Research-Based Curricula

What Might Your Future School Look Like?

Key Stage 5

Design and Technology, and Arts and Design

Ørestad School in Copenhagen designed by the architects 3XN and opened in 2007. Tse, H. M., Daniels, H., Stables, A., & Cox, S. (Eds.). (2018). *Designing buildings for the future of schooling: Contemporary visions for education.* Routledge.

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Building global university access programmes

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About this Pack

Who is this pack for?

- This pack was created for all students, regardless if this is your best subject or your worst.
- It's not graded or marked by your teacher. It's a chance to explore the subject and learn in a new way that's different to the classroom.
- Each pack is written by a student at the University of Cambridge who is researching this topic and has special knowledge on the subject. When they were your age they knew nothing about it either!
- By completing their mini-course, you will find out why it's interesting and you will build your skills that help you improve at school.

So… why complete this pack?

- Learn new cool areas of a subject that you won't cover in the classroom
- Sharpen your academic skills, like short essay writing and interpreting data
- Experience what it's like to explore a subject freely
- Better understand what you enjoy and don't – it will help you make decisions about your future studies and career choices!

What's in this booklet?

Your RBC booklet is a pack of resources containing:

- ✓ More about how and why study this subject
- ✓ Six 'resources' each as a lesson with activities
- ✓ A final assignment to gauge learning
- ✓ Extra guidance throughout about the university skills you are building
- ✓ End notes on extra resources and where to find more information

Meet the Author

Name David Baker

Area of Study and Degree PhD in Education

University University of Cambridge

My background

I studied Geography, Art and English for my A Levels, and went straight on to study architecture in London and Newcastle. Not long after I passed my final architecture exams, I set up my own architectural business. I ran that for 25 years, designing and building many different types of buildings in the UK and abroad. In 2000, when I was 50 years old, it stopped being fun and so I retrained as a D&T teacher, doing a one-year course to learn how to be a teacher. I retired from teaching when I reached 66 (it was getting quite tiring). I then retrained for my third career by studying for an MPhil in Education Research at the Faculty of Education in Cambridge University. And now I am mid-way through a three-year research project which hopefully will lead to a PhD in a couple of years' time.

My research

My research looks at the design of schools, in particular all of the places where the teachers and support staff work and spend their time in school, like their offices and staffrooms. I believe that if we provide nice spaces for the teachers, then they will be happier; and happier teachers are better teachers, so in the end pupils will benefit as well.

Studying architecture at university

Architecture at university is studied in two stages.
The first stage is a three-year course where you will learn about the design and construction of buildings. It is very enjoyable and creative. You will then need to decide if you want to go on to become an architect and to work in an architectural practice, or if you want to do something else, like town planning or landscape design or something completely different.
If you do decide to become an architect, then you will move to the second stage. You will take a further course, this time for two years, where you will learn much more about the business of architecture. You will still be practicing how to design buildings but you will also learn about building contracts and planning law – much more serious but still very interesting and important.

Building Your Skills

Research-Based Curricula packs challenge you to build your skills in this subject but also to be used across any of your schoolwork.

Any time you see a badge, look out for a skill you'll be building!

These skills are the type of skills that teachers and universities look for as you progress, so see how many you know below.

Skills you may see and use in this pack

Research — *your ability to work on your own and find answers online or in other books*

Creativity — *your ability to create something original and express your ideas*

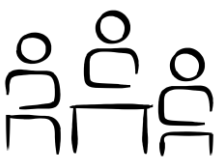
Problem solving — *your ability to apply what you know to new problems*

Source analysis — *your ability to evaluate sources (e.g. for bias, origin, purpose)*

Data analysis — *your ability to discuss the implications of what the numbers show*

Active reading — *your ability to engage with what you are reading by highlighting and annotating*

Critical thinking — *your ability to think logically to build an argument clearly*

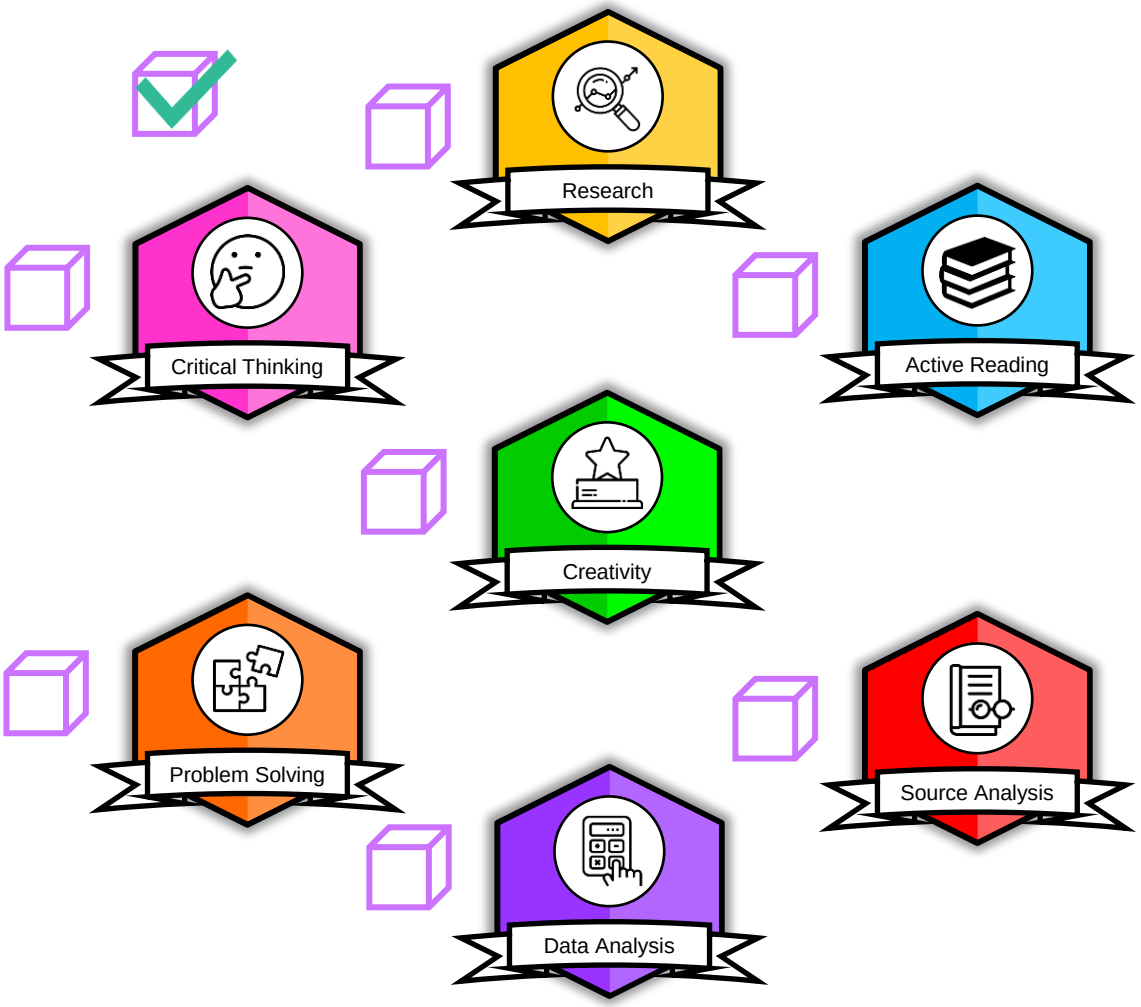


Psst! You can learn more about these skills in the Academic Study Skills section.

Your Skills Badges

As you work through this booklet, you'll have the chance to build the skills you have read on the previous page.

Make sure to revisit this page once you have mastered each skill. Tick off each skills badge below once completed!



Look out for these badges in the Data Source, Activities and Further Reading sections of each Resource. If you complete a skill more than once, write the number of times you completed it next to the badge.

When you've earned all seven skills badges, you can discuss with your teacher how to further build your skills!

Vocabulary

Be sure to use this section as you go through your booklet. If you see an emboldened word, you can find the definition here. If you are still unsure about the meaning or use of the word, we encourage you to use a dictionary or ask a teacher. See page 10 to add your own words.

Term	Definition
Iterative	As in 'iterative design'. A way of designing where you continually review your designs and try to make them better with each 'iteration', that is, each repetition.
Socio-Economic Influences	The ways on which the society in which someone lives and their economic situation (i.e. if the country is rich or poor) can affect the way that you design something.
Prototype	The first version of a product that is sufficiently realistic that it can be tested.
Responsible Design	A way of designing that thinks about the effect of the design on the environment both now and in the future. Sometimes called 'sustainable design'.
Interior Design	Designing the insides of a building, in particular the finishes (like the walls, floors and ceilings), the fittings (like cupboards and worktops) and the furniture that create the look and feel of a space. You can study this in college or university.
Genres	Another word for style – the look of an object or group of designed objects, like buildings or paintings.
Portfolio	The folder or carrying case that artists use to store their work in. In the case of this project, it is the paper document or computer file containing your work.
Mnemonic	Pronounced 'neemonic' – the 'm' is silent. Something that helps you remember something. I have introduced you to three mnemonics in this resource.

Vocabulary

Term	Definition
Anthropologist	Someone who studies people and their customs, beliefs, and relationships. You can study anthropology at university.
Psychologist	Someone who studies the human mind and human emotions and behaviour, and how different situations have an effect on people. You can study psychology at university.
Philosopher	Someone who studies or writes about the meaning and purpose of life. You can study philosophy at university.
Educator	Someone who teaches people; another word for a teacher, although not necessarily someone who works in a school. You can study education at university.

Vocabulary

When you find words, you don't recognise in a lesson, be sure to look up their definition. Use this page to write them down and make a note of their definition!

Term	Definition

Introduction to Subject

The design of schools

Course overview

This project will allow you to practice a wide range of skills, whether you are studying D&T:Product Design or Art & Design. You will do this by answering the brief of designing a school for the future.

If you are studying D&T then the skills are listed in the Exam Specification under the general heading of Section ***3.2 Designing & Making Principles***. This is a checklist of the main subject headings.

Main topic	Sub-topics		
3.2.2 Design theory	Iterative design processes		
3.2.3 How technology & cultural changes can impact the work of designers	Design influences	Design styles and movements	Designers and their work
3.2.4 Design processes	Socio-economic influences	Major developments in technology	Social, moral and ethical issues
3.2.5 Analysis and evaluation	The use of a design process	Prototype development	Iterative design process
3.2.8 Responsible design	Testing and evaluating	Use of third-party feedback	
3.2.2 Design theory	Environmental issues	Conservation of energy and resources	

Introduction to Subject

The design of schools

If you are studying Art & Design, then the main skills and topics are listed in the Exam Specification in Section ***3.7 Three-dimensional design***. But even if your main focus is in some of the other Subject Content Areas like ***3.3 Art, craft and design*** or ***3.5 Graphic communication***, you might find many of the activities in this booklet will provide you with material for your portfolio.

Main topic	Sub-topics		
Areas of study	Interior design	Environmental and architectural design	3D digital design
Skills & techniques	Appreciation of solid, void, form, shape, texture, colour, decoration, surface treatment, scale, proportion, structure, rhythm and movement.		
	Awareness of intended audience or purpose for their chosen area(s) of three-dimensional design.		
	Awareness of the relationship between three-dimensional design and urban, rural or other settings.		
	Appreciation of the relationship of form and function and, where applicable, the ability to respond to a concept, work to a brief, theme or topic, or answer a need in the chosen area(s) of three-dimensional design.		
Knowledge and understanding	Historical and contemporary developments and different styles and genres.		
	How images and artefacts relate to social, environmental, cultural and/or ethical contexts, and to the time and place in which they were created.		
	Continuity and change in different styles, genres and traditions relevant to three-dimensional design.		
	A working vocabulary and specialist terminology that is relevant to their chosen area(s) of three-dimensional design.		

Introduction to Subject

The design of schools

The topics within this pack will include:

The background to school design – understanding the need

The background to school design – what has gone before

Looking at the organisation of your school

Initial ideas and iterative design – specify, sketch, review, repeat

Final ideas and prototyping

Testing and evaluating your design

Course outcome

If, when you leave school, you are planning on continuing to study art & design, or some form of product design or engineering, the university or college that you go on to will be very interested in your past work. We have therefor designed this booklet so that by the end of it, you will have a complete project that you can include in a portfolio which you can talk about at interview. You will see in the Instructions section in each Resource we have suggested including your work in a Project Portfolio, using whichever software you are comfortable with. The title of your Portfolio will be 'A Design for a School for the Future'.

