

## Year 10 & 11 Topics - Tech Award Digital Information Technology

In years 10 & 11 we teach the following topics over the course of the year. Each topic develops and deepens the Core knowledge that will underpin all areas of the curriculum at KS4 and KS5.

### Component 2: Collecting, Presenting and Interpreting Data

Learning Aim A: Investigate the role and impact of using data on individuals and organisations				
Topic	Rationale	Knowledge acquisition	Key vocabulary	Skills and enrichment
<b>A1 Characteristics of data and information</b>	Students need to understand the concepts of data and that data is meaningless without converting it into information by adding structure and context.	Characteristics of data: <ul style="list-style-type: none"> <li>• no meaning</li> <li>• no structure</li> <li>• no context</li> <li>• unprocessed</li> </ul>	<ul style="list-style-type: none"> <li>• data</li> <li>• meaning</li> <li>• structure</li> <li>• context</li> <li>• unprocessed</li> </ul>	<ul style="list-style-type: none"> <li>• reading</li> <li>• effective writing</li> <li>• oracy</li> <li>• literacy</li> <li>• communication</li> <li>• working collaboratively</li> <li>• note taking</li> </ul>
		Characteristics of information: <ul style="list-style-type: none"> <li>• has meaning</li> <li>• has structure</li> <li>• has context</li> <li>• is processed</li> </ul>	<ul style="list-style-type: none"> <li>• information</li> <li>• has meaning</li> <li>• has structure</li> <li>• has context</li> <li>• is processed</li> </ul>	
<b>A2 Representing information</b>	Students need to understand the different ways of representing information and will be able to explain situations where they would be used.	Representing information <ul style="list-style-type: none"> <li>• text</li> <li>• numbers</li> <li>• tables</li> <li>• graphs/charts</li> <li>• infographics</li> </ul>	<ul style="list-style-type: none"> <li>• text</li> <li>• numbers</li> <li>• tables</li> <li>• graphs/charts</li> <li>• infographics</li> </ul>	

<b>A3 Ensuring data is suitable for processing</b>	Students need to understand the methods that can be used to ensure data input is suitable and within boundaries so that it is ready to be processed.	Validation methods: <ul style="list-style-type: none"> <li>• range check</li> <li>• type check</li> <li>• lookup check</li> <li>• data type check</li> <li>• presence check</li> <li>• length check</li> </ul>	<ul style="list-style-type: none"> <li>• validation</li> <li>• range check</li> <li>• type check</li> <li>• lookup check</li> <li>• data type check</li> <li>• presence check</li> <li>• length check</li> </ul>	<ul style="list-style-type: none"> <li>• independence</li> <li>• reading</li> <li>• effective writing</li> <li>• literacy</li> <li>• IT</li> <li>• research</li> <li>• numeracy</li> <li>• communication</li> <li>• working collaboratively</li> <li>• note taking</li> <li>• excel skills</li> </ul>
		Verification methods: <ul style="list-style-type: none"> <li>• proofreading</li> <li>• double entry</li> </ul>	<ul style="list-style-type: none"> <li>• verification</li> <li>• proofreading</li> <li>• double entry</li> </ul>	
<b>A4 Data collection</b>	Students need to understand how the data collection method and data collection features affect its reliability.	Data collection methods: <ul style="list-style-type: none"> <li>• primary data – information collected directly from source</li> <li>• secondary data – information collected by third party</li> </ul>	<ul style="list-style-type: none"> <li>• primary data</li> <li>• secondary data</li> </ul>	
		Data collection features: <ul style="list-style-type: none"> <li>• size of sample</li> <li>• who was in the sample</li> <li>• where the data was collected</li> <li>• when the data was collected</li> <li>• methods used</li> </ul>	<ul style="list-style-type: none"> <li>• sample size</li> <li>• sample type</li> <li>• probability</li> <li>• non-probability</li> </ul>	
		Big data: <ul style="list-style-type: none"> <li>• definition of big data – a large collection of data collected from a large number of sources</li> <li>• collection of big data, e.g. social networks, shop loyalty schemes, census, sensors, ATM/cash machines, mobile phone networks, Wi-Fi points, digital television, search engine data, e-commerce</li> </ul>	<ul style="list-style-type: none"> <li>• Big data</li> <li>• social networks</li> <li>• shop loyalty schemes</li> <li>• census</li> <li>• sensor</li> <li>• ATM/cash machines</li> <li>• mobile phone networks</li> <li>• Wi-Fi points</li> <li>• digital television</li> <li>• search engine data</li> <li>• e-commerce</li> </ul>	

