Mine Hunter or Cake Hunt

Program Aim Create a game that uses tilting inputs on iOS devices (iPads or iPods)

Computer Science Concepts Used

-**Decomposition** involves breaking a project up into manageable sections and solving them separately

-**Generalisation** involves adapting an idea to solve a similar problem

Prior Learning Pupils need to have used loops, selection and simple variables in gaming contexts before attempting this module

-**Rules based Algorithm** involves working out the rules that govern the game

1, **Decompose** the game and create a **rules based algorithm** Learning Path	2, Pupils **create** their own **adaptations** of the **game**	3, Pupils **evaluate** each others game adaptations	4, Pupils **respond to** each other **evaluations** and finish the game	5, Pupils **test** their game with pupils from another class or year group

Overview I have provided the planning with two versions of the game Mine Hunter and Cake Hunt. Use what ever one you think will enthuse your students most. They are the same game with different sprites.

1, Decompose the game and create a rules based algorithm

Full screen mode

Display the game Mine Hunter or Cake Hunt set your

screen so it can't rotate. This is a button on the side of your iPad or button on the slide up tab from the bottom of your iPad. Put the game in full screen mode using the two arrows button. The game will then start automatically.
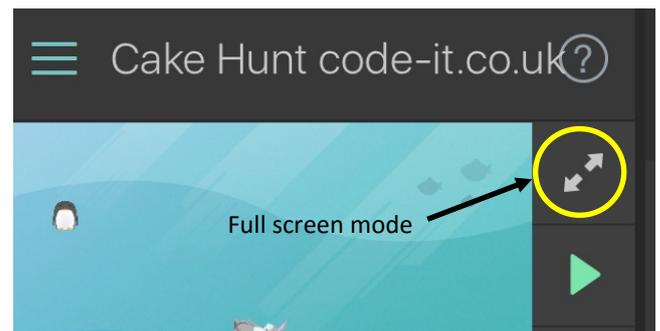
Make sure you play it demonstrating the tilt function to steer the missile or rabbit without explaining it.

Now hand out the decomposition rules based algorithm sheet. Tell your pupils that once they have worked out all the rules they can get onto the iPad to start creating it independently.

Remind pupils that you are not looking for code but for what everything does or what they can see happening explained in everyday language. It is best to do this away from digital devices in-case a student looks up the answers online from the code-it website.

Check pupils work against the teacher checklist of events found on the planning page before allowing them to proceed with step 2.Language doesn't have to be the same but all the elements needs to have been discovered. This will become an important aid to deciding what needs doing when pupils are building their own version.
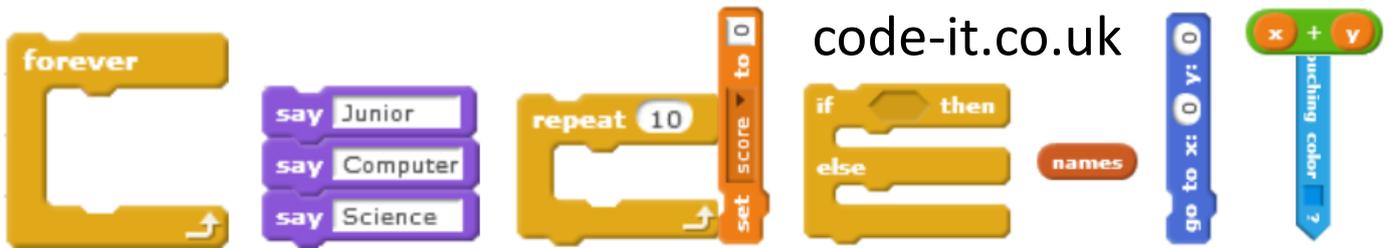
Mine Hunter or Cake Hunt P2

NOTE Saving the game

Email from the tablet works well but as none of my schools have other sharing options I am unable to test these. You can rename the files be going into **project overview mode** via the three lines in top left of the screen.

