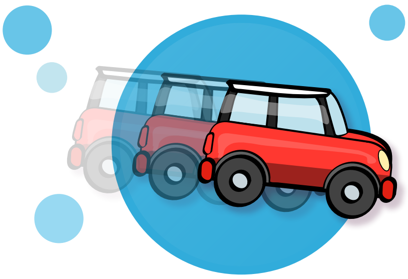


Speed, direction and co-ordinates

Object properties

Computer programmers use numbers to set or change an object's **properties**. These could be things like the object's **co-ordinate** position on the screen, the **direction** that it faces or the **speed** at which it moves. The higher the number, the faster it moves.

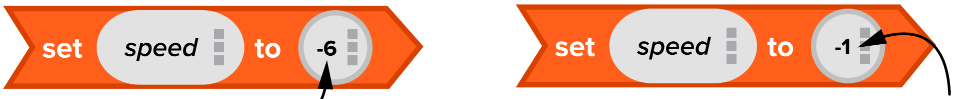
What you'll build

In *Level 5 - Speed, direction and co-ordinates*, you'll be able to make things go faster and slower, move in the exact direction you want them to, or appear in a precise location on the screen.

- Use buttons to set or change the speed of a car.
- Use key press events to control the speed and direction of a car.
- Sail a ship safely to shore, avoiding obstacles that affect its position.
- Combine conditional events with object properties to make a fun parachuting game.

Your blocks

You'll be using the **set** and **change** command blocks to control an object's properties.

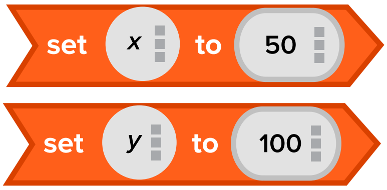


```
set speed to -6
```

```
set speed to -1
```

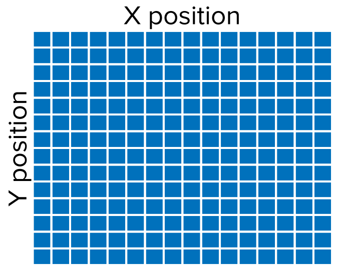
Speed can be set between -6 and 6.

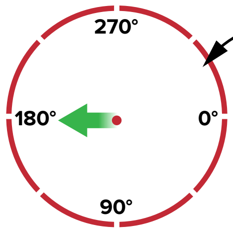
Changing speed by a negative number will slow objects down.



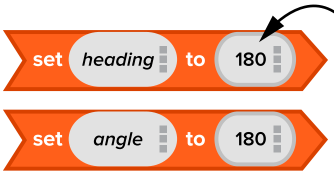
```
set x to 50
set y to 100
```

The numbers used to set up X and Y positions refer to the co-ordinate plane of the stage.





The numbers used to set heading and angle refer to degrees of turn on the stage.



```
set heading to 180
set angle to 180
```

To move an object in the direction that it faces, both the **heading** and **angle** values must be the same.

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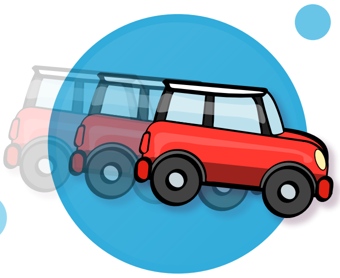


Speed, direction and co-ordinates

Can you match the words to their definition?

x co-ordinate	The vertical position of an object on the screen.
object property	A pair of numbers which describe the position of an object on the screen.
co-ordinates	Something about an object that can be represented by a number.
heading	The horizontal position of an object on the screen.
angle	The direction in which an object moves.
y co-ordinate	The direction that the object is facing.

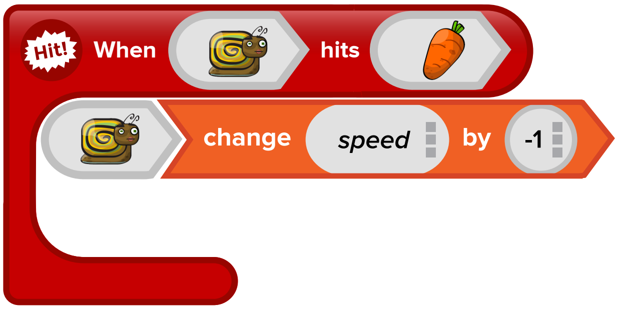
Free Code Challenge

Can you create a character that moves faster each time that it eats something? Choose a character and add some buttons or use key press events to make it move around the screen. Set the speed of your character at the start. Then add some objects for them to eat. Use hit events in your code so that when the character hits the food, the food disappears and the character's speed increases. You could add some obstacles which will make your character slow down when they are hit, by using negative numbers. Use the space below to plan your app.

