

# The Robert Napier School



## COMPUTATIONAL THINKING

### DECOMPOSITION

Breaking down a problem into smaller chunks. This makes it more manageable and easier to understand.

1

### PATTERN RECOGNITION

Looking carefully in lines of code for patterns, similarities and trends.

2

### ABSTRACTION

Filtering out and focusing on what is important. Ignoring what is not important.

3

### ALGORITHM DESIGN

A plan and step by step instructions on how to solve the problems.

4

### DEBUGGING

Looking through your program to find errors and then fixing them.

5

### EVENT DRIVEN PROGRAMMING

User action such as:

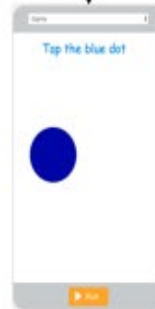
- Mouse clicks
- Touchscreen
- Key presses
- Hovering over a picture
- Voice input ("OK Google", Siri, Alexa)

Events can also be triggered by:

- Sensors (e.g. if movement is sensed turn the light on)
- Messages from other programs

Event

```
1 onEvent ("startbutton", "click", function () {  
2   setScreen ("Game");  
3 }  
4
```



```
onEvent ("GoForward", "click", function () {  
  moveForward (25);  
});  
onEvent ("TurnRight", "click", function () {  
  turnRight (90);  
});  
onEvent ("TurnLeft", "click", function () {  
  turnRight (90);  
});
```

### PAIR PROGRAMMING

The driver: To control the keyboard and mouse and place the code blocks into the correct places.

The navigator: To help support the driver by watching for any mistakes, reading instructions to the driver, and seeking support if needed.

### Questions

What is decomposition?

What is abstraction?

What is algorithm design?

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## USER INPUT

**Text boxes** – allowing the user to input a string.

**Checkboxes** - allowing for the user to indicate a yes or no response.

**Button** – linked to an event that will capture and process the data when it is clicked

## GETTEXT

`getText("id")` is a built-in subroutine that collects the text entered into a textbox; "id" is to be replaced with the name given to the text box.

```
var x = getText(▼"id");
```

## VARIABLE (VAR)

Sometimes we need computers to remember the information we give it and that it calculates during programs. A variable **can be thought of as a box that the computer can use to store a value**. The value held in that box can change or 'vary'. A program can use as many variables as it needs it to.

A variable can store letters, integers (numbers) or text.

For example:

```
>>> money_in_bank = 20
>>> total_money = money_in_bank + 10
>>> print(total_money) 30
```

## SELECTION – BOOLEAN LOGIC (IF/ELSE/ELIF)

Selection is the process of making a **decision** based on a **condition**. Selection allows you to add more avenues and routes to your coding.

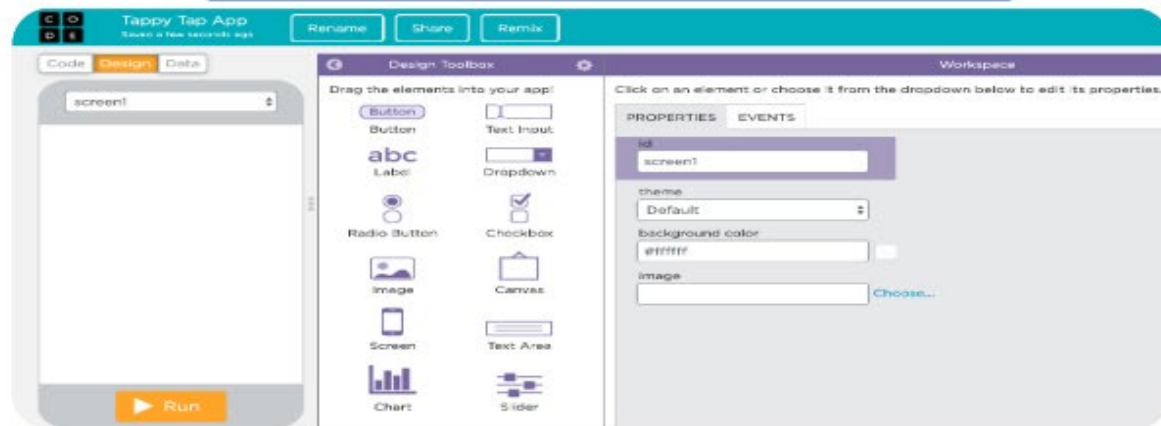
```
if (score > 10) {
  setText(▼"feedback_label", "Great Work");
} else if ((score > 6)) {
  setText(▼"feedback_label", "Not Bad");
} else {
  setText(▼"feedback_label", "Hard Luck");
}
```

## EVENT HANDLER

You can use an **event handler** to determine when to collect the data and what to do with it once it has been collected and linked with a variable.

```
onEvent(▼"login", ▼"click", function() {
  var username = getText(▼"username");
});
```

## GRAPHICAL USER INTERFACE (GUI)



## EVALUATION

*Verb*

"To **judge** or **calculate** the quality, importance, amount, or value of something"

## Questions

What is `getText`?

What is a variable?

What does the term 'selection' mean?