DIXONS SIXTH FORM ACADEMY

# SUMMER WORK

## A LEVEL COMPUTER SCIENCE

2025

STUDENT NAME:

# About the Summer Work

This booklet contains a number of tasks that students are expected to complete to a good standard in order to be able to be enrolled in this subject.

The tasks are to do research and then learn how to put that information into a website of interlinked webpages using HTML code.

Please do the following:

1. complete the Tasks as directed
2. compress the folder and send it to jpatel@dixons6a.com (see Task 10 for this)

There is also a section on additional work for learning some web programming. This is not compulsory but it would be very good if you could complete this!

## What you will need

Details about the software you will need are included in the Tasks.

# Welcome to Computer Science

## Subject outline

One perception of Computer Science is that it is forever changing. Technology has evolved so much that we live in a world where it is difficult to image life without computerised systems. However, this evolving technology is built upon some solid foundations that have stood since its inception – this is Computer Science.

There are three main strands to Computer Science, and these form our "Big Picture Questions":

- How do computers work?
- How do computers communicate and work together?
- How do we make computers work for us?

Everything that we will do falls under one of these questions.

At Dixons we study AQA A level Computer Science which is breaks down these themes further and examines them in three parts:

1. Paper 1:

   This paper tests your ability to program, as well as some theoretical knowledge of Computer Science around the question "**How do we make computers work for us?**"

2. Paper 2:

   This paper tests theoretical knowledge of Computer Science around the questions "**How do computers work?**" and "**How do computers communicate and work together?**"

3. NEA:

   The non-exam assessment assesses your ability to use the knowledge and skills gained through the course to solve or investigate a practical problem. You will be expected to follow a systematic approach to problem solving,

## What an Excellent Student "Looks Like"

To study computer science and get the best out of it you need to have three main attributes:

1. You need to have, or be developing, excellent coding skills.

   These are:

   - good programming habits,
   - good use of programming techniques
   - being able to problem solve quickly
   - being able to code across several programming languages

2. You need to have excellent mathematical ability.

   In reality, Computer Science is really Applied Mathematics so you need to have a very good grasp of it and be agile in your thinking!

3. You need to be hard working, well-organised, concentrate well and be resilient

   Computer Scientists are design engineers and often work at a problem over a long period of time. Sometimes things can go wrong, and you start again.

   You will get frustrated, and you need to develop good resilience.

   A lot of work and practice needs to take place outside of lesson time, so you need to be able to concentrate well wherever you are and organise your time well.

# Induction Work

## Initial Assessment

All students will have an initial test to help determine what support you will need to help develop your programming skills. This will come in the form of an Initial Assessment followed by a discussion with your teacher.

## 6-week Basic Programming

When we start the course in September, there will be a 6-week period where we cover the basics of programming. Everyone will do this course BUT If the Initial Assessment indicates it, or you have never programmed before, there will be mandatory Support sessions to help you with this.

## Coding and Theory Blocks

Throughout the course, you will be completing a program of Coding Blocks and Theory Blocks. These are designed to ensure that you have the correct competences to sit both exam papers and complete your NEA. For each Block you will take a competency test and build up a set of Blocks to show your progress.

The coding blocks can be found o the website Computer Science Tutorials

# Careers & Higher Education

## Need some Inspiration?

Computer Science matters!!! Watch This

Computer Science is everywhere!! Watch this

Computer Science is for everyone!!! Watch this

Many careers are linked to Computer Science. Many students who take this course want to go on to a career as a programmer – maybe you could be the next Bill Gates or Mark Zuckerberg!

In terms of the local area, there are many new niche sectors beginning to develop that will require computer scientists in new media and telecoms, research and development in heavy and light industries and growing Small/Medium sized Enterprises.

Below are some link to places that you can look for more information and inspiration:

### A sample of Universities

Computer Science at Oxford University

Computer Science at Cambridge University

Computer Science at Manchester University

### Some Different Careers

What can you do with a Computer Science Degree?