<b>A5 Quality of information and its impact on decision making</b>	Students need to understand the factors that affect the quality of information and their impact on decision making.	Quality of information factors: <ul style="list-style-type: none"> <li>• source/collection method</li> <li>• accuracy</li> <li>• age</li> <li>• completeness</li> <li>• amount of detail</li> <li>• format/presentation</li> <li>• volume</li> </ul>	<ul style="list-style-type: none"> <li>• quality</li> <li>• source</li> <li>• collection method</li> <li>• accuracy</li> <li>• age</li> <li>• completeness</li> <li>• amount of detail</li> <li>• format</li> <li>• presentation</li> <li>• volume</li> </ul>	
<b>A6 Sectors that use data modelling</b>	Students need to understand that different types of organisation use data modelling to help make decisions.	Types of sectors: <ul style="list-style-type: none"> <li>• transport</li> <li>• education</li> <li>• retail</li> <li>• banking</li> <li>• entertainment</li> <li>• government</li> <li>• health care</li> <li>• construction</li> <li>• communication</li> <li>• health and safety</li> </ul>	<ul style="list-style-type: none"> <li>• organisations</li> <li>• sectors</li> <li>• transport</li> <li>• retail</li> <li>• banking</li> <li>• construction</li> <li>• health and safety</li> </ul>	
		Data modelling in decision making: <ul style="list-style-type: none"> <li>• which customers to target for advertisements</li> <li>• where to deploy staff during busy periods</li> <li>• just-in-time delivery</li> <li>• where and when to adapt transport schedules</li> <li>• financial management</li> <li>• accident prevention</li> <li>• demographic analysis</li> </ul>	<ul style="list-style-type: none"> <li>• data modelling</li> <li>• staff deployment</li> <li>• just-in-time</li> <li>• transport schedules</li> <li>• financial management</li> <li>• accident prevention</li> <li>• demographic analysis</li> </ul>	

<b>A7 Threats to individuals</b>	Students need to understand the different threats that face individuals who have data stored about them	Threats to individuals: <ul style="list-style-type: none"> <li>invasion of privacy</li> <li>fraud</li> <li>targeting vulnerable groups of people</li> </ul>	<ul style="list-style-type: none"> <li>threats</li> <li>invasion of privacy</li> <li>fraud</li> <li>vulnerable groups</li> </ul>	
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<b>Learning Aim B: Create a dashboard using data manipulation tools</b>				
<b>Topic</b>	<b>Rationale</b>	<b>Knowledge acquisition</b>	<b>Key vocabulary</b>	<b>Skills and enrichment</b>
<b>B1 Data processing methods</b>	Students need to understand how data can be imported from an external source. They will then explore how to apply data processing methods.	Data manipulation methods: <ul style="list-style-type: none"> <li>importing data, e.g. from other files, the internet</li> <li>formulae, e.g. add, divide, subtract, multiply</li> <li>decision-making functions, e.g. IF, WHATIF, SUMIF</li> <li>lookup functions, e.g. VLOOKUP, HLOOKUP</li> <li>string operation functions, e.g. LEFT, RIGHT</li> <li>count functions, e.g. COUNTBLANK, COUNTIF</li> <li>logical operators, e.g. NOT, AND, OR</li> <li>sorting, e.g. sorting multiple columns and values</li> <li>outline, e.g. group, ungroup, subtotal</li> <li>filtering, e.g. greater than, less than, equals, contains, begins with, ends with</li> <li>text to columns, e.g. delimited, fixed width</li> </ul>	<ul style="list-style-type: none"> <li>data manipulation</li> <li>importing data</li> <li>formulae</li> <li>decision-making functions</li> <li>IF, WHATIF, SUMIF</li> <li>lookup functions</li> <li>VLOOKUP, HLOOKUP</li> <li>string operation functions</li> <li>LEFT, RIGHT</li> <li>count function</li> <li>COUNTBLANK, COUNTIF</li> <li>logical operators</li> <li>NOT, AND, OR</li> <li>Sorting</li> <li>multiple columns</li> <li>group</li> <li>ungroup</li> <li>subtotal</li> <li>filtering</li> </ul>	<ul style="list-style-type: none"> <li>independence</li> <li>problem solving</li> <li>reading</li> <li>effective writing</li> <li>literacy</li> <li>IT</li> <li>excel skills</li> <li>research</li> <li>numeracy</li> <li>communication</li> <li>working collaboratively</li> <li>analysis</li> <li>evaluation</li> <li>reflective practice</li> <li>self-management</li> <li>self-monitoring</li> <li>note taking</li> </ul>

