underwater exploring.

Display the data in your graph with proper titles, labels, effective fonts and font sizes, and an appropriate scale.

Show Mr. Desmond your graph.

b) Create a circle graph (also known as a pie chart) that displays the relative frequency, as a percentage, of the four types of fish that appeared over the two days of underwater exploring.

Display the data in your circle graph with proper titles and labels.

Position the circle graph below your bar graph so that both can be seen.

Show Mr. Desmond your graphs.