BBC Software Engineering Apprenticeships

KPMG Software Engineering Apprenticeships

Degree Apprenticeships in Aerospace Software Development

GCHQ Careers

## Links to key information:

Click here for the Course Information Guide on our website

Click here for the AQA Specification for A Level Computer Science

# Summer Work Tasks

## Developing Webpages in Bootstrap

For this work you will need to be able to demonstrate that you can:

1. Build interlinked web pages using the Bootstrap Framework that incorporate:
    a. contextual menu/navigation bar
    b. organised content comprising images, text and video
    c. links to other pages
2. Demonstrate that you can logically organise information. In this case:
    a. contextual menu/navigation bar
    b. organised content comprising images, text and video
    c. links to other pages

You will need to use the reference W3Schools Bootstrap 5 Tutorial

You will complete 9 Tasks for this tutorial:

- Task 1: Compile your Content (3.5 hours)
- Task 2: About Bootstrap Webpages (30 mins)
- Task 3: Setting up Folders for your Webpages (30 minutes)
- Task 4: Build a Basic Bootstrap Webpage (1 hour)
- Task 5: Add Text and Styling to a Bootstrap Webpage (1 hour)
- Task 6: Add Images to a Bootstrap Webpage (30 minutes)
- Task 7: Add Video to a Bootstrap Webpage (30 minutes)
- Task 8: Build Individual Webpages (3-4 hours)
- Task 9: Add a Menu/Navigation Bar to a Bootstrap Webpage (1 hour)

# Task 1: Compile Content

Before you make the website, you need to the information that will go onto it. This includes text, images and video. You will make a website to present information about a computer.

**You need to do research by using the internet and making notes, saving images and links to videos that you would like to use**.

To help you to do this well, the task has been broken down into 30-minute chunks as follows:

## 1a. What is a Computer?

Carry out some research by following the tasks below:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Carry out research about the **different types of computer that there are** and make notes under the heading "**Different Types of Computer**" | |
| 2 | Carry out research about **what a computer can do** and make notes under the heading "**What a Computer Can Do**" | |
| 3 | Carry out research about **what a computer can't do** and make notes under the heading "**What a Computer Can't Do**" | |

During your research:

1. **save some images** that you would like to put on your webpages
2. **save links to videos** that you may like to include on your webpages

## 1b. What is a Processor?

A Processor is the chip that drives the computer. There are lots of different types of processors.

Carry out some research by following the tasks below:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Carry out research to answer the question **"what is a processor?".**<br><br>Make your notes under the heading "**What is a Processor**" | |
| 2 | Carry out research to answer the question **"what do the numbers mean?".** For example, a new computer may be advertised as having - Intel® Core™ i5-12400 Processor, Hexa-core at 2.5 GHz / 4.4 GHz with 18 MB cache.<br><br>Make your notes under the heading "**How a Processor is Described**" | |
| 3 | Carry out research to answer the question **"what is the difference between an Apple Mac and a PC?".**<br><br>Make your notes under the heading "**How a Mac Differs From a PC**" | |

During your research:

1. save some images that you would like to put on your webpages
2. save links to videos that you may like to include on your webpages

## 1c. What are Input devices?

A Computer needs Input Devices and there are lots of them.

Carry out some research by following the tasks below:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Carry out research to answer the question **"What is the purpose of a mouse and keyboard?".**<br><br>Make your notes under the heading "**The Purpose of the Keyboard and Mouse**" | |
| 2 | Carry out research to answer the question **"How can the computer be operated by voice?".**<br><br>Make your notes under the heading "**How Computers Can be Operated by Voice**" | |
| 3 | Carry out research to answer the question **"how does a barcode scanner work?".**<br><br>Make your notes under the heading "**How a Barcode Scanner Works**" | |
| 4 | Carry out research to answer the question **"how does a digital camera work?".**<br><br>Make your notes under the heading "**How does a Barcode Scanner Work**" | |

During your research:

1. save some images that you would like to put on your webpages
2. save links to videos that you may like to include on your webpages

## 1d. What are Output devices?

A Computer needs Output Devices and there are lots of them.

Carry out some research by following the tasks below:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Carry out research to answer the question **"what does resolution mean when referring to a monitor?".**<br>Make your notes under the heading "**Resolution of Monitors**" | |
| 2 | Carry out research to answer the question **"how do headphones and speakers work?".**<br>Make your notes under the heading "**How Speakers and Headphones Work**" | |
| 3 | Carry out research to answer the question **"how do inkjet printers work?".**<br>Make your notes under the heading "**How an Inkjet Printer Works**" | |

During your research:

1. save some images that you would like to put on your webpages
2. save links to videos that you may like to include on your webpages
3. save links to any music that you may like to include on your webpages

## 1e. What is computer memory?

A Computer needs Memory – but what is it?

