Knowledge Organiser

Year 10

Cycle 2 - OPTIONS

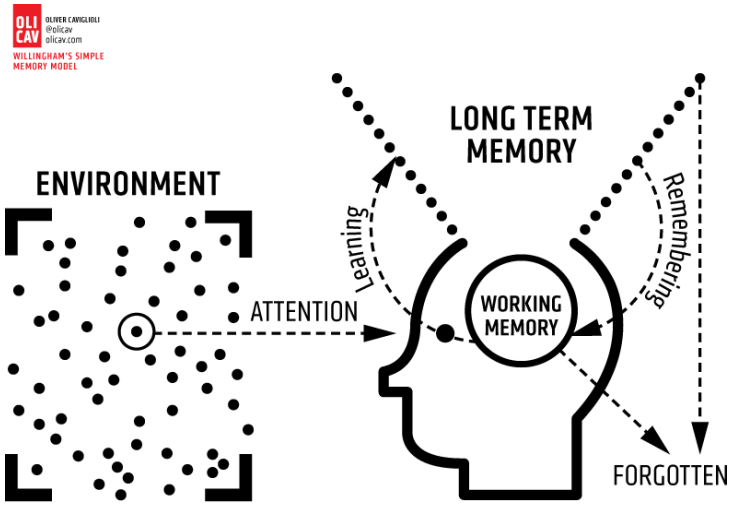
Name:

Inspiring Excellence

Using your Knowledge Organiser for homework

- Your Knowledge Organiser contains the essential knowledge that every student must know.
- Regular use of the Knowledge Organiser helps you to recap, revise and revisit what you have learnt in lessons.
- The aim is to help remember this knowledge in the long term and to help strengthen your memory
- You will use the Knowledge Organiser to help learn during homework.
- You will be assessed on the knowledge from your Knowledge Organiser; the more you revisit information the more likely it will be remembered for lessons, assessments and exams.

- For each homework you will be asked to look at a particular section of your Knowledge Organiser.
- Make sure you follow the homework timetable below so that you do the right homework for the right subjects each day.
- Each day (Monday to Friday) you will study 2 subjects for 30 minutes each.
- All Knowledge Organiser homework is completed in your blue Knowledge Workbooks
- All Maths and English homework is completed on SPARX and must be 100% completed each week.



Homework Timetable Year 10

	Monday	Tuesday	Wednesday	Thursday	Friday
Subject 1	Science	Geog/History	Maths	Option Block F	Maths
Subject 2	English	Option Block E	English	Science	Option Block G

How to use your Knowledge Organiser

In your blue knowledge book you will always write the date, subject heading and ensure that they are underlined with a ruler.

Task 1: Questions

Where a subject includes questions to answer, you must answer these in your blue book. This is the main task to do as a minimum. If you have additional time, or where there are no questions, then do the following Tasks 2-4

Task 2: The Cover – Write – Check method

1. Study the relevant section of your Knowledge Organiser for several minutes.
2. Cover the Knowledge Organiser.
3. In your blue book, write out what you can remember.
4. Check the Knowledge Organiser to see if you got it right.
5. Correct any mistakes in purple pen.
6. Repeat the process – even if you got it 100% correct.
7. Complete sections that you have previously studied using the same process.

Task 3: Free recall

1. Pick a section of the Knowledge Organiser you have studied recently.
2. Without looking at the Knowledge Organiser write down everything you can remember about the topic.
3. Check the Knowledge Organiser to see how much you got right.
4. Correct any mistakes and add any missing parts in purple pen.

Task 4: Elaboration

1. Once you have completed the Cover – Write – Check method, add any additional details you can to your notes.
2. Remember your Knowledge Organiser only contains the core knowledge, there is much to learn beyond it so practise adding more detail when you can.

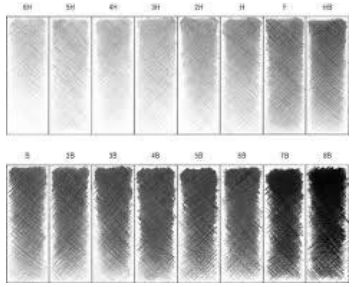
Year 10 Options Cycle 2 Knowledge Organiser Contents Page

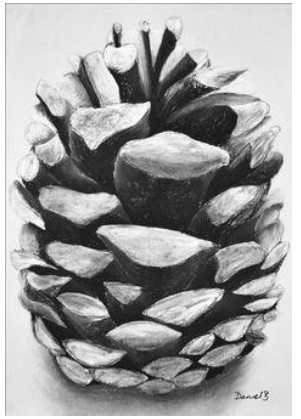
A. Visual Elements Keywords

Line	Line is the path left by a moving point. A line can be horizontal, diagonal or curved and can also change length.
Shape	A shape is an area enclosed by a line. Shapes can be geometric or irregular.
Form	Form is a three dimensional shape, such as a cube, sphere or cone.
Tone	This refers to the lightness or darkness of something. This could be a shade, or how dark or light a colour appears.
Texture	This is to do with the surface quality of something. There are two types of texture: Actual texture really exists, so you can feel it or touch it; Visual texture is created using marks to represent actual texture.
Pattern	A design that is created by repeating lines, shapes, tones or colours.
Colour	Red, yellow and blue are primary colours, which means they can't be mixed using any other colours.

B. Key Knowledge 1: USING TONE to CREATE 3D EFFECT

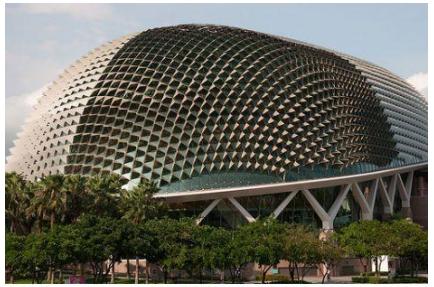
- Create different tones by using different grades of pencil
- HB means 'hard black' this is a standard pencil.
- H pencils are **lighter** as the number gets higher
- B pencils are **darker** as the number gets higher
- You can use pencils to make a variety of marks and tones by how much pressure you apply when using them





E. Expert Modelling: Designers inspired by nature

Zaha Hadid



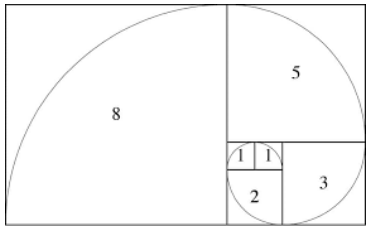
Heatherwick Studio

What Visual Elements can you see in this work?

CREATIVE ARTS
GCSE 3D DESIGN YEAR 10 – BIOMIMICRY

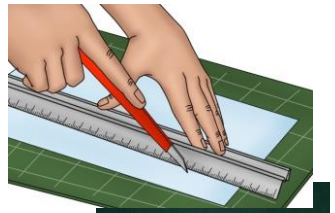
C. Key Knowledge 2: FIBONACCI SEQUENCE

The Fibonacci sequence follows the rule that each number is the sum of the two preceding ones, starting from 0 and 1. This is often found in nature as a growth pattern.



D. Key Knowledge 3: 3D Modelling

Use a scalpel and safety ruler to cut intricate shapes. Experiment with modelling in a variety of different found materials: corrugated card, toothpicks, lollipop sticks, ear buds, newspaper, scrap wood.



F. WIDER READING / THINKING

Amazing buildings inspired by nature

https://www.youtube.com/watch?v=KhSDH7-kyGU

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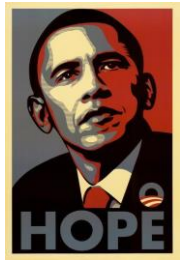
B. Key Knowledge 1: tick once mastered

- ❑ To know how to use a gridded scale to help you draw in scale and in proportion
- ❑ To understand how to paint the wide range of tones present in our skin
- ❑ monochromatic colours are all the colours in a single hue ranging from the lightest to the darkest.
- ❑ Understand basic photoshop skills to manipulate our own photographs
- ❑ To understand the process of lino and dry point printing
- ❑ A continual line drawing means you can take your pencil off of the paper, and blind line drawing means you cant look at the page.

E. Expert Modelling:

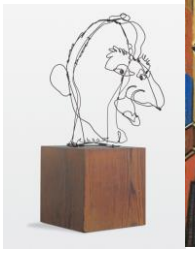
Mark Powell

Lucian Freud



Shepard Fairy

Miguel Ángel Belinchón



Alexander Calder

Pablo Picasso

Diane Komater

Francoise Nielly

What Visual Elements can you see in this work?

GCSE ART AND DESIGN. YEAR 10 – PORTRAITURE

Threshold Concepts:

1. Artists make marks, drawing our attention
2. Art communicates, in every sense
6. Art engages head, hands and heart

C. Key Knowledge 2: tick once you have used these colour relationships in a piece of work

- ❑ Complimentary colours sit opposite each other on the colour wheel. Split complimentary are the colours either side of on of the two complimentary colours.
- ❑ Monochromatic colours are the different tones within a hue from light to dark.
- ❑ Analogous colours are three that sit next to each other on the colour wheel.
- ❑ You need to use all the primary colours while mixing flesh tones to ensure you record all the colours present when

D. Key Knowledge 3

why is mark making important when working with lino?

Why is contrast important when you create art with this method?

How does this medium help the artist reflect the people in his portraits?

F. Wider thinking / further reading:

https://www.npg.org.uk/whatson/self/home/

check out these helpful videos and reading on portraiture!

COMPONENT 1 - Exploring Enterprises

CUSTOMER NEEDS

Learning Aim B Explore how market research helps enterprise meet customer needs & understand competitor behaviour.

Why is it important to anticipate and identify customer needs?

Customers are vital if a business is going to be successful; therefore, the entrepreneur must find out about customer wants and needs. This can be done via market research.

Anticipating customer needs is what is 'expected' of your customers.
For example: When will customers come to the enterprise? What will they want to buy? What market are we going to operate in? How many customers will we have?

Identifying customer needs can only be done once you know who your customers are. The enterprise has to think carefully about its customers, their needs and how they are likely to buy something.
If a 'need' is identified and met then it is very likely to lead to a sale. If you don't identify needs you'll be providing goods and services customers don't want.
How might this be problematic? Think beyond cash flow.

What 3 factors are important when identifying customer expectations?

Value: Customers will want 'good value' goods and services. They want to feel they have got good quality for what they have paid for the good or service.

Enquires: You must respond to enquires rapidly to offer good customer service; this could be a question or a complaint. Customers want to feel they are well thought of as they're spending money with you; they want to have confidence in you and feel listened to. They will tell others how they feel about your enterprise.

Information: Customers are most likely to repeat purchase if they understand what is being offered and its clear to understand. Sometimes (for example when buying a car, jargon can confuse people and put them off). They're also most likely to repeat purchase if they get what they're expecting. Not providing clear information can lead to fines, court and prison depending on the severity.

What is 'after sales' service?

After sales is what the enterprise offers are the customer has left with their purchase. This is can be as simple as checking if they can help the customer in any way (e.g. with a new piece of technology) or finding out if they're happy with their recent purchase (this might be in the form of a SMS questionnaire). Some customers might rate companies publicly (e.g. Trust Pilot, Trip Advisor etc.).

SCAN ME

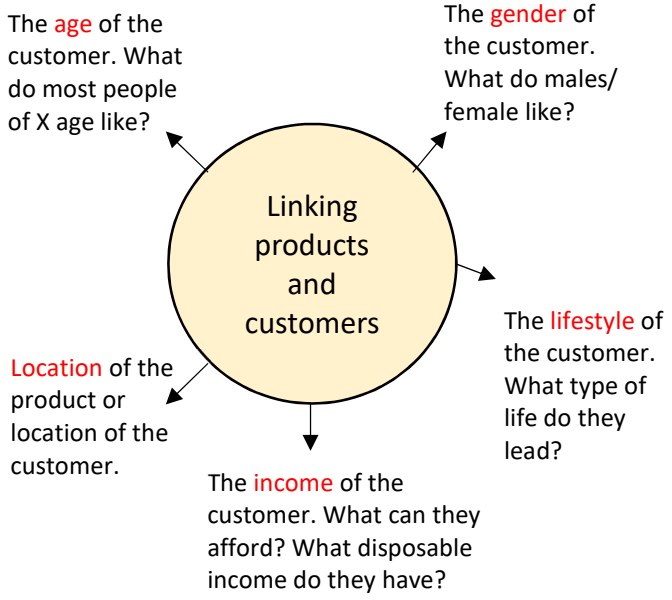
How can a business provide after sales service?

- **Repairs and Maintenance** - this might be offered when you get a new car.
- **Delivery information / tracking** – this might be in the form of providing updates on where the delivery is (web link so it can be self-tracked or via SMS). It might also be the enterprise checking the delivery went smoothly and the customer is happy.
- **Guarantees** – this is the offering of repairs for a specified amount of time after the sale if the product breaks.

SCAN ME

How can a product be linked to a customer?

Linking customers and products well means the enterprise is using its time and resource well.



COMPONENT 1 - Exploring Enterprises

MARKET RESEARCH

Learning Aim B Explore how market research helps enterprise meet customer needs & understand competitor behaviour

Primary

This is research which is collected first hand from the customer by the enterprise. The enterprise should always gain the respondents consent before conducting research.