Go to **Project Overview Mode** from the design screen
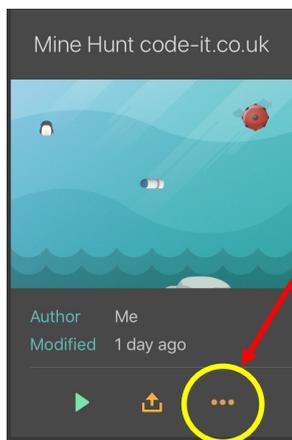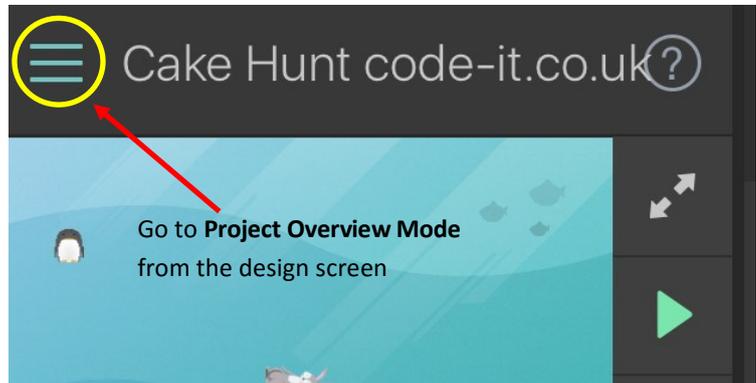
Once in **Project Overview Mode** you can click the **three dots** to turn the tile and see the **rename** screen

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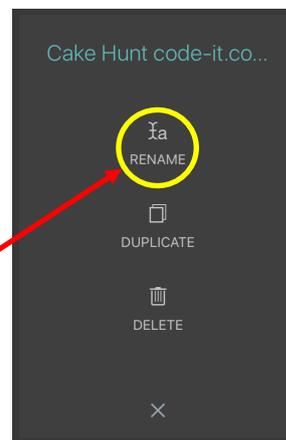
2, Pupils create their own adaptations of the game

The process of adapting a general rules based algorithm into code that works on a digital device is a complex and frustrating one. There is an amazing amount of thinking going on but unlike the algorithm stage pupils can see their progress when parts of the program begin to work. Your job as teacher is to point them to resources that they can learn from independently such as the hint cards. Or getting them to identify which part of the algorithm they are recreating. Don't help anyone if they say they are stuck on everything, insist on them identifying the clear algorithmic goals they are trying to achieve. A good educator asks more questions that encourages them to puzzle things out for themselves. Avoid the tyranny of the finished project. It is better for pupils to end up with a part completed project that they mainly completed themselves than a completed project you or their peers coded. Where is the learning in that? Provide hints not fully formed solutions. Your pupils will thank you for this approach in the long run. Get pupils onside with this approach. If one person solves something and then shares their solution with the four people alongside them then only one out of five pupils has learnt anything. I now have pupils who hide their solutions and only hint as to which blocks were useful. Without struggle there is no learning.
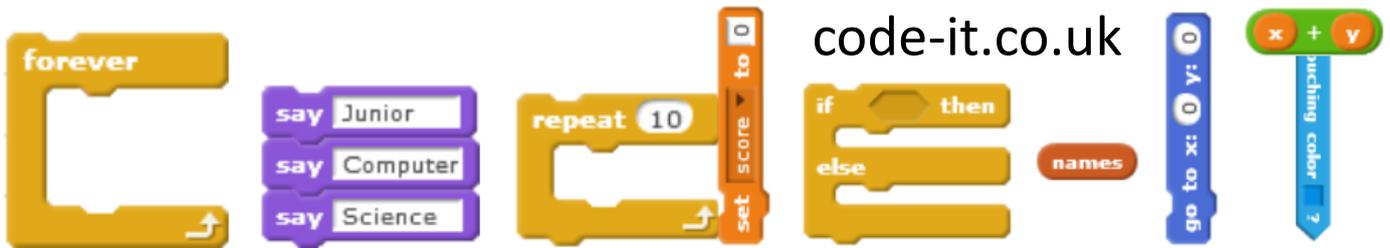
Mine Hunter or Cake Hunt P3

2, Pupil's create their own adaptations of the game cont

The code examples underneath are only one way to convert some of the algorithm rules into code. When pupils come up with different ways celebrate their ingenuity.

```
forever
    go to x: (pick random from -240 to 240)  y: (pick random from -1
    wait (pick random from 3 to 6) secs
```

Water Bomb or Cake going to a random location for a random time between 3 and 6 seconds

A good further challenge would be to exclude the random locations starting in the centre

```
When starting to play
set [Objects] to 3
forever
    if <touching [Missle] ?> then
        change scale by -10 %
        change [Objects] by -1
        wait 0.1 secs
```

If touching Missile reduce objects variable by 1
Set in the Water Bomb or Cake or this could be set in the missile or Rabbit with a little adaptation such as changing the touching missile to touching Water Bomb and removing the scale.