Resource One Overview

Topic

The background to school design – understanding the need

Key Stage 5 Subject Area

Develop 'an awareness of intended audience or purpose', 'the ability to respond to a concept, work to a brief, theme or topic, or answer a need' and an understanding of how to 'use a design process'

Objectives

By completing this resource, you will be able to:

- ✓ Learn that you are embarking on a design process, made up of several distinct stages.
- ✓ Learn that the first of these stages is to understand the background to the design problem (and to know what 'background' means).
- ✓ Learn the 5W and 1H **Mnemonic** for thinking about the background to a design problem.
- ✓ Learn the names of some of the major thinkers about education.
- ✓ Start thinking about the purpose of a school for the future.

Instructions

1. **Read the data source**
2. **Complete the activities**
3. **Explore the further reading**
4. **Move on to the Resource Two**

Resource One
Data Source

Specification links

Whether you are a D&T or an A&D student, you will be expected to show in your **Portfolio** that you understand the background to any design problem that you face. You will need to show that you have an 'awareness of intended audience or purpose' and 'the ability to respond to a concept, work to a brief, theme or topic, or answer a need'. You will also need to demonstrate that you can 'use a design process'.

Section A

An Anthropologist's view of education

… the African children I observed were far more independent. At an early age, they were expected to be undemanding--especially after weaning--and to "hang out" and play with peers not adults. When with adults, they were to pay attention and model themselves on mature social behaviour and speech. They should attend to tasks essential to the family's survival and comfort and, in effect, educate themselves. Much of their play mimicked adult work and clearly served to practice and improve skills they'd soon be expected to employ for the greater good. (Educational anthropologist, David Lancy, 2017).

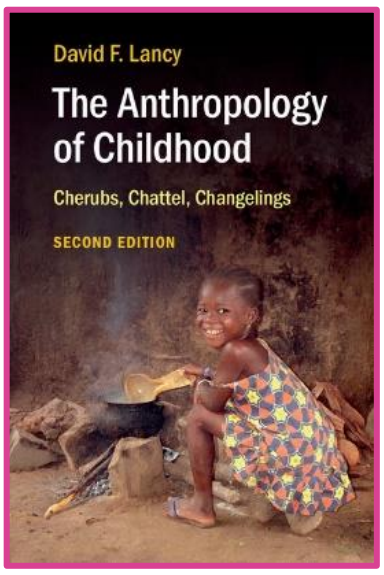


Figure 1

Front cover of David Lancy's book, ''The Anthropology of Childhood'

Resource One
Data Source

Section B

Psychologists' views of education

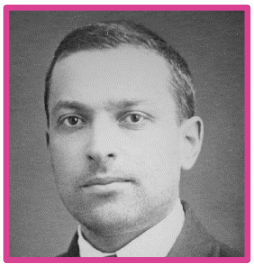
There are several **Psychologists** who have written about education and have influenced how children are now taught.

1. Lev Vygotsky

"By giving our students practice in talking with others, we give them frames for thinking on their own."

Figure 2

Lev Vygotsky, 1896-1934



"The brain is not only an organ capable of preserving or reproducing our past experiences, but it is also a combining, creative organ, capable of re-elaborating and creating new norms and approaches with elements of past experiences. [Teaching] must be oriented not to the yesterday, but to the tomorrow of the child's development."

2. Jean Piaget

Figure 3

Jean Piaget, 1896-1980

"Are we forming children who are only capable of learning what is already known? Or should we try to develop creative and innovative minds, capable of discovery from the preschool age on, throughout life?"

"The principal goal of education is to create men who are capable of doing new things, not simply of repeating what other generations have done - men who are creative, inventive, and discovers. The second goal of education is to form minds which can be critical, can verify, and not accept everything they are offered."

Resource One
Data Source

3. Benjamin Bloom

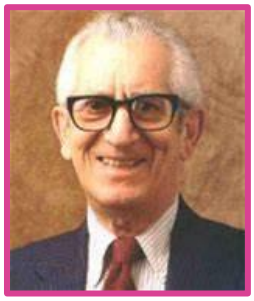


Figure 4

Benjamin Bloom, 1913-1999

"Education must be increasingly concerned about the fullest development of all children and youth, and it will be the responsibility of the schools to seek learning conditions which will enable each individual to reach the highest level of learning possible."

"…a student attains 'higher order thinking' when he no longer believes in right or wrong".

"After forty years of intensive research on school learning in the United States as well as abroad, my major conclusion is: What any person in the world can learn, almost all persons can learn if provided with appropriate prior and current conditions of learning."

4. Jerome Bruner

Figure 5

Jerome Bruner, 1915-2016

"Education must be not only a transmission of culture but also a provider of alternative views of the world and a strengthening of the will to explore them."

"Surely knowledge of the natural world, knowledge of the human condition, knowledge of the nature and dynamics of society, knowledge of the past so that one may use it in experiencing the present and aspiring to the future--all of these, it would seem reasonable to suppose, are essential to an educated man. To these must be added another--knowledge of the products of our artistic heritage that mark the history of our aesthetic wonder and delight."

Resource One
Data Source

Section C

A Philosopher's view of education

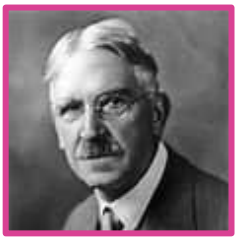


Figure 6

John Dewey, 1859-1952

Many important **Philosophers** have thought about education. John Dewey was a philosopher and educational reformer, who has had a great influence on current thinking.

"The one continuing purpose of education, since ancient times, has been to bring people to as full a realization as possible of what it is to be a human being. Other statements of educational purpose have also been widely accepted: to develop the intellect, to serve social needs, to contribute to the economy, to create an effective work force, to prepare students for a job or career, to promote a particular social or political system. These purposes offered are undesirably limited in scope, and in some instances, they conflict with the broad purpose I have indicated; they imply a distorted human existence. The broader humanistic purpose includes all of them, and goes beyond them, for it seeks to encompass all the dimensions of human experience."

Section D

An Educator's view of education

Figure 7

Maria Montessori, 1870-1952

As you would expect, many **Educators** have written about the purpose of education. The work of Maria Montessori has had a big influence, especially on primary education.

"An education capable of saving humanity is no small undertaking: it involves the spiritual development of man, the enhancement of his value as an individual, and the preparation of young people to understand the times in which they live."

"Education should no longer be about imparting of knowledge, but must take a new path, seeking the release of human potentialities."

Resource One
Data Source

Section E

A Government's view of education

Figure 8

The Rt Hon Nick Gibb MP, Minister of State at the Department for Education, July 2015

Active Reading

Increasingly, Governments have sought to direct the work of schools. Below is a recent statement.

"Education is the engine of our economy, it is the foundation of our culture, and it's an essential preparation for adult life. Delivering on our commitment to social justice requires us to place these 3 objectives at the heart of our education system.

We all have a responsibility to educate the next generation of informed citizens, introducing them to the best that has been thought and said, and instilling in them a love of knowledge and culture for their own sake. But education is also about the practical business of ensuring that young people receive the preparation they need to secure a good job and a fulfilling career and have the resilience and moral character to overcome challenges and succeed."

Resource One Activities

Theoretical activities

Activity 1 What are the 5Ws and the 1H?

Activity 2 List three disciplines that have things to say about education.

Activity 3 List three of the major 20th Century thinkers about education

Activity 4 Why do you think that a significant number of these people have been psychologists?

Activity 5 What is the difference between the anthropologist's view of education and the Government's view of education?

Practical activities

Thinking about the background to a design problem means thinking about the problem that you, as a designer, must solve. You need to find out about the human needs that your design must satisfy, or the situation that you must improve. This will help to understand the need for schools.

Activity 1 Think through these questions about the fundamental human need for education. Discuss them with others in your class or at home. This is the 5Ws and 1H way of understanding the background to a design problem.

- Why do people need education?
- What does education mean?
- Where is education done?
- Who does education?
- When is education done?
- How is education done?

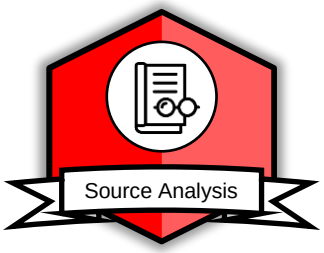
Resource One Activities

Activity 2 Read the extracts above to see if they give you some ideas that help in working out your answers to these questions.

Activity 3 Write down your ideas in answer to these questions. This should not take more than 2 A3 pages or 4 A4 pages.

Activity 4 Get more ideas in the 'Further reading' section below.

Activity 5 Include all these ideas as the first pages in your Project Portfolio.



Resource One
Further Reading

Explore

- https://www.britannica.com/topic/education is a very useful page from the Britannica web site that asks and answers several related questions about education.
- Interview one of your teachers, or your parent/guardian, or your best friend, about why they think children need education, and what kind of education is needed for the future. Add their answers to your Project Portfolio.

Image Sources

- Images from Pixabay.
- Author's own images.
- Open access images.
- Lancy, D. F. (2014). *The anthropology of childhood: Cherubs, chattel, changelings*. Cambridge University Press.

Resource Two Overview

Topic

The background to school design – what has gone before

Key Stage 5 Subject Area

Know about Design styles and movements', 'Designers and their work' and 'historical and contemporary developments and different styles and genres'

Objectives

By completing this resource, you will be able to:

- ✓ Understand the need for historical research at this stage in the design process.
- ✓ Learn about some of the 20th Century designers of schools.
- ✓ Learn about some of the 21st Century designers of schools.
- ✓ Learn about some of the different styles of new schools.

Instructions

1. **Read the data source**
2. **Complete the activities**
3. **Explore the further reading**
4. **Move on to the Resource Three**

Resource Two
Data Source

Specification links

In the D&T Spec, you are expected to know a little about 'Design styles and movements', and 'Designers and their work'. In the A&D Spec you are expected to know about 'historical and contemporary developments and different styles and **Genres**'. This is not just an exercise in history though. All designers need to research what has been done before to solve the design problem. That (might) stop you from 'reinventing the wheel', as the expression goes.

There is a long history to school design, but because of space, we have had to limit the resource here to some of the major designers of the 20th and 21st Centuries. In the Further Research section, you will find ideas for more research into other countries and architects.

Section A

20th Century designers

1. Alvar Aalto

Figure 9

Alvar Aalto, 1898 – 1976, and his designs

Alvar Aalto was a Finnish architect and designer. His work included architecture, furniture, textiles and glassware, as well as sculptures and paintings. Tehtaanmäki Elementary School was built in 1938-1940. Like many of his buildings they sit into the landscape and follow the slope of the site. In the classroom you can see some of the furniture that he designed. Made from plywood, it still looks modern.

Resource Two
Data Source

2. Arne Jacobsen

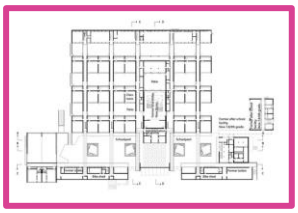


Figure 10

Arne Jacobsen, 1902 – 1971, and his designs

Active Reading

Arne Jacobsen was a Danish architect and furniture designer. He is remembered for his contribution to architectural functionalism and for the worldwide success he enjoyed with simple well-designed chairs.

He designed the Munkegaard School at Gentoft, Denmark in 1954–1956. You can see what an organised and functional design it is, with each classroom having its own little courtyard. The land is flat and featureless so he could spread his building over it in a regular pattern. But do you think it is perhaps a little regimented?

3. Arne Jacobsen

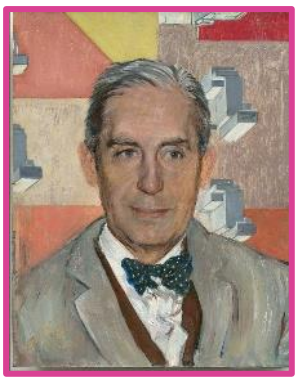


Figure 11

Walter Gropius, 1883 –1969

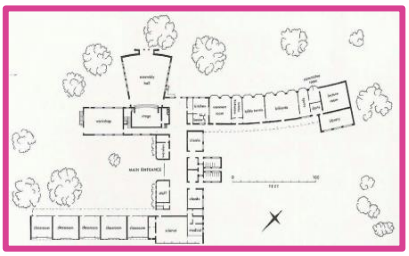
Walter Gropius was a German-American architect and founder of the Bauhaus School, who, along with Alvar Aalto, Ludwig Mies van der Rohe, Le Corbusier and Frank Lloyd Wright, is widely regarded as one of the pioneering masters of modernist architecture and of what became known as the International Style.

