Design, Technology & Computer Science Curriculum Statement 2022-2023

D&T Intent

"Design and technology is an inspiring, rigorous and practical subject. Using creativity and imagination, pupils design and make products that solve real and relevant problems within a variety of contexts, considering their own and others' needs, wants and values. They acquire a broad range of subject knowledge and draw on disciplines such as mathematics, science, engineering, computing and art." (DfE, 2013)

Design, Technology and Engineering have a rich cultural heritage in this country and remain a vital industry for our economic success. We remain world leaders across Design and Engineering sectors, and the Industries contribute significantly to the national, and local, economies. Through our rich and varied curriculum, pupils will enjoy positive experiences and learn how to take risks, becoming resourceful and innovative while developing their confidence and resilience through creative problem solving. They will learn to critically evaluate products and technology and to understand how it impacts on our lives, society and the world as a whole.

Students will learn to:

- Develop the creative, technical and practical expertise needed to participate in, and contribute to, an increasingly technological world
- Apply industry recognised approaches to product design and project management to ensure effective and efficient working practices.
- Build and apply a repertoire of knowledge in order to design and make high-quality prototypes and products for a variety of users, and in a variety of materials, considering their needs and the needs of the environment.
- Test and evaluate their ideas and products and the work of others, critically and develop resilience and perseverance to overcome problems
- Understand and apply the principles of nutrition and learn how to cook.

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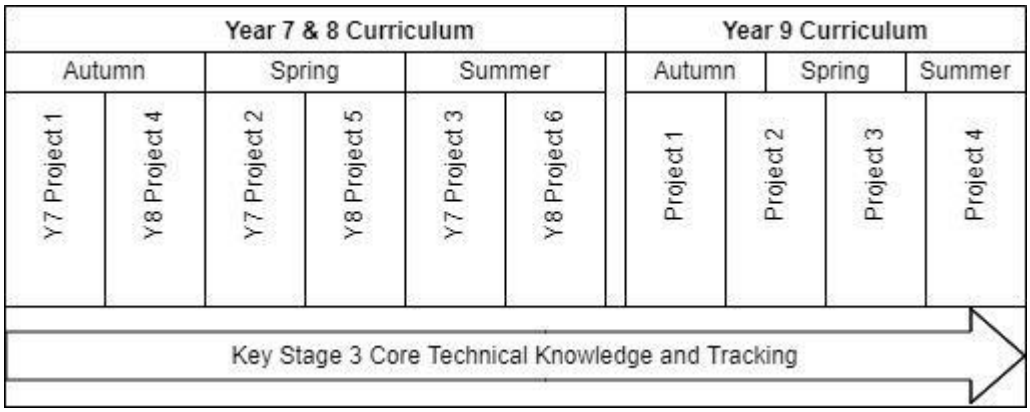
Implementation

At Key Stage 3 pupils are placed in mixed ability groups. In years 7 and 8 they receive 3 lessons per fortnight and rotate between material areas once a term completing approximately 12-13 weeks per cycle. In year 9 they receive 4 lessons per fortnight and rotate 4 times in the year completing approximately 9-10 weeks per cycle.

The KS3 schemes of work are inspired by the National Curriculum Programmes of STudy (2014) and the DATA (Design and Technology Association) Expert Group Progression map. Students in year 7 and 8 will experience each of the main material areas (Food, Textiles, Resistant Materials, Graphics, Computing and STEM).

At present, Electronics is **not** being delivered due to staffing but we will be developing this over the next academic year with a view to some basic electronics being delivered in year 9. Year 9 will undertake 4 units of work across the year. The aim is to try and provide some further experience to help inform options choices.

Fig. 1 Key Stage 3 Curriculum Model



At Key Stage 4 pupils opt to study the subjects with options being taken in year 9 for a curriculum start in year 10. They receive 5 lessons per fortnight throughout years 10 and 11. All students follow accredited programmes at either GCSE for Product Design (Textiles, Graphics or Resistant Materials focus), Food Preparation and Nutrition, or Cambridge National Certificate level for Creative iMedia.

At Key Stage 5 students again opt as part of transition to post 16 education. In year 12 they receive 8 hours per fortnight throughout the first year of their courses. In year 13 they receive 9 hours per fortnight. Courses offered include the Advanced Level Product Design (Fashion & Textiles Option) and Advanced Level Product Design as well as the BTEC Extended Certificate in Engineering at Level 3.

All lessons are taught in specialist facilities with rooms available for each material area and some rooms with a multi-material capability. Computer and CAD/CAM facilities are available throughout the department with 2 dedicated Computer Science rooms, 3 more multi-purpose suites and availability of chromebooks for teachers without computer access in their rooms.

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The department offers a range of extra-curricular activities from Engineering and STEM clubs to slot car racing and 'Girls who Code'. As we recover from the effects of Covid we will gradually increase the number of visits and trips we conduct. Recent trips have included 'Girls on Track' - year 7 girls trip to the Extreme-E racing event. In addition, support lessons and revision programmes are offered as required and have in the previous year included sessions in the school week, during half terms and holidays.

Assessment

For all pupils in year 7, Baseline testing provides initial data with which to guage ability, prior learning and is used to inform teaching and learning from that point as well as where pupils may need additional support or intervention for lost learning. Baseline tests are carried out early in the Autumn term and data is recorded on a department tracking sheet.