Scale change is an added option to make it more difficult to target the water bombs/cakes later on in the game. The wait 0.1 second stops the objects variable reducing by more than 1 before the missile or rabbit returns to the centre.
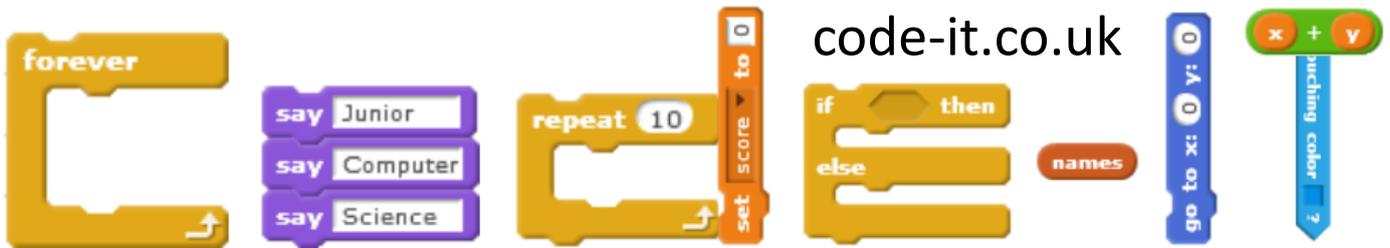
```
When starting to play
forever
    if <(Objects) <= 0> then
        say [Game over dude]
        wait 1 secs
        stop [all]
```

If objects equals 0 or less than 0 end the game

This code uses the less than or equal to maths operator <= to end the game. The code is set in the water bomb or cake but with a few adaptations could be placed in other sprites.
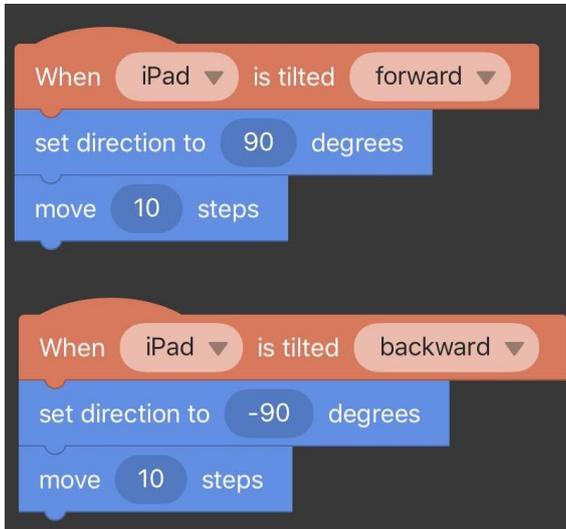
Mine Hunter or Cake Hunt P4

Missile or Rabbit code to face the sprite in the direct that the iPad is tilted and then move towards it.

Tickle is to be congratulated on the ease of app use with swish rotation dial degrees or typed data entry. Younger pupils find the rotation easy to cope with as the sprite rotation faces where it will be heading/pointing towards.

Note that 0 degrees doesn't point up as it does on Scratch.

