

KHS Key Stage 3 Levelling & Baseline Testing

CAS Hub meeting - 22nd October 2014

Rational

- ▶ KHS will continue to use levels at KS3
- ▶ Students should be baseline tested at the start of year 7
- ▶ The baseline test will give each student a starting level for Computing
- ▶ Targets can then be set for each student based on the starting level
 - ▶ Students should make 2 sub-levels of progress per year in KS3



Our Process

- ▶ We have 1 lesson per fortnight at KS3
 - ▶ 90 minutes per lesson
 - ▶ 18 lessons per year (max)
- ▶ We selected the aspects of the curriculum that we thought we could reasonably cover
- ▶ We broke Computing into 3 strands:
 - ▶ Algorithms & Programming
 - ▶ Data & Data Representation
 - ▶ Hardware, Software & Communication
- ▶ We also created a separate Digital Literacy strand
- ▶ We created 8 levels per strand



KHS KS3 COMPUTING LEVELS

	Algorithms & Programming	Data & Data Representation	Software, Hardware & Communication
1	WHAT IS AN ALGORITHM	IDENTIFYING DATA TYPES	WHAT IS A COMPUTER
2	FOLLOWING SIMPLE ALGORITHMS	TRANSFERRING DATA	INPUT -PROCESS-OUTPUT & INTRODUCTION TO SOFTWARE
3	SEQUENCES	INTRODUCTION TO BINARY	INPUT, OUTPUT & STORAGE DEVICES, SOFTWARE V'S HARDWARE & HTML
4	SELECTION / DECISIONS	USING BINARY	THE CPU & INTRODUCTION TO THE WEB
5	ITERATIONS / LOOPS	SIMPLE DATA REPRESENTATION	INSIDE THE COMPUTER & CASCADING STYLE SHEETS
6	COMBINING SEQUENCE, SELECTION & ITERATION	SIMPLE BIT PATTERNS & BOOLEAN OPERATORS	THE OPERATING SYSTEM & MULTIPAGE WEBSITES
7	PLANNING & CREATING SOLUTIONS TO COMPLEX PROBLEMS	SIMPLE LOGIC & DATA STORAGE	UTILITY SOFTWARE & SERVER SIDE PROCESSING
8	EFFECTIVE PLANNING OF EFFICIENT & ROBUST SOLUTIONS	COMPLEX LOGIC & BIT PATTERNS	SOFTWARE INTERACTION & SERVER SIDE PROCESSING USING A DATABASE