At Key Stage 3 Assessment is managed in line with Academy policy using a 4 tier model. The model starts at 'Developing' level progressing to 'Secure', 'Advanced' and 'Exceptional'. Assessment criteria for each unit are created in line with the DATA progression document, but there are also specific generic DT descriptors for parents and pupils which give a holistic view of a pupil's attainment for each of years 7, 8 and 9 (See below).

Pupils are tested twice a term regardless of which unit they are working on. One test assesses core and the other specialist knowledge and progress. These are recorded and tracked within the department and we are currently developing our practice in this area to improve consistency of practice and pupil progression across time and across material areas.

Pupil progress is also tracked using whole school tracking systems and data analysis tools such as 4Matrix with regular termly data captures.

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Assessment Criteria - Year 7

Description of skill **Year 7**	Developing	Secure	Advanced	Exceptional
DESIGNING - Understanding contexts, users and purposes	Shows a little understanding of Technology's impact on society. Can identify a celebrity designer or chef. Can follow, with support, a provided brief and specification, showing an emerging awareness of users needs.	Shows some understanding of Technology's impact on society and will be aware that some people are famous as designers, computer scientists or chefs. Can follow a provided brief and specification to an extent, showing an awareness of users needs.	Shows clear understanding of Technology's impact on society and recognises a small number of influential designers, computer scientists and chefs. Brief and specification will be teacher led but starting to show some ability to adapt to needs and requirements	Shows and communicates deeper understanding of Technology's impact on society. Can recognise a range of influential designers, computer scientists and chefs and is able to explain their achievements. Can create basic design briefs and manufacturing specifications that may lack detail and have minimal justification
DESIGNING - Generating, developing, modelling and communicating ideas	Can generate a single idea with no consideration of use, user or materials. Modelling to test ideas will be minimal and communication difficult to understand or have no relevance to subject matter. Graphic communication will be weak and in 2D	Can generate an idea with little consideration of use, user or materials. Modelling to test ideas will be basic and communication difficult to understand or have little relevance to subject matter. Graphic communication will be mainly in 2D	Can generate simple ideas with obvious relevance to needs but limited functionality. Modelling is very basic or non-existent using a single method to test their design ideas meeting requirements only superficially. Communication is still mainly reliant on 2D design but 3D drawing skills are developing. Orthographic drawing skills are starting to be developed.	Can generate basic ideas with clear relevance to needs and some limited consideration of functionality, aesthetics and innovation. Modelling is basic, using a limited number of methods to test their design ideas. Communication is more advanced with both 2D and 3D techniques and some effective rendering employed as well as some meaningful annotation. Orthographic drawing skills are evident at a basic level with some dimensional information.
COMPUTATIONAL THINKING	Start to show some weak understanding of computational thinking.	Shows some understanding of computational thinking - may be able to explain some of the terms: decomposition, pattern recognition, abstraction and algorithms	Shows clear understanding of and demonstrates a basic level of independent computational thinking. Demonstrates basic skills in decomposition, pattern recognition, abstraction and algorithms	Children show clear understanding of and demonstrate competence in computational thinking. Can clearly demonstrate skills in decomposition, pattern recognition, abstraction and algorithms
MAKING - Planning	Can, with support, follow a simple flowchart. Design ideas will show little or no development. Can, with support, follow a simple production plan and read a cutting list. Can, with support, use pre-designed templates and patterns.	Can follow a simple flowchart. Design ideas will show little development beyond basic shape. Can follow a simple production plan and can read a cutting list as well as produce pre-designed templates and patterns.	Can create a simple flowchart. Design ideas may show some detail of construction techniques and materials and they will produce a simple cutting list. Can use pre-designed patterns and templates and may develop basic ones of their own	Can create a complex flowchart and simple pseudocode. Design ideas will show detail of development as exploded and cross sectional views, demonstrating construction techniques, materials and processes. Can produce an effective and partly costed cutting list. Can produce their own simple templates and patterns.
MAKING - Practical skills and techniques	Can, with support, follow instructions and use simple blockly code to create very basic programs. Will show little understanding of appropriate tools and equipment, and needs lots of support in using them appropriately and safely.	Can follow instructions and use simple blockly code to create basic programs. Will show a little understanding of appropriate tools and equipment but may need lots of support in using them appropriately and safely.	Can independently use blockly code to create programs with some complexity in the code. Shows some understanding of appropriate tools and equipment but may need some support in using them appropriately and safely.	Can independently create complex blockly code which works effectively, with few errors. Shows a good understanding of appropriate tools and equipment and will need little support in using them appropriately and safely.
EVALUATING - Existing products and own ideas	Can, with support, compare their products against the original specification and identify one way of improving them. Can, with scaffolding, evaluate other products at a simple level and identify a way they impact on the world.	Can compare their products against the original specification and can identify one or two ways of improving them. They can evaluate other products at a simple level and identify some ways they impact on the world.	Can evaluate their products against the original specification and identify several ways of improving them. They actively involve others in the testing of their products. Can disassemble and evaluate other products and identify some ways they impact on the world.	Can test, evaluate and refine their ideas and products against their specification, taking into account the views of intended users and other interested groups. Can disassemble and accurately evaluate other products and identify several ways they impact on the world and consider their possible life cycle.
TECHNICAL KNOWLEDGE - Making products work	Can label the key aspects of the BBC Microbit and start to use basic technical terminology. Will have little awareness of material types and manufacturing processes. Can recognise a simple mechanism.	Can recognise the key aspects of the BBC Microbit and use basic technical terminology. Will have some awareness of material types and manufacturing processes. Can recognise simple mechanisms.	Children identify the key aspects of the BBC Microbit and use technical terminology appropriately They have good awareness of material types and manufacturing processes and recognise a small range of simple mechanisms.	Children describe the key aspects of the BBC Microbit and confidently use technical terminology. They can identify the main material types and some examples of each as well as manufacturing processes, and they recognise a range of mechanisms.
COOKING AND NUTRITION - Where food comes from	Knows how one food item is produced, processed and sold. They may have little awareness of where foods come from.	Knows how some foods are produced, processed and sold. They will have some awareness of where foods come from. May begin to understand that people choose different types of food.	Know how foods are produced, processed and sold in different ways, e.g. conventional and organic farming, fair trade. Understand that people choose different types of food and that this may be influenced by availability, season, need, cost, where the food is produced, culture and religion	Know how to compare the cost of food when planning to eat out or cook at home and show awareness of the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour
COOKING AND NUTRITION - Food preparation, cooking and nutrition	Will struggle to understand the importance of healthy eating and that food provides energy and nutrients. Little or no awareness of how to store, prepare and cook food safely and hygienically. Can, with much support, select and prepare ingredients, use utensils and electrical equipment. Can, with much support, understand how to use taste, texture and smell to decide how to season dishes and combine ingredients. Can, with support, follow a simple recipe with some accuracy.	Can partly understand the importance of healthy eating and that food provides energy and nutrients. Will show some awareness of how to store, prepare and cook food safely and hygienically and to use date-mark and storage instructions on food and drinks. Can, with support, select and prepare ingredients, use utensils and electrical equipment and will understand you can apply heat in different ways. Can, with support, understand how to use taste, texture and smell to decide how to season dishes and combine ingredients. Can follow a simple recipe with some accuracy.	Can demonstrate a good understanding of the importance of a healthy and varied diet as depicted in the Eatwell Guide. Know that food provides energy and nutrients in different amounts; that they have important functions in the body; and that people require different amounts during their life. Know how to taste and cook a broader range of ingredients and healthy recipes using utensil and equipment safe. Show awareness of how to actively minimise food waste such as composting fruit and vegetable peelings and recycling food packaging. Can begin to adapt and use their own recipes	Can demonstrate a strong understanding of the importance of energy balance and the implications of dietary excess or deficiency, e.g. malnutrition, maintenance of a healthy weight. Can use utensils and equipment confidently, safely and accurately and will develop recipes to account for a range of needs, wants and values. Can use a wider range of cooking techniques to include stir frying and sauteing. They will actively seek to minimise food waste when cooking.