Crack the code

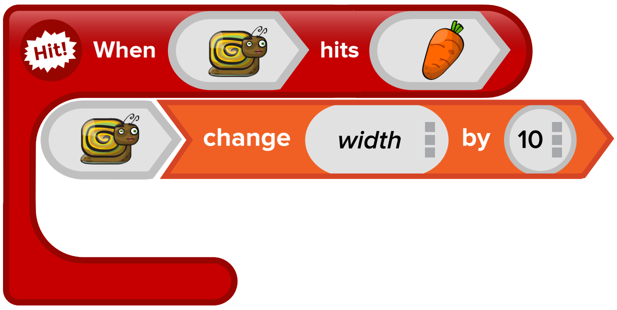
Can you match each instruction to the right piece of code?

1. When the snail eats the carrot, the snail gets slower.
2. When the snail eats a carrot, the snail gets fatter.
3. When the snail eats the carrot, the carrot changes position.
4. When the snail eats the carrot, the carrot gets smaller.



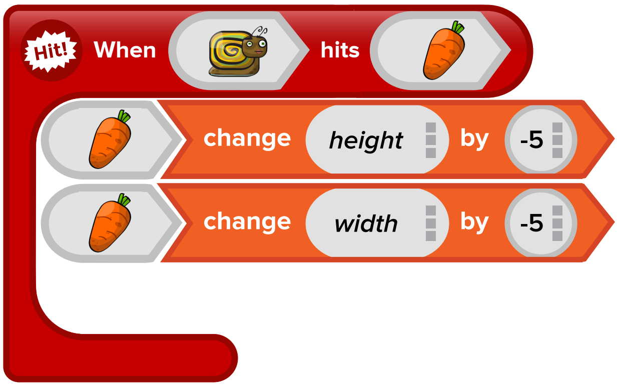
```
Hit! When 🐌 hits 🥕
    🐌 change speed by -1
```

Instruction number ______________________



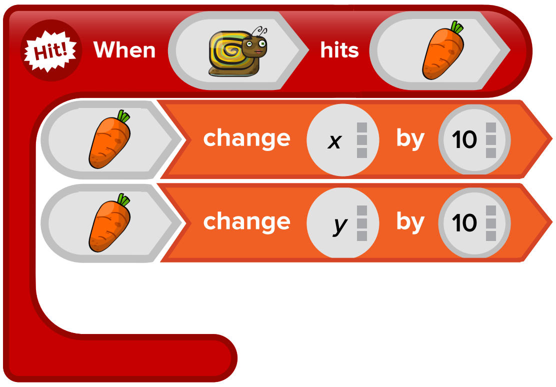
```
Hit! When 🐌 hits 🥕
    🐌 change width by 10
```

Instruction number ______________________



```
Hit! When 🐌 hits 🥕
    🥕 change height by -5
    🥕 change width by -5
```

Instruction number

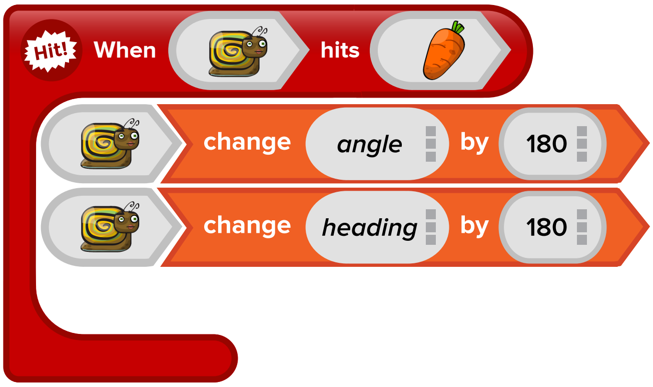


```
Hit! When 🐌 hits 🥕
    🥕 change x by 10
    🥕 change y by 10
```

Instruction number ______________________

Now try and complete the instructions to this piece of code:

When the snail eats the carrot, the ____.



```
Hit! When 🐌 hits 🥕
    🐌 change angle by 180
    🐌 change heading by 180
```