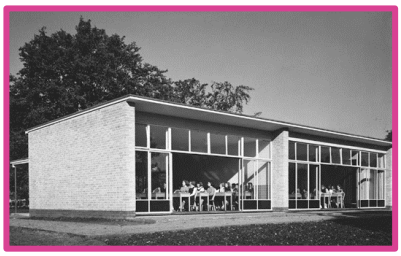
Resource Two
Data Source

He designed Impington Village College in Cambridgeshire together with an English architect, Maxwell Fry in 1938-39. This is a single storey building in a courtyside setting. As you can see, Gropius and Fry placed great emphasis on letting light and air into the classrooms.

Figure 12

Walter Gropius' designs





Section B

21st Century designers

1. Norman Foster

Figure 13

Norman Foster, b. 1935

Norman Foster is an award-winning and prolific British architect known for sleek, modern designs of steel and glass with innovations in contouring and inner space management.

Below is his design for Langley Academy in Slough, completed in 2008. The building's environmental features save 20 percent in water consumption and approximately 150 tonnes of carbon per year compared to a traditional academy.

Figure 14

Norman Foster's designs

Resource Two
Data Source

2. Francis Kéré

Figure 15

Francis Kéré, b. 1965

Francis Kéré is an architect from Burkina Faso in Africa. He is known for creating innovative works that are often sustainable and built collaboratively by teams of local workers. Educated at the Technical University of Berlin, he has lived in Berlin since 1985.

His Benga Riverside School in Mozambique was completed in 2018. It is made of a number of separate buildings, with big overhanging roofs to protect the classrooms from the sun.

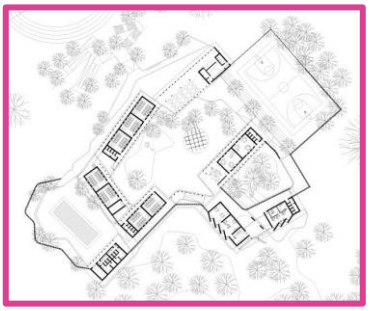


Figure 16

Francis Kéré's designs

3. Zaha Hadid

Figure 17

Zaha Hadid, 1950-2015

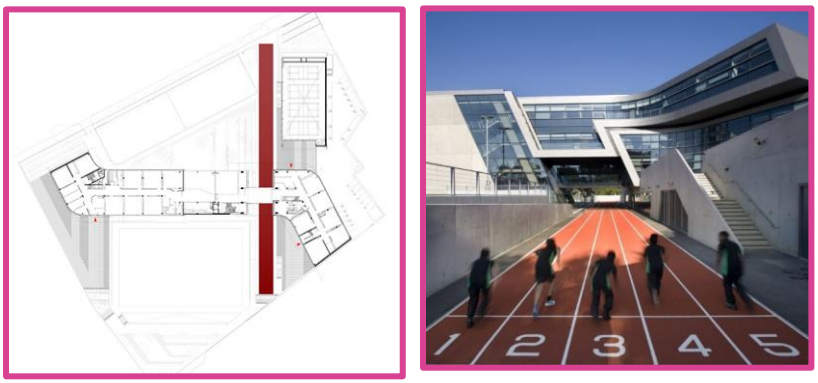
Zaha Hadid was a Muslim Iraqi-British architect, artist and designer, recognised as a major figure in architecture of the late 20th and early 21st centuries. Born in Baghdad, Iraq, Hadid studied mathematics as an undergraduate before starting her architectural studies in 1972.

Resource Two
Data Source

Her design for the Evelyn Grace Academy, completed in 2010, is very dynamic and has a sprint track running right through the centre of the school. It sits on a small urban site so had to be built four storeys high to get all of the rooms onto the site.

Figure 18

Zaha Hadid's designs



Resource Two Activities

Theoretical activities

Activity 1 Why can it be useful to look at the work of earlier designers and artists?

Activity 2 List three of the major school designers of the 20th and 21st Century?

Activity 3 What can you learn about a school from looking at the plan?

Activity 4 What can you learn about a school from looking at photos?

Activity 5 Choose two of the examples of school buildings from the Data Bank and compare and contrast them. Explain why you think they are different.

Practical activities

Whether you are creating an artwork or designing a product it can be very helpful to look at earlier examples of similar work. This is not because you want to copy it but because it can inspire you to come up with your own new and interesting ideas. Also, often a 'new' idea is actually a development of an 'old' idea.

Activity 1 Because the task we are setting you in Resource 4 is to come up with ideas for a school of the future, read the examples in Resource Two to see the kinds of information you should be looking for and some of the designers whose work you should research further.

Activity 2 Search in the library or on the internet for examples of school designs. Be on the lookout particularly for photos and plans. The plans can tell you a little about how a school is organised and what the teachers and architects believe is important to have in a school. The photos will tell you what the teachers and architects believe a school should look like. Should it be grand or modest, or dynamic and exciting, or plain and functional? Decide also if they are to be low- or high-fidelity model/visuals. How much time you have for this work will be an important criterion.

Resource Two Activities

Activity 3 Take photos of your own school and if possible, obtain a plan of the school. You might be able to get a plan from the School Office or the Reception (explain why you need it). If that's not possible, there should be a simple layout plan on the wall in the entrance for the use of visitors and the fire brigade. You could photograph that.

Activity 4 Find out who designed your school and write a little about them and the history of the school. How would you describe the look of the school?

Activity 5 Cut and paste the information into a document that you can include in your Project Portfolio but be sure to add your own observations and thoughts on the designs that you discover.

Resource Two
Further Reading

Explore

- https://vimeo.com/61639560 is a short film about Passmores Academy, a school for 1200 pupils in Harlow, Essex. It was designed by the English architects Jestico and Whiles and was a finalist in the 2011 World Architecture Award Competition. In the film, teachers and pupils talk about their school and the difference it has made to them. You could make notes of some of the key points in the film and add those to your Project Portfolio.
- Research other school buildings by Jestico and Whiles at Education – Projects – Jestico + Whiles.

Image Sources

- Images from Pixabay.
- Author's own images.
- Open access images.

Resource Three Overview

Topic

Looking at the organisation of your school

Key Stage 5 Subject Area

Understand 'how technology & cultural changes can impact the work of designers' and the 'socio-economic influences' on a design

Objectives

By completing this resource, you will be able to:

- ✓ Understand that a design or artwork is influenced by many things in the world around you (sometimes called 'contextual factors')
- ✓ Learn that these 'contextual factors' include the technology, the environment, the society, the culture, the time and the place (amongst other things) into which the design/artwork will fit
- ✓ Learn how to analyse a brief systematically in order to become aware of the 'contextual factors'
- ✓ Understand that these are the things you must think about as you develop your design/artwork.

Instructions

1. **Read the data source**
2. **Complete the activities**
3. **Explore the further reading**
4. **Move on to the Resource Four**

Resource Two
Data Source

Specification links

The D&T Spec has quite a complicated-sounding requirement for you to understand 'How technology & cultural changes can impact the work of designers' and the **Socio-Economic Influences** on a design. The A&D Spec asks for something similar when they specify that you know 'how images and artefacts relate to social, environmental, cultural and/or ethical contexts, and to the time and place in which they were created'.

What this means is that your portfolio should have a mind-map or an annotated list showing all of the things that you have thought about when coming up with your design. There is an example in the Instructions and Activities section below.

Section A

The organisation of schools

Irrespective of whether you are designing a product (it could be a chair or a building) or an artwork (a painting, a graphic or a sculpture), one way of moving from analysing your brief into actually designing is to think about how you will ORGANISE the parts of your product or artwork. This means thinking

- what are the parts of your product/artwork, and
- how will they fit together.

To illustrate this way of thinking, this resource aims to make you think about different ways of organising the parts of a school.

1. Organise your new school by departments

This is probably how your own school is organised, as it is the most common way of organising schools in the UK. (Some people think it is the only way to organise a school, but as you will see below, it is not). Each subject department has its own separate area of the school and its own classrooms, often arranged along its own corridor. It will probably have its own department office where the subject teachers spend their time when not in the classrooms.

Resource Two
Data Source

Here is an example of a design produced by the Government for a school that is organised by departments. Each colour is a different department. This plan is the ground floor; other departments are on the upper floors. The top left is Foreign Languages (in yellow); top right (in orange) is D&T; bottom right is science (in orange); bottom left is PE (dark green). The dining hall (blue) and the school hall (green) are in the centre.

Figure 19

Illustration of organising a school by departments

2. Organise your new school by subject groups

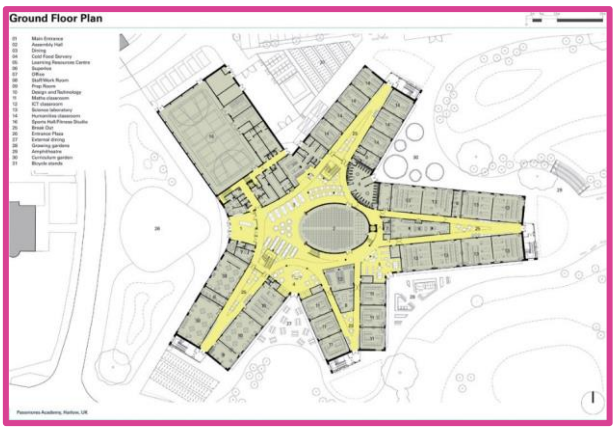
This is sometimes called the 'faculty' model and it is where similar subjects are grouped together in a separate block or wing of the building. You might for instance have a STEM Faculty where science, technology, engineering, and maths are all grouped together, sharing some classrooms, labs and workshops, and sharing a faculty teachers' office. Or you might have a Humanities Faculty bringing together history, geography, religious studies and philosophy, and if you think they will be taught in your school, psychology or sociology. The advantage of this organisation is that some rooms can be shared and that the subject teachers might work together on cross-curricular projects.

Resource Two
Data Source

Below is the plan of the Passmore Academy that I described in Resource 2. Each wing houses a different faculty with some shared spaces in the centre of each wing.

Figure 20

Illustration of organising a school by subject groups



3. Organise your new school by projects

This is uncommon in the UK but in America there is a whole group of schools called High Tech High schools organised so that the students can work together on projects. This approach to education is called project-based learning or PBL. Although there might still be departments or faculties there will also be spaces where students can work together on projects or do lots of the research themselves. There may be shared spaces called Makerspaces where pupils can try out ideas by making models or **Prototypes**, perhaps using laser cutters or 3D printers.

Active Reading

4. Organise your new school by careers

Again, this is more common in America where there are schools that focus on preparing pupils for specific careers in particular industries. In the UK there are examples of schools with an 'academic' pathway (for students planning on going to university for instance) and various vocational pathways, often depending on the needs of the local economy.

Resource Two
Data Source

The University Technical Colleges (UTCs) are English examples of this type of school which have a focus on STEM subjects and vocational qualifications.

An interesting US example is the Irving Independent School District which offers a variety of Career and Technical Education (CTE) programmes across the eight schools in its district. This is a graphic showing the different CTE programmes.

Figure 21

Examples of different types of careers

4. Organise your new school by Small Learning Communities (SLC)

Some schools can feel very big and impersonal, especially for Year 7s when they make the move from their small primary schools with maybe no more than four hundred pupils into schools with over a thousand pupils. Some schools therefor have a Lower, Middle and Upper School where pupils of each age group will spend most of their time, except when they need to visit specialist spaces such as the gym, the science labs or the DT workshops. Form tutors and subject teachers might stay with the pupils for their entire time in each of the SLCs so they get to know their pupils really well.