Carry out some research by following the tasks below:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Carry out research to answer the question **"what is the purpose of RAM?".**<br><br>Make your notes under the heading "**The Purpose of RAM**" | |
| 2 | Carry out research to answer the question **"what do the numbers mean when referring to RAM?".**<br><br>Make your notes under the heading "**How RAM is Described**" | |
| 3 | Carry out research to answer the question **"how much RAM can you have in a computer and why is that important?".**<br><br>Make your notes under the heading "**How the Size of RAM Affects a Computer**" | |

During your research:

1. save some images that you would like to put on your webpages
2. save links to videos that you may like to include on your webpages

## 1f. What are Storage devices?

A Computer needs Storage – but what is it?

Carry out some research by following the tasks below:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Carry out research to answer the question **"what is a Hard Disk Drive (HDD)?".**<br><br>Make your notes under the heading "**What is an HDD?**" | |
| 2 | Carry out research to answer the question **"what is a Solid State Drive (SDD)?".**<br><br>Make your notes under the heading "**What is an SSD?**" | |
| 3 | Carry out research to answer the question **"how much Storage can you have in a computer and why is that important?".**<br><br>Make your notes under the heading "**How the Size of Storage Affects a Computer**" | |

During your research:

1. save some images that you would like to put on your webpages
2. save links to videos that you may like to include on your webpages

## 1g. How does a computer connect to the world?

A Computer needs the internet to communicate?

Carry out some research by following the tasks below:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Carry out research to answer the question **"what is an ethernet connection and how does it work?".**<br><br>Make your notes under the heading "**What is an ethernet connection?**" | |
| 2 | Carry out research to answer the question **"what is a WiFi connection and how does it work?".**<br><br>Make your notes under the heading "**What is a WiFi Connection?**" | |
| 3 | Carry out research to answer the question **"What is a Bluetooth connection and how does it work?".**<br><br>Make your notes under the heading "**What is a Bluetooth Connection**" | |

During your research:

1. save some images that you would like to put on your webpages
2. save links to videos that you may like to include on your webpages

## 1h. What is Software for a computer? (approx. 30 mins)

A Computer needs software to operate it?

Carry out some research by following the tasks below:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Carry out research to answer the question **"what is Windows - the software that controls a PC?".**<br>Make your notes under the heading "**What is Windows Software?**" | |
| 2 | Carry out research to answer the question **"what is iOS – the software that controls a MAC?".**<br>Make your notes under the heading "**What is iOS software?**" | |
| 3 | Carry out research to answer the question **"what is Android – the software that controls mobile phones?".**<br>Make your notes under the heading "**What is Android software?**" | |
| 4 | Carry out research to answer the question **"What is a Bluetooth connection and how does it work?".**<br>Make your notes under the heading "**What is a Bluetooth Connection**" | |

During your research:

1. save some images that you would like to put on your webpages
2. save links to videos that you may like to include on your webpages

# Task 2: Bootstrap Webpages

For this task you will find out about how webpages are constructed using HTML code and CSS.

Bootstrap is a framework for laying out and styling a webpage in a particular way. It is a very popular framework.

## 2a. Find out about a basic Bootstrap webpage

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (start to 5:38) about Basic Webpages and make sure that you understand it. | |
| 2 | Make your own "Hello World" basic webpage using W3Schools. | |

# Task 3: Setting up Folders

All websites are made up of files inside folders.

As you should have seen in Task 2 a webpage is text made up of html code so, to save a webpage it must be stored as a file.

Specifically,

- Files must be saved inside a website folder
- Images must be stored inside folders on the website

For the website you are going to make, you will need to set up a folder ready for you to put your pages. Do the following:

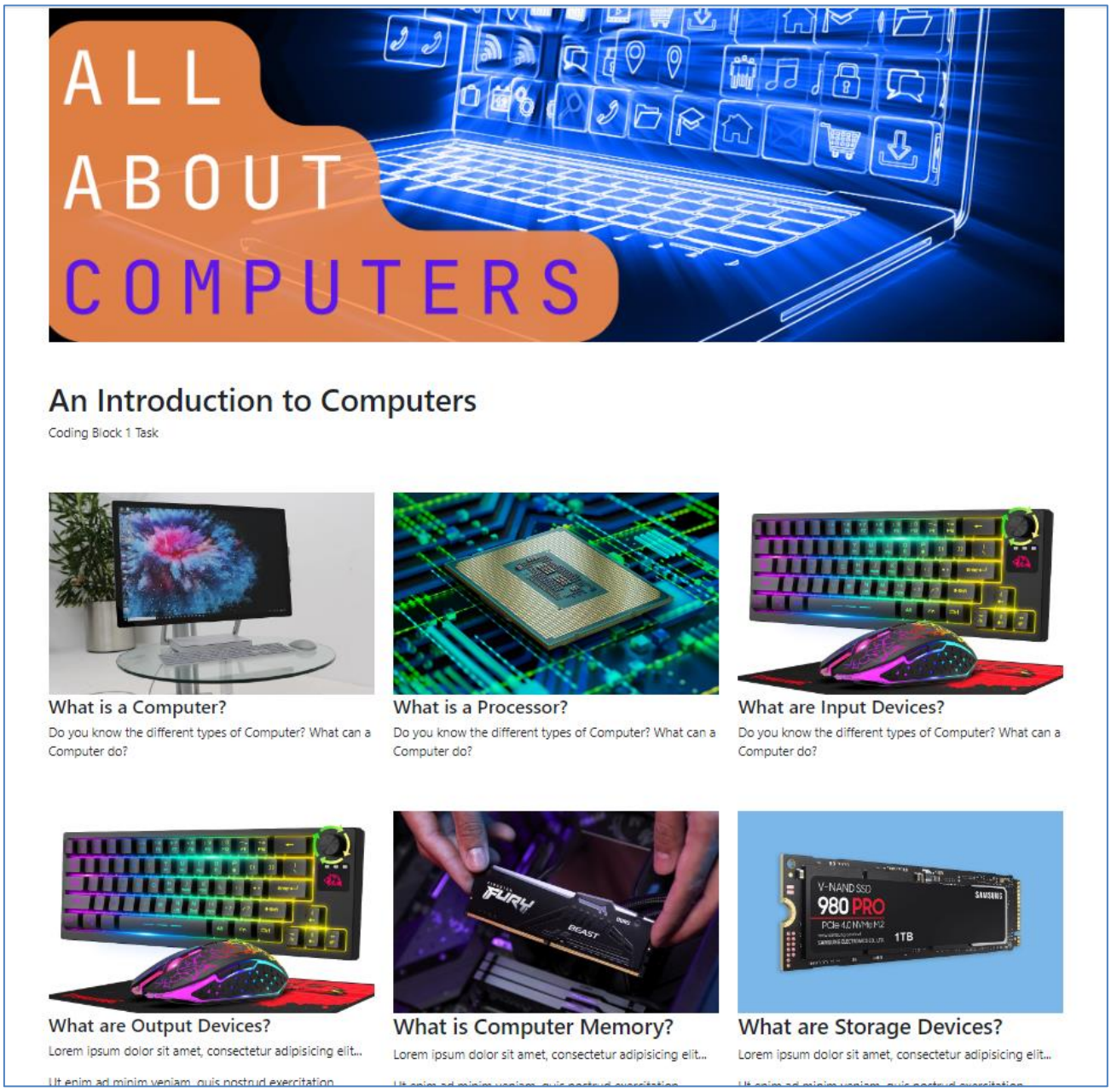
## 3a. Watch this video (approx. 10 minutes)

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (5:38 to 7:07). This video takes you through the process of creating the website folder with the correct subfolders. | |
| 2 | Having watched the video, make your website folder with the following subfolders:<br>• css<br>• images<br>• pages<br>• videos | |

# Task 4: Build a Basic Webpage

As you should have seen in Task 2, a webpage is a file made up of html code

For the task you are going to make a basic Bootstrap webpage as a text file. This is the webpage that we will make:



You will use some software to edit the website. This software is called Visual Studio and it can be downloaded from here: https://code.visualstudio.com/download

Once you have downloaded it, do the following:

## 4a. Install Visual Studio Code

This should be a simple process.

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video: https://code.visualstudio.com/learn/get-started/basics | |
| 2 | Install and get familiar with VS Code | |
| 3 | You may want to customise the interface so watch this video: https://code.visualstudio.com/learn/get-started/personalize | |

## 4b. Set up Visual Studio Code to use your folder system

Now that you have set up Visual Studio, you now need to make it use the website folder that was created in Task 3b.

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (7:07 to 8:19) | |
| 2 | Set up Visual Studio to work with your folder | |

## 4c. Learn about the Basic Bootstrap Page

Now that you have set up the website folder, you now need to make a basic Bootstrap webpage.