How can primary research benefit an SME?

- They can gain new customers
- They can gather information about existing customers to keep them loyal and how to encourage them to spend more
- They can tailor the wants and needs of the customer to make sure they leave satisfied
- The enterprise is in control of the research, what they research and how they research; the data collected is then owned by the SME.

What might the drawbacks of primary research be?

- It takes a lot of time and can cost an lot of money;
- It may not be accurate (Ex: Sample size/Honesty)
- It may be biased – the enterprise may word the questions in a way in which they get the answers they want.

What can these things lead to?

- Overall improved performance of the enterprise;
- More satisfied customers;
- The ability for the enterprise to enter new markets (take their products to a new market);
- Increase their products.

How can an enterprise gather primary research?

- Questionnaires;
- Visits/observations;
- Interviews;
- Focus groups;
- Surveys.

SCAN ME

Secondary

Secondary research is research which has already been collected by someone else and you're using it to save you time and money. It may be freely available research or it may be research which it bought.

How can secondary research benefit an SME?

- It is instantly available as it already exists;
- It is publically available and often free to use;
- If details of how it was collected are included it can help the secondary research understand the data better, including any challenges, making it more useful.
- The data is likely to have already been analysed (trends spotted etc.)

What might the drawbacks of secondary research be?

- It is not possible to check the quality of the research
- It may not be perfectly relevant to your enterprise
- It may be out of date
- The method of collection or the source of the research may not be relevant to your enterprise.

How can an enterprise gather secondary research?

- Online research, internet searches
- Company materials
- Market reports
- Reports in trade journals and magazines
- Government reports

SCAN ME

Qualitative – OPEN questions

Collection of information such as ideas, thoughts and feelings. QUALITative research gives QUALITy answers (e.g. the respondent can expand on their answer to give you lots of information).

Quantitative – CLOSED questions

QUANTITative research is much easier to measure as it uses statistics. It can be used to spot patterns of identity trends.

This research can tell you the QUANTITY of times something has happened, but not why (problem?) as it only deals in numbers.

SCAN ME

COMPONENT 1 - Exploring Enterprises

COMPETITORS / COMPETITION

Learning Aim B Explore how market research helps enterprise meet customer needs & understand competitor behaviour

How can I spot competitors?

Identifying competitors allows entrepreneurs to make careful decisions about their enterprise from marketing, pricing and after sales services they provide. Researching competitors is important before you start up your enterprise. This can involve looking online if the enterprise has an online presence or visiting the enterprise/local area if possible to see what goods and services they offer; also, how they offer them.
Factors you might want to consider about your competitors are: location, goods, quality, price, reputation, opening times, customer type and whether or not they operate online.

How can products stand out from

Some ways might be (but this depends on the good/service). They need to encourage customers to make a purchase:

- Features
- Functions
- Colours
- Flavours
- Scents
- Pricing
- Design
- Aesthetics
- Promotions
- Aftersales service
- Incentives
- Quality

Features of competition: Price. Quality, USP, Availability.

Price: This is one of the first ways customers will compare you with your competitors – are you more expensive or not? Being the cheapest doesn't always make you the most attractive; sometimes customers look for the best 'all round' service or for something which stands out.

Quality: Sometimes this is linked to price as the customer wants to make sure the quality matches the price. It is sometimes linked to price as an indicator of how long something might last or the outcome of the service (something expensive would be expected to be very high quality).

Often customers will use the internet to find out of the quality from recent goods and services provided / images and reviews from the enterprise and its past consumers.

SCAN ME

Unique Selling Point: Goods and services can have features and selling points which make them unique (e.g. flavors, rare materials or a service which is different – example: a barbers who offer beard shaving as well as hair cutting (if they're the only ones in the area, otherwise it would be unique)).

Being unique doesn't always mean no other enterprise does something, it means you're unique in that location or to the customers you're serving. Taking Uncle Joes mint balls to London may be seen as unique as they're from the North of England. Being unique gives you options – e.g. pricing.

SCAN ME

Availability of a good– this means whether the product is in stock or whether it can be delivered quickly.

Availability of a service– this means can the customer 'book in' and is it easy to 'book in' (e.g. hair appointment – can you book in and can you maybe book in by calling in, phoning them enterprise or via an app?)

Loyal customers might wait if a good or service isn't available, but you must first work on gaining the loyalty of the customers over time (products mostly being available, different, good quality, reasonably prices etc.).

Child Development

Year 10 Unit 3: Principles of Early Years Practice In this unit you will look at some of the key principles that are reflected in best practice in early years. You will learn about inclusive practice as a way of valuing children and ensuring that they can benefit from the opportunities within the setting. You will also explore how children are empowered to ensure that children learn to become independent and develop a strong self-image, as well as ways in which this is put into practice. A further principle of working with children is the key person approach, which early years settings use to meet children's emotional and care needs. In this unit, you will learn why the key person approach is important to children's learning and development. If you wish to work in early years, it is important that you have a good understanding of the principles as you will need to incorporate them into your practice.		
Week 1 (Learning Aim A1) How children benefit from inclusive practice	The positive effects of inclusive practice on children's outcomes, including: • development of a positive self-image affecting confidence, motivation and positive attitudes towards others • developmental benefits as any needs are identified and a wide range of opportunities is available and, if necessary, adapted to meet needs • opportunities to play and socialise with other children and thus gain social skills and learn to express feelings and emotions • development of self-efficacy, a 'can do' attitude, that gives children confidence to try out new activities or cope in unfamiliar situations • emotional wellbeing as a result of being accepted and cared about by others • positive benefits to health outcomes as physical needs are met through inclusive practice • development of enduring positive attitudes towards others as a result of observing how to value and support others regardless of their age, disability, race, background, gender or lifestyle.	**Key Words** Inclusive Practice Self-image Self-efficacy
Week 2 (Learning Aim A2) How outcomes for children may be affected by non-inclusive practice:	How outcomes for children may be affected by non-inclusive practice: poor self-image as a result of feeling unwanted, helpless or inferior • low self-efficacy as children may have 'learnt helplessness' or see themselves as victims • delayed development as a result of late identification of needs or needs not being met • poor health outcomes if physical care needs have not been attended to, e.g. individual dietary needs unmet • educational outcomes lower as a result of not being given the same opportunities to develop skills and knowledge because needs were not met.	**Key Words** Learnt helplessness
Week 3 (Learning Aim B) Ways in which early years settings implement inclusive practice	Inclusive practice in early years settings, including: • adopting a non-judgemental attitude, e.g. respecting individual differences, cultures and beliefs, uniqueness of each child • implementing a welcoming environment, e.g. posters in different languages, greeting parents • using or displaying resources that reflect children's lives and celebrate diversity, e.g. home corner, dressing-up clothes • developing strong relationships with children and their families to ensure that children's individual needs are fully understood • adapting provision to meet the individual needs of children • keeping children safe • establishing routines • adults consistently acting as positive role models.	**Key Words** Non-judgemental Implementing Role Models

Week 4 (Learning Aim C1) The importance of empowerment of children in early years settings	Why early years settings seek to empower children: • children have a right to be informed, involved and consulted about all decisions that affect them • to value children as their feelings and opinions are taken into account • to show respect to children • to involve children in decision making, e.g. play opportunities, routines. How empowerment benefits children, including: • benefits to physical development, e.g. children gain confidence to try new challenges, more motivated to practise skills, helps children to make decisions about risk • benefits to emotional development e.g. self-esteem encouraged from being given opportunities to be involved in decision-making processes, more likely to be able to manage own behaviour if they have had some input in decisions about appropriate behaviour, boundaries and expectations • benefits to social development, e.g. children develop self-respect and learn to respect and value others and the feelings of others • benefits to cognitive development, e.g. involvement in decision-making process encourages motivation, perseverance and concentration.	**Key Words** Empowerment Self-esteem Perserverance
Week 5 (Learning Aim C2) How adults in early years settings empower children	Ways adults in early years settings empower children appropriate to their age/stage of development, including: • involving children in physical care routines and encouraging them to be involved in self-care to support independence, e.g. washing, dressing • giving children appropriate control and privacy when dressing, e.g. half closing a door so that toddlers can use the toilet in private • encouraging children to help themselves at meal and snack times • supporting child-initiated play whereby children can make choices as to what and how they play, and with whom • involving children in planning so that children feedback what they have enjoyed doing and can make suggestions as to what they wish to do next • involving children in all aspects of preparing the environment, e.g. choosing equipment to put out, tidying away, preparing snacks.	**Key Words** Physical care routines Self-care Child initiated play
Week 6 (Learning Aim D1) Why the key person approach is used in early years settings	Definition of key person role as someone who develops a strong and consistent relationship with a child and their family to ensure emotional and care needs are met. • Main roles of key person, e.g. developing a special bond with the child, sharing information with parents, supporting transition and observing the child. • Key person approach is a requirement of early years education/care frameworks, e.g. Early Years Foundation Stage (England) • Key person approach helps parents to effectively exchange and share information effectively to support children's physical care and development, e.g. dietary needs, allergies, health conditions, ensuring medical and physical needs are met.	**Key Words** Key person Transition

Section 7 (Learning Aim D2) How the key person approach supports children's development	How the key person approach supports children's development: • emotional development is supported as young children are prevented from becoming distressed when separated from parent/carer, e.g. key person understands children's individual emotional needs and ways to comfort them, children feel more secure • language development is supported, e.g. children communicate more to people with whom they have a strong relationship, key person knows how best to communicate with child • children's learning is supported, e.g. key person knows children's interests, children feel more confident to try new experiences and explore • children's physical development is supported, e.g. key person is aware of the child's stage of development, recognises suitable equipment and resources • children's social development is supported as children learn to make relationships beyond their family circle, e.g. key person approach helps children to develop relationships with others in the setting.

Programming - Python

Comment – Text within the code that is ignored by the computer. A Python comment is preceeded by a #.

```
# This is an example of a comment
```

Output – Processed information that is sent out from a computer

Python	Pseudocode
print("Hello World!") Hello World! print("Hello", "World!") Hello World! print("Hello"+"World!") HelloWorld! print("Hello\nWorld!") Hello World!	OUTPUT "Hello World"

Input – Data sent to a computer to be processed

print("Enter name") name=input() print("Hello", name) print("Enter age") age=int(input())	OUTPUT "Enter name" name ← USERINPUT OUTPUT "Hello", name OUTPUT "Enter age" age ← USERINPUT

Assignment - The allocation of data values to variables, constants, arrays and other data structures so that the values can be stored.

- *Variable* – Value that can change during the running of a program. By convention we use lower case to identify variables (eg `a=12`)
- *Constant* – Value that remains unchanged for the duration of the program. By convention we use upper case letters to identify constants. (e.g. `PI=3.141`)

Data Types

Integer	age = 12	age ← 12
Float (real) number	height = 1.52	height ← 12
Character	a = 'a'	a ← 'a'
String – multiple characters	name = "Bart"	name ← "Bart"
Boolean (true/false)	a = True b = False	a ← True b ← False

Arithmetic Operators

Add	7 + 2 = 9	7 + 2
Subtract	7 – 2 = 5	7 - 2
Multiply	7 * 2 = 14	7 * 2
Divide	4 / 2 = 2	4 / 2
power	2 ** 3 = 8	2 ** 3
Integer division	7 // 2 = 3	7 DIV 2
Modulus (remainder)	7 % 2 = 1	7 MOD 2

Relational Operators – Allows the Comparison of values

Less than	<	<	7<2	-> False
Greater than	>	<	7 > 2	-> True
Equal to	==	==	7==2	-> False
Not equal to	!=	≠ or <>	7!=2	-> True
Less than or equal to	<=	≤	7<=2	-> False
Greater than or equal to	>=	≥	7>=2	-> True

Boolean Operators

AND	and	7 < 2 and 1 < 2	-> False
OR	or	7 < 2 or 1 < 2	-> False
NOT	not	not 7 < 2	-> True

Sequencing represents a set of steps. Each line of code will have some operation and these operations will be carried out in order line-by-line

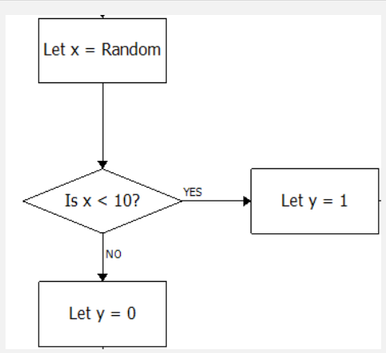
Using + operator for adding a = 1 b = 2 c = a + b print(c) -> 3	a ← 1 b ← 2 c ← a + b OUTPUT c
Using + operator for concatenation a = 'Hello ' b = 'World' c = a + b print(c) -> Hello World	a ← 'Hello ' b ← 'World' c ← a + b OUTPUT c

Random number

Random integer	import random random.randint(0,9)	RANDOM_INT(0,9)
Choice	random.choice('a','b','c')	
Random value from 0 to 1	random.random()	

Selection represents a decision in the code according to some condition. The condition is met then the block of code is executed otherwise it is not. Often alternative blocks of code are executed according to some condition.

```
x=RANDOM_INT()
IF  x < 10 THEN
 y=1
ELSE
 y=0
ENDIF
```