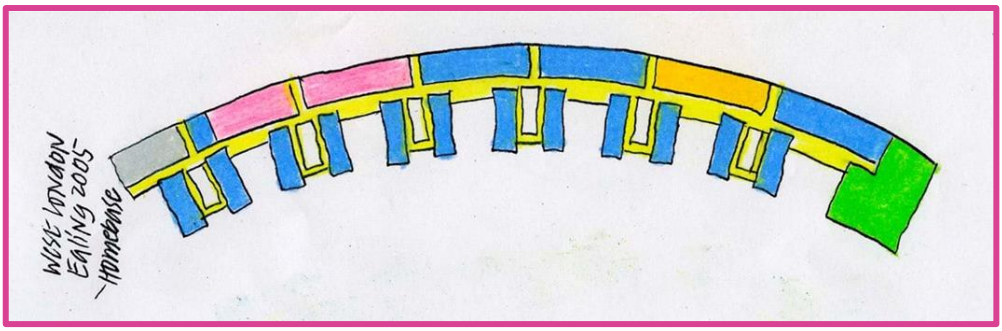
Resource Two
Data Source

5. Organise your new school by Schools-Within-Schools (SWS)

This is a way of organising large schools that usually occupy a big campus. They are a little like SLCs, except that each school-within-the-school is semi-independent, with all its own classrooms and most of the specialist rooms in its own separate building. It will have its own school office and staffroom, and probably only share some of the really big spaces like the gym and the theatre with the other schools-within-the-school. There are some interesting examples in Australia where the SWSs have children of all ages in each SWS, much like in a family.

Figure 22

A sketch by Norman Foster of the Alec Reed Academy of 2005



Source Analysis

Image description - This is a sketch by Norman Foster of a very large school in West London, the Alec Reed Academy of 2005, that combines elements both of SLCs and SWSs. On the far left is a nursery, on the far right is the 6th Form block, and in between each projecting wing is a pair of year groups. The shared rooms – labs, school hall and such like - are in the outer curve.

Resource Three Activities

Theoretical activities

Activity 1 What are the 2 ways in which you can analyse a brief?

Activity 2 Which do you think will be the most useful way of analysing your brief to design a school for the future? And why?

Activity 3 What are the 'contextual factors' that might influence the design of your school?

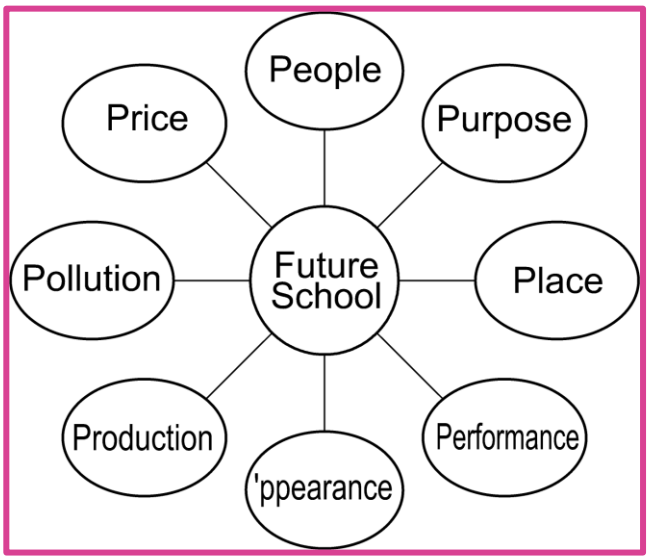
Activity 4 What are the 6 ways of organising a school?

Activity 5 Which of the 6 ways are you thinking of using for your school? And why?

Practical activities

Activity 1 Think about your brief of designing a school for the future and the factors that might influence your design.

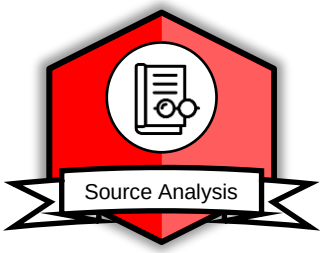
Activity 2 Use the 8Ps to draw a mindmap of these factors. This is called 'analysing the brief'. It is basically 'thinking about thinking'. The main factors on the mindmap should look something like this:



Resource Three Activities

Activity 3

Each of the 'P' headings should prompt you to think about the following:



- ***People -*** Who will use the school and what are their needs and wants? (Note – needs and wants are NOT the same thing. As a designer you will often have to think about the difference between the two)
- ***Purpose -*** What is the building for? What is its purpose? Why is it needed? What must it do? Theses can be tough questions to answer.
- ***Place -*** Where will the building be sited? This is a crucial question when designing a building.
- ***Performance -*** How will the building fulfil its purpose? What must it actually do? How big must it be and how will it be organised?
- ***'ppearance -*** I have cheated a bit here (you've noticed). But this is the moment when you must think about aesthetics – what will your building look like and feel like?
- ***Production -*** probably too detailed to think about for this portfolio project, but this is the point where you think about how your building will be built and what materials it will be built from.
- ***Pollution -*** what will the environmental impact of your building be? How sustainable will it be?
- ***Price -*** again, not something to think about in this portfolio, but as a real designer you will have to think about what your building will cost.

Resource Three Activities

Activity 4 Alternatively, (and your teacher might have already suggested this) use the ACCESS FM mnemonic to analyse the brief. The letters stand for:

- ***A*** **-** aesthetics
- ***C*** **-** cost
- ***C*** **-** client
- ***E*** **-** environment
- ***S*** **-** safety
- ***S*** **-** size
- ***F*** **-** function
- ***M*** **-** materials and manufacture

For a detailed explanation of what you should write about under each heading, go to http://isdesigntechnology.weebly.com/uploads/2/0/8/9/20899510/access_fm_help_sheet1.pdf

Activity 5 Whichever way you analyse the brief, each main heading should have your detailed thoughts attached to it.

Activity 6 Think in particular about 'function'. This is a very important word, and you may have heard the expression 'form follows function' meaning that the form, or shape of the building, will be determined by its function, by what it must do.

Activity 7 Ask yourself what the users might want to do in the building, and what spaces they might need to do those things.

Activity 8 This analysis should produce (at least) an A3 page to go in your Portfolio. Analysing your brief can be one of the most creative aspects of design.

Resource Three
Further Reading

Explore

- The expression ‘form follows function’ was first coined by the American architect Louis Sullivan. Researching him on the internet will carry you into interesting debates about functional architecture.
- Look at https://3xn.com/. 3XN is the architectural practices that designed the school on the front cover. Compare it to the work of The Social Design Collaborative (https://www.socialdesigncollab.org/). It will give you an insight into the extremely varied lives of architects in different countries.

Image Sources

- Images from Pixabay.
- Author’s own images.
- Open access images.

Resource Four Overview

Topic

Initial ideas and iterative design – specify, sketch, review, repeat

Key Stage 5 Subject Area

Understand and demonstrate iterative design
D&T Spec (in the section on 'Design Processes')

Objectives

By completing this resource, you will be able to:

- ✓ Learn the meaning of iterative design.
- ✓ Learn the process of iterative design.
- ✓ Be able to practice iterative design.
- ✓ Learn about writing a performance specification.
- ✓ Learn about different ways to visualise your ideas.

Instructions

1. **Read the data source**
2. **Complete the activities**
3. **Explore the further reading**
4. **Move on to the Resource Five**

Resource Four
Data Source

Specification links

One of the most important requirements in the D&T Spec (in the section on 'Design Processes') is that you understand what is meant by **Iterative** design and that you demonstrate this in your Portfolio. The A&D Spec is less clear on your work process, but the Skills and Techniques section does require that you to have 'the ability to respond to a concept…' which is a roundabout way of asking you to show that you can design.

Section A

Iterative design process

There are a number of ways of describing the ways in which designers gradually refine and improve their ideas in the course of a design process. For instance, in one of the videos linked below you will find the designers describing their process as Explore/Create/Evaluate. If you search on the internet for a diagram of the iterative process you will find many other formulations and diagrams, most of which tend to be circular, like this one.

However, you choose to think about iteration, it will always involve this process of reviewing or testing each new idea as it comes to you and trying to make it better.

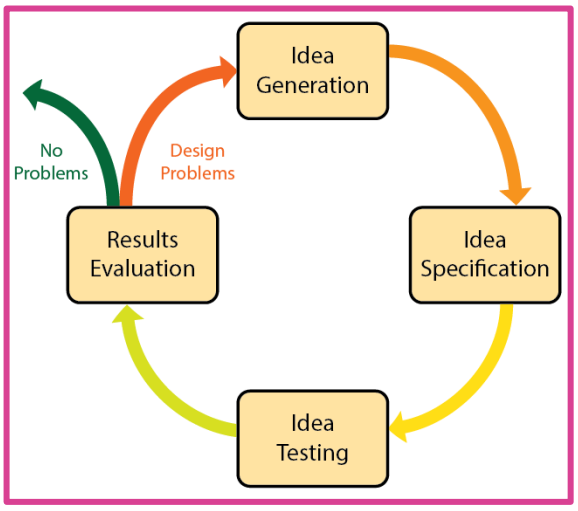


Figure 23

Diagram of the iterative design process

Resource Four
Data Source

The Design & Technology Association have made a useful YouTube film to explain the entire design process and how it can be applied to the problem of a young girl who has injured her back and must lie flat for two months. She likes to do jigsaw puzzles so the challenge is to design a device that will allow her to do puzzles whilst still lying flat in bed. Watch the film at https://youtu.be/Rnsk5lA52ps

Section B

Writing a performance specification

The word 'specification' can mean several things. For instance, the exam board uses the word to describe the knowledge, skills, and understanding that you must have to pass their exam. In the case of a design, it is a description of what the final product or artwork must do to be successful and to satisfy the brief. A useful template for writing your performance specification is to say:

To be successful my design must...

Using this starter phrase, write at least six bullet points describing what your design must be (safe, quiet, bright, warm, sustainable etc) or must have (for instance, rooms for teaching, rooms for keeping fit, places to eat, places to think etc).

In the case of the jigsaw puzzle problem mentioned above, the specification might say:

"*To be successful my device must…*"

- allow the girl to do puzzles whilst laying flat in bed
- be lightweight and safe
- hold the pieces in place so that they do not fall off whilst she is playing
- be easy to keep clean

Resource Four
Data Source

Section C

Types of sketches to help visualise ideas

All of the diagrams I am using now are taken from recent school designs that I worked on in East London.

1. Bubble diagrams

Bubble diagrams (sometimes grandly called ‘concept webs’ or ‘concept diagrams’). The bubbles can represent the activities or the spaces that you are thinking about.

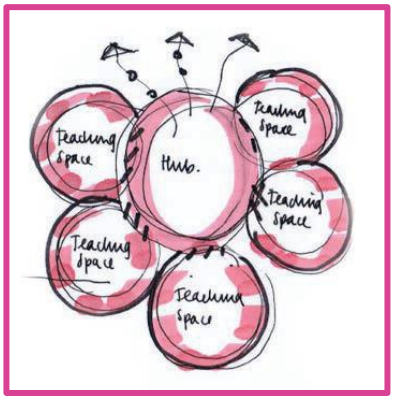


Figure 24

Example of bubble diagrams

2. Flow diagrams

In these diagrams you give more thought to how people will move through the building. It might show where people enter the building and how they will move from place to place. These diagrams might actually start to take up rough shapes that could become buildings and how it might fit on a site.

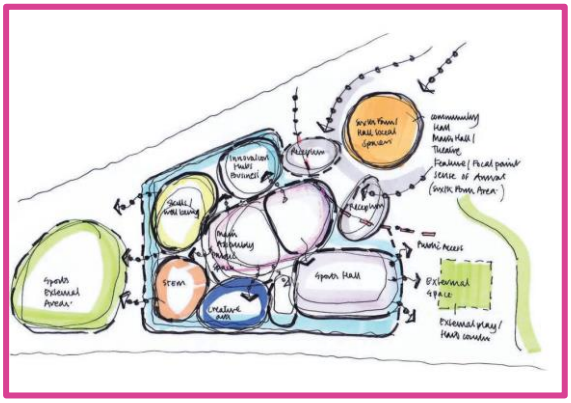


Figure 25

Example of flow diagrams

Resource Four
Data Source

Active Reading

3. Sketch plans

Now is the moment to start thinking about rooms but still only very roughly. These are sketch plans of a Primary school that I designed in Stratford in East London. I drew them first in felt tip and just added a little coloured crayon to show the classrooms, the school hall and some of the other types of space. I then made a neater drawing in pencil, again adding a little crayon and neater writing.

Figure 26

Examples of sketch plans

Image description – At the top is the first rough sketch using felt tips and at the bottom is the neater sketch using a pencil.

Resource Four Activities

Theoretical activities

Activity 1 What does it mean to use an iterative design process?

Activity 2 What are the benefits of an iterative design process?