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Assessment Criteria - Year 8

Description of skill **Year 8**	Developing	Secure	Advanced	Exceptional
DESIGNING - Understanding contexts, users and purposes	Shows some understanding of Technology's impact on society and will be aware that some people are famous as designers, computer scientists or chefs. Can follow a provided brief and specification to an extent, showing an awareness of users needs.	Shows clear understanding of Technology's impact on society and recognises a small number of influential designers, computer scientists and chefs. Brief and specification will be teacher led but starting to show some ability to adapt to needs and requirements	Shows and communicates deeper understanding of Technology's impact on society. Can recognise a range of influential designers, computer scientists and chefs and is able to explain their achievements. Can create basic design briefs and manufacturing specifications that may lack detail and have minimal justification	Can clearly and effectively communicate deep understanding of Technology's impact on society. They will be knowledgeable about influential designers, computer scientists and chefs, being able to discuss and explain their influence. They will produce an adequate manufacturing specification containing sufficient detail with some justification.
DESIGNING - Generating, developing, modelling and communicating ideas	Can generate an idea with little consideration of use, user or materials. Modelling to test ideas will be basic and communication difficult to understand or have little relevance to subject matter. Graphic communication will be mainly in 2D	Can generate simple ideas with obvious relevance to needs but limited functionality. Modelling is very basic or non-existent using a single method to test their design ideas meeting requirements only superficially. Communication is still mainly reliant on 2D design but 3D drawing skills are developing. Orthographic drawing skills are starting to be developed.	Can generate basic ideas with clear relevance to needs and some limited consideration of functionality, aesthetics and innovation. Modelling is basic, using a limited number of methods to test their design ideas. Communication is more advanced with both 2D and 3D techniques and some effective rendering employed as well as some meaningful annotation. Orthographic drawing skills are evident at a basic level with some dimensional information.	Can generate imaginative ideas having some consideration of functionality, aesthetics and innovation. Modelling is sufficient, using a variety of methods to test their design ideas, meeting several requirements Communication is detailed and effective, using a range of techniques, effective rendering and annotation. Orthographic drawing is well developed, accurate and well dimensioned.
COMPUTATIONAL THINKING	Shows some understanding of computational thinking - may be able to explain some of the terms: decomposition, pattern recognition, abstraction and algorithms	Shows clear understanding of and demonstrates a basic level of independent computational thinking. Demonstrates basic skills in decomposition, pattern recognition, abstraction and algorithms	Children show clear understanding of and demonstrate competence in computational thinking. Can clearly demonstrate skills in decomposition, pattern recognition, abstraction and algorithms	Shows clear understanding of and demonstrates high levels of competence in computational thinking. Can demonstrate skills in decomposition, pattern recognition, abstraction and algorithms
MAKING - Planning	Can follow a simple flowchart. Design ideas will show little development beyond basic shape. Can follow a simple production plan and can read a cutting list as well as produce pre-designed templates and patterns.	Can create a simple flowchart. Design ideas may show some detail of construction techniques and materials and they will produce a simple cutting list. Can use pre-designed patterns and templates and may develop basic ones of their own	Can create a complex flowchart and simple pseudocode. Design ideas will show detail of development as exploded and cross sectional views, demonstrating construction techniques, materials and processes. Can produce an effective and partly costed cutting list. Can produce their own simple templates and patterns.	Can create complicated, multipart flowcharts and effective pseudocode. Design ideas will show clear and effective detail of development as exploded and cross sectional view, demonstrating construction techniques, materials and processes. Can produce a detailed and fully costed cutting list. Can produce good quality, accurate templates and patterns.
MAKING - Practical skills and techniques	Can follow instructions and use simple blockly code to create basic programs. Will show a little understanding of appropriate tools and equipment but may need lots of support in using them appropriately and safely.	Can independently use blockly code to create programs with some complexity in the code. Shows some understanding of appropriate tools and equipment but may need some support in using them appropriately and safely.	Can independently create complex blockly code which works effectively, with few errors. Shows a good understanding of appropriate tools and equipment and will need little support in using them appropriately and safely.	Can independently create complex blockly code and show some skill in text based code to create efficient and effective programs. Can independently identify appropriate tools and equipment, using them appropriately, safely and independently.
EVALUATING - Existing products and own ideas	Can compare their products against the original specification and can identify one or two ways of improving them. They can evaluate other products at a simple level and identify some ways they impact on the world.	Can evaluate their products against the original specification and identify several ways of improving them. They actively involve others in the testing of their products. Can disassemble and evaluate other products and identify some ways they impact on the world.	Can test, evaluate and refine their ideas and products against their specification, taking into account the views of intended users and other interested groups. Can disassemble and accurately evaluate other products and identify several ways they impact on the world and consider their possible life cycle.	Can select appropriate methods to evaluate their products in use and modify them to improve performance, taking on board feedback from user groups. Can produce short reports, making suggestions for improvements. Can disassemble and accurately evaluate other products and identify several ways they impact on the world and consider cradle to grave lifecycles and circular economy approaches.
TECHNICAL KNOWLEDGE - Making products work	Can recognise the key aspects of the BBC Microbit and use basic technical terminology. Will have some awareness of material types and manufacturing processes. Can recognise simple mechanisms.	Children identify the key aspects of the BBC Microbit and use technical terminology appropriately They have good awareness of material types and manufacturing processes and recognise a small range of simple mechanisms.	Children describe the key aspects of the BBC Microbit and confidently use technical terminology. They can identify the main material types and some examples of each as well as manufacturing processes, and they recognise a range of mechanisms.	Children describe and explain the key aspects of the BBC Microbit and Confidently and accurately use technical terminology They can identify and categorise the main material types and several examples of each as well as appropriate manufacturing processes, and they recognise a wide range of mechanisms.
COOKING AND NUTRITION - Where food comes from	Knows how some foods are produced, processed and sold. They will have some awareness of where foods come from. May begin to understand that people choose different types of food.	Know how foods are produced, processed and sold in different ways, e.g. conventional and organic farming, fair trade. Understand that people choose different types of food and that this may be influenced by availability, season, need, cost, where the food is produced, culture and religion	Know how to compare the cost of food when planning to eat out or cook at home and show awareness of the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour	Can calculate and compare the cost of food when planning to eat out or cook at home and will demonstrate strong understanding of the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour
COOKING AND NUTRITION - Food preparation, cooking and nutrition	Can partly understand the importance of healthy eating and that food provides energy and nutrients. Will show some awareness of how to store, prepare and cook food safely and hygienically and to use date-mark and storage instructions on food and drinks. Can, with support, select and prepare ingredients, use utensils and electrical equipment and will understand you can apply heat in different ways. Can, with support, understand how to use taste, texture and smell to decide how to season dishes and combine ingredients. Can follow a simple recipe with some accuracy.	Can demonstrate a good understanding of the importance of a healthy and varied diet as depicted in the Eatwell Guide. Know that food provides energy and nutrients in different amounts; that they have important functions in the body; and that people require different amounts during their life. Know how to taste and cook a broader range of ingredients and healthy recipes using utensil and equipment safe. Show awareness of how to actively minimise food waste such as composting fruit and vegetable peelings and recycling food packaging. Can begin to adapt and use their own recipes	Can demonstrate a strong understanding of the importance of energy balance and the implications of dietary excess or deficiency, e.g. malnutrition, maintenance of a healthy weight. Can use utensils and equipment confidently, safely and accurately and will develop recipes to account for a range of needs, wants and values. Can use a wider range of cooking techniques to include stir frying and sauteing. They will actively seek to minimise food waste when cooking.	Can show that they know how to use nutrition information and allergy advice panels on food labels to help make informed food choices. Can use an even broader range of preparation techniques and methods when cooking, e.g. steaming, blending; how to modify recipes and cook dishes that promote current healthy eating messages. They will be very competent in the principles of cleaning, preventing cross contamination, chilling, cooking food thoroughly and reheating food until it is steaming hot.