Level	Algorithms & Programming	Data & Data Representation	Software, Hardware & Communication
1	<p>WHAT IS AN ALGORITHM</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand the word algorithm. 	<p>IDENTIFYING DATA TYPES</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can recognise different types of data such as text & numbers. 	<p>WHAT IS A COMPUTER?</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand that a number of devices can be considered as computers. <input type="checkbox"/> I can identify a variety of computers
2	<p>FOLLOWING SIMPLE ALGORITHMS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I am able to follow and understand simple sequenced instructions. <input type="checkbox"/> I am able to put simple instructions in the correct order. <input type="checkbox"/> I am able to follow instructions to create a simple program. 	<p>TRANSFERRING DATA</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand that computers do not communicate in the same way as humans. <input type="checkbox"/> I know that computers transfer data in binary 	<p>INPUT-PROCESS-OUTPUT & INTRODUCTION TO SOFTWARE</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can identify the computer system process: input > process > output. <input type="checkbox"/> I know that the internet is a network of computers. <input type="checkbox"/> I can list some different software
3	<p>SEQUENCES</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can break down a simple problem into a sequence and write the steps/instructions in plain English. <input type="checkbox"/> I can understand and follow a flow chart for a sequence based problem. <input type="checkbox"/> I can convert a given algorithm for a simple sequence based problem into a program. 	<p>INTRODUCTION TO BINARY</p> <ul style="list-style-type: none"> <input type="checkbox"/> I know that computers use binary to represent data. <input type="checkbox"/> I know what the 0 and 1 represent. <input type="checkbox"/> I am able to count in binary. 	<p>INPUT, OUTPUT & STORAGE DEVICES, SOFTWARE V'S HARDWARE & HTML</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can list simple input, output and storage devices within the classroom. <input type="checkbox"/> I can identify the Central Processing Unit inside a computer <input type="checkbox"/> I know the difference between hardware & software <input type="checkbox"/> I know what HTML stands for <input type="checkbox"/> I know that web pages are written in HTML.
4	<p>SELECTION/DECISIONS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can break down a decision based problem into a set of steps/instructions written in plain English. <input type="checkbox"/> I can understand and follow a flow chart for a decision based problem. <input type="checkbox"/> I can convert a given algorithm for a decision based problem into a program. 	<p>USING BINARY</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can perform conversions between denary and binary (and vice versa). <input type="checkbox"/> I know the terms bit & byte <input type="checkbox"/> I understand how bit patterns represent numbers and images. 	<p>THE CPU & INTRODUCTION TO THE WEB</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand the term process <input type="checkbox"/> I can explain what the CPU does <input type="checkbox"/> I can identify a variety of communication methods <input type="checkbox"/> I know the difference between the internet & the WWW <input type="checkbox"/> I know the difference between static & dynamic webpages & content <input type="checkbox"/> I am able to create a basic webpage written in HTML.
5	<p>ITERATIONS/LOOPS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can break down a problem that includes repetition into a set of steps/instructions written in plain English. <input type="checkbox"/> I can create a flow chart for a decision based program. <input type="checkbox"/> I can convert a given algorithm for a problem that includes repetition into a program <input type="checkbox"/> I can debug simple errors in a program 	<p>SIMPLE DATA REPRESENTATION</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand and am able to explain the difference between denary (base 10) and binary (base 2). <input type="checkbox"/> I understand the difference data and information <input type="checkbox"/> I can identify the Boolean operators <input type="checkbox"/> I am able to define data types such as integer, real, string & Boolean. <input type="checkbox"/> I understand basic compression 	<p>INSIDE THE COMPUTER & CASCADING STYLE SHEETS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can recognise the internal components of the computer system. <input type="checkbox"/> I understand why and when computers are used <input type="checkbox"/> I can identify a variety of application software <input type="checkbox"/> I am able to create a webpage using HTML and CSS <input type="checkbox"/> I know what CSS stands for & what they do
6	<p>COMBINING SEQUENCE, SELECTION & ITERATION</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can break down complex problems that incorporate sequence, selection and repetition into plain English/flow charts. <input type="checkbox"/> I can write simple text based programs that incorporate sequence, selection and repetition. <input type="checkbox"/> I can write and call simple functions. 	<p>SIMPLE BIT PATTERNS & BOOLEAN OPERATORS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can perform simple operations using bit patterns e.g. binary addition. <input type="checkbox"/> I understand the relationship between binary and file size. <input type="checkbox"/> I can use a combination of Boolean and relation operators to evaluate data - for programming or database purposes 	<p>THE OPERATING SYSTEM & MULTIPAGE WEBSITES</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can identify a variety of Operating Systems <input type="checkbox"/> I understand the main functions of the OS <input type="checkbox"/> I can identify the difference between the OS and application software <input type="checkbox"/> I can create a multi-page website using HTML & CSS
7	<p>PLANNING & CREATING SOLUTIONS TO COMPLEX PROBLEMS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can convert basic algorithms into pseudo code. <input type="checkbox"/> I can break down multi-task problems and plan a solution that incorporates a variety of programming techniques. <input type="checkbox"/> I can write multi-task programs in a text based programming language using a variety of techniques including functions. <input type="checkbox"/> I can evaluate programming solutions against requirements and justify the programming techniques used. 	<p>SIMPLE LOGIC & DATA STORAGE</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand the relationship between colour depth and resolution, including the effect on file size <input type="checkbox"/> I know the relationship between data representation and data quality <input type="checkbox"/> I understand simple Boolean logic and can use truth tables 	<p>UTILITY SOFTWARE & SERVER SIDE PROCESSING</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand the main functions of utility software <input type="checkbox"/> I can identify different types of utility software <input type="checkbox"/> I know the difference between client side and server side processing <input type="checkbox"/> I know the difference between the 'Get' and 'Post' method <input type="checkbox"/> I can create a PHP webpage with a form and use the Get & Post methods
8	<p>EFFECTIVE PLANNING OF EFFICIENT & ROBUST SOLUTIONS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can plan and create a solution to a complex problem following the software design lifecycle. <input type="checkbox"/> I can show that efficiency and robustness have been considered during the process and explain the decision making process behind the use of the programming techniques used. 	<p>COMPLEX LOGIC & BIT PATTERNS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand the relationship between binary and electrical circuits, including Boolean logic <input type="checkbox"/> I understand more complex Boolean logic and use truth tables. <input type="checkbox"/> I can perform operations using bit patterns: binary and hex 	<p>SOFTWARE INTERACTION & SERVER SIDE PROCESSING USING A DATABASE</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand how different software (application, OS & utility) work together <input type="checkbox"/> I know how software and hardware communicate <input type="checkbox"/> I understand how to access a database from a web page <input type="checkbox"/> I can create a dynamic webpage to display data from a database