Activity 3 What is the standard way of writing a performance specification?

Activity 4 Why do we start with bubble diagrams before starting to think about the appearance of the building?

Practical activities

Thus far in this programme you have thought about the background to school design, done a little research into earlier school designs, and reviewed ways of organising schools. At last, it is time to actually begin to design your school.

Activity 1 Read the sections on iterative design, specification writing, and sketch designing in Resource Four. There is a lot of content in this Resource!

Activity 2 Write your performance specification for a successful future school

Activity 3 Produce an initial idea as a 'bubble diagram' showing the basic parts of your school and how they might fit together with each other.

Activity 4 Review that initial idea against your specification.

Activity 5 Sketch out some alternative and maybe better bubble diagrams.

Activity 6 Once you have a bubble diagram that you are happy with, you can start to sketch out a shape that might actually become a building layout. This process of sketching and reviewing and improving means you will actually be 'iterating'.

Activity 7 Keep all of the sketches as they develop to show the process of improvement.

Resource Four
Further Reading

Explore

There are several useful videos where designers explain how they use an iterative design process. Below are just two examples but if you search online, you will certainly find others.

- Watch this short video (2 mins.) about how the designers of a racing yacht use the iterative design process in the design of the steering wheel for their yacht.
  https://youtu.be/Ayjet1dIUa4
- Watch this short video (5 mins.) about how a graphic designer uses an iterative design process to design a web page.
  https://youtu.be/-ZxzAt4ciEI

Image Sources

- Images from Pixabay.
- Author's own images.
- Open access images.

Resource Five Overview

Topic
Final ideas and prototyping

Key Stage 5 Subject Area
Understand and use a design process
D&T Spec (item 3.2.4)

Objectives
By completing this resource, you will be able to:

- ✓ To develop and visualise a final design.
- ✓ To understand what prototyping means.
- ✓ To learn about different kinds of models.
- ✓ To learn about low-fidelity and high-fidelity models.
- ✓ To produce a model of the final design.
- ✓ To annotate and explain the final design.

Instructions

1. **Read the data source**
2. **Complete the activities**
3. **Explore the further reading**
4. **Move on to the Resource Six**

Resource Five
Data Source

Specification links

In order to demonstrate your understanding and use of a design process (D&T Spec item 3.2.4) you now need to commit to a final design. This is also the moment when you show your understanding of prototyping by producing a model/visual, whether real or virtual, of this design.

Similarly (although rather more vaguely) and irrespective of whether your topic area is **Interior Design**, Environmental and architectural design, or 3D digital design, the A&D Spec will be looking for a final design and some evidence, especially if it is a graphic design product, that it 'works'.

Section A

Prototyping

The exam specifications talk about prototyping. This is a technical term for producing a version of your design in such as way that it can be tested to see how good an idea it is. The key prototyping questions is 'does it work?'. In the case of a building design though, this is difficult. How can you fully test a building without using it? So designers and architects make models and then use their imagination and the opinion of 'third parties' to tell them if they think it is a good design – if it works.

Figure 27

Example of prototypes

Resource Five
Data Source

Section B

Modelling

Producing a design idea in three dimensions – 3D - is an immensely useful way of visualising and developing your thoughts, and of testing them. But before starting you need to think in detail about the purpose of the model and in particular how accurate it needs to be. The technical term for this is fidelity, which is another word for 'truthfulness'. A high-fidelity model is very close in appearance to the final product; a low-fidelity model is quite rough and only creates a general impression of the final product. The video linked in the Further Research section below gives you a very good idea of this concept. A low-fidelity model is often described as 'rough and ready' or 'quick and dirty'. It has the great advantage of speed and cheapness.

Section C

Modelling

A key decision also is whether to produce a 'real', tangible model or a virtual, i.e. computer-based model. If you have access to a computer then free programmes like SketchUp (https://www.sketchup.com/) are brilliant and well worth learning.

Apart from these decisions about real vs virtual, purpose and fidelity, you will also need to consider what materials you have and how much time you have – model making can become very time consuming and can actually hold up progress if you spend too much time on perfecting it.

Resource Five
Data Source

Section D

Types of models

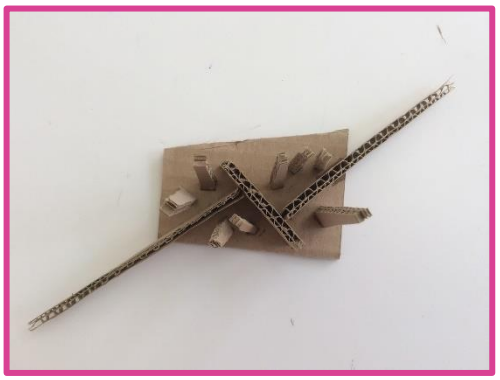
There are different types of models for different purposes.

1. Diagram models

These can be a little like your bubble diagrams, but in 3D. They aim to show the general arrangements of elements and can be quite abstract and blocky. If you do an image search on the Internet, look for examples of 'abstract modelling' to see examples. The advantage of making a diagram model is that, before gluing the pieces down you can move them about. They are very low-fidelity.

Figure 28

Example of a diagram model



2. Concept models

These are also low-fidelity and aim, almost in a sculptural way, to convey an idea. Again, an internet search using this term will show you the idea.

3. Massing models

Here you are getting closer to the idea of a building, but seeking to model just the main blocks or masses of the building. Construction kits like LEGO can be fine for this kind of model, although personally I like blocks of balsa wood. Sometimes it's good enough just to use odd scraps of wood, dowel, wire and cardboard as in this example.

Resource Five
Data Source

Figure 29

Example of a massing model

4. Solid/ void models

In this kind of model, the fidelity is greater as you are trying to show not just the solid elements like walls and floors but the open elements like windows and doors, and perhaps the structure that is holding everything together. You are trying to model space – not an easy thing to do - and so the materials need to be stronger and stand up on their own in order to surround the space. If you have access to a 3D printer, these can be brilliant for making small solid/void models as in this example. The free software 3dslash is a fun way of developing quick solid/void models (https://www.3dslash.net/index.php).

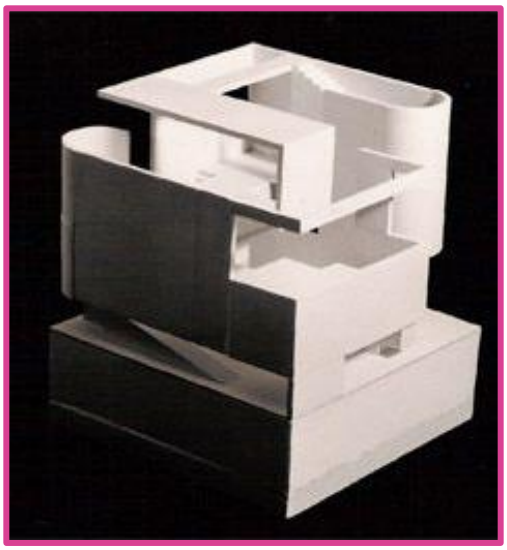


Figure 30

Example of a solid/ void model

Resource Five
Data Source

5. Other models

There are other types of models with greater fidelity such as development models, presentation/finish models, site contour models and models that show the surroundings of your building but these would not be relevant for a short ideas project such as your future school. They also imply that you have a particular site in mind for your future school; so maybe that could be your next project.

Resource Five Activities

Theoretical activities

Activity 1 What is the purpose of prototyping?

Activity 2 What is the difference between a drawing and a model as a type of prototype?

Activity 3 What are the advantages and disadvantages of these different techniques?

Activity 4 What is the difference between a low-fidelity and a high-fidelity model/visual?

Activity 5 What are the advantages and disadvantages of the different types of model?

Practical activities

This is the moment when you bring all of your previous thinking together and make your final design decisions about your school for the future.

Activity 1 Write a brief description of the main idea for your school of the future. You might call it ‘My Big Idea’ and explain what the purpose of your school will be and how you have designed it to fulfil that purpose.

Activity 2 Read Resource Five and decide on the type of model/visual that will best communicate your ideas and be the most ‘testable’.

Activity 3 Decide also if they are to be low- or high-fidelity model/visuals. How much time you have for this work will be an important criterion.

Activity 4 These final visuals do not have to show every detail but there should be enough of an impression that you can use the visual to explain your ideas to ‘third parties’ – people at school and/or at home. (You might like to jump ahead and read about this next stage in Resource 6).

Activity 5 Produce the diagrams, drawings, and models.

Resource Five
Further Reading

Explore

- The idea of modelling and prototyping a design can be applied to any product or artwork. This video applies the idea of low- and high-fidelity prototyping to the design of a smartphone app. https://youtu.be/TNjg21F4XCI

Image Sources

- Images from Pixabay.
- Author's own images.
- Open access images.

Resource Six Overview

Topic
Testing and evaluating your design

Key Stage 5 Subject Area
Test and evaluate your design
D&T Spec (item 3.2.5)

Objectives
By completing this resource, you will be able to:

- ✓ Learn about testing and evaluating a design.
- ✓ Learn about third-party feedback and how to obtain it.
- ✓ Complete your Project Portfolio.

Instructions

1. **Read the data source**
2. **Complete the activities**
3. **Explore the further reading**
4. **Move on to the Final Reflection Activity**

Resource Six
Data Source

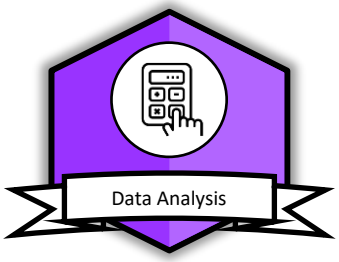
Specification links

The last stage in the design process is to test and evaluate your design. The D&T Spec (item 3.2.5) expects you to carry out this work of both self-evaluation and testing, and asking other people what they think of your design. The specification specifically mentions 'third-party feedback'. You should include these results as the last pages in your Portfolio.

The A&D Spec is slightly less specific on this task but would still expect you to reflect on your work and to say whether it does what you set out to achieve. Similarly, showing your work to other people ('third-parties') and recording their comments would be useful.

Section A

About testing



Although you will have been reviewing and refining your ideas in earlier stages of the design process – after all, that is what iterative design is all about – this is the anxious moment when you review the final product and put it to the test. If it were a product with a working prototype then you could use it and put it to the test. For instance, if it were a bottle opener you could see how easy or difficult it was to open a bottle with it. And it is true that some aspects of a building design could be physically tested, for instance by putting a large and accurate model of it into a wind tunnel to see if it sways about. But the trouble with buildings, and in particular buildings that innovate in the way that perhaps your future school design will, is that you can't really find out if it works until you build it and use it. And worse still, it is often only over time that you discover if it works or not.

Resource Six
Data Source

Figure 31

House being tested in a 100mph wind

Image description - The image on the right is from a rather scary video of a house being tested in a 100mph wind. https://youtu.be/Fyk55HRQs-c

Section B

About evaluating

So, if full scale testing is out, the next best thing is to evaluate, that is, to judge, your final design against your earlier work. This means looking back at what you set out to achieve and to compare your final design against what you wrote down particularly in your mindmap and your specification in Resources 3 and 4.

This is a tough exercise and requires to you to be very honest with yourself. Does your final design really address all of the contextual factors in the mindmap and all of the criteria in your specification? This is often best presented in your portfolio as a checklist but beware of putting a simple score against each item as it can be misleading. After all, some feature will be far more important to the success of your school than others. Better just to give an honest opinion in words.

A useful mnemonic for this work is WWW.EBI, standing for:

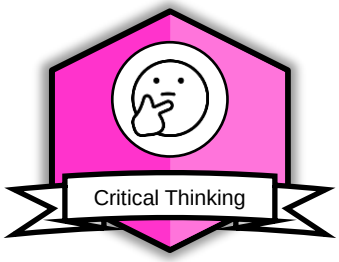
What Works Well; Even Better If…

Resource Six
Data Source

Section C

About third party feedback

The exam specification mentions one other way of finding out if your design is successful and that is to ask other people for their opinion. This is called 'third-party feedback'. Ideally you should ask people with some extensive experience in this area like your teachers but anyone who has used this kind of product before, and most people have been to school, will tell you a great deal about the good and bad points of your design. In order to be sure that you are asking the same questions in the same way to each 'third party', you should devise a short questionnaire – no more than 10 questions – and write down their answers carefully. You might also think about using Google Forms or some of the other free questionnaire software so that the third parties can complete the questionnaire themselves. This is a very useful skill to have by the way.