			<ul style="list-style-type: none"> <li>greater than, less than, equals, contains, begins with, ends with</li> <li>text to columns</li> <li>delimited</li> <li>fixed width</li> </ul>	
		<p>Other processing methods:</p> <ul style="list-style-type: none"> <li>absolute and relative cell referencing, e.g. use of dollar sign (\$) and named cells</li> <li>macros, e.g. for automatic navigation, change graph options, change data ranges</li> <li>data validation, e.g. list check, type check, length check</li> <li>multiple and linking worksheets, e.g. for dashboard and raw data</li> <li>cell comments</li> <li>alternative views, e.g. hiding/unhiding cells, freezing planes</li> <li>conditional formatting, e.g. data bars, colour scales, icon sets</li> </ul>	<ul style="list-style-type: none"> <li>absolute cell referencing</li> <li>relative cell referencing</li> <li>named cells</li> <li>macros</li> <li>automatic navigation</li> <li>graph options</li> <li>data ranges</li> <li>data validation</li> <li>list check</li> <li>type check</li> <li>length check</li> <li>multiple worksheets, dashboard</li> <li>raw data</li> <li>cell comments</li> <li>alternative views</li> <li>hiding/unhiding cells</li> <li>freezing planes</li> <li>conditional formatting</li> </ul>	
<b>B2 Produce a dashboard</b>	Students need to use a dashboard to select and display information summaries based on a given large data set.	<p>Show data summaries from the data set:</p> <ul style="list-style-type: none"> <li>totals</li> <li>counts</li> <li>percentages</li> <li>sales breakdowns</li> <li>departmental breakdown</li> </ul>	<ul style="list-style-type: none"> <li>data summaries</li> <li>totals</li> <li>counts</li> <li>percentages</li> <li>sales breakdowns</li> </ul>	<ul style="list-style-type: none"> <li>independence</li> <li>problem solving</li> <li>reading</li> <li>effective writing</li> <li>literacy</li> <li>IT</li> </ul>

		<ul style="list-style-type: none"> <li>• time allocations</li> <li>• budget allocations</li> </ul>	<ul style="list-style-type: none"> <li>• departmental breakdown</li> <li>• time allocations</li> <li>• budget allocations</li> </ul>	<ul style="list-style-type: none"> <li>• Excel skills</li> <li>• creativity</li> <li>• research</li> <li>• numeracy</li> <li>• communication</li> <li>• working collaboratively</li> <li>• analysis</li> <li>• evaluation</li> <li>• reflective practice</li> <li>• self-management</li> <li>• self-monitoring</li> <li>• note taking</li> </ul>
		<p>Appropriate presentation methods:</p> <ul style="list-style-type: none"> <li>• form controls, e.g. dropdown menus, spinners, tick boxes, radio buttons</li> <li>• graphs/charts, including dynamic charts/graphs</li> <li>• pivot tables</li> <li>• conditional formatting</li> <li>• select data/range</li> </ul>	<ul style="list-style-type: none"> <li>• presentation methods</li> <li>• form controls</li> <li>• dropdown menus</li> <li>• spinners</li> <li>• tick boxes</li> <li>• radio buttons</li> <li>• graphs/charts</li> <li>• dynamic charts/graphs</li> <li>• pivot tables</li> <li>• conditional formatting</li> <li>• select data/range</li> </ul>	
		<p>Use appropriate presentation features:</p> <ul style="list-style-type: none"> <li>• font size, style and colour</li> <li>• cell borders and shading</li> <li>• graphics</li> <li>• axis labels</li> <li>• titles, including overall and section titles</li> </ul>	<ul style="list-style-type: none"> <li>• presentation features:</li> <li>• font size, style and colour</li> <li>• cell borders</li> <li>• shading</li> <li>• graphics</li> <li>• axis labels</li> <li>• titles</li> </ul>	

Learning Aim C: Draw conclusions and review data presentation methods.				
Topic	Rationale	Knowledge acquisition	Key vocabulary	Skills and enrichment
<b>C1 Drawing conclusions based on the data</b>	Students need to draw conclusions on the data set, using their dashboard in order to make recommendations.	Drawing conclusions: <ul style="list-style-type: none"> <li>trends</li> <li>patterns</li> <li>anomalies</li> <li>possible errors</li> </ul>	<ul style="list-style-type: none"> <li>conclusions</li> <li>trends</li> <li>patterns</li> <li>anomalies</li> <li>possible errors</li> </ul>	<ul style="list-style-type: none"> <li>analysis</li> <li>evaluation</li> <li>reflective practice</li> <li>self-management</li> <li>self-monitoring</li> </ul>
		Make recommendations: <ul style="list-style-type: none"> <li>which customers/areas to target for advertisements</li> <li>where to deploy staff to deal with increased demands</li> <li>how and when to adapt transport schedules</li> </ul>	<ul style="list-style-type: none"> <li>recommendations</li> </ul>	
<b>C2 How presentation affects understanding</b>	Students need to assess how well they have used the presentation features listed in B2, to ensure they do not lead to:	<ul style="list-style-type: none"> <li>information being misinterpreted</li> <li>information being biased</li> <li>inaccurate conclusions being made</li> </ul>	<ul style="list-style-type: none"> <li>misinterpretation</li> <li>bias</li> <li>inaccurate conclusions</li> </ul>	