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (8:19 to 15:10) | |
| 2 | Having learned about the basic Bootstrap webpage, it's your turn to make it.<br>• Make the basic Bootstrap webpage<br>• Save it into the root of your website folder and name it **index.html** | |

# Task 5: Add Text and Styling

As you should have seen in Task 4, html code is made up of tags for different sections of the website that are given classes to make them use Bootstrap styling.

For this task you are going to change the way that **text** looks using Bootstrap styling of tags.

Do the following:

## 5a. Learn about text tags

Do the following:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (15:10 to 30:05) | |

## 5b. Learn about Bootstrap Styles

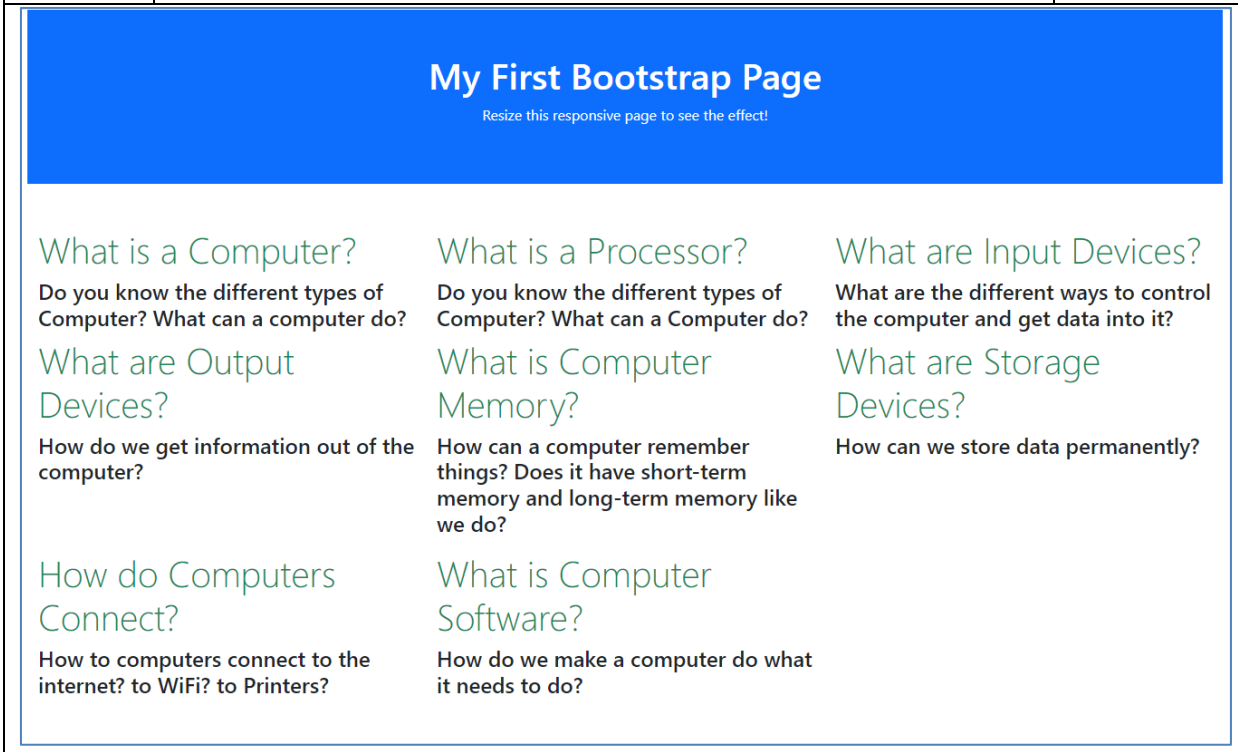
Do the following:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (30:05 to 41:46) | |

## 5c. Add some basic styling to the Bootstrap webpage

Do the following:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Apply styling to the text tags in your **index.html** file so that it looks like this: | |



# Task 6: Add Images

Remember, html code is made up of tags for different sections of the website and that includes images. Only text is used to place an image. However, the image must be present in your folder system.