These blocks work because behind the scenes they are in continuous loops which means they are constantly being checked for action.
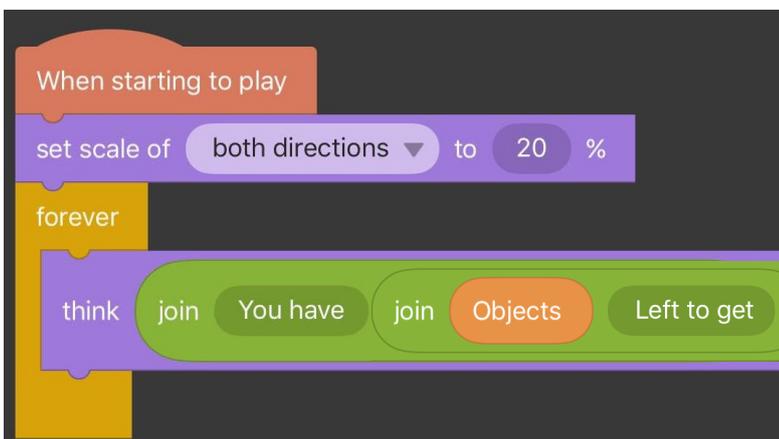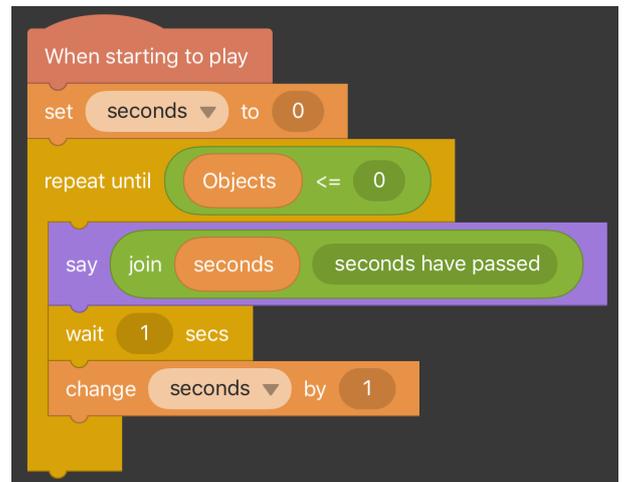
Seconds Timer

This needs to be in a separate sprite tucked away where the text can be read but the sprite not get in the way of the game.

If pupils have created a counting machine in Scratch they will be familiar with this idea.

http://code-it.co.uk/scratch/countingmachine/
countingmachineoverview
Book version is better! (But I would say that :)

How many objects have you got left?

This code can be placed in any sprite tucked out of the way. It is worth checking that the text can be read.

Note the extra spaces added after You have and before Left. This is to stop text concatenating (joining together)
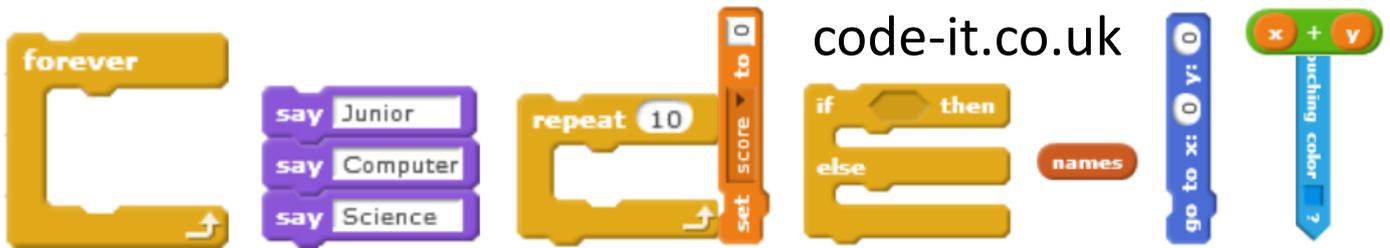
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3, Pupils evaluate each others code

Evaluating algorithms and the resultant code is an important step in games design. Asking questions about functionality, usability and enjoyment. The first two are rather easier to assess but ultimately when those are done we are left with the most important question which is do I wasn't to play my game? Does anyone else want to play it? How long does it hold my or their attention?

Methods of evaluation

The tried and tested post it note can be a quick way to evaluate but it doesn't really value all the time and effort that has gone into someone's creation.

A tick list is quick and efficient but will it be detailed enough to capture all the issues and nuances?

Really although it takes longer I find two people playing a game and feeding back orally to the author works best. One person can be tempted to sugar soap things or be intimidated but two outnumber the author. Some instruction on outlining positive as well as things to approve or two stars and a wish can help some pupils. A checklist of things to look for can be a great starter but can also hinder and straightjacket the evaluators.

If you have a child with particularly low self esteem choosing their program evaluators carefully can be important. You may want to evaluate it with them yourself.

The only draw back on oral evaluation is the lack of evidence that it has taken place and the ability for the child to prove they have acted on or considered the suggestions.

4, Pupils respond to the evaluation.

Evaluation like marking is only useful if it helps the author to improve or refine their work. Providing substantive time to do this is important. I find it helps to remind them that the final evaluation will be with pupils from another class or year group.

5, Pupils from another class test their game

This is not always possible but it does add focus if you facilitate it.