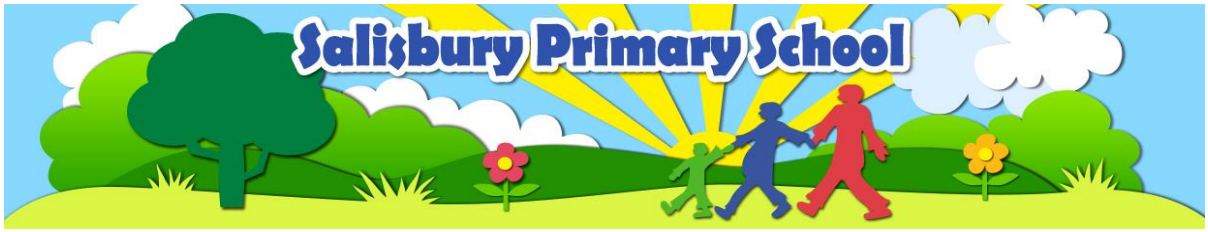

Burst the bubbles

Overview
In this lesson children will learn that objects can be programmed to do actions at the start or when they are clicked on, they will learn that start and click are events

Learning objectives
Learn how to combine start events and click events to make a simple game

Success Criteria
ALL I can use code to make a bubble pop when it is clicked on
MOST I can use code to make a bubble move when my app starts, and pop when it is clicked on
SOME I can use code to make three bubbles move when my app starts, and pop when they are clicked on

Key words
code, icon, object, action, design, click

Lesson 2 Up in the air (PC/Mac)

Overview
In this lesson children will practise using a keypress event to make an object change direction, and begin to use the terms 'algorithm' and 'execute' in a computer programming context

Learning objectives
Learn how to program an object to change direction when different keys are pressed on a keyboard

Success Criteria
ALL I can program a plane to change direction when a key is pressed
MOST I can program a plane to move and change direction when different keys are pressed
SOME I can design and program an app and explain which lines of code execute when different keys are pressed

Key words
run, execute, direction, code, control, key pressed

Fly a helicopter

Overview
In this lesson children will learn that objects can be programmed to do an action when a button is clicked and that different buttons can be programmed to make different actions happen

Learning objectives
Learn how to program buttons to move another object around

Success Criteria
ALL I can write code to program a button to make a helicopter move
MOST I can write code to program different buttons that can be used to control a helicopter
SOME I can write code to program a button to make a helicopter stop and hover and explain how my code works

Key words
button, program, direction, run, execute, control, click

Space travel

Overview
In this lesson children will practise using time in their code. They will create simple animations using time events to make objects perform actions in a sequence.

Learning objectives
Practise using time to program a sequence of actions and make simple animation

Success Criteria
ALL I can use time in my code to program a rocket to fly straight to the moon
MOST I can use time in my code to control a rocket to fly in a sequence of directions
SOME I can explain how I used time in my code to control a rocket to fly in a sequence of directions to different locations

Key words
time, sequence, algorithm, function box, after, execute, seconds

That's amazing!

Overview
In this lesson children will learn that objects can be programmed to respond to their background or environment and begin to understand what the word 'condition' means in computer programming

Learning objectives
Learn how to use conditional 'if' statements to program a maze game

Success Criteria
ALL I can write code to program a spaceship to move in different directions when different keys are pressed
MOST I can use a conditional 'if' statement in my code to program a spaceship to stop when it hits a wall in a maze
SOME I can explain how I used a conditional 'if' statement in my code to make the spaceship stop when it hits a wall

Key words
keys, wall, condition, if/ then, background

Hungry snake

Overview
In this lesson children consolidate their understanding of conditions in programming and learn how different types of conditions can be used in code for different purposes.

Learning objectives
Learn how to use conditional 'if' statements to program a simple game; use 'if hit' statements to check if objects have collided

Success Criteria
ALL I can write code to program a snake to move in different directions when different keys are pressed
MOST I can use a conditional 'if' statement in my code to program an egg to disappear when the snake hits it
SOME I can design a simple game and explain how the code used to create my app executes as the game is being played

Key words
background, if/then, condition, conditional function, key pressed

Pop game

Overview
In this lesson children will be introduced to variables and how they can be used in computer programming. They will begin to understand that a score in an app is written into the code as a variable.