KHS KS3 ICT/DIGITAL LITERACY

ICT / Digital Literacy
1 USING BASIC SOFTWARE & FINDING INFORMATION WITH HELP
2 USING BASIC SOFTWARE & FINDING INFORMATION INDEPENDENTLY
3 USING A VARIETY OF SOFTWARE & FINDING RELEVANT INFORMATION
4 CREATING A VARIETY OF DIGITAL CONTENT & FINDING SPECIFIC INFORMATION
5 CREATING DIGITAL CONTENT FOR A GOAL & AUDIENCE
6 CREATING DIGITAL CONTENT BY COMBINING SOFTWARE. VALIDITY & RELIABILITY OF INFORMATION
7 EFFECTIVELY CREATING DIGITAL CONTENT BY COMBINING SOFTWARE. RE PURPOSING CONTENT FOR DIFFERENT AUDIENCES
8 EFFECTIVE EVALUATION & IMPROVEMENTS

1

2

3

4

5

6

7

8



Level	ICT / Digital Literacy
1	<p>USING BASIC SOFTWARE & FINDING INFORMATION WITH HELP</p> <ul style="list-style-type: none"> <input type="checkbox"/> I use technology to create digital content. <input type="checkbox"/> I use search technologies to find information with guidance.
2	<p>USING BASIC SOFTWARE & FINDING INFORMATION INDEPENDENTLY</p> <ul style="list-style-type: none"> <input type="checkbox"/> I use technology purposefully to create and store digital content. <input type="checkbox"/> I use technology to retrieve digital content. <input type="checkbox"/> I use search technologies to find information independently.
3	<p>USING A VARIETY OF SOFTWARE & FINDING RELEVANT INFORMATION</p> <ul style="list-style-type: none"> <input type="checkbox"/> I use a variety of software with guidance to create, edit and store digital content. <input type="checkbox"/> I have an awareness of audience and purpose. <input type="checkbox"/> I use search technologies to find relevant information independently. <input type="checkbox"/> I talk about my work and make changes to improve it.
4	<p>CREATING A VARIETY OF DIGITAL CONTENT & FINDING SPECIFIC INFORMATION</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can use a variety of software with increasing independence to create, organise, and manipulate digital content. <input type="checkbox"/> I am showing an awareness of the quality of the digital content collected. <input type="checkbox"/> I recognise the audience when designing and creating digital content. <input type="checkbox"/> I use search technologies to collect specific information independently. <input type="checkbox"/> I can make improvements to my work based on feedback given.
5	<p>CREATING DIGITAL CONTENT FOR A GOAL & AUDIENCE</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can design, create, manipulate and present digital content to achieve a specific goal. <input type="checkbox"/> I can design and create suitable digital content for a given audience. <input type="checkbox"/> I use refined search techniques to collect specific information <input type="checkbox"/> I can make appropriate improvements to my work based on feedback given and can comment on the success of the solution.
6	<p>CREATING DIGITAL CONTENT BY COMBINING SOFTWARE. VALIDITY & RELIABILITY OF INFORMATION</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can design, create, manipulate and present effective digital content to achieve a specific goal combining software packages and internet services. <input type="checkbox"/> I can evaluate digital content and repurpose it for an alternative audience. <input type="checkbox"/> I use refined search techniques to collect valid and reliable data. <input type="checkbox"/> I can use criteria to evaluate the quality of my work, and can make some refinements to the solution.
7	<p>EFFECTIVELY CREATING DIGITAL CONTENT BY COMBINING SOFTWARE. REPURPOSING CONTENT FOR DIFFERENT AUDIENCES</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can effectively design, create, manipulate and present digital content to achieve a specific goal combining software packages and internet services. <input type="checkbox"/> I can evaluate digital content and repurpose it effectively for an alternative audience. <input type="checkbox"/> I use refined search techniques to effectively collect valid and reliable data. <input type="checkbox"/> I can use criteria to evaluate the quality of my work; I can identify improvements and make some refinements to the solution.
8	<p>EFFECTIVE EVALUATION & IMPROVEMENTS</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can evaluate the appropriateness of digital devices, software and internet services to achieve given goals. <input type="checkbox"/> I can design criteria to evaluate digital content and repurpose it effectively for an alternative audience. <input type="checkbox"/> I use multiple technologies and refined search techniques to effectively collect valid and reliable data. <input type="checkbox"/> Can use criteria to evaluate the quality of their work, can identify improvements making appropriate refinements to the solution, and future solutions.