Assessment Criteria - Year 9

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Description of skill **Year 9**	Developing	Secure	Advanced	Exceptional
DESIGNING - Understanding contexts, users and purposes	Shows clear understanding of Technology's impact on society and recognises a small number of influential designers, computer scientists and chefs. Brief and specification will be teacher led but starting to show some ability to adapt to needs and requirements	Shows and communicates deeper understanding of Technology's impact on society. Can recognise a range of influential designers, computer scientists and chefs and is able to explain their achievements. Can create basic design briefs and manufacturing specifications that may lack detail and have minimal justification	Can clearly and effectively communicate deep understanding of Technology's impact on society. They will be knowledgeable about influential designers, computer scientists and chefs, being able to discuss and explain their influence. They will produce an adequate manufacturing specification containing sufficient detail with some justification.	Can clearly and effectively communicate deep understanding of Technology's impact on society. They will be knowledgeable about influential designers, computer scientists and chefs, being able to discuss and explain their influence. They will produce a fully justified, detailed manufacturing specification.
DESIGNING - Generating, developing, modelling and communicating ideas	Can generate simple ideas with obvious relevance to needs but limited functionality. Modelling is very basic or non-existent using a single method to test their design ideas meeting requirements only superficially. Communication is still mainly reliant on 2D design but 3D drawing skills are developing. Orthographic drawing skills are starting to be developed.	Can generate basic ideas with clear relevance to needs and some limited consideration of functionality, aesthetics and innovation. Modelling is basic, using a limited number of methods to test their design ideas. Communication is more advanced with both 2D and 3D techniques and some effective rendering employed as well as some meaningful annotation. Orthographic drawing skills are evident at a basic level with some dimensional information.	Can generate imaginative ideas having some consideration of functionality, aesthetics and innovation. Modelling is sufficient, using a variety of methods to test their design ideas, meeting several requirements Communication is detailed and effective, using a range of techniques, effective rendering and annotation. Orthographic drawing is well developed, accurate and well dimensioned.	Can generate imaginative ideas, fully considering functionality, aesthetics and innovation. Modelling is advanced, using a wide variety of methods to test design ideas, meeting all requirements. Communication is detailed and effective, using a wide range of techniques, effective rendering and annotation. Orthographic drawing is well developed, accurate and fully and accurately dimensioned.
COMPUTATIONAL THINKING	Shows clear understanding of and demonstrates a basic level of independent computational thinking. Demonstrates basic skills in decomposition, pattern recognition, abstraction and algorithms	Children show clear understanding of and demonstrate competence in computational thinking. Can clearly demonstrate skills in decomposition, pattern recognition, abstraction and algorithms	Shows clear understanding of and demonstrates high levels of competence in computational thinking. Can demonstrate skills in decomposition, pattern recognition, abstraction and algorithms	Fully understands and demonstrates very high levels of competence in computational thinking. Can demonstrate high level skills in decomposition, pattern recognition, abstraction and algorithms
MAKING - Planning	Can create a simple flowchart. Design ideas may show some detail of construction techniques and materials and they will produce a simple cutting list. Can use pre-designed patterns and templates and may develop basic ones of their own	Can create a complex flowchart and simple pseudocode. Design ideas will show detail of development as exploded and cross sectional views, demonstrating construction techniques, materials and processes. Can produce an effective and partly costed cutting list. Can produce their own simple templates and patterns.	Can create complicated, multipart flowcharts and effective pseudocode. Design ideas will show clear and effective detail of development as exploded and cross sectional view, demonstrating construction techniques, materials and processes. Can produce a detailed and fully costed cutting list. Can produce good quality, accurate templates and patterns.	Can create complicated, multipart flowcharts and effective pseudocode. Design ideas show clear and effective annotated detail of development as 2D / 3D, exploded and cross sectional views, demonstrating construction techniques, materials and processes. Can produce a detailed and fully costed cutting list. Can produce high quality, accurate templates and patterns.
MAKING - Practical skills and techniques	Can independently use blockly code to create programs with some complexity in the code. Shows some understanding of appropriate tools and equipment but may need some support in using them appropriately and safely.	Can independently create complex blockly code which works effectively, with few errors. Shows a good understanding of appropriate tools and equipment and will need little support in using them appropriately and safely.	Can independently create complex blockly code and show some skill in text based code to create efficient and effective programs. Can independently identify appropriate tools and equipment, using them appropriately, safely and independently.	Can independently create complex blockly code and show high level skill in text based code to create efficient and effective programs. Can independently identify and select appropriate tools and equipment, using them accurately, appropriately and safely.