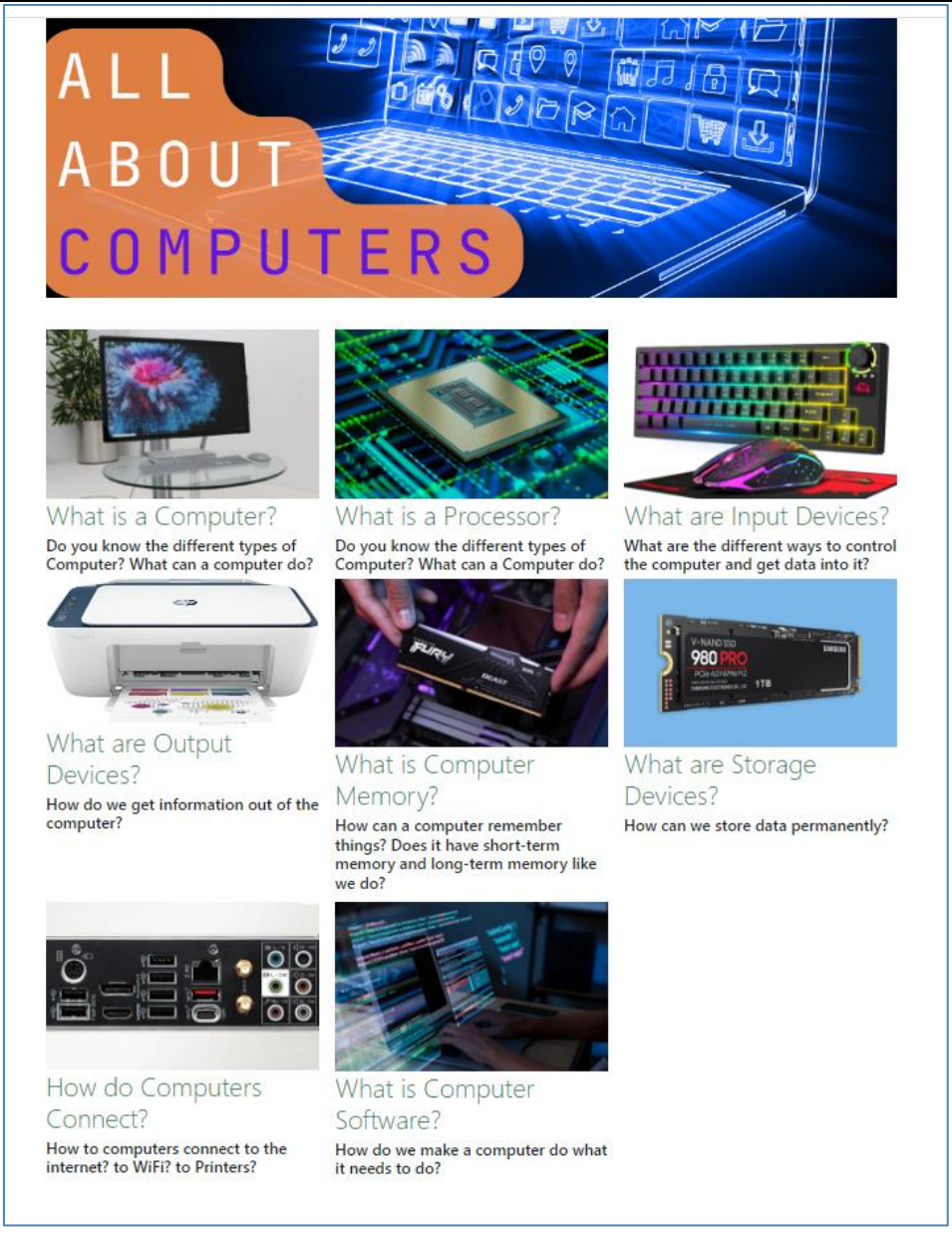
For this task you are going to add images to your webpage using Bootstrap styling to make the image responsive. You should have been sent the images so please check your email. If you have not got them, please contact Jay using jpatel@dixons6a.com

Do the following:

## 6a. Learn about image tags (12 minutes)

Do the following:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (41:46 to 53:25) | |
| | Add images to your **index.html** file so that it looks like this: | |



# Task 7: Add Videos

Remember, html code is made up of tags for different sections of the website and that includes images. Only text is used to place a video. This time, the video can be present in your folder system, or it can be stored on another website and then embedded into your website.