Using The Levels

- ▶ We expect our current students to start off at a relatively low level
- ▶ Our scheme of work has/will be written with this in mind
- ▶ In the future, students will come to us with a better understanding of Computing
- ▶ The levels will stay the same
- ▶ Our scheme of work will be tweaked to cater for students to achieve the higher levels



Baseline Testing

- ▶ We need to baseline test our year 7 students to get an idea of their starting level for Computing
- ▶ We could have used the INGOT test but this would only give us a score
- ▶ We needed something that was linked to our specific levels
- ▶ So we have created our own test using Socrative



4. Short Answer Question



The turtle below needs to draw a picture using a set of instructions given. What shape will be produced?

Instructions:

Pen down

Forward 100

Right 90

Forward 100

Right 90

Forward 100

Right 90

Forward 100

Right 90

Correct Answers (Optional)

Square

+Add

-Delete

Explanation:

+ Add Image

Saved

The Test

- ▶ The questions are linked to the levels
- ▶ We have only added questions for Computing
- ▶ We have only added questions for levels 1-5 for each strand
- ▶ We will modify the baseline test in the future to cater for students that have a better understanding of Computing



Level	Data & Data Representation	Questions								
<p>1</p>	<p>IDENTIFYING DATA TYPES</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can recognise different types of data such as text & numbers. 	<p>A name, such as "Sarah", is what kind of data? String/Text, Number, Boolean, Date</p> <p>Age, such as 12, is what kind of data? String/Text, Number, Boolean, Date</p>								
<p>2</p>	<p>TRANSFERRING DATA</p> <ul style="list-style-type: none"> <input type="checkbox"/> I understand that computers do not communicate in the same way as humans. <input type="checkbox"/> I know that computers transfer data in binary 	<p>How do computers communicate?</p> <ul style="list-style-type: none"> a) Using light pulses b) Using binary – patterns of 0's & 1's c) They talk to one another using English d) They use Python <p>What does a computer use binary for?</p> <ul style="list-style-type: none"> a) Transferring data b) It doesn't use binary c) Making webpages 								
<p>3</p>	<p>INTRODUCTION TO BINARY</p> <ul style="list-style-type: none"> <input type="checkbox"/> I know that computers use binary to represent data. <input type="checkbox"/> I know what the 0 and 1 represent <input type="checkbox"/> I am able to count in binary. 	<p>In binary what does 0 (zero) represent?</p> <p>In binary what does 1 (one) represent?</p> <table border="1"> <tr><td>0</td><td>00</td></tr> <tr><td>1</td><td>01</td></tr> <tr><td>2</td><td></td></tr> <tr><td>3</td><td>11</td></tr> </table> <p>What is 2 bit binary pattern missing from the table above?</p>	0	00	1	01	2		3	11
0	00									
1	01									
2										
3	11									
<p>4</p>	<p>USING BINARY</p> <ul style="list-style-type: none"> <input type="checkbox"/> I can perform conversions between denary and binary (and vice versa). <input type="checkbox"/> I know the terms bit & byte <input type="checkbox"/> I understand how bit patterns represent numbers and images. 	<p>Convert 1010 into denary</p> <p>Convert 1111 into denary</p> <p>Convert 12 in binary (use 4 bits)</p> <p>Convert 8 in binary (use 4 bits)</p> <p>How many bits are in a byte?</p> <p>A computer screen is made up from small dots that make up the image. These dots are called</p> <ul style="list-style-type: none"> a. pixels b. pixies c. pilates d. pixels <p>Here is a grid with 25 squares made from 5 rows and 5 columns:</p>								