IF …	IF i > 2 THEN
	j ← 10
	ENDIF
		if i > 2:
		j=10

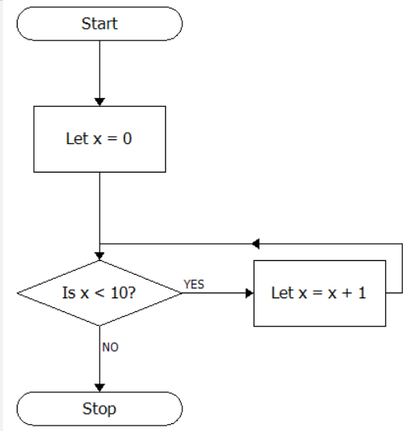
IF … ELSE …	IF i > 2 THEN
	j ← 10
	ELSE
	j ← 3
	ENDIF
		if i > 2:
		j=10
		else:
		j=3

IF … ELSE IF … ELSE	IF i ==2 THEN
	j ← 10
	ELSE IF i==3
	j ← 3
	ELSE
	j ← 1
	ENDIF
		if i ==2:
		j=10
		elif i==3:
		j=3
		else:
		j=1

Iteration Sometimes we wish the code to repeat a set of instructions

`WHILE` loops are used when the we do not know beforehand the number of iterations needed and this varies according to some condition.

```
x = 0
while (x < 10):
      x = x + 1
```



while True: print("Hello World")	WHILE TRUE OUTPUT "Hello World" ENDWHILE
a=0 while a<4: print(a) a=a+3	a ← 0 WHILE a < 4 OUTPUT a a ← a + 3 ENDWHILE

`FOR` loops are used when we know before hand the number of iterations we wish to make.

for a in range(3): print(a)	FOR a ← 0 TO 3 OUTPUT a ENDFOR

Nested structures - Use constructs (e.g. `WHILE, FOR, IF`) inside another.

use a nested FOR loop to print out a grid	`for i in range (10):`
	`  for i in range (10):`
	`  print ("x ",end="")`
	`  print()`

Use a nested while and if to print out only even numbers	`i=0`
	`while i<51:`
	`  if (i%2==0):`
	`  print(i)`
	`  i=i+1`

Lists

Create a list	`shapes=["square","circle"]`
Access element by index pos	`shapes[1] -> circle`
Append item to list	`shapes.append("triangle")`
Remove item from list	`shapes.remove("circle")`
Remove item from list by index	`shapes.pop(1)`
Insert item into list	`shapes.insert(2,"rectangle")`
Number of elements in a list	`len(shapes)`
Get index pos of item in list	`shapes.index("triangle")`

Concatenating lists	`shapesGroup1["square","circle"]`
	`shapesGroup2=["triangle"]`
	`shapes=shapesGroup1+shapesGroup2`

Loop through list	`for i in range(len(shapes)):` `  print(shapes[i])`
Reverse elements in a list	`shapes.reverse()`
Order elements in a list	`shapes.sort()`

2D lists - A list if lists

Create a 2D list	`d = [ [23, 14, 17], [12, 18, 37], [16, 67, 83]]`

Another way to create a 2D list	`a = [23, 14, 17]`
	`b = [12, 18, 37]`
	`c = [16, 67, 83]`
	`d = [a,b,c]`

Access element by index position	`d[1][2] -> 37`

Strings

Get length of a string	`len("Hello")`	`LEN("Hello")`
Character to character code	`ord("a") -> 97`	`ORD("a")`
Character code to character	`chr(101) -> 'e'`	`CHR(101)`
String to integer	`a=int("12")`	`a=INT("12")`
String to float	`a=float("12.3")`	`a=FLOAT("12.3")`
integer to string	`a=str(12)`	`a=STR(12)`
real to string	`a=str(12.3)`	`a=STR(12.3)`

Concatenation -merge multiple strings together	`a="hello "`
	`b="world"`
	`c=a+b`
	`print(c) ->`
	`hello world`

Return the position of a character If there is more than 1 of the same character the position of the first character is returned.	`student = "Hermione"` `student.index('i')`
Find the character at a specified position	`student = "Hermione"` `print(student[2]) -> r`

sub strings - select parts of a string

Example	`student="Harry Potter"`	
Output the first two characters	`print(student[0:2])`	Ha
Output the first three characters	`print(student[:3])`	Har
Output characters 2-4	`print(student[2:5])`	Rry
Output the last 3 characters	`print(student[-3:])`	Ter
Output a middle set of characters	`print(student[4:-3])`	y Pot

*A negative value is taken from the end of the string.

Subroutines are a way of managing and organising programs in a structured way. This allows us to break up programs into smaller chunks.

- Can make the code more modular and more easy to read as each function performs a specific task.
- Functions can be reused within the code without having to write the code multiple times.

- **Procedures** are subroutines that do not return values
- **Functions** are subroutines that have both input and output

Procedure:
No input parameters or return
	`SUB greeting()`
	`  OUTPUT "hello"`
	`ENDSUB`
		`def greeting():`
		`  print("hello")`
		
		`call: greeting()`

Procedure: One input parameter, no return	`SUB greeting(name)`
	`  OUTPUT "Hello",name`
	`ENDSUB`
		`def greeting(name):`
		`  print("Hello",name)`
		
		`greeting("grey")`

Function:
1 input parameter, and 1 return value
	`SUB add(n)`
	`  a ← 0`
	`  FOR a ← 0 TO n`
	`  a ← a + n`
	`  ENDFOR`
	`  RETURN a`
	`ENDSUB`
		`def add(n):`
		`  a=0`
		`  for a in range(n+1):`
		`  a=a+n`
		`  return a`

Function:
Two input parameters, and 1 return value
	`SUB (num1,num2)`
	`  sum=num1+num2`
	`  return sum`
		`def add(num1,num2):`
		`  sum=num1+num2`
		`  return sum`
		
		`greeting(1,2)`

The **scope** of a variable determines which parts of a program can access and use that variable.

A **global variable** is a variable that can be used anywhere in a program. The issue with global variables is that one part of the code may inadvertently modify the value because global variables are hard to track.

A **local variable** is a variable that can only be accessed within a certain block of code typically within a function. Local variables are not recognized outside a function unless they are returned. There is no way of modifying or changing the behavior of a local variable outside its scope.

Global variables need to defined throughout the running of the whole program. This is an inefficient use of memory resources. Local variables are defined only when they are needed an so have less demand on memory. Local variables only exist within the subroutine.

Reading and writing files

Open file Whatever we are doing to a file whether we are reading, writing or adding to or modifying a file we first need to open it using:

`open(filename,access_mode)`

There are a range of access mode depending on what we want to do to the file, the principal ones are given below:

Access Mode	Description
r	Opens a file for reading only
w	Opens a file for writing only. Create a new file if one does not exist. Overwrites file if it already exists.
a	Append to the end of a file. Create a new file if one does not exist.

Reading text files

read – Reads in the whole file into a single string	`f=open("filetxt","r")`
	`print(f.read())`
	`f.close()`

readline – Reads in each line one at a time	`f=open("file.txt","r")`
	`print(f.readline())`
	`print(f.readline())`
	`print(f.readline())`
	`f.close()`

readlines – Reads in the whole file into a list	`f=open("file.txt","r")`
	`print(f.readlines())`
	`f.close()`

Writing text files

Write in single lines at a time	`file=open("days.txt",'w')`
	`file.write("Monday\n")`
	`file.write("Tuesday\n")`
	`file.write("Wednesday\n")`
	`file.close()`

Write in a list	`say=["How\n","are\n","you\n"]`
	`file=open("say.txt",'w')`
	`file.writelines(say)`
	`file.close()`

Data Validation Routines

Check if an entered string has a minimum length	OUTPUT "Enter String"
	s ← USERINPUT
	IF LEN(S) > 5 THEN
	  OUTPUT "STRING OK"
	ELSE
	  OUTPUT "TOO SHORT"
	ENDIF

Check is a string is empty	OUTPUT "Enter String"
	s ← USERINPUT
	IF LEN(S) == 0 THEN
	  OUTPUT "EMPTY STRING"
	ENDIF

Check if data entered lies within a given range	OUTPUT "Enter number" s num ← USERINPUT IF num > 1 AND num < 10 OUTPUT "Within range" ENDIF

Authentication Routine

```
OUTPUT "Enter Username"
username ← USERINPUT
OUTPUT "Enter Password"
password ← USERINPUT

WHILE username != "bart" OR password !="abc"

 OUTPUT "Login failed"
 OUTPUT "Enter Username"
 username ← USERINPUT
 OUTPUT "Enter Password"
 password ← USERINPUT

ENDWHILE

OUTPUT "Login Successful"
```

Debugging

Syntax errors – Errors in the code that mean the program will not even run at all. Normally this is things like missing brackets, spelling mistakes and other typos.

Runtime errors – Errors during the running of the program. This might be because the program is writing to a memory location that does not exist for instance. eg. An array index value that does not exist.

Logical errors - The program runs to termination, but the output is not what is expected. Often these are arithmetic errors.

Test data

Code needs to be tested with a range of different input data to ensure that it works as expected under all situations. Data entered need to be checked to ensure that the input values are:

- within a certain range
- in correct format
- the correct length
- The correct data type (eg float, integer, string)

The program is tested using normal, erroneous or boundary data.

Normal data - Data that we would normally expect to be entered. For example for the age of secondary school pupils we would expect integer values ranging from 11 to 19.

Erroneous data - Data that are input that are clearly wrong. For instance, if some entered 40 for the age of a school pupil. The program should identify this as invalid data but at the same time should be able to handle this sensibly which returns a sensible message and the program does not crash.

Boundary data - Data that are on the edge of what we might expect. For instance if someone entered their age as 10, 11, 19 or 20.

YEAR 10 DANCE – CYCLE 2

Week 1

Performance Skills

Focus
Concentrating on your movements when performing – no talking, laughing or giving up
Alignment
Having your body in the correct position – in line with each other.
suspend
Holding your movements longer than usual before releasing to fall/drop.
Technique
Having the correct alignment, placement and dynamics for the style you're performing in.
Expression
Using your facial expression, performance skills, and energy when presenting your work.
Extend
Reaching your body to the longest possible.
Flex
Pulling your toes back as far as you can to straighten your feet.

Week 2

COSTUME DESIGN

Colours and symbolism

Colour can hold meaning and connotations within dance.

White: Purity, Innocence, Goodness, Faith.

Red: Dancer, Blood, Passion, Love, Fear

Green: Nature, Growth, Innocence, Progress, Jealously

Purple: Royalty, High Status, Power, Wealth.

When created for a specific work, a **costume** may be designed to expose or enhance the lines formed by the **dancer's** body, or to express the choreographer's artistic vision, or to engage the audience, or combinations of these. A **costume** may portray or relate to some characteristic, mood, or theme of the **dance**.

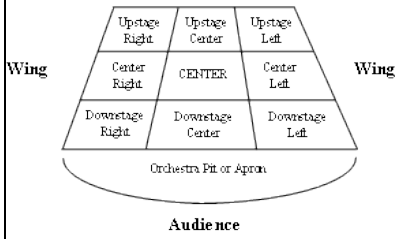
Week 3

Performance Skills

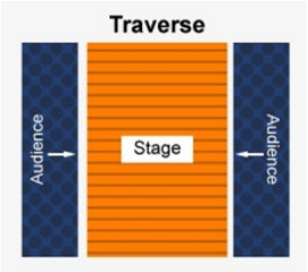
Point
Curving your feet with your toes pointing down.
Arch
Pulling your shoulders and head back to curve your spine in the opposite direction to a contract.
Twist
Using your upper body to 'twist' your spine from front to back.
Leap
Jumping from one leg to the other in a forwards travelling direction.
Kicks
Swinging one leg up in the air, pointing the foot, keeping the supporting leg straight with heel on the floor.
Unison
Performing the same actions moving at the same time as your group/partner.
Cannon
Moving at different times to your partner/group – usually one after the other.

Week 4

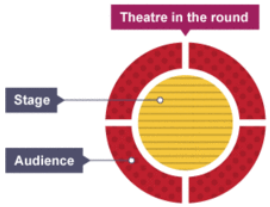
Stage positions



Staging Types: Traverse Stage the audience is on two sides facing towards each other.



Staging Types: Theatre-**in-the-round** is a form of theatrical staging in which the acting



area may be raised or at floor level, is surrounded by the audience.

Week 5

Structure of Choreography

Chronological:
The logical order of events from beginning to middle to end.
Dramatic Irony:
When the audience or reader knows something important which the main character does not.
Foreboding:
A feeling or sign that things are about to change for the worse.

Performance Skills

Mirroring
Performing movements in perfect unison, using opposite gestures and directions to your partner.
Formation
The shape you stand in when performing your movements – e.g. lines or circles.
Dynamics
The speed you perform your movements.
Energy
Performing your movements with excitement and high speed!