Example

When the Royal Institute of British Architects wanted to find out about the design of schools, they asked teachers questions like *'Thinking about the school in which you currently teach, overall, how would you rate the quality of the buildings?'* and the teachers could answer 'very poor, poor, good, or very good' (not many teachers said 'very good'). Giving people a range of possible answers is a good way to get feedback that you can show in a graph. The range of answers is called a Lickert scale.

Again, this will provide excellent material to conclude your portfolio with as it will show the examiners that you are not afraid to take advice and criticism of your work.

Resource Six
Activities

Theoretical activities

Activity 1 What is meant by testing?

Activity 2 What is meant by evaluating?

Activity 3 What is meant by ‘third-party feedback’?

Activity 4 What is the purpose of these processes?

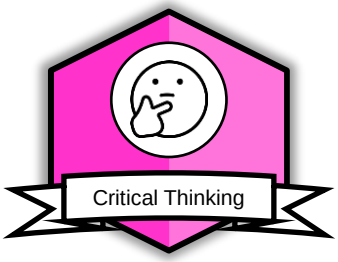
Practical activities

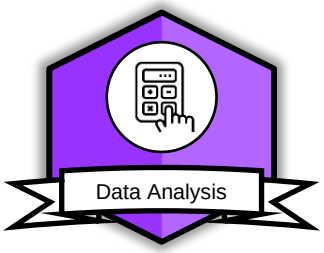
Activity 1 Carry out testing and evaluating.

Activity 2 Arrange and obtain third-party feedback.

Activity 3 Write up the testing, evaluating and third-party feedback.

Activity 4 Tidy up your Project Portfolio into a presentable form.





Resource Six
Further Reading

Explore

- Watch this video (8 mins.) by Ross Atkin about how he uses testing and evaluating in his design process. https://youtu.be/0mCBnfGU3Cg

Image Sources

- Images from Pixabay.
- Author's own images.
- Open access images.

Final Reflection Activity

Instructions

Look back at the ideas that you have recorded in your portfolio pages and think about the conversations that you had with your teacher and friends.

Here is a brief list that you can use to check the quality of your work, using the 8Ps from Resource 3.

1. Have you thought deeply about the people who will use the school, and what they might need and want, both now and in the future? Have you thought not simply about the pupils and the teachers but about all of the other people who work in a school like the office staff, the kitchen staff and the caretakers? Have you also thought about the parents and the wider community who might use the school's facilities when the pupils are not there?
2. Have you thought deeply about the purpose of a school for the future, and the purpose of education for the future? Have you written down your views on what are the most important things to learn in school to prepare you for your future?
3. Have you considered the place where your school is located and what that might mean for its design? Have you thought about whether schools should be built right in the middle of towns and cities, or can they be built in the countryside?
4. Have you thought about how the school will perform its functions and how it might be organised? What are the spaces that you think the school will need to have, in order to perform its function of educating young people for their futures, and maybe also providing for the lifelong learning of the whole community?
5. Have you thought about the appearance of the building? What will your building look like? Have you studied the designs of famous architects to give you some ideas for your building?
6. Have you thought about how sustainable your building will be? Will it generate its own electricity and what will it do with its waste? Will it be built from renewable materials, like timber, or long lasting materials like brick?
7. Have you used a variety of techniques to visualise your ideas like sketches and diagrams and models?

Success criteria

There is no right or wrong answer to the design of a school for the future. Hopefully, your design will be your own unique and creative ideas.

Study Skills, tips & Guidance

This a section includes helpful tips to help you complete this pack, as well as improve your study skills for school.

It also includes a few fantastic easy-to-use resources to know what to do next and where else you can look for more information on the subject.

Helpful information you will find in this section:

1. Cornell Notes
2. Academic terminology (key words)
3. Academic Writing Style
4. Referencing
5. How to Evaluate Your Sources
6. Subject Guidance
7. University Guidance

Psst! Learning these tips to improve your school skills could help you do better in exams and make assignments easier!

You can use the tips and web links in this section throughout your pack!

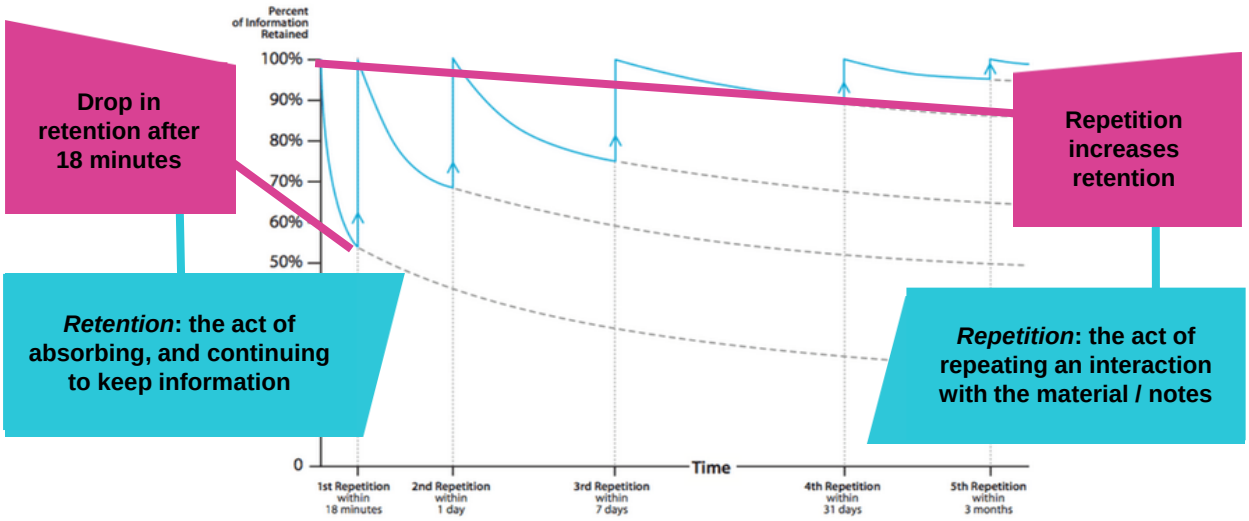
Academic Study Skills

Cornell Notes

Why is good note taking important?

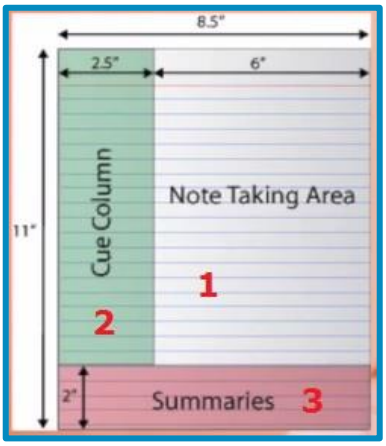
If it feels like you forget new information almost as quickly as you hear it, even if you write it down, that's because we tend to lose almost 40% of new information within the first 24 hours of first reading or hearing it.

However, if we take notes effectively, we can retain and retrieve almost 100% of the information we receive. Consider this graph on the rate of forgetting with study/repetition:



Learning a new system

The Cornell Note System was developed in the 1950s at the University of Cornell in the USA. The system includes interacting with your notes and is suitable for all subjects. There are three steps to the Cornell Note System.



Step 1: Note-Taking

1. ***Create Format:*** Notes are set up in the Cornell Way. This means creating 3 boxes like the ones on the left. You should put your name, date, and topic at the top of the page.
2. ***Write and Organise:*** You then take your notes in the 'note taking' area on the right side of the page. You should organise these notes by keeping a line or a space between 'chunks' /main ideas of information. You can also use bullet points for lists of information to help organise your notes.

Academic Study Skills

Cornell Notes

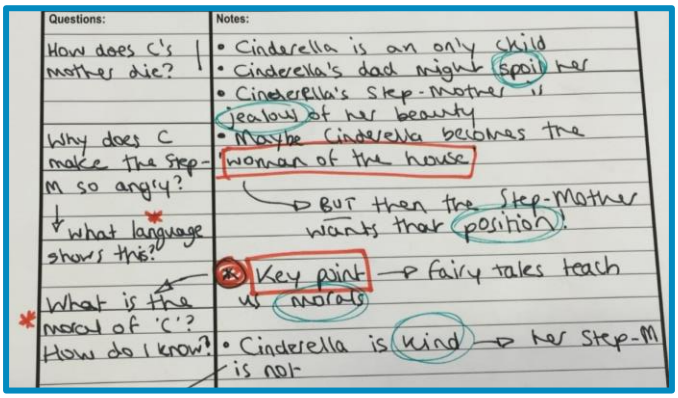
Step 2: Note-Making

1. ***Revise and Edit Notes***: Go back to box 1, the note taking area and spend some time revising and editing. You can do this by: highlighting 'chunks' of information with a number or a colour; circling all key words in a different colour; highlighting main ideas; adding new information in another colour.

2. ***Note Key Idea:*** Go to box 2 on the left-hand side of the page and develop some questions about the main ideas in your notes. The questions should be 'high level'. This means they should encourage you to think deeper about the ideas. Example 'high level' questions would be:

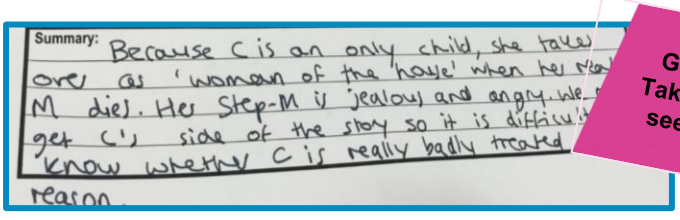
    - Which is most important / significant reason for…
    - To what extent…
    - How does the (data / text / ideas) support the viewpoint?
    - How do we know that…

Here is an example of step 1 and step 2 for notes on the story of Cinderella



Step 3: Note-Interacting

1. ***Summary:*** Go to box 3 at the bottom of the page and summarise the main ideas in box 1 and answer the essential questions in box 2.



Give the Cornell Note Taking System a try and see if it works for you!

Academic Study Skills

Key Words

Below is a series of key terms you will come across from teachers and tutors as you got through school, especially as you enter upper secondary.

Knowing these will help you understand what you are being asked to do!

- ***Analyse:*** When you analyse something you consider it carefully and in detail in order to understand and explain it. To analyse, identify the main parts or ideas of a subject and examine or interpret the connections between them.
- ***Comment on:*** When you comment on a subject or the ideas in a subject, you say something that gives your opinion about it or an explanation for it.
- ***Compare:*** To compare things means to point out the differences or similarities between them. A comparison essay would involve examining qualities/characteristics of a subject and emphasising the similarities and differences.
- ***Contrast:*** When you contrast two subjects you show how they differ when compared with each other. A contrast essay should emphasise striking differences between two elements.
- ***Compare and contrast:*** To write a compare and contrast essay you would examine the similarities and differences of two subjects.
- ***Criticise:*** When you criticise you make judgments about a subject after thinking about it carefully and deeply. Express your judgement with respect to the correctness or merit of the factors under consideration. Give the results of your own analysis and discuss the limitations and contributions of the factors in question. Support your judgement with evidence.
- ***Define:*** When you define something you show, describe, or state clearly what it is and what it is like, you can also say what its limits are. Do not include details but do include what distinguishes it from the other related things, sometimes by giving examples.
- ***Describe:*** To describe in an essay requires you to give a detailed account of characteristics, properties or qualities of a subject.
- ***Discuss:*** To discuss in an essay consider your subject from different points of view. Examine, analyse and present considerations for and against the problem or statement.

Academic Study Skills

Key Words

- ***Evaluate:*** When you evaluate in an essay, decide on your subject's significance, value, or quality after carefully studying its good and bad features. Use authoritative (e.g. from established authors or theorists in the field) and, to some extent, personal appraisal of both contributions and limitations of the subject. Similar to assess.
- ***Illustrate:*** If asked to illustrate in an essay, explain the points that you are making clearly by using examples, diagrams, statistics etc.
- ***Interpret:*** In an essay that requires you to interpret, you should translate, solve, give examples, or comment upon the subject and evaluate it in terms of your judgement or reaction. Basically, give an explanation of what your subject means. Similar to explain.
- ***Justify:*** When asked to justify a statement in an essay you should provide the reasons and grounds for the conclusions you draw from the statement. Present your evidence in a form that will convince your reader.
- ***Outline:*** Outlining requires that you explain ideas, plans, or theories in a general way, without giving all the details. Organise and systematically describe the main points or general principles. Use essential supplementary material, but omit minor details.
- ***Prove:*** When proving a statement, experiment or theory in an essay, you must confirm or verify it. You are expected to evaluate the material and present experimental evidence and/or logical argument.
- ***Relate:*** To relate two things, you should state or claim the connection or link between them. Show the relationship by emphasising these connections and associations.
- ***Review:*** When you review, critically examine, analyse and comment on the major points of a subject in an organised manner.