EVALUATING - Existing products and own ideas	Can evaluate their products against the original specification and identify several ways of improving them. They actively involve others in the testing of their products. Can disassemble and evaluate other products and identify some ways they impact on the world.	Can test, evaluate and refine their ideas and products against their specification, taking into account the views of intended users and other interested groups. Can disassemble and accurately evaluate other products and identify several ways they impact on the world and consider their possible life cycle.	Can select appropriate methods to evaluate their products in use and modify them to improve performance, taking on board feedback from user groups. Can produce short reports, making suggestions for improvements. Can disassemble and accurately evaluate other products and identify several ways they impact on the world and consider cradle to grave lifecycles and circular economy approaches.	Can select appropriate methods to evaluate their products in use and modify them to improve performance, taking on board feedback from user groups. Can produce more detailed reports, clearly identifying improvements. Can disassemble and accurately evaluate other products and identify several ways they impact on the world and consider cradle to grave lifecycles and circular economy approaches.
TECHNICAL KNOWLEDGE - Making products work	Children identify the key aspects of the BBC Microbit and use technical terminology appropriately They have good awareness of material types and manufacturing processes and recognise a small range of simple mechanisms.	Children describe the key aspects of the BBC Microbit and confidently use technical terminology. They can identify the main material types and some examples of each as well as manufacturing processes, and they recognise a range of mechanisms.	Children describe and explain the key aspects of the BBC Microbit and Confidently and accurately use technical terminology They can identify and categorise the main material types and several examples of each as well as appropriate manufacturing processes, and they recognise a wide range of mechanisms.	Children explain the key aspects of the BBC Microbit and Klaw - using them independently to a high level. Confidently and accurately use technical terminology They can identify and categorise the main material types and numerous examples of each as well as appropriate manufacturing processes, and they recognise a very wide range of mechanisms.
COOKING AND NUTRITION - Where food comes from	Know how foods are produced, processed and sold in different ways, e.g. conventional and organic farming, fair trade. Understand that people choose different types of food and that this may be influenced by availability, season, need, cost, where the food is produced, culture and religion	Know how to compare the cost of food when planning to eat out or cook at home and show awareness of the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour	Can calculate and compare the cost of food when planning to eat out or cook at home and will demonstrate strong understanding of the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour	Can accurately calculate and compare the cost of food when planning to eat out or cook at home and will demonstrate a high level of understanding of the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour
COOKING AND NUTRITION - Food preparation, cooking and nutrition	Can demonstrate a good understanding of the importance of a healthy and varied diet as depicted in the Eatwell Guide. Know that food provides energy and nutrients in different amounts; that they have important functions in the body; and that people require different amounts during their life. Know how to taste and cook a broader range of ingredients and healthy recipes using utensil and equipment safe. Show awareness of how to actively minimise food waste such as composting fruit and vegetable peelings and recycling food packaging. Can begin to adapt and use their own recipes	Can demonstrate a strong understanding of the importance of energy balance and the implications of dietary excess or deficiency, e.g. malnutrition, maintenance of a healthy weight. Can use utensils and equipment confidently, safely and accurately and will develop recipes to account for a range of needs, wants and values. Can use a wider range of cooking techniques to include stir frying and sauteing. They will actively seek to minimise food waste when cooking.	Can show that they know how to use nutrition information and allergy advice panels on food labels to help make informed food choices. Can use an even broader range of preparation techniques and methods when cooking, e.g. steaming, blending; how to modify recipes and cook dishes that promote current healthy eating messages. They will be very competent in the principles of cleaning, preventing cross contamination, chilling, cooking food thoroughly and reheating food until it is steaming hot.	Can show that they use nutrition information and allergy advice panels on food labels to help make well-informed food choices. Can select and choose from a full range of preparation techniques and methods when cooking. Demonstrate that they can modify recipes and cook dishes that promote current healthy eating messages. They will be highly competent in the principles of cleaning, preventing cross contamination, chilling, cooking food thoroughly and reheating food until it is steaming hot.