	Week 6	Week 7	Week 8	Week 9	Week 10
YEAR 10 DANCE – CYCLE 2	**Key Vocabulary** **Correlation:** A direct link between two things. **Control:** Using your strength perform movements correctly. **Reiterate:** To repeat something for effect, impact or emphasis. **Suspension of disbelief:** To suspend your disbelief is to forget the performance and be drawn into the action as if it were real. **Symbolism:** The use of images or movement that stand for or represent something else. The use of symbols to represent ideas or qualities. **Musicality** Performing in time with the beat of the music **Contrast** Showing a clear difference between the dynamics you're performing in or the styles e.g. from slow to fast.	**Key Features of Dance**  **Projection:** Involves throwing energy out of the body to give a quality of life to the movement. **Floor Work**: Performing movements using the floor. **Emphasis:** Involves knowing what aspect of energy, space and time to accent at different moments. **Releve**: To rise. **Use of Breath:** Use of inhale and exhale provides a greater fluidity of movement and musicality. **Fan Kick:** A round leg kick high in a fan motion starting inward and around or vice versa. **Chaine Turn:** Fast series of turns.	**Definitions** **Cultural background of the dance.** When researching the cultural context you should compare the acceptable norms of our own society with that of others, this can be on a local, national or worldwide level. You should consider how minority groups are represented in the dance. **Political background of the dance.** When researching political context you should consider how the political climate has influenced the choreographic concept and the presentation of the dance. This would include looking at which Government is in office, Labour, Conservative, Liberal or Liberal Democrats. You may wish to research government policy (Legislation)	**Revision for Knowledge Organiser test:** Pick three sections you feel you need revise. You may choose to look over one week in particular you feel you don't know as well. Use the following to support you with your revision: LOOK COVER WRITE CHECK Draw a picture to represent your chosen word/section. Create flash cards that include your words/sections and their definitions. Put your word/section into a scenario. For example, "I would flex my feet during the style of Jazz". Create a mind map expressing an idea or theme.	**Key Vocabulary:** **Use of Breath:** Use of inhale and exhale provides a greater fluidity of movement and musicality. **Political:** The political climate has influenced the choreographic concept and the presentation of the dance. This would include looking at which Government is in office, Labour, Conservative, Liberal or Liberal Democrats. **Symbolism** The use of images or movement that stand for or represent something else. The use of symbols to represent ideas or qualities. **Contrast:** A marked difference between two or more things placed side by side for dramatic effect **Mirroring:** Performing movements in perfect unison, using opposite gestures and directions to your partner.

YEAR 10 DRAMA CYCLE 2

Week 1

Devising Techniques

Role Play: This is the act of pretending to be somebody else, of taking on a role.
Characterisation: The act of changing voice, body language, movement, gesture etc when in role.
Still image: This is a frozen picture which communicates meaning. It's sometimes called a **freeze frame** or tableau.
Naturalistic: The performance is as close to real life as possible.
Non-Naturalistic: The performance is more theatrical and stylised and tells the story using a variety of techniques such as flashbacks; direct address to the audience; multiple role-play.
Mime: the theatrical technique of expressing an idea or mood or portraying a character entirely by gesture and bodily movement without the use of words

Bertolt Brecht is German poet, playwright, and theatrical reformer whose epic theatre departed from the conventions of theatrical illusion and developed the drama as a social and ideological forum for leftist causes.

Week 2

Devising Techniques

Cross Cutting: Cross-cutting is a device to move between two or more scenes staged in the space at the same time.
Narration: Narrating is adding a spoken commentary for the audience about the action onstage.
Slow motion: is an effect in film-making whereby time appears to be **slowed** down
Hot-Seating: An actor sits in the hot-seat and is questioned **in role**, spontaneously answering questions they may not have considered before.
Thought-Tracking: A thought-track is when a character steps out of a scene to address the audience about how they're feeling.
Gesture: a **defined** movement which clearly communicates **meaning**.
Movement: the physical methods actors use to help with characterisation

Bertolt Brecht's Epic theatre is a form of didactic drama presenting a series of loosely connected scenes that avoid illusion and often interrupt the story line to address the audience directly with analysis, argument, or documentation.

Week 3

Devising for performance

Monologue: an extended speech by one person

Developing a role and characterisation:
Individual and group work on character is vital for effective devising, whether you end up being a single character or playing multiple roles.
To develop a role, you must establish their given circumstances; for instance:

- Who am I?
- Where am I?
- When is it
- Where have I just come from?
- What do I want? (Objectives)
- How will I get what I want?

Genre	Style and Form
Tragedy	Mask
Comedy	Mime
Farce	Promenade
Documentary Theatre	Site-specific Theatre
Morality Play	Verbatim Theatre
Melodrama	Physical Theatre

Week 4

Building Blocks: Devising

Tableaux: A group of motionless figures representing a scene from a story.

Movement and Physical Sequence:
Movement and physical sequences in devised work are either literal or symbolic and serve different purpose.
Liberal: You can develop movement and physical sequences by selecting an element from the research that has clearly identifiable gestures including:
● pace ● size ● the portrayal as realistic or caricature ● the number in the group doing the gestures in synchronisation.
Symbolic: This style of physical movement sequence can be used alongside more 'traditional' dramatic forms. Many artists that use this style of movement like to create the movements before adding context and meaning.

Week 5

Building Blocks: Devising

Improvisation: The core principles of improvisation for devising are:
The starting point must be rooted in research findings, such as:
- an image
- a line of text
- an object
- a scenario
- a piece of music

Status: the power difference in the relationship between two characters

Genre: a French word meaning 'category' or 'type', e.g. comedy, tragedy, docudrama, farce, or melodrama.

Space: the effective use of available **space in** a performance

Pace: the speed at which someone speaks, e.g. the speed of response in an argument

	Week 6	Week 7	Week 8	Week 9	Week 10
YEAR 10 DRAMA – CYCLE 2	<u>Key themes and meaning DNA</u> Key themes present in DNA by Dennis Kelly are explored using a mixture of short dramatised sequences, narration and talking head-style interviews with some of the key characters. The main **themes** of the play are bullying, gang membership, social responsibility, morality and leadership. The **characters** remain in role in the interview-style sequences, commenting on the events of the play and explaining their views on the events and their role in what has taken place. The **narrator** examines these themes as some key moments are played out. The **narrator** examines the morality and motivations of Leah, Phil, John Tate, Cathy and other characters, as some key moments are played out, providing a voice-over commentary and exploring how the characters link to the themes of the play. The **action** sequences illustrate the themes by moving between significant moments and drawing out some of the key quotations that relate to each of the themes being explored.	<u>Frantic Assembly Context</u> Frantic Assembly was founded in 1994 by Scott Graham, Steven Hoggett and Vicki Middleton; students at Swansea Universtiy. They were inspired and then encouraged to form own theatre company although untrained in any aspect of theatre of dance. Key focuses: • Movement must move narrative • Encouragement learning and training • Setting gradual tasks to build up exercise • Work on character development after the work is created Exercises: • Round by through • Chair Duets • Walking on the wall • Jet Pack • Lifting Exercise • Push/Pull • Hymn Hands Productions: • I think we're alone • Sometimes thinking • The Unreturning • Fatherland • Things I know to be true • The curious incident of the dog in the night-time	<u>DNA by Dennis Kelly</u> <u>Key Points</u> **DNA** was written by Dennis Kelly in 2007 and first performed at the Cottesloe Theatre of the National Theatre on 16th February 2008 and it was directed by Paul Miller.  **DNA** is a dark, chilling and nilhilistic play, examining teenage gang culture and their hierarchical power structures, and the nature of guilt and responsibility, The play captures the nuances of teenage conversation with overlapping dialogue and incomplete sentences punctuated by the group. **DNA** is a play of many themes: responsibility, leadership, gangs, bullying and power. **Directed** by Paul Miller **Set, Costume and Video Designer** by Simon Daw **Lighting Designer** by Paule Constable **Sound Designer** by Rich Walsh **Associate Video Designer** by Paul Kenah	<u>Revision for Knowledge Organiser test:</u> Revise areas on Performance and Devising skills. Ensure clear understanding of Performance skills. You may choose to look over all the performance and devising skills and use the following to support you with your revision: LOOK COVER WRITE CHECK Ensure you have knowledge of White Rose. This includes understanding of the characters, the themes and knowledge of the original performance conditions. Remember how you used the performance and devising elements when creating your drama work on key scenes.	**<u>Performance Criteria Component 1</u>** **Performers must develop skills in:** ● rehearsing and learning lines; adapting work in response to rehearsals (to be done collaboratively) ● voice: use of clarity, pace, inflection, pitch and projection ● physicality: use of space, gesture, stillness and stance ● ability to combine and apply vocal and physical skills ● characterisation ● communication with other performers and with the audience ● understanding of style, genre and theatrical conventions. **Performers will be assessed on their ability to realise artistic intentions through the:** ● use of vocal and physical skills ● creation of character ● communication of creative intent to an audience ● understanding of style, genre and theatrical conventions.

GCSE Food preparation and nutrition

Week 13 Finishing techniques and garnishes	**Week 14** Different dietary needs
Adding a food on a finished dish can improve the aesthetic appearance. Decorations on savoury food dishes are called garnishes. Decorations on sweet foods are simply called decorations. Some examples of garnishes include: Fanning – a strawberry can be cut into slices with a knife leaving the top of the strawberry intact which creates a fan affect Waterlilly effect – using a knife, a V shape is cut around the middle to create a toothed affect. Tomatoes and melon can be prepared in this way Scoring with a fork – score down with a sharp knife or fork to give ridged effect. Cucumber and lemons can be prepared in this way. Twists – slice, then cut from the edge to just past the centre. Cucumber, oranges, lemons can be prepared in this way. Ribbons – courgettes or cucumbers can be peeled along their length to produce ribbons which can be arranged in different ways, e.g making a spiral, folding or wrapping around another food. Specific skills to improve the overall aesthetic: Pipping – piping mash, meringues and other things can make a big difference to the outcome of the dish. Creating sugar work: This can elevate a desert with good finishing techniques with sugar work. Melted chocolate: this can also help elevate a desert as melting and then creating shapes can help with decorations. For more inspiration: https://www.youtube.com/watch?v=1zrxJ5ySyok.	**Lactose intolerant** Intolerant to lactose. Those affected vary in the amount of lactose they can tolerate before symptoms develop. Symptoms may include abdominal pain, bloating, diarrhoea, gas, and nausea. **Coeliac** Intolerant to wheat - Classic symptoms include gastrointestinal problems such as chronic diarrhoea, abdominal distention, malabsorption, loss of appetite and among children failure to grow normally. **Lacto-ovo vegetarian** lacto-ovo vegetarian is a vegetarian who consumes some animal products, such as eggs and dairy. Unlike pescatarians, they do not consume fish or other seafood. **Lacto vegetarian** a person who does not eat meat and eggs. **Vegan** excludes meat, eggs, dairy products, and all other animal-derived ingredients **Vegetarian** Do not eat meat, poultry, fish, or any products derived from animals, including eggs, dairy products, and gelatine **Pescatarian** a person who does not eat meat but does eat fish**.** **Food allergy** Is an immune system reaction that occurs soon after eating a certain food. Even a tiny amount of the allergy-causing food can trigger signs and symptoms such as digestive problems, hives or swollen airways and this could be fatal.

Week 15
Diet related diseases

Obesity

Obesity, or being obese, means being very overweight.

How can it be measured?

You can use body mass index (BMI) to see if your weight falls into the normal range. It is measured by calculating weight (KG)/ height (M) squared.

Health problems linked to obesity include:

1. Type 2 diabetes
2. Coronary heart disease
3. Stroke
4. Cancers
5. Arthritis
6. Depression

Cardiovascular disease

When your heart beats it pumps blood around your body to give your body cells oxygen, energy and the nutrients it needs. The blood then takes away the waste products from your body.

The two main types of cardiovascular disease are:

1. Coronary heart disease
2. Stroke.

Tooth decay - What causes tooth decay?

Tooth decay begins with plaque forming on your teeth and gums that contains bacteria. Over time, this bacteria can interact with the sugars in the foods you eat to make acid. This acid attacks your tooth enamel and can cause tooth decay.

Type 2 diabetes

Diabetes is a condition when the sugar in a person's blood gets too high.

More likely to develop type 2 diabetes if:

- You are overweight/obese
- You are over 40 years old
- You eat fatty, salty and sugary foods often
- You have high blood pressure
- You do not exercise regularly.

Week 16
Energy needs

Your body needs energy for every function and movement that it performs

Energy we use is measured in kilocalories (kcal) or kilojoules (kj).

1g of each nutrient	Energy value in Kcal
Protein	4.0
Fat	9.0
Carbohydrate	3.75

The amount of energy you need changes throughout your life because of these main factors:

- Age – teenagers compared to babies or elderly.
- Activity- your energy needs will change from day to day depending on these activities
- Health – Your own health also affects the amount of energy needed.
- Gender – Whether you are male or female will affect your energy needs.

Basal metabolic Rate

Basal metabolic rate (BMR) is the number of kilocalories you need to stay alive for 24 hours.

Physical activity level

Physical activity level is a way of showing your daily physical activity as a number. Your PAL will vary depending on how you spend your time during the day.

$$\text{Physical activity level} = \frac{\text{Total energy expenditure [24 hours] /}}{\text{Basal metabolic rate [24 hours}}$$

Week 17
Raising agents

Raising agents are something added to sweet or savoury mixtures, such as cakes scones and breads to make them rise.

Chemical

chemical raising agents produce CARBON DIOXIDE

Biological

Yeast is a biological raising agent which during fermentation produces carbon dioxide gas.