Write any other key words you come across below. Ask your teacher to explain their meaning or use a dictionary to find out.

Academic Study Skills

Academic Writing Style

What is academic writing?

'Academic writing' is a specific way of writing when communicating research or discussing a point of view. You will most often do this in essays and reports.

Academic writing has a logical structure and uses formal language. Unlike creative or narrative writing, academic writing uses different sources of information to support what is being said (see next page about different sources).

Top Academic Writing Tips

Do's

- Do use words you know the meaning of and are confident using.
- Remember words don't have to be complicated to be clear!
- Do write words out fully e.g., do not, cannot, does not, it would.
- Use the third person point of view
- Minimise use of informal adjectives such as cool, amazing and wonderful.

Don'ts

- Do not use contractions e.g., don't, can't, doesn't, it'd.
- Do not use public speaking phrases like "We can all agree that…" and "As I previously mentioned…".
- Do not use conversational phrases such as 'literally' or 'basically' too often.
- Do not use slang or jargon, for example, 'awks', 'lit', 'woke'.
- Do not use words that express value judgements e.g., crazy, ridiculous, terrible. Suitable synonyms are surprising, unjustified or distressing.

Academic Study Skills

Academic Writing Style

Expressing your opinion in academic writing

In academic writing, it is best practice to express an opinion without writing in the first person.

Rather than saying 'In my opinion, this proves that', you can express your opinion by saying:

- 'Based on (insert fact/theory/finding) it shows that…"
- 'The graph here indicates that…';
- 'The aforementioned problems in Smith's argument reveal that…';
- 'Such weaknesses ultimately mean that…', and so on.

Signposting

Signposting guides your reader through different sections of your writing. It lets those who read your writing know what is being discussed and why, and when your piece is shifting from one part to another. This is crucial to for clear communication with your audience.

Signposting stems for a paragraph which expands upon a previous idea	Signposting stems for a paragraph which offers a contrasting view
Building on from the idea that ... (mention previous idea), this section illustrates that ... (introduce your new idea).	However, another angle on this debate suggests that ... (introduce your contrasting idea)
To further understand the role of ...(your topic or your previous idea) this section explores the idea that ... (introduce your new idea)	In contrast to evidence which presents the view that ... (mention your previous idea) an alternative perspective illustrates that ...
Another line of thought on ... (your topic or your previous idea) demonstrates that ...	However, not all research shows that ... (mention your previous idea). Some evidence agrees that ...

Academic Study Skills

Referencing

What is a reference or referencing?

A reference is just a note in your assignment that tells your reader where particular ideas, information or opinions that you have used from another source has come from. It can be done through ‘citations’ or a ‘bibliography’.

When you get to university, you will need to include references in the assignments that you write. As well as being academic good practice, referencing is very important, because it will help you to avoid plagiarism.

Plagiarism is when you take someone else’s work or ideas and pass them off as your own. Whether plagiarism is deliberate or accidental, the consequences can be severe. You must be careful to reference your sources correctly.

Why should I reference?

Referencing is important in your work for the following reasons:

- It gives credit to the authors of any sources you have referred to or been influenced by.
- It supports the arguments you make in your assignments.
- It demonstrates the variety of sources you have used.
- It helps to prevent you losing marks, or failing, due to plagiarism.

When should I use a reference?

- You should use a reference when you:
- Quote directly from another source.
- Summarise or rephrase another piece of work.
- Include a specific statistic or fact from a source.

Academic Study Skills
Referencing

How do I reference?

There are a number of different ways of referencing, but most universities use what is called the Harvard Referencing Style. Speak with your tutor about which style they want you to use, because the most important thing is you remain consistent!

The two main aspects of referencing you need to be aware of are:

1. In-text citations

These are used when directly quoting a source. They are in the body of the work, after you have referred to your source in your writing. They contain the surname of the author of the source and the year it was published in brackets.

- E.g. *Daisy describes her hopes for her infant daughter, stating "I hope she'll be a fool—that's the best thing a girl can be in this world, a beautiful little fool." (Fitzgerald, 2004).*

2. Bibliography

This is a list of all the sources you have referenced in your assignment. In the bibliography, you list your references by the numbers you have used and include as much information as you have about the reference. The list below gives what should be included for different sources.

- ***Websites:*** Author (if possible), *title of the web page*, 'Available at:' website address, [Accessed: date you accessed it].
  - E.g. *'How did so many soldiers survive the trenches?',* Available at: http://www.bbc.co.uk/guides/z3kgjxs#zg2dtfr [Accessed: 11 July 2019].

- ***Books:*** Author surname, author first initial, (year published), *title of book*, publisher
  - E.g. Dubner S. and Levitt, S., (2007) *Freakonomics: A Rogue Economist Explores the Hidden Side of Everything,* Penguin Books

- ***Articles:*** Author, *'title of the article'*, where the article comes from (newspaper, journal etc.), date of the article.
  - E.g. Maev Kennedy, *'The lights to go out across the UK to mark First World War's centenary',* The Guardian Newspaper, 10 July 2014.

Academic Study Skills

Referencing

Is it a source worth citing? Use these tips to question your sources before referencing it.

- ***Currency – the timelines of the information:*** When was it published or posted? Has it been revised or updated? Does your topic require current information, or will older sources work as well?
- ***Relevancy – the importance of the information for your needs:*** Does the information relate to your topic or answer your question? Who is the intended audience? Have you looked at a variety of sources?
- ***Authority - the source of the information:*** Who is the author/ publisher/ source/ sponsor? What are the author's credentials? Is the author qualified to write on the topic?
- ***Accuracy – the reliability and correctness of the source:*** Is the information supported by evidence? Has the information been reviewed or refereed? Can you verify whether it is a personal or professional source? Are there errors?
- ***Purpose – the reason the information exists:*** Does the author make the intensions/ purpose clear? Is the information fact opinion or propaganda? Are there are biases? Does the viewpoint appear objective?

Academic Study Skills

Evaluating Your Sources

What is a source?

When you learn new things, you might get information from all sorts of different places. These places are called sources. Some sources are more reliable than others. For example, information in a textbook written by an expert is more reliable than information in a non-expert's social media post.

How do you decide which source to use? From newspaper articles to books to tweets, this provides a brief description of each type of source and breaks down the factors to consider when selecting a source.

Twitter

A platform for millions of very short messages on a variety of topics.

Blog

Blogs (e.g. Wordpress) are an avenue for sharing both developed and unpublished ideas and interests with a niche community.

Youtube

A collection of millions of educational, inspirational, eye-opening and entertaining videos.

Newspaper

A reporting and recording of cultural and political happenings that keeps the general public informed. Opinions and public commentaries can also be included.

Journal

A collection of analytics reports that outline the objectives, background, methods, results and limitations of new research written for and by scholars in a niche field.

Academic book

The information presented is supported by clearly identified sources. Sometimes each chapter has a different author.

Encyclopaedia

Books or online – giving information on many different subjects. Some are intended as an entry point into research, some provide detailed information and onwards references.

Popular magazine

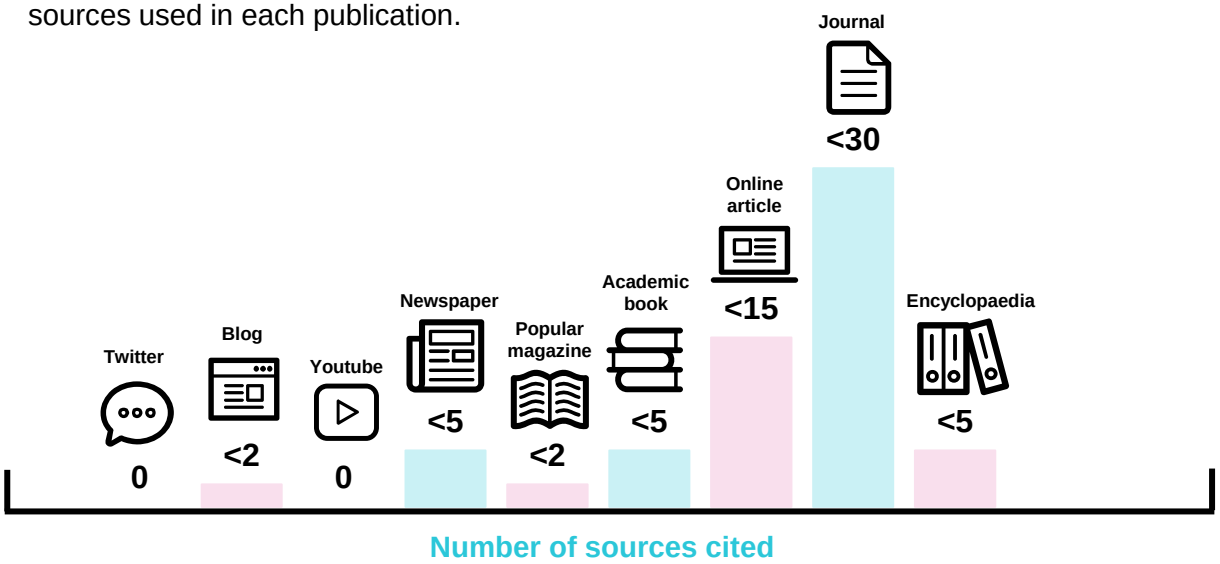
A glossy compilation of stories with unique themes intended for specific interests.

Academic Study Skills

Evaluating Your Sources

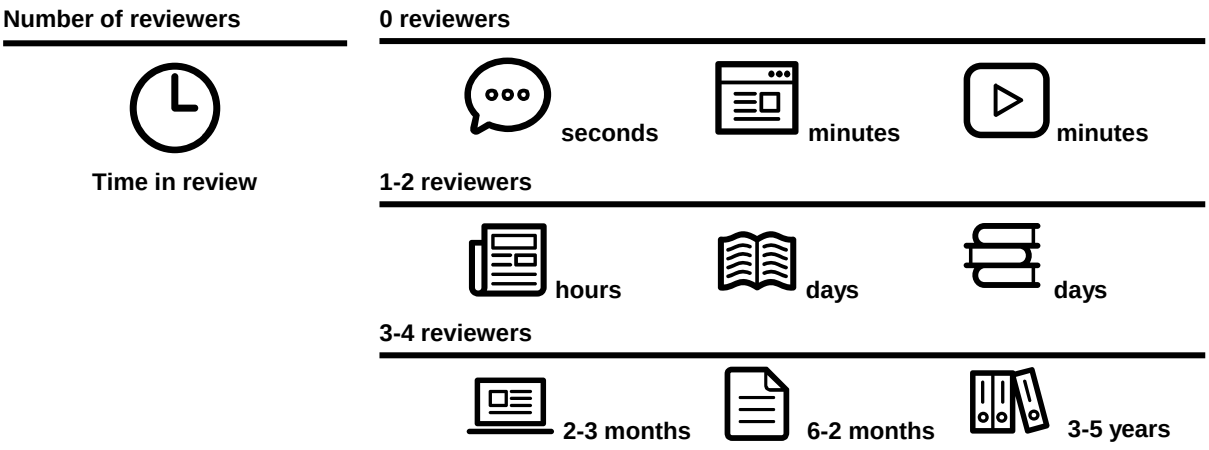
Number of outside sources

When an author used many outside sources into their writing, they demonstrate familiarity with ideas beyond their own. As more unique viewpoints are pulled into a source, it becomes more comprehensive and reliable. This shows the typical number of outside sources used in each publication.



Degree of review before a source is published

Two factors contribute to the amount of inspection that a source receives before it might be published: the number of reviewers fact-checking the written ideas, and the total time spent by reviewers as they fact-check. The more people involved in the review process and the longer the review process takes, the more credible the source is likely to be.



What's next?

Where can this subject take me?

Pathways

A degree in Arts gives students access to many career choices. Students who study Arts often secure jobs in English Literature, Music, Fine Arts and Design, History and Geography, and Modern Foreign Language.