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Impact

By the end of Key Stage 3, we aim for all pupils to have a good understanding of how we apply science and maths to engineer design solutions for given needs and problems. They will appreciate that we live and work in human made environments and how particular individuals have contributed to our technological progress. They will also understand how such progress impacts on the lives of individuals and society as a whole.

Pupils will have developed both theoretical and practical knowledge and improved applied knowledge (skills) through engaging practical activities. They will hold sufficient depth and complexity of knowledge in materials, manufacturing processes, structures and mechanisms to facilitate transition to GCSE, as well as appropriate mathematical tools and specialist vocabulary.

Take up at KS4 remains high in the Academy with

We promote a fully inclusive approach to the subject which emphasises that no material area is sacred domain for any particular gender, etc. Pupils will have learned that anyone can thrive and achieve highly across all material areas and disciplines and this will show through positive engagement in subject take up at Key Stage 4 and 5 as well as in progression to STEM related pathways at Higher Education Level and Apprenticeships.

Take up at KS4 remains high in the Academy with take up in GCSE and Cambridge Nationals generally maintaining numbers each year despite a decline nationally. Currently (21-22) number are:

GCSE D&T(Graphics):	35
GCSE D&T (Textiles):	51
GCSE D&T (Res Mat):	47
GCSE Food & Nut:	49
Cam Nat iMedia:	61
Cam Nat Engineering:	97
GCSE Comp Sci:	69

Numbers progressing to KS5 are also maintaining their levels with fluctuations in some subjects year on year.