Fermentation needs certain conditions for it to work:

1. **Time**
2. **Heat source**
3. **Moisture**
4. **Food source**

Mechanical

Mechanical raising agent are the things that you physically do to a product such as whisking, sieving, folding, mixing. They trap air throughout the mixture and this air turns to steam in the oven.

Week 18
Raising agents

Why is food cooked?

- To make food safe to eat
- To improve the flavours of food
- To improve appearance and smell-
- To improve the texture of food
- To improve the shelf life
- To give variety to the diet

Heat can change the appearance, colour, flavour, texture and smell of food. When food is prepared and cooked you may see one or more of the changes.

Methods of heat transfer

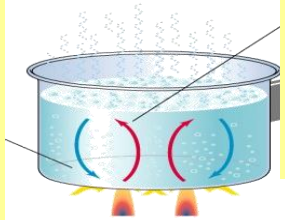
Conduction

Conduction is when the heat travels through solid materials like metal as well as food.

Convection

Convection is when heat travels through air or water. The movement of heat in water or in the air is called the convection current.

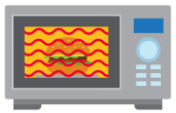
Water cools, becomes more dense and sinks



Hot, less dense water rises

Radiation

Radiation is when heat rays directly warm and cook food. Heat



Week 19
Cooking methods

The ways in which we cook food can be divided into the following groups:

1. Cooking with water
2. Cooking with 'dry heat'
3. Cooking with fat

Cooking with dry heat
- Grilling
- Dry frying
- Baking
- BBQ

Cooking with water
- Blanching
- Boiling
- Braising
- Poaching
- Simmering
- Steaming

Cooking with fat
- Shallow frying
- Stir-frying
- Roasting

Choosing the cooking method – Factors to consider

- Type of food – E.g. Yorkshire puddings require baking
- Skill of the cook – Poaching requires skill
- Time available- Stewing takes hours
- Dietary needs- Low fat diets require low fat
- Sensory requirements- crispy skin or soft vegetables
- Equipment available

Key cooking methods you must understand:

Baking – Poaching – BBQ – boiling – Braising – Dry frying – Grilling – Roasting – shallow frying – Simmering – steaming – stir frying

Week 20
Micro-organisms

Micro-organisms are tiny forms of life, both plants and animals. There are three groups:

1. Bacteria

Optimum conditions

- A suitable temperature and pH
- A supply of moisture and nutrients (particularly protein, fats, minerals and sugar)
- The right level of oxygen (aerobic bacteria need oxygen; anaerobic do not
- Sufficient time – shelf life of food

High risk foods: meat, poultry, fish, seafood, eggs, milk, cream and some cheeses

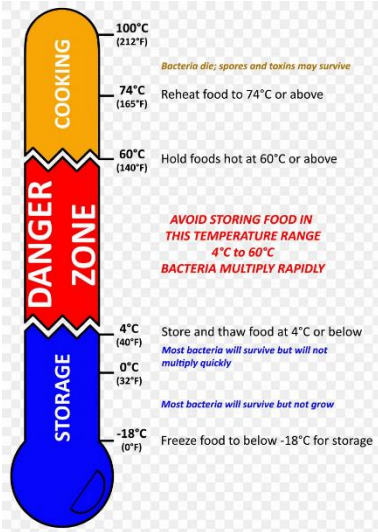
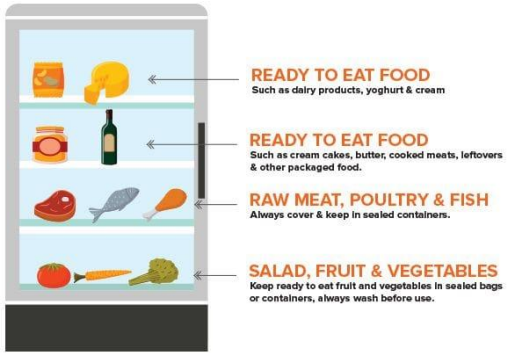
2. Yeast

- optimum conditions to grow and multiply:
- A suitable temperature: 25 – 30 degrees in optimum but they can still grow (slowly) in cooler temperatures.
- A suitable pH – pH of 4 – 4.5 is optimum for yeasts – Acidic
- A supply of moisture
- A supply of energy and nutrients: particularly carbohydrates
- The right level of oxygen – Aerobic and anaerobic
- Sufficient time

High risk foods: jam, honey, fruit, yoghurts and fruit juices

3. Moulds

- Suitable temperature – 20 degrees – 30 degrees, but they can still grow in fridges at lower temperatures.
- A suitable pH – ranging from 2.0 -9.0 – optimum seems 7.0
- A supply of moisture; moulds grow particularly well in humid conditions and on moist foods, but there are some that can grow on dry foods too.
- A supply of energy and nutrients

Week 21 Types of bacteria	Week 22 Principles of food safety	Week 23: List of Seneca for cycle 2
There are different from bacterial food poisoning, because only a few bacteria can cause the illness and the food is the vehicle by which they enter the body, rather than the place where they multiply. In other terms it's the food that is the cause, not the body. The bacteria can come from various different sources including dirty water, sewage, manure, wild animals bird and insects. We need to learn about various different foodborne diseases such as: **1. Campylobacter** **Foods found in:** **Raw and undercooked meats and poultry, raw milk** **2. Escherichia coli (E.coli)** **Foods found in:** **Undercooked meat products e.g burgers, raw milk, raw milk products, apple juice, some cooked meats** **3. Listeria monocytogenes** **Foods found in:** **Soft cheese, pates, cook-chill products, salads, fried rice** **4. Salmonella** **Foods found in: Meat, poultry, raw egg products e.g mayonnaise, milk, dairy products, sauces, salads dressings, coconut, beansprouts** **5. Staphylococcus aureus** **Foods found in:** **Poultry, cooked meats and meat products, egg and egg products, salads, milk and milk products, some dried foods. Found on/in the skin hair, nose, mouth and throats of people and animals.**	**<u>Personal hygiene</u>** people who handle food in a commercial or domestic kitchen must keep themselves clean and hygienic and follow the basic personal hygiene rules**.** **<u>Cross contamination</u>** Cross contamination is the transfer of bacteria from contaminated foods, liquid and solid substances, surfaces, materials or animals to other foods   **<u>Food storage</u>**  	**Week 13:** 1.1.4 – cooking methods 1.1.5- sauce making 1.1.6 – dough and pastry 1.1.7 – shaping and finishing dough **Week 14:** 2.3.2 – informed choices for balanced diet 2 2.3.5 - Diet modifications **Week 15**: 2.3.6 diet related diseases 2.3.7 diet related diseases 2 **Week 16:** 2.3.3- Energy needs 2.3.4 – nutritional analysis 2.3.8 – end of topic test – nutritional needs and health **Week 17:** 3.2.3 Raising agents 1.1.8 – Raising agents and setting mixtures **Week 18:** 3.1.1 – Reasons for cooking and heat transfer **Week 19:** 3.1.2- water based cooking methods 3.1.3- fat based cooking methods 3.1.4- dry cooking methods 3.1.5 – dry cooking methods **2** **Week 20:** 4.1.1 – micro-organisms and signs of food spoilage 4.1.5 – micro-organisms in food production **Week 21:** 4.1.2- enzymes and signs of food spoilage 4.1.3- Food poisoning 4.1.4 – bacterial contamination **Week 22:** 4.2.1 Temperature Control 4.2.2 Ambient Foods & Food Labels 4.2.3 Preparing, Cooking & Serving Food 4.2.4 End of Topic Test - Food Safety **Evaluation of Seneca – complete any outstanding Seneca in preparation for cycle 2**

Year 10 French Knowledge Organiser cycle 1

Complete your weekly assignment on Seneca

Extensions:

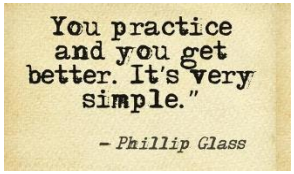
- Create revision cards for each of the main tenses studied to help you remember how to form them.
- Find a picture in a magazine/online and write a photo description
- Do 10 minutes of Duolingo every day to build your vocabulary
- Write a glossary of vocabulary we see in class – memorise it and test yourself at home.

GCSE Music

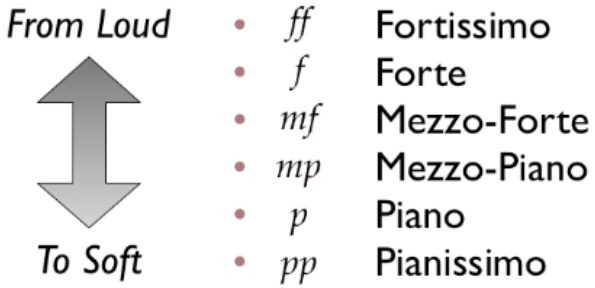
KNOWLEDGE ORGANISER – Instrumental Practice

KEY CONCEPTS

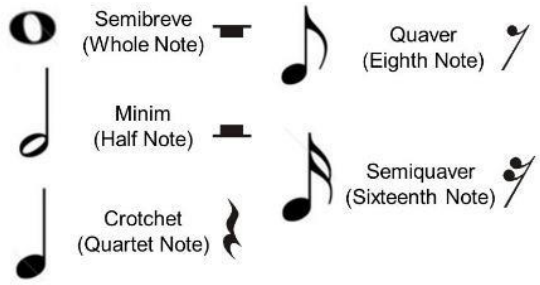
Reviewing your performance	Watching a video of your performance and using it to amend or set new targets
Solo performance skills	Understanding the techniques needed when performing as a soloist and being able to demonstrate them
Preparing for performance	Using rehearsal time and peer/self-assessment to prepare for a performance to a wider audience
Stage Presence	Researching what stage presence is and how to achieve it

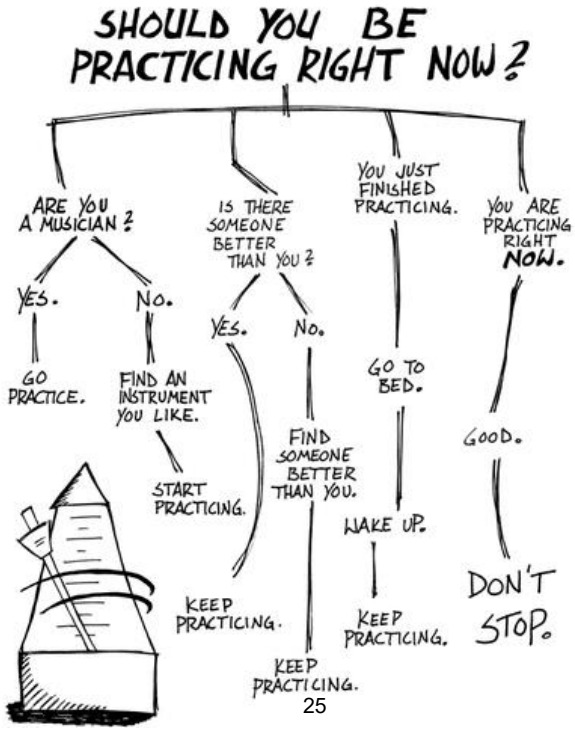


DYNAMICS



NOTE VALUES





KEYWORDS

Technique	ability and control of an instrument
Pitch	high or low sound
Timing	the ability to stay in time accurately
Rhythm	A repeated pattern of sound
Phrasing	the shape of a sequence of notes
Confidence	a belief in your ability to succeed
Repertoire	a collection of pieces
Musical Interaction	the relationship between performers
Practice	developing skills to aid performance
Strength	something you are good at
Weakness	something you need to develop
Time Management	planning and using your time sensibly and profitably – not wasting it
Consistency	always doing something
Focus	keeping your attention on one thing
Fluent	performing with no gaps or hesitations
Accurate	making no mistakes

Musical Elements - DR SMITH

Dynamics – volume
Loud, quiet, soft

Rhythm – long and short beats
Syncopation, dotted, swung, straight, off beat, back beat

Structure – organisation of the music
Verse/chorus, intro/outro, 12 bar blues

Melody – the tune
Stepwise, scalic, triadic, chromatic, leaping

Metre – how many beats in a bar
6 4 3
8 4 4

Instrumentation – the instruments used
Guitar, bass, drum kit, drum machine, voice, tech effects

Texture – the layers in the music
Melody and accompaniment, homophonic,

Tempo – speed
Fast, slow

Tonality – key
Major, minor, pentatonic

Harmony – chords
Chord sequence, power chords, parallel chords

1960s-1970's Rock Music

Rhythm - Opening drum fill, regular beat, syncopated not ostinato, back beat, 2/4, 4/4, 2/2, C, Common Time/Split Common Time,

Melody - short phrases, repetitive melodic ideas, 'hook' (in chorus/on words of title), riff, sequences

Styles:

Psychedelic rock – based on the culture of perception-altering hallucinogenic drugs like LSD, tries to recreate the experience

Heavy metal – loud, aggressive sounding, powerful chord sequences and repetitive driving rhythms, amplified distorted guitars

Rock 'n Roll – came before Rock Music, walking bass line, primary chords, developed from Blues

Film Music

Music contained in the action – digetic music e.g. radio on in the scene

Background music – underscoring, helps to establish mood, time, and place, supports dramatic development and character, moves action forward, adds to dramatic impact, provide continuity across edits

Micky Mousing

Use of Leitmotif

Instrumental colour is very important

Popular Music, Rock Music, Musicals, Film and Game Music

Game Music

Designed to repeat indefinitely

Lacking lyrics and playing over gameplay sounds

Limited polyphony for earlier game music - only three notes can be played simultaneously on the Nintendo so complex rapid sequences of notes.