Arts and Design

- the ability to develop individual ideas and collaborate with others as part of a creative team
- strong observational, research and analytical skills
- creative problem solving
- the ability to communicate ideas, visually, orally and in writing
- resilience and the ability to learn from criticism and be objective about your work
- open minded and open to a variety of influences

What are some are the 'interdisciplinary' subjects in this course?

Interdisciplinary is a term you will hear used by higher education institutions. It's also how many professionals and academics in the real-world operate: they use multiple subjects, or disciplines, to achieve their work.

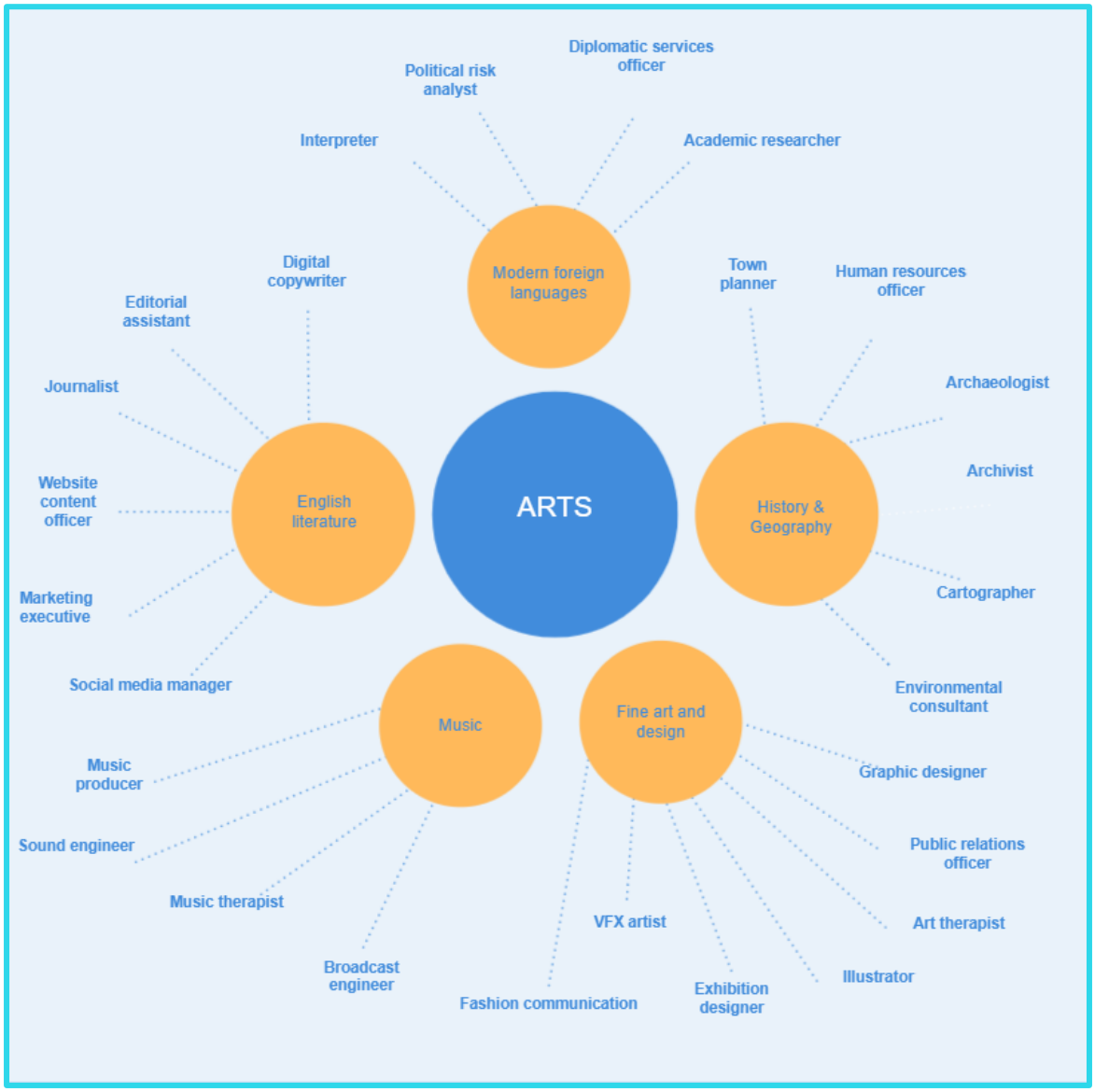
By thinking about which subjects you like, alongside maths, it can help you choose a career pathway later.

Read more about subject selection and careers pathways

- **https://targetjobs.co.uk**
- **https://www.prospects.ac.uk**
- **https://thinkuni.org/**

What's next?

Arts subject maps & jobs



Find out about Arts-related careers here:
PROSPECTS: https://www.prospects.ac.uk
TARGET JOBS: https://targetjobs.co.uk

What's next?
University Guidance

Different people go to university for different reasons. You might have a particular job in mind or just want to study a subject you are passionate about.

Whatever your motivations, going to university can help improve your career prospects, and develop your confidence, independence and academic skills.

Choosing a course and university

Choosing the right course to study is an important decision so make sure you take time to research the different options available to you. Here are some top tips:

- You don't have to choose a course which you have already studied, there are lots of courses which don't require prior knowledge of the subject. You can apply skills gained from school studies to a new field.
- The same subject can be taught very differently depending on the course and university you choose. Look at university websites to find out more about the course content, teaching styles and assessment types.
- When choosing a university, think about what other factors are important to you. Do you want to study at a campus university or be based in a city center? What accommodation options are there? Does the university have facilities for any extracurricular activities you're involved in?
- To research your options, have a look at university prospectuses and websites, as well as seeing if there are opportunities to speak to current students who can give you a real insight into what life is like there.

What's next?

University Guidance

Exploring Careers and Subject Options

- Find job descriptions, salaries and hours, routes into different careers, and more at **https://www.startprofile.com/**
- Research career and study choices, and see videos of those who have pursued various routes at **http://www.careerpilot.org.uk/**
- See videos about what it's like to work in different jobs and for different organisations at **https://www.careersbox.co.uk/**
- Find out what different degrees could lead to, how to choose the right course for you, and how to apply for courses and student finance at **https://www.prospects.ac.uk/**
- Explore job descriptions and career options, and contact careers advisers at **https://nationalcareersservice.direct.gov.uk/**
- Discover which subjects and qualifications (not just A levels) lead to different degrees, and what careers these degrees can lead to, at **http://www.russellgroup.ac.uk/media/5457/informed-choices-2016.pdf**

Other useful resources

- **https://www.ucas.com/**
- **https://www.whatuni.com/**
- **http://unistats.direct.gov.uk/**
- **https://www.opendays.com/**
- **https://www.thecompleteuniversityguide.co.uk/**

You may or may not have thought about studying at university.

Don't worry – you have plenty of time to think about this and explore your options if you would like to go!

What's next?

University Guidance

UCAS and the university application process

All applications for UK degree programmes are made through UCAS. There is lots of information on the UCAS website to guide you through the process and what you need to do at each stage.

Apply	• Applications **open in September** the year before you plan to start university. • You can apply for up to **five courses.** • The deadline for most courses is **15 January**, though there is an earlier deadline of **15 October** for Oxford and Cambridge, medicine, veterinary medicine/science and dentistry.
Decisions	• Some courses may require an interview, portfolio or admissions test in addition to UCAS application. Check individual university websites details. • Check UCAS Track which will be updated with decisions from the universities you have applied for and to see your deadline for replying to any offers. • You should choose a firm (or first) choice university and an insurance choice. If you already have your exam results or a university thinks your application is particularly strong, you might receive an **unconditional offer**.
Results	• If you're holding a conditional offer, then you will need to wait until you receive your exam results to have your place confirmed. • Clearing & Adjustment allows you to apply to courses which still have vacancies if you didn't meet the conditions of your offer, have changed your mind about what or where you want to study, or have met and exceeded the conditions of your offer and would like to look at alternate options.

Personal statements

An important part of your application is the personal statement. The personal statement gives you the opportunity to tell universities why they should offer you a place.

Here a few top tips for making your personal statement stand out:

- You can only submit one personal statement so it's important that you are consistent in your course choices. Make sure you have done your research to show your understanding of the subject area and passion for it.
- Start by brainstorming all your skills, experience and attributes. Once you have everything written down, you can begin to be selective – you only have 47 lines so won't be able to include everything.
- The ABC method: action, benefit and course can be a useful way to help demonstrate your relevant experience and how it applies to the course you're applying for.

What's next?

University Guidance

Personal Statement do's and don'ts

Read the tips below from real life professors and admissions staff in university Arts departments, on the 'do's' and 'don'ts' of what to include in your personal statement.

Psychology

- Tell us why you want to study Arts and Design.
- What area of Arts and Design fascinates you?
- Demonstrate your interest by telling us what you have recently read, watched or listened to and how they helped your understanding of Arts and Design.
- Describe how your school or individual work has equipped you with the necessary knowledge and ability to be a successful Arts and Design student.

Other useful resources

- Key dates and deadlines: **www.access-ed.ngo/timelines-for-applying-to-university**
- Get tutor advice on writing a UCAS personal statement at **www.access-ed.ngo/writing-your-ucas-personal-statement**
- An easy template to start practising your personal statement: **https://www.ucas.com/sites/default/files/ucas-personal-statement-worksheet.pdf**
- Untangle UCAS terminology at **https://www.ucas.com/corporate/about-us/who-we-are/ucas-terms-explained**
- **Discover more about the** application process including when to apply and how to fill in your application on the **UCAS website.**
- Read more useful advice about what to include in your personal statement on **UCAS**, **the Complete University Guide** and **The Student Room.**
- Attend one of our **virtual sessions** to find out more about applying and personal statements.

Insight into the University of Cambridge

The University of Cambridge and its Colleges are committed to widening participation to higher education. Hundreds of outreach initiatives and events are run each year both in Cambridge and in schools and colleges across the UK.

Outreach Projects

neaco

The Network for East Anglian Collaborative Outreach (neaco) delivers activities across East Anglia to help students in Years 9-13, with little or no experience of university, to explore the world of higher education. Find out more.

(Pre-16 Team Projects)

Insight Discover

Insight Discover is a programme that students follow from Year 7 to Year 8, which aims to develop key academic skills to support them in their academic work. In addition, the programme introduces students to university and the options which are available to them in the future. Find out more.

Insight Explore

Insight Explore is an academic programme which aims to develop participants interests and tackle the barriers many students face when applying to university. Find out more.

Realise

The Realise project's aim is to encourage more young people in care to consider higher education. We run a large number of events ranging from science days to theatre days to give a taste of life as a student at Cambridge. Find out more.

Insight into the University of Cambridge

(Post-16 Team Projects)

HE+

HE+ is a collaboration between the University of Cambridge's Admissions Office and Colleges, and state schools/colleges across the UK. The University and schools in 20 regions collaborate to form regional consortia to support highly-able students from under-represented areas and backgrounds and involves approximately 4,000 students in Year 12 each year. Find out more.

Insight+

Insight + aims to support students making competitive applications to selective Higher Education Institutions by supporting students over 12 months from Easter in Year 12. Students receive additional subject specific teaching across five subject strands (English, Physics, Maths, Chemistry and History) which is delivered by experience teachers and departmental outreach practitioners. Find out more.

Sutton Trust Summer Schools

Sutton Trust Summer Schools are free subject-specific residential courses for Year 12 students studying at state-maintained schools in the UK. The five-day summer schools in July and August allow students to explore their interest in one of 26 subjects and gain an insight into what it is like to live and study as a first-year undergraduate student at Cambridge. Find out more.

Experience Cambridge

Experience Cambridge gives participants an insight into teaching and study at the University, and the opportunity to explore their preferred subject area in further detail. The initiative involves one day-long visit to the University and covers subject sessions and Cambridge Admissions guidance. Find out more.

Apply: Cambridge

Apply: Cambridge is a specialist and free programme designed to support highly able students from underrepresented backgrounds and areas to make successful applications to the University of Cambridge. We work with students every step of the way over a 6-month period, helping them navigate the process and effectively prepare for the Cambridge application. Find out more.

STEM SMART

STEM SMART is a free, 17-month programme to support students in raising their attainment at school and develop their confidence to apply to study physical sciences and engineering at top universities. Find out more.

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