A' Level Product Design:	22
A' Level Product Design (Tex):	15
BTEC L3 Engineering:	15
A' Level Comp Sci:	17
Cam Tech L3 IT:	17

Progression to Higher Education in 2021.

For those students who completed studies in 2021 and for whom we have destinations data:

- 7 progressed into Technology / Fashion or Engineering related courses and apprenticeships
- 10 progressed into Computing or computer related courses and apprenticeships

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Progression

As pupils progress through Key Stage 3, they are given the opportunity to focus on specific areas of the subject such as resistant materials, food technology, engineering, computer science / systems, textiles and graphics. Pupils follow a 'circus' rotation of work in 3 subject disciplines each year from years 7 to 8 and currently 4 in year 9. Most pupils work in mixed ability groups across the key stage, however, a small number of students opt to follow a STEM Futures programme where there is greater emphasis on extending learning and greater challenge.

All teachers are made aware of any disadvantaged pupils on the department class lists and all teachers are reminded of their responsibility to ensure that any obstacles to learning are removed. The department supports the needs of all pupils regardless of any potential barriers as we believe in 'success for all'. Close tracking of all pupils is being developed and will become an intrinsic part of monitoring in DT&CS to ensure all pupils' progress is regularly reviewed and intervention/support provided where appropriate.

While we use the circus system to expose students to a wide range of materials and manufacturing methods, we recognise that this can result in 'spikey' progress. Students identify and engage with, and progress at different rates in different material areas. To ensure that students develop a strong, consistent understanding of Technology as a whole and progress more evenly across the curriculum, we endeavour to construct the curriculum to ensure core DT skills and knowledge are delivered progressively, regardless of when in the circus they are experienced.

Core knowledge and skills are mapped according to the Design and Technology Association Progression Framework (Table 1). Coverage is mapped across each unit of work and teachers employ professional knowledge to ensure that challenge and progression are supported according to the prior learning and achievement of their students.

Table 1. Design and Technology Association Progression Framework – Coded Objectives

	Lower KS3	Upper KS3	Across KS3
DA - DESIGNING Understanding contexts, users and purposes	DA 1 - develop detailed design specifications to guide their thinking DA 2 - use research including the study of different cultures, to identify and understand user need DA 3 - identify and solve their own design problems	DA 4 - develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety DA 5 - research the health and wellbeing, cultural, religious and socio-economic contexts of their intended users DA 6 - understand how to reformulate design problems given to them	DA 7 - work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacturing, construction, food, energy, agriculture and fashion DA 8 - consider the influence of a range of lifestyle factors and consumer choices when designing products DA 9 - take creative risks when making design decisions DA10 - consider additional factors such as ergonomics, anthropometrics or dietary needs DA 11 - analyse where human values may conflict and compromise has to be achieved
DB - DESIGNING Generating, developing, modelling and communicating ideas	DB 1 - use 2D and begin to use 3D CAD packages to model their ideas DB 2 - produce models of their ideas using CAM to test out their ideas	DB 3 - use 3D CAD to model, develop and present their ideas DB 4 - use CAD and related software packages to validate their designs in advance of manufacture	DB 5 - use specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations DB 6 - combine ideas from a variety of sources DB 7 - use a variety of approaches, for example biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses DB 8 - decide which design criteria clash and determine which should take priority DB 9 - develop and communicate design ideas using annotated sketches DB 10 - produce 3D models to develop and communicate ideas DB 11 - use mathematical modelling to indicate likely performance before using physical materials and components, for instance when developing circuits or gearing systems DB 12 - give oral and digital presentations and use computer-based tools