Modern game music more cinematic

Including devices like fanfares, a hero's theme etc.

Pop music from 1990's to present

RnB - strong backbeat, use of drum machine, 4/4, clear melodic lines, repetitive phrases, use of melodic fills (at the end of vocal phrases), (mostly) consonant harmonies, clear harmonic progressions, sometimes use a hip hop beat (closed hi hat semiquavers, open on the off beat, hand clap off the beat)

Rock 'n Roll - steady / rock /4 beat / 8 beat rhythm, driving rhythm (in drum kit), emphasis on 2 & 4 / backbeat / off-beats, typically three guitars and drum kit, strong bass, repetitive melody lines, memorable 'hook'

Guitar based pop – 4/4 drum beat, drum fills, effects pedals on guitars (distortion) use of riffs and hooks, repeated chord sequences, **Soft Rock** (combined with folk music to produce softer sound), **Country** (acoustic instruments with vocal harmonies, often banjo or violin)

Music of Broadway 1950s to 1990s

4 main types of song: solo character, duet character, action song, chorus number

Ballads – slow romantic, reflective, comedy songs, - funny, music illustrates the lyrics, production numbers –full company, changes in location or plot

Themes based on original stories, Shakespeare, political themes

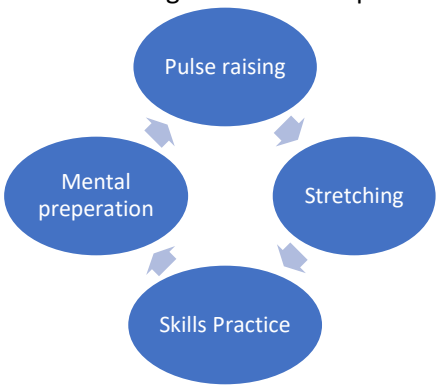
Songs often 32 bar form, often have a middle 8

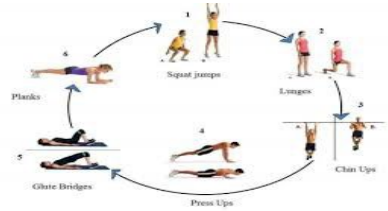
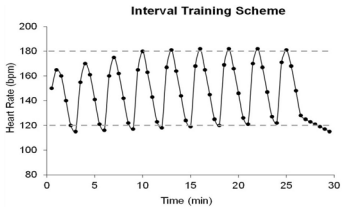
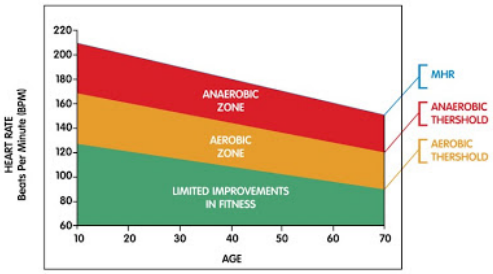
Catchy riffs and hooks, catchy melodic lines

Harmony and instrumentation will reflect the musical style e.g. jazz (Bernstein), Rock (We Will Rock You), etc.

Orchestral or band accompaniment

Word painting used to reflect the lyrics in the songs

Week 1	Week 2	Week 3	Week 4
Aerobic and Anaerobic system When we work **aerobically** it means we work **with oxygen.** **Glucose+Oxygen=Energy+CO2+water**  **Low to moderate intensity - Long distance running** When we work **anaerobically** it means we work **without oxygen or borrow oxygen.** **Glucose = Energy+Lactic acid**  **Short periods of time, less than 60 seconds – 100metre sprint.** **Excess post exercise consumption (EPOC) – The amount of energy needed to recover after anaerobic** **The Recovery Process:** • **Cool down** • **Manipulation of diet** • **Ice baths and Massage**	**Components of Fitness** **Health** A state if complete physical, mental and social well-being and not merely the absence of disease or infirmary. **Fitness** The ability to meet, or cope with the demands of the environment. **Components of Physical Fitness:** **Aerobic Endurance** – The ability of the heart, lungs and blood to transport oxygen to the working muscles whilst exercising. **Muscular Endurance** – The ability to use voluntary muscles repeatedly without tiring. **Strength** – The amount of force a muscle can exert against a resistance. **Flexibility** – The range of movement at a joint. **Components of Skill-related Fitness:** **Agility** – The ability to change the position of the body quickly and control the movement. **Balance** – The ability to maintain the body's centre of mass above the base of support. **Co-ordination** – The ability to use two or more body parts together. **Power** – The ability to perform a strength exercise quickly. **Reaction Time** – The time taken to respond to a stimulus. **Speed** – The ability to put body parts into motion quickly.	**Fitness testing** For each component of fitness there is a test you can do to see how good you are in each component. **Aerobic Endurance** – Multi-Stage Fitness Test/Cooper Run/ Bleep Test **Muscular Endurance** – 60 seconds sit up Test **Strength** – Hand Grip Dynamometer Test **Flexibility** – Sit and Reach Test **Speed** – 30 metre Sprint Test **Agility** – Illinois Test **Balance** – Standing Stork Test **Co-ordination** – Alternate Hand Wall Toss Test **Power** – Vertical Jump Test **Reaction Time** – Ruler Drop Test. **The reasons we fitness test** • Motivation • Providing variety • Establish a starting level of fitness & monitor improvement • Identify strengths and weaknesses **Limitations of fitness testing** • Tests are general • Do not replicate sporting movement • Conducted in Isolation • Must be carried out using the correct procedure to make valid. • Need high levels of motivation	**Warm up and Cool down** **Warm up:** A warm up prepares the body for the physical activity to follow. It also: • Raises the body temperature • Increases range of movement at the joints that will be used • Increases the amount of oxygen delivered to the working muscles. • Reduces the possibility of injury. There are 4 stages to a warm up:  **Cool Down:** Allows the body's systems to recover after exercise. Reducing the performers heart rate and breathing rate back to resting rates. Waste products like Lactic acid and Carbon dioxide need to be removed. A cool down will also prevent DOMS from happening. There are 2 stages to a cool down: • Pulse lowering • Stretching

Week 5	Week 6	Week 7	Week 8
Types of training **Circuit Training** – Circuit training can be really adaptable depending on what exercises you include. You will need to decide how many stations there will be and how long you want to exercise for at each station.  **Continuous Training –** This training is long, slow or steady-paced. Performers train at a steady-pace at a moderate intensity for at least 30 minutes. Running, cycling or rowing are examples.  **Plyometric Training -** This training develops explosive power and strength. It involves exercises which muscles are quickly and repeatedly contracted/shortened which produces great force.  **For all types of training you need to know the advantages/disadvantages and sports it would benefit.**	**Types of training continued** **Fartlek Training -** The meaning of Fartlek is 'speed play'. This training is performed outdoors with no rest. The performer varies the speed and goes over different terrains (beach, woodland, hills). 30 seconds hard → 1 minute steady 1 minute hard → 1 minute steady 90 seconds hard → 1 minute steady 2 minutes hard → 1 minute steady 90 seconds hard → 1 minute steady 1 minute hard → 1 minute steady 30 seconds hard → 1 minute steady **Interval training -** This training involves work periods with rest and recovery periods. You can vary the intensity and lengths of the work periods.  **Weight training** – This training involves the use of weights /resistance to cause adaptions to the muscles. There are 2 types of weight training: • Free weights • Resistance machines  **For all types of training you need to know the advantages/disadvantages and sports it would benefit.**	**Principles of training** **The SPORT Principle:** **S – SPECIFIC -** training must be **relevant** to the **individual** and their **sport.** **P – PROGRESSIVE –** This means the training needs to get harder over time. **O – OVERLOAD –** This can be used through the FITT principle. You can overload through frequency, intensity, time and type. **R – REVERSIBILTY -** systems **reverse** or de-adapt if training stops or is significantly reduced or injury prevents training from taking place. **T – TEDIUM –** Training needs to be varied to stop boredom from taking place. **The FITT Principle:** A way in which you can adapt your training. Through **Frequency** *(how much),* **Intensity** *(how hard),* **Time** *(how long)* **and Type** *(what type).* **F – FREQUENCY** – The number of training sessions you complete over a period of time. **I – INTENSITY** – How hard you train. This can be done through heart rate or reps per exercise. **T – TIME** – How long you train for. Aim for 15 to 60 mins. This can depend on the intensity of the exercise. **T – TYPE** – Appropriate types of training should be used depending on your needs and goals.	**Training Thresholds**  One of the most effective ways to measure intensity and working hard enough to make fitness gains. **BPM = Beats per minute.** **MHR = Maximum heart rate** To work out your maximum heart rate (MHR) = 220- age There are two training zones that you Aerobic training zone and Anaerobic training zone. If you work in the aerobic training zone (with oxygen) you work between 60-80% of your MHR. If you work in the anaerobic training zone (without oxygen) you work between 80-90% of your MHR.

A. Visual Elements Keywords

Line	Line is the path left by a moving point. A line can be horizontal, diagonal or curved and can also change length.
Shape	A shape is an area enclosed by a line. Shapes can be geometric or irregular.
Form	Form is a three dimensional shape, such as a cube, sphere or cone.
Tone	This refers to the lightness or darkness of something. This could be a shade, or how dark or light a colour appears.
Texture	This is to do with the surface quality of something. There are two types of texture: Actual texture really exists, so you can feel it or touch it; Visual texture is created using marks to represent actual texture.
Pattern	A design that is created by repeating lines, shapes, tones or colours.
Colour	Red, yellow and blue are primary colours, which means they can't be mixed using any other colours.

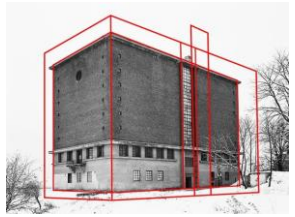
B. Key Knowledge 1: RULES of COMPOSITION

- ❑ **Rule of Thirds**
- ❑ **Balancing Elements**
- ❑ **Leading Lines**
- ❑ **Symmetry & Patterns**
- ❑ **Viewpoint**
- ❑ **Background**
- ❑ **Depth**
- ❑ **Framing**
- ❑ **Cropping**
- ❑ **Experimentation**

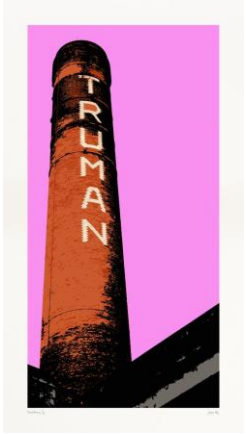
Tick once you have shown evidence of these in your photo shoots and edits

E. Expert Modelling:

Tom Manley



Alexey Bogolepov



Miles Donovan

Jayson Lilley

What Visual Elements / Rules of Composition can you see in this work?

GCSE PHOTOGRAPHY YEAR 10 – URBAN LANDSCAPES

Threshold Concepts:

1. Artists make marks, drawing our attention

2. Art communicates, in every sense

6. Art engages head, hands and heart

C. Key Knowledge 2: tick once you have used these techniques in Photoshop

- ❑ Adjusted and image to black and white showing various edits and grades of contrast
- ❑ Combined two or more images together manually and digitally
- ❑ Adjusted the colour of an image
- ❑ Imported hand made textures into Photoshop
- ❑ Combined and experimented all above techniques to create a digital image

D. Key Knowledge 3

How can Photography be used in different ways?

Why do we Photograph things / people / places?

How has Photoshop changed Photography?

What different jobs can you do as a Photographer?

F. Wider thinking / further reading:

https://www.youtube.com/watch?v=n9oYwTMtAlw

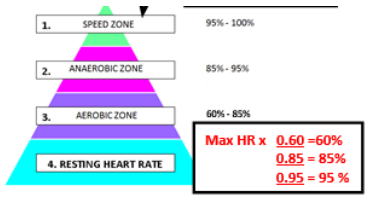
Check out these helpful video tutorials in Photoshop

Year 10 Spanish Knowledge Organiser cycle 1

Complete your weekly assignment on Seneca

Extensions:

- Create revision cards for each of the main tenses studied to help you remember how to form them.
- Find a picture in a magazine/online and write a photo description
- Do 10 minutes of Duolingo every day to build your vocabulary
- Write a glossary of vocabulary we see in class – memorise it and test yourself at home.