Learning objectives
Learn how to use variables to keep track of the score in a game

Success Criteria
ALL I can write code which includes a variable that will increase in value each time a balloon is popped
MOST I can program the variable to increase in value by different amounts when different balloons are popped
SOME I can add a time limit to my app and explain how I have used a variable to keep the score

Key words
variable, condition, score, start, click, place, time

Loops in Space

Overview
In this lesson children consolidate their understanding of repetition and loops by using them in code to make an object turn repeatedly, and to make an animation.

Learning objectives
Learn how to use a loop to make a space animation

Success Criteria
ALL I can write code that uses a loop to create a timer that counts down
MOST I can program a button to start the countdown and a rocket to launch when the countdown is finished
SOME I can use loops in my code to program a rocket to turn repeatedly so it flies in a loop until it is instructed to stop

Key words
if... equals, condition, repetition, loops, animation, countdown, reset

Faster and slower

Overview
In this lesson children will begin to develop an understanding of the relationship between values used in code and the action of the object they relate to. They will explore setting values in code to program the speed of an object.

Learning objectives
Learn how to set values in code to program the speed of an object

Success Criteria
ALL I can write code that sets a value to set the speed of a car
MOST I can program buttons to increase or decrease the speed of a car and to stop the car
SOME I can create an app in which a player can control the speed of a car by pressing different keys and I can explain
how my app works

Key words
numbers, debug, object, action, speed, acceleration, deceleration

Simple Driving game

Overview
In this lesson children will use variables to control the direction and speed of a car within a game. They are introduced to the concept of working iteratively and explore what it means to use computational thinking to solve challenges.

Learning objectives
Learn how to change an object's direction and heading to create a driving game

Success Criteria
ALL I can use values in my code to control the speed and direction of a car
MOST I can use conditional events and values that represent angles in my code
SOME I can use computational thinking to design and create an app that solves a challenge and explain how my app
works

Key words
angle, speed, heading, if, assign, decompose, iteratively

Around the world

Overview
In this lesson children practise setting values in their code to control the movements of a boat. They are introduced to using co-ordinates in code and using negative numbers to alter the location of the boat along the X axis when it hits moving waves.

Learning objectives
Practise changing an object's direction and heading to create a sailing game. Learn to change its co-ordinates to move it around.

Success Criteria
ALL I can write code that uses a value to make a boat move at the start and change heading and angle when keys are
pressed
MOST I can write a conditional statement that includes changing the co-ordinates of the boat to push the boat backwards
when it hits the waves
SOME I can design and create an app that uses conditions, co-ordinates and values in the code and explain how my app
works

Key words
angle, co-ordinates, condition, negative numbers, Y axis, X axis

(Parachuting cows iPad/tablet)

Overview
In this lesson children will use an iPad to practise setting values and using co-ordinates in their code to control the movements and location of an object. They are introduced to programming values specific to iPads.

Learning objectives
Learn to make an object rotate to the orientation (angle) of an iPad

Success Criteria
ALL I can write code that makes the parachuting cow rotate and float in the in the direction I rotate the iPad
MOST I can program clouds in my app to move across the screen as the parachuting cow floats down
SOME I can include a conditional event in my code that makes the parachuting cow return to the top of the screen when it
hits a cloud and explain how the code for my game executes as it is being played

Key words
iPadZ, Y axis, if, true, assign, value

Driving game

Overview
In this lesson children will practise assigning values in their code to control the movements of a car. They are introduced to assigning a value for friction to speed up or slow down the car when it meets different surfaces.

Learning objectives
Learn how to set friction to effect the speed and movement of a car in a driving game

Success Criteria
ALL I can write code that uses a value to make the speed of a car increase or decrease when different keys are pressed
MOST I can write code that uses a value to control the direction of a car and make it respond to friction
SOME I can design and create a driving game, using conditions in my code, and explain how my app works

Key words
friction, angle, heading, direction, speed, condition, input

(Your own app)

Overview
In this lesson children will apply the computer programming concepts they have learned in Unit 5a to design, create and debug programs. They will use logical reasoning to explain how their code executes.