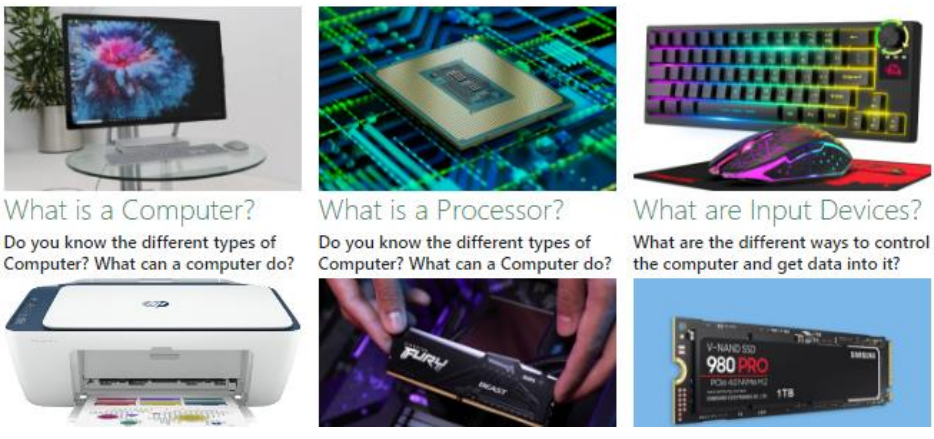
For this task you are going to add videos to your webpage using Bootstrap styling to make the video responsive.

## 7a. Learn about video tags (10 minutes)

Do the following:

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (53:25 to 57:47) | |
| | Add videos to your **index.html** file so that it looks like this: | |





# Task 8: Build Individual Pages

Now it is your turn to make the pages.

You need to make individual pages based on your research.

## Page1: What is a Computer? (approx. 30 mins)

Using your research and what you have learned from Tasks 2-7, do the following:

1. Make a new file for this webpage in the pages folder and name it **computer.html**
2. Build the page with the content from your **Task 1a** research:
    a. you will need to decide how to lay out the page
    b. you will need to decide what images to add and where
    c. you will need to decide what videos to add and where

## Page 2: What is a Processor? (approx. 30 mins)

1. Make a new file for this webpage in the pages folder and name it **processor.html**
2. Build the page with the content from your **Task 1b** research:
    a. you will need to decide how to lay out the page
    b. you will need to decide what images to add and where
    c. you will need to decide what videos to add and where

## Page 3: What are Input devices? (approx. 30 mins)

1. Make a new file for this webpage in the pages folder and name it **inputs.html**
2. Build the page with the content from your **Task 1c** research:
    a. you will need to decide how to lay out the page
    b. you will need to decide what images to add and where
    c. you will need to decide what videos to add and where

## Page 4: What are Output devices? (approx. 30 mins)

1. Make a new file for this webpage in the pages folder and name it **outputs.html**
2. Build the page with the content from your **Task 1d** research:
    a. you will need to decide how to lay out the page
    b. you will need to decide what images to add and where
    c. you will need to decide what videos to add and where

## Page 5: What is computer memory? (approx. 30 mins)

1. Make a new file for this webpage in the pages folder and name it **memory.html**
2. Build the page with the content from your research:
    a. you will need to decide how to lay **Task 1e** out the page
    b. you will need to decide what images to add and where
    c. you will need to decide what videos to add and where

## Page 6. What are Storage devices? (approx. 30 mins)

1. Make a new file for this webpage in the pages folder and name it **storage.html**
2. Build the page with the content from your **Task 1f** research:
    a. you will need to decide how to lay out the page
    b. you will need to decide what images to add and where
    c. you will need to decide what videos to add and where
    d. save links to videos that you may like to include on your webpages

## Page 7: How does a computer connect to the world? (approx. 30 mins)

1. Make a new file for this webpage in the pages folder and name it **connections.html**
2. Build the page with the content from your **Task 1g** research:
    a. you will need to decide how to lay out the page
    b. you will need to decide what images to add and where
    c. you will need to decide what videos to add and where

## Page 8: What is Software for a computer? (approx. 30 mins)

1. Make a new file for this webpage in the pages folder and name it **software.html**
2. Build the page with the content from your **Task 1h** research:
    a. you will need to decide how to lay out the page
    b. you will need to decide what images to add and where
    c. you will need to decide what videos to add and where

# Task 9: Add a Navigation

Having built all of your pages, you now need to make connections between them using a Menu of Navigation Bar.