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MA - MAKING Planning	**MA 1 - produce ordered sequences and schedules for manufacturing products they design, detailing resources required** **MA 2 - produce costings using spreadsheets for products they design and make**	**MA 3 - create production schedules that inform their own and others' roles in the manufacturing of products they design** **MA 4 - make simple use of planning tools, for instance Gant charts** **MA 5 - communicate their plans clearly so that others can implement them** **MA 6 - match and select suitable materials considering their fitness for purpose**	**MA 7 - select appropriately from specialist tools, techniques, processes, equipment and machinery, including computer-aided manufacture** **MA 8 - select appropriately from a wider, more complex range of materials, components and ingredients, taking into account their properties such as water resistance and stiffness**
MB - MAKING Practical skills and techniques	**MB 1 - make use of specialist equipment to mark out materials** **MB 2 - use a broad range of material joining techniques including stitching, mechanical fastenings, heat processes and adhesives** **MB 3 - use CAD/CAM to produce and apply surface finishing techniques, for example using dye sublimation** **MB 4 - investigate and develop skills in modifying the appearance of materials including textiles and other manufactured materials e.g. dying and appliqué**	**MB 5 - adapt their methods of manufacture to changing circumstances** **MB 6 - recognise when it is necessary to develop a new skill or technique**	**MB 7 - follow procedures for safety and hygiene and understand the process of risk assessment** **MB 8 - use a wider, more complex range of materials, components and ingredients, taking into account their properties** **MB 9 - use a broad range of manufacturing techniques including handcraft skills and machinery to manufacture products precisely** **MB 10 - exploit the use of CAD/CAM equipment to manufacture products, increasing standards of quality, scale of production and precision** **MB 11 - apply a range of finishing techniques, including those from art and design, to a broad range of materials including textiles, metals, polymers and woods**
EA - EVALUATING Own ideas and products	**EA 1 - evaluate their products against their original specification and identify ways of improving them** **EA 2 - actively involve others in the testing of their products**	**EA 3 - select appropriate methods to evaluate their products in use and modify them to improve performance** **EA 4 - produce short reports, making suggestions for improvements**	**EA 5 - test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups**
EB - EVALUATING Existing products	**EB 1 - products through disassembly to determine how they are constructed and function** **EB 2 - the positive and negative impact that products can have in the wider world**	**EB 3 - products that they are less familiar with using themselves** **EB 4 - products considering life cycle analysis EB 5 - how products can be developed considering the concept of 'cradle to grave'** **EB 6 - the concept of circular economy approaches in relation to product development and consumption**	**EB 7 - new and emerging technologies**
EC - EVALUATING Key events and individuals			**EC 1 - about an increasing range of designers, engineers, chefs, technologists and manufacturers and be able to relate their products to their own designing and making**
TK - TECHNICAL KNOWLEDGE Making products work	**TK 1 - how to classify materials by structure e.g. hard words, soft woods, ferrous and non ferrous, thermoplastic and thermosetting plastics** **TK 2 - about the physical properties of materials e.g. grain, brittleness,** **flexibility, elasticity, malleability and thermal TK 3 - how more advanced electrical and electronic systems can be powered and used in their products** **TK 4 - how to use simple electronic circuits incorporating inputs and outputs** **TK 5 - about textile fibre sources e.g. natural and synthetic and fabrics e.g. plain and woven TK 6 - how to select and modify patterns and use in textile construction**	**TK 7 - how materials can be cast in moulds** **TK 8 - how to make adjustments to the settings of equipment and machinery such as sewing machines and drilling machines** **TK 9 - how to apply computing and use electronics to embed intelligence in products that respond to inputs** **TK 10 - make use of sensors to detect heat, light, sound and movement such as thermistors and light dependant resistors** **TK 11 - how to apply the concepts of feedback in systems** **TK 12 - how to control outputs such as actuators and motors** **TK 13 - how to use software and hardware to develop programmes and transfer these to programmable components for example, microcontrollers** **TK 14 - how to make use of microcontrollers in products they design and manufacture themselves** **TK 15 - how to construct and use simple and compound gear trains to drive mechanical systems from a high revving motor**	**TK 16 - use learning from science to help design and make products that work** **TK 17 - use learning from mathematics to help design and make products that work** **TK 18 - understand the properties of materials, including smart materials, and how they can be used to advantage TK 19 - understand the performance of structural elements to achieve functioning solutions** **TK 20 - understand how more advanced mechanical systems used in their products enable changes in movement and force** **TK 21 - how to competently use a range of cooking techniques for example, selecting and preparing ingredients; using utensils and electrical equipment**
CNA - COOKING AND NUTRITION Where food comes from		**CNA 1 - how to compare the cost of food when planning to eat out or cook at home** **CNA 2 - about the influence of food marketing, advertising and promotion on their own diet and purchasing behaviour**	**CNA 3 - that food is produced, processed and sold in different ways, e.g. conventional and organic farming, fair trade** **CNA 4 - that people choose different types of food and that this may be influenced by availability, season, need, cost, where the food is produced, culture and religion**
CNB - COOKING AND NUTRITION Food preparation, cooking and nutrition	**CNB 1 - the importance of a healthy and varied diet as depicted in the Eatwell Guide and eight tips for healthy eating** **CNB 2 - that food provides energy and nutrients in different amounts; that they have important functions in the body; and that people require different amounts during their life** **CNB 3 - how to taste and cook a broader range of ingredients and healthy recipes, accounting for a range of needs, wants and values CNB 4 - how to actively minimise food waste such as composting fruit and vegetable peelings and recycling food packaging**	**CNB 5 - the importance of energy balance and the implications of dietary excess or deficiency, e.g. malnutrition, maintenance of a healthy weight** **CNB 6 - how to use nutrition information and allergy advice panels on food labels to help make informed food choices** **CNB 7 - how to use a broader range of preparation techniques and methods when cooking, e.g. stir-frying, steaming, blending** **CNB 8 - how to modify recipes and cook dishes that promote current healthy eating messages** **CNB 9 - the principles of cleaning, preventing cross contamination, chilling, cooking food thoroughly and**	**CNB 10 - how to store, prepare and cook food safely and hygienically** **CNB 11 - how to use date-mark and storage instructions when storing and using food and drinks** **CNB 12 - how to select and prepare ingredients CNB 13 - how to use utensils and electrical equipment CNB 14 - how to apply heat in different ways** **CNB 15 - how to use taste, texture and smell to decide how to season dishes and combine ingredients CNB 16 - how to adapt and use their own recipes CNB 17 - how to cook a repertoire of predominantly savoury dishes to feed themselves and others a healthy and varied diet**

		reheating food until it is steaming hot	

Progression across the subject(s) is also facilitated through options processes at key stage transitions.

Students are able to choose from a range of material areas to specialise their design and manufacture skills at KS4 and continue to develop through to post-16 courses as shown in Fig.1.

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Fig.1 Budmouth Academy Design, Technology and Computing Programmes of Study and Progression Routes