	Week 1	Week 2	Week 3	Week 4	Week 5
BTEC SPORT UNIT 1	**Components of Fitness Learning aim A** **Physical Fitness** 1. Body Composition 2. Aerobic Endurance 3. Strength (Muscular) 4. Speed 5. Flexibility 6. Muscular Endurance **Skill - related Fitness** 1. Co-ordination 2. Reaction time 3. Agility 4. Balance 5. Power Can you link these components to different sports?	**Exercise Intensity Learning aim A** 220-Age=Max HR Training Pyramid  **BORG Scale – Rating of Perceived Exertion (RPE)**  RPE x 10 = Heart rate bpm E.g Level 13 x 10 =130bpm	**Principles of Training Learning aim A** **FITT Principle** Frequency – How often do you train? (How many times a week) Intensity – How hard do you train? (Heart rate/pyramid, BPM, BORG scale RPE) Time – How long you train for? (min. 30mins) Type – What type of training method (e.g. weight, circuit, interval…?) **SPARRV Principle** Specificity – training specific to the individual needs of athlete (Sport, Position, Component of fitness, Age, Gender) Progressive Overload – Make training gradually harder so body gradually improves and adapts (increase *FREQUENCY/INTENSITY/TIME)* Adaptation – Body adapts in response to training (gets stronger because of strength training etc.) Rest and Recovery –Allows adaptation to take place and to avoid injuries due to fatigue/tiredness (have rest days) Reversibility – Body will reverse back if training is stopped for a prolonged time (illness, injury, and motivation) Variation – Training must be varied to avoid boredom (use different *TYPEs* of training methods)	MID CYCLE ASSESSMENT OF LEARNING AIM A List 3 areas you need to improve on from Learning aim A 1 2 3 **Learning aim B** **Warm up** - Pulse raiser, stretches, joint mobilisation **Cool down** – Pulse lowering, Static stretches, Developmental stretches (PNF)	**Flexibility training** **1. Static Stretching – Active (you), Passive (someone/thing else)** **2. Ballistic Stretching – bouncing, actions** **3. PNF Stretching – stretch, hold, tension, stretch further** **Strength, muscular endurance and power training** **1. Free weights – Sets, reps, barbell, dumbbell** **2. Circuit Training – stations** **3. Plyometric – bouncing, throwing, jumping**

	Week 6	Week 7	Week 8	Week 9	Week 10
BTEC SPORT UNIT 1	**Aerobic Endurance Training** **1. Continuous training – non-stop 30 mins** **2. Fartlek Training – 'Speed play', slow, medium, fast/different terrain** **3. Interval Training – work, rest, work, rest** **Speed Training** **1. Hollow Sprint - broken up by 'hollow' lower level work** **2. Acceleration Sprints - jogging to striding and finally to sprinting at maximum speed.** **3. Interval Training -– work, rest, work, rest**	MID CYCLE ASSESSMENT OF LEARNING AIM A List 3 areas you need to improve on from Learning aim A 1 2 3 **Learning aim C** Why are tests important? Pre-test procedures: • Consent • Calibration of equipment Accurate measurements and recording results Reliability, validity and practicality	**Muscular Endurance** **Sit up and press up tests** Count how many sit ups or press-ups completed in 1 minute ✓ Quick and easy ✓ Little equipment ✓ Large groups at once ➢ Arguments of correct technique can affect results **Power** **Vertical Jump test** Stand side on to wall reach up and mark/set the measure. Standing jump as high as possible touching wall. Measure between two marks/measures ✓ Quick and easy ➢ Technique can affect result as need to jump and mark wall **Strength** **Grip dynamometer** 3 attempts, squeeze grip dynamometer measure result in Kg or KgW. ✓ Simple and easy test ✓ Lots of normative data ➢ Must be adjusted for hand size which may affect results **Flexibility** **Sit and Reach test** Both feet against the **sit and reach box**, reach forward and measure result in centimetres ✓ Well known test ✓ Quick and easy to perform ➢ measures lower back & hamstrings only ➢ length of arms and legs affect results	**Agility** **Illinois Agility test** Cones set up as in the image, lie face down on the floor at the start, measure time to complete course in seconds ✓ Cheap and easy to conduct ➢ Human error with timing can affect results ➢ Weather or surface conditions can affect results **Speed** **35m sprint test** Sprint from one line/cone to another in a straight line over 35m. Record time and compare to normative data ✓ Little equipment so cheap to run ➢ Human error when timing can affect results **Aerobic Endurance** **Multi Stage Fitness Test (MST/Bleep test)** Cones/Lines **20m apart**, run in-between to the sound of a beep. **Gradually gets faster**. Longer you can keep up the higher the level ✓ Can test a large group at once ✓ Tests to maximum effort ➢ Practice can affect score ➢ If outside environment may affect ➢ Scores can be subjective **Forestry Step Test** Step/ bench- 33cm for females and 40cm for males. Step up and down for 5 minutes to a metronome. **(90bpm/22.5steps a min)**. Record pulse and compare to table ✓ Low cost ✓ Can be performed inside or outside ✓ Can test on your own ➢ People may struggle to keep with the stepping pace on metronome	**Body Composition** **Body Mass Index (BMI)** $BMI = \frac{\text{Weight (kg)}}{\text{Height (m)} \times \text{Height (m)}}$ ➢ Easy to carry out ➢ Results can be misleading as muscles weighs more than fat **Bioelectrical Impedance Analysis (BIA)** BIA = electricity passed through body from **WRIST** to **ANKLE.** Measures the resistance from muscle and fat ✓ Quick and gives instant results ✓ Can be repeated over time with no bad effects ➢ Needs expensive equipment **Sum of Skinfolds** Use **CALLIPERS** to measure skin on the **BICEP, TRICEP, SHOULDER BLADE** and **HIP.** Add measurements together and use to the **JACKSON-POLLOCK** nomogram (4 lines) • Provides accurate percentages of body fat ➢ Needs specialist equipment ➢ Problems with people revealing bare skin

F. Decorative Techniques

Appliqué	When one shape of fabric is sewn on top of another piece of fabric, it can be attached using hand stitching or zig-zag machine stitch.
Transfer print	An image from the computer is printed onto paper and then transferred to fabric using a heat press.
Tie dye	A resist dye technique-elastic bands are put around fabric and then placed in dye to create interesting patterns where the elastic bands have been.
Reverse appliqué	Fabric is layered and then a design or pattern is cut into the top layers to reveal the fabrics underneath
Hand embroidery	Using a needle and thread to create patterns or pictures or word with stitches
Batik	Another resist dye method, hot wax is used to draw onto fabric, then dye is painted onto the fabric. Where the wax is the dye will not soak in, and when the wax is removed, white lines remain.
Fabric pens/paints/ crayons	Dye can be applied straight to fabric by pens, paints or crayons, often they need "fixing" (setting of the dye so it won't come out) this is done with heat.
CAD CAM machine embroidery	This is using an automated sewing machine to create words or pictures onto fabric. The machine have some pre programmed designs but your own designs can be up loaded to the machine too if you have he correct software.

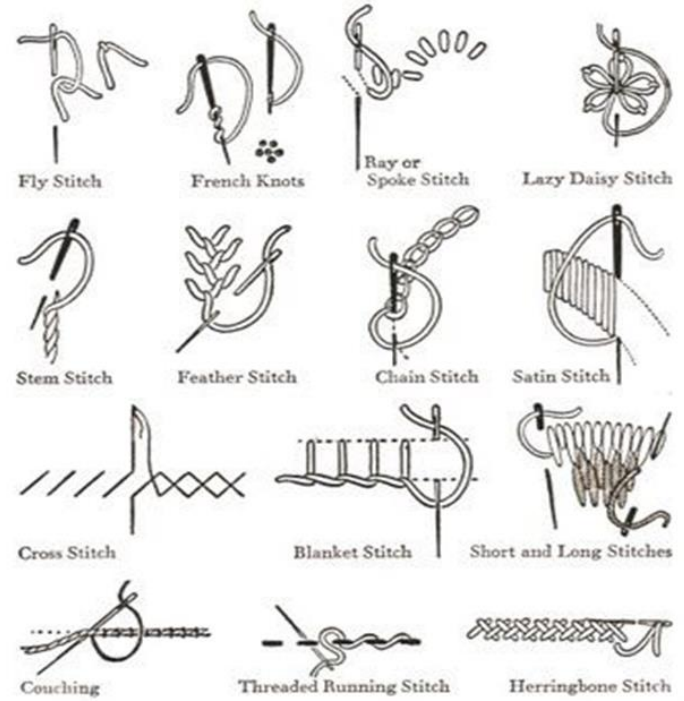
G. Label the Equipment

H. Exemplars:

"In all things of nature there is something of the marvellous" Aristotle

ART & DESIGN
Project – YEAR 10 TEXTURE & THE NATURAL ENVIRONMENT

I. Key Knowledge: Decorative stitches

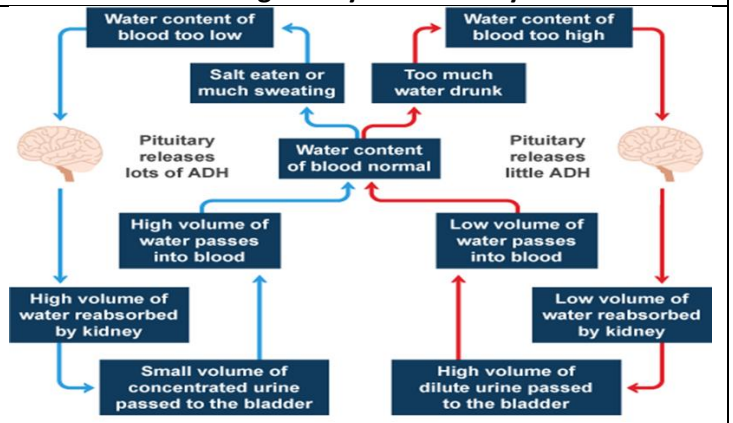
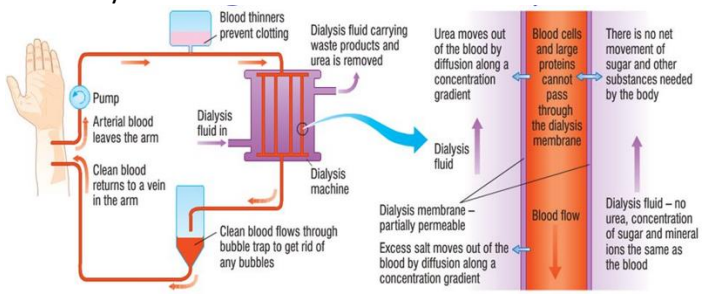


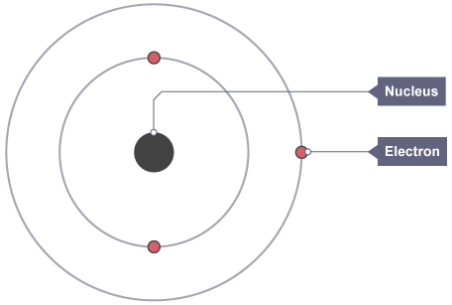
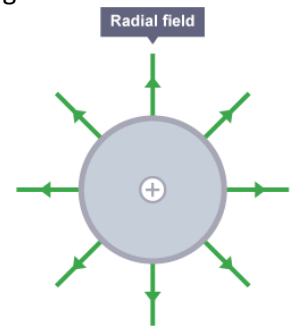
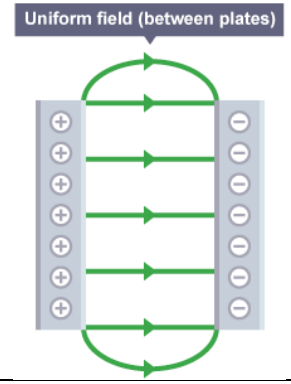
J. Common key words used in annotation

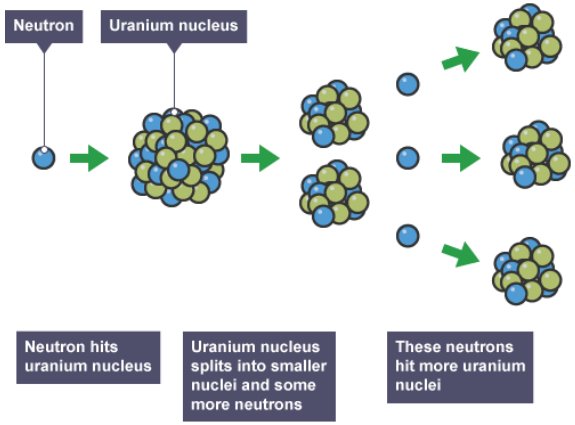
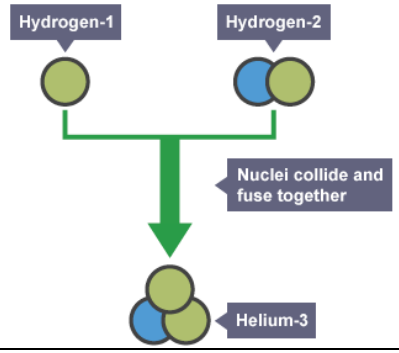
Contrasting	Fastenings
Composition	Interesting
Details	Intricate
Developed	Manipulated
Embroidery	Piece
Experimented	Textures
Evaluation	Unusual

Revision Guide: Foundation pages 57-60, Higher pages 58-61

Lessons 1 & 2 Plant hormones and responses	Lessons 3 & 4 Using plant hormones	Lessons 5 & 6 Controlling body temperature
Plants produces hormones to coordinate and control. **Positive tropism**: a plant grows towards the stimulus **Negative tropism**: a plant grows away from stimulus. Responses to light are called **phototropism** -Light is the stimulus -**Positive phototropism** is where plants grow towards light -**Negative phototropism** where roots grow away from light. Responses to gravity is called **gravitropism** -Gravity is the stimulus -**Negative gravitropism** is where shoots grow away from gravity -**Positive gravitropism** is where roots grow towards gravity. **Auxin** is the name of plant hormone responsible for unequal growth in roots and shoots. In shoots auxin stimulates growth. In roots auxin slows growth rate down.	**Gibberellins** are important in initiating seed germination. **Ethene** controls cell division and ripening of fruits **Using plant hormones:** **Rooting powder**-contains growth hormones to make stem cuttings develop roots quickly. **Weed killer**-Selective weed killers contain growth hormones that cause the weeds to grow too quickly and then die. **Promoting growth in tissue culture**- using hormones will help encourage tissues from plants growth by stimulating cell division. **Ethene** is used in the food industry to control ripening of fruit during storage and transport. **Gibberellins** can be used to: -End seed dormancy -Promote flowering -increase fruit size.	Body temperature is monitored and controlled by the **thermoregulatory centre** in the **hypothalamus** in the brain. Thermoregulatory centre contains receptors sensitive to the temperature of the blood. The skin contains temperature receptors and sends nervous impulses to the thermoregulatory centre. If body temperature is too high, blood vessels dilate (vasodilate) and sweat is produced from the sweat glands. Water evaporated from skin transferring energy to the environment. Skin flushes: so that you transfer more energy by radiation. These mechanisms cause a transfer of energy from the skin to the environment. If the body temperature is too low, blood vessels constrict (vasoconstriction), sweating stops and skeletal muscles contract (shiver).