## 9a. Add Navigation Bars

| Task No | Task | Date Completed |
|---|---|---|
| 1 | Watch this video (57:47 to end) | |
| 2 | Add a Navigation to **index.html** file so that it links to all pages | |
| | Add a Navigation to **computer.html** file so that it links to all pages | |
| | Add a Navigation to **processor.html** file so that it links to all pages | |
| | Add a Navigation to **inputs.html** file so that it links to all pages | |
| | Add a Navigation to **outputs.html** file so that it links to all pages | |
| | Add a Navigation to **memory.html** file so that it links to all pages | |
| | Add a Navigation to **storage.html** file so that it links to all pages | |
| | Add a Navigation to **connections.html** file so that it links to all pages | |
| | Add a Navigation to **software.html** file so that it links to all pages | |

## 9b. Zip (Compress) your Folder and Hand it in! (10 mins)

The last step is to hand in your work. Do the following:

1. Locate your website folder
2. Press and hold (or right-click) the file or folder, select (or point to) **Send to**, and then select Compressed (zipped) folder.

   A new zipped folder with the same name is created in the same location. To rename it, press and hold (or right-click) the folder, select Rename, and then type the new name.

Send the compressed (zipped) folder as an attachment to jpatel@dixons6a.com

# And Finally…

Well done!!!!

If you have any problems at any time, please contact Jay Patel on email using jpatel@dixons6a.com

# Reading list

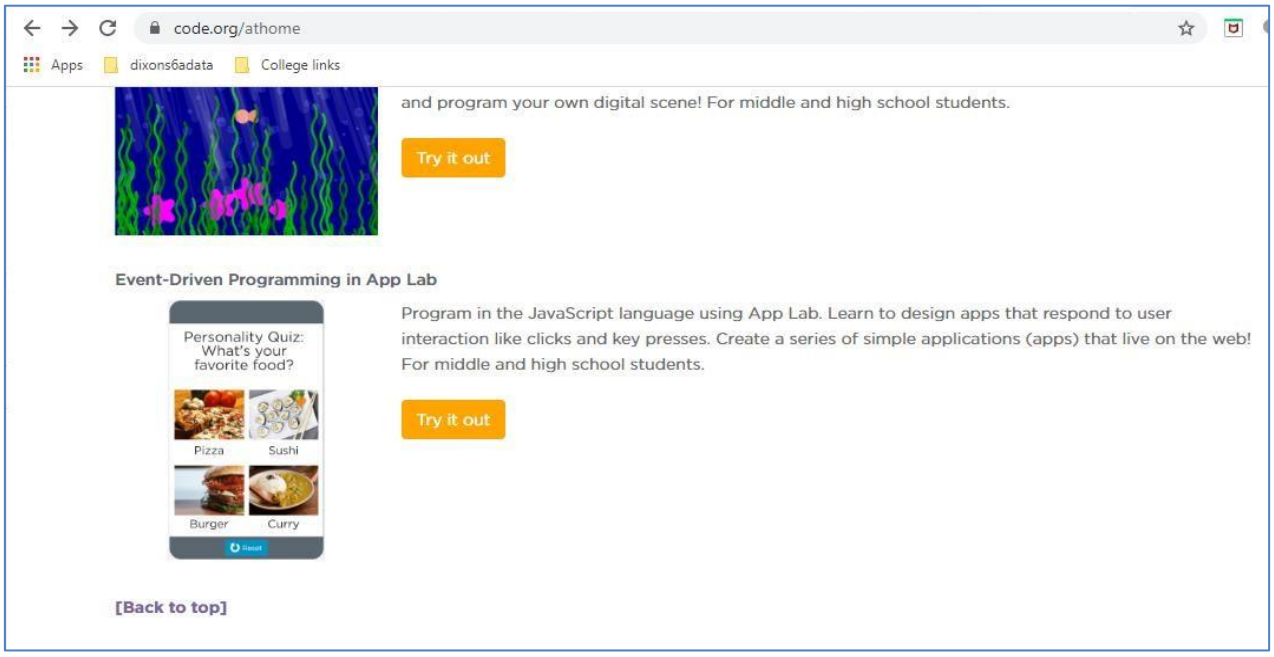
## Further Reading and Tasks

One of the fundamental programming tasks that you will learn about in this course is that of Web Programming using JavaScript. In order to prepare for that, you could do this course on Code.org.

You will need to sign up, watch videos and then complete the tasks.

Keep a record of what you do by taking screenshots of your work and compiling it on a MS WORD page.

Step 1: Go to Code.org and find the course ( https://studio.code.org/s/csp5-virtual )




You need to choose Event Driven Programming in App Lab

Step 3: Sign up to the website

Step 4: Complete the Course

You will find videos, tasks and much more in here.