Learning objectives
Learn to design and make your own app; practise assigning values in code to control the movement of objects.

Success Criteria
ALL I can design and create an app in which I assign values to control how objects move
MOST I can design and create an app and use coordinates in my code
SOME I can use computational thinking to design and create an app that solves a challenge, and explain how my app
works

Key words
if, assign, rotate, variable, condition, coordinate, axis

Making random numbers

Overview
In this lesson children will consolidate their understanding of variables and how they can be used in code. They will learn that the value of a variable can be programmed to generate randomly and change in response to an event or at set time intervals.

Learning objectives
Learn how to make and use random numbers in your apps

Success Criteria
ALL I can write code that uses random numbers to simulate a dice
MOST I can write code that uses random numbers to move cars random distances along the X axis so that they race
SOME I can write code to reset my app and make the cars move back to the start. I can explain how my app works

Key words
variable, generated, random, intervals, time, simulate

Caterpillar catcher

Overview
In this lesson children will practise writing code which uses random number generation to determine how objects will move and to change their locations. They will practise using variables and conditional events in code.

Learning objectives
Learn how to code a game that uses random numbers to move objects in random directions

Success Criteria
ALL I can write code that uses random numbers to move a caterpillar in random directions
MOST I can write code that uses random numbers to move a caterpillar to random locations
SOME I can design and create a game which uses random numbers and includes conditions. I can explain how my app
works

Key words
random number, generates, angle, coordinates, variable, degrees, value, condition, score

Cross the road

Overview
In this lesson children will practise writing code which uses random number generation to determine the speed at which an object will move. They will learn to distinguish between times when use of a random number in code is effective and times when it is more appropriate to set a value.

Learning objectives
Practise writing code which uses random numbers to move objects at random speeds, and then create a game

Success Criteria
ALL I can write code that uses random numbers to program two cars to move at random speeds
MOST I can write code that uses random numbers to program four cars to move in different directions at random speeds
SOME I can design and create a game which uses random numbers and includes a condition and a variable. I can
explain how my app works

Key words
random number, generate, angle, coordinates, variable, degrees, value, condition

Ping pong

Overview
In this lesson children will practise writing code which uses random number generation to determine the direction in which an object will move. They will apply and develop their knowledge of angles through consideration of the most appropriate angles to use in their code, in order to achieve their goal.

Learning objectives
Learn how to create a tennis game, using random directions

Success Criteria
ALL I can write code which uses random numbers to make a ball fall from the top of the screen in a random direction
MOST I can write code which uses a mouse move event to move a bat, and a conditional event to make the ball bounce
off the bat
SOME I can write code to create a ping pong game and explain how my app works

Key words
random number, generate, angle, mouse move, variable, degrees, event, condition, match

Pinball

Overview
In this lesson children will apply and consolidate the knowledge acquired in the previous lesson by making a pinball game. In addition, they will learn to add a 'Go' button and to stop the ball when it falls to the bottom.

Learning objectives
Learn how to create a pinball app, using random directions

Success Criteria
ALL I can write code which uses random numbers to make a ball move up the screen in a random direction when a
button is pressed
MOST I can write code to make the ball bounce back in random directions when it hits the edges of the screen
SOME I can write code to create a pinball game and explain how my app works

Key words
random number, generate, angle, bounce, variable, degrees, event, condition

Your own app

Overview
In this lesson children will apply computer programming concepts learned in Unit 5b to design, create and debug programs. They will use logical reasoning to explain how their code executes.

Learning objectives
Learn how to program your own app, choosing your own objects and events; practice using random numbers to control
the movement of objects

Success Criteria
ALL I can design and create an app in which random numbers control how objects move
MOST I can develop an app by adding random numbers to make objects move or change location randomly, increasing
the challenge
SOME I can use computational thinking to design and create an app that uses random numbers, and explain how my app
works

Key words
random numbers, generate, angle, bounce, variable, degrees, event, condition