Lessons 7 & 8 Removing waste products	Lessons 9 & 10 Kidneys	Lessons 11 & 12 Treating kidney failure: Dialysis
Water leaves the body via the lungs during exhalation. Water, ions and urea are lost from the skin as sweat There is no control about the water, ions and urea loss by lungs and skins. Excess water, ions and urea are removed by the kidneys in the urine. Water levels in the blood need to stay the same. Too much water in the blood and water will move in to the cells by osmosis. The cells will swell and burst (lysis). Too little water or there is too little solute, water will move out of cells by osmosis, blood cells will shrink (crenation). Urea formation: Proteins are broken down in to amino acids. Amino acids are used for growth and repair, excess is broken down in the liver. Ammonia is formed, this is called deamination. Ammonia is toxic, it is converted in to urea. Urea is excreted from body through sweat and urine via the kidneys.	Kidneys have a role in **homeostasis** to maintain the water balance of the blood (**osmoregulation**). Kidneys produce urine by **filtration** of the blood and **selective reabsorption** of useful substances such as glucose, some ions and water. Kidneys act like filters in a process called **filtration**. -Glucose, mineral ions, urea and water all move out of the blood in to the kidney. -This produces filtrate. -Proteins and blood cells remain in the blood as they are too large. **Selective reabsorption** -Glucose is reabsorbed in to the blood by diffusion and active transport. -The amount of water and ions reabsorbed varies depending on what the body needs. The waste products that the kidneys don't want to put back in to the blood becomes urine. Urine contains all the urea, an amount of water not required by the body and some ions not required by the body. Urine is sent to the bladder for storage via the ureter. **Anti Diuretic Hormone (ADH):** hormone which controls the water levels in the body. Produced by the pituitary gland.	 Kidneys may become damaged by infection, genetic issues or damaged due to an accident. -Can be fatal -Toxins (urea) build up -Water and ion balance is not maintained -Cells can be damaged by osmosis Dialysis is where the function of the kidneys is carried out artificially.  Kidney transplant: where the kidney is replaced with a healthy one.

Lesson 1 Electrostatic forces	**Lesson 2** Electric fields
Atoms are made of charged protons and electrons and neutral neutrons.  Atoms have no overall charge, but if it loses or gains an electron it becomes a charged ion. Electrons can be transferred between insulators due to friction. This results in a material which gains electrons and becomes negative and one which loses electrons and becomes positive. Objects that are charged can affect other charge objects due to static electricity, which produces the non-contact electrostatic force. Opposite charges lead to a force of attraction (attract). Like charges lead to a force of repulsion (repel). Neutral (uncharged) objects may also be attracted to charged objects (regardless of whether the object itself is positively or negatively charged.) The forces will be larger when the objects are closer together.	The region where charges experience a force is called an electric field. Electric fields are shown in diagrams with field lines. The arrows on these lines show the direction a positive charge will move in the field. The closer the field lines are together, the stronger the force. The field around a point charge is radial:  The field between two parallel plates is uniform: 

Lesson 1 Uses of radioactivity	**Lesson 2** Activity and half-life	**Lesson 3** Fission and Fusion
Background radiation is the low-level constant exposure to radiation that occurs naturally. That majority of background radiation is from natural sources including rocks and cosmic rays. Around 12% of background radiation is due to artificial sources, largely from medical applications. Exposure to radiation, called dose, is masured in Sievert (Sv). 1 Sv is the amount of damage caused by absorbing 1 joule of energy in each kg of body mass. Doses are usually given in mSv (1000 mSv = 1Sv). Radioactive isotopes can be used in a number of ways: • Sterilising food and surgical equipment • Treatment of cancers • Medical tracers and medical imaging (gamma camera) • Inspecting underground pipes for leaks • Smoke detectors The choice of source used will depend on: • The type of radiation emitted (and how far/through what it must travel) • The half-life • Whether it is toxic/poisonous	Radioactive isotopes have a very wide range of half-life values. Sources containing nuclei that are most unstable have the shortest half-lives. The decay is rapid with a lot of radiation emitted in a short time. A radioactive isotope with a short half-life will have a high activity as a result. Sources with nuclei that are least unstable have the longest half-lives. These sources emit little radiation each second but emit radiation for a long time. Nuclei with short half-lives are still found on Earth because radioactive decays occur in long “chains” where one isotope decays into another. The decay of an isotope with a long half-life can produce one with a short half-life.	Nuclear fission is the splitting of a large atomic nucleus in to smaller nuclei.  All of the fission products have kinetic energy. The neutrons may go on to start a chain reaction. The chain reaction is controlled in a nuclear reactor to control the energy released. The explosion caused by a nuclear weapon is caused by an uncontrolled chain reaction Nuclear fusion wis when two small, light nuclei join together to make one heavy nucleus. 

Y10 Triple Science Chemistry
Cycle 2 – Acids and Alkalis

Lesson 1 Recap on Acids and Alkalies	Lesson 2 Neutralisation	Lesson 3 Strong and weak Acids
Acidic and alkaline solutions **Acids** Acids form acidic solutions in water. Acids produce hydrogen ions, H^+ in aqueous solution. For example: $HCl(aq) \rightarrow H^+(aq) + Cl^-(aq)$ Acidic solutions have pH values less than 7. **Alkalis** Alkalis form alkaline solutions in water. Alkalis produce hydroxide ions, OH^- in aqueous solution. For example: $NaOH(aq) \rightarrow Na^+(aq) + OH^-(aq)$ Alkaline solutions have pH values greater than 7. **Neutral solutions** A neutral solution is neither acidic, nor alkaline. A neutral solution has a pH value of 7. **Indicators and the pH scale** The pH scale measures the acidity or alkalinity of a solution. The pH of a solution can be measured using a pH probe, or estimated using universal indicator and a colour chart.	**Neutralisation** **Bases and alkalis** A base is any substance that reacts with an acid to form a salt and water only. This means that metal oxides and metal hydroxides are bases. Bases that are soluble in water are called alkalis and they dissolve in water to form alkaline solutions. For example: • copper oxide is a base, but it is not an alkali because it is insoluble in water • sodium hydroxide is a base, and it dissolves in water so it is also an alkali	**Strong and weak acids** **Acids in solution are a source of hydrogen ions, H^+. The hydrogen ions are produced when the acid dissociates or breaks down to form ions.** Strong acids completely dissociate into ions in solution. For example, hydrochloric acid is a strong acid. It ionises completely to form hydrogen ions and chloride ions: $HCl(aq) \rightarrow H^+(aq) + Cl^-(aq)$ Nitric acid and sulfuric acid are also strong acids. Weak acids only partially dissociate in solution. For example, ethanoic acid is a weak acid. It is only partially ionised to form hydrogen ions and ethanoate ions: $CH_3COOH(aq) \rightleftharpoons H^+(aq) + CH_3COO^-(aq)$ The $\rightleftharpoons$ symbol is used in the equation to show that the reaction is a reversible reaction and does not go to completion. **pH and Hydrogen Ion Concentration- The pH of a solution is a measure of its concentration of hydrogen ions:** • the higher the concentration of H^+ ions in an acidic solution, the lower the pH • the lower the concentration of H^+ ions in an acidic solution, the higher the pH This means that, for a given concentration in aqueous solution, the stronger an acid, the lower the pH.

<table>
<tr><th>Lesson 4
Titration</th><th>Lesson 5
Required Practical</th><th>Lesson 6
Titration Calculations</th></tr>
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Making salts from acids and alkalis

A soluble salt can be prepared by reacting an acid with a dilute solution of an alkali such as sodium hydroxide or ammonia. The main steps are:

1. Carry out a titration. This is to determine the volumes of acid and alkali that must be mixed to obtain a solution containing only salt and water.
2. Mix the acid and alkali in the correct proportions, as determined in step 1, but this time without including an indicator.

Pure dry crystals can be produced by crystallisation, followed by drying on a watch glass or in a warm oven.

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Carrying out a titration to find out volumes of acid and alkali solutions that react

The apparatus needed includes:

- a pipette to accurately measure the volume of a reactant before transferring it to a conical flask
- a burette to add small, measured volumes of one reactant to the other reactant

Method

This is an outline method for carrying out a titration in which an acid is added to an alkali. The method is the same for sulfuric acid, hydrochloric acid and nitric acid.

1. Use the pipette and pipette filler to add a measured volume of sodium hydroxide solution to a clean conical flask.
2. Add a few drops of indicator and put the conical flask on a white tile.
3. Fill the burette with hydrochloric acid and note the starting volume.
4. Slowly add the acid from the burette to the alkali in the conical flask, swirling to mix.
5. Stop adding the acid when the end-point is reached (when the indicator first permanently changes colour). Note the final volume reading.
6. Repeat steps 1 to 5 until concordant titres are obtained. More accurate results are obtained if acid is added drop by drop near to the end-point.

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Titration calculations - Higher

The results of a titration can be used to calculate the concentration of a solution, or the volume of solution needed

$$\frac{V_1 \times C_1}{N_1} = \frac{V_2 \times C_2}{N_2}$$

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<tr><th>Lesson 7
Chemical cells + Batteries</th><th colspan="2">Lessons 8 and 9
Fuel cells</th></tr>
</table>

Chemical cells

Chemical cells use chemical reactions to transfer energy by electricity. The voltage of a cell depends upon a number of factors, including what the electrodes are made from, and the substance used as the electrolyte.

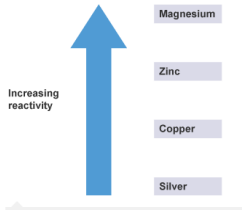
A simple cell can be made by connecting two different metals in contact with an electrolyte. A number of cells can be connected in series to make a battery, which has a higher voltage than a single cell.

In non-rechargeable cells, eg alkaline cells, a voltage is produced until one of the reactants is used up. When this happens, we say the battery 'goes flat'.

In rechargeable cells and batteries, like the one used to power your mobile phone, the chemical reactions can be reversed when an external circuit is supplied.

What affects the voltage of a cell?

Here is a simple reactivity series:



If we connect different combinations of these metals to make a cell, we find that the voltage changes. In the below table, the positive electrodes and what they are made from are listed along the top and the negative electrodes along the side.

Fuel cells

Fuel cells work in a different way than chemical cells. Fuel cells produce a voltage continuously, as long as they are supplied with:

- a constant supply of a suitable fuel
- oxygen, eg from the air

The fuel is oxidised electrochemically, rather than being burned, so the reaction takes place at a lower temperature than if it was to be burned. Energy is released as electrical energy, not thermal energy (heat).

Hydrogen-oxygen fuel cells

Hydrogen-oxygen fuel cells are an alternative to rechargeable cells and batteries. In a hydrogen-oxygen fuel cell, hydrogen and oxygen are used to produce a voltage. Water is the only product.

The overall reaction in a hydrogen-oxygen fuel cell is:

hydrogen + oxygen → water

$2H_2(g) + O_2(g) \rightarrow 2H_2O(l)$

Electrode half equations – Higher Tier only

At the negative electrode: $2H_2 + 4OH^- \rightarrow 4H_2O + 4e^-$

At the positive electrode: $O_2 + 2H_2O + 4e^- \rightarrow 4OH^-$

When you add these two half equations together, you get the following overall equation:

$2H_2 + 4OH^- + O_2 + 2H_2O + 4e^- \rightarrow 4H_2O + 4e^- + 4OH^-$

The hydroxide ions, electrons and two H_2O molecules will now cancel because they are on both sides, leaving the overall equation:

$2H_2 + O_2 \rightarrow 2H_2O$

Evaluating Different Fuel Cells

Fuel cells have different strengths and weaknesses, depending on the intended use. For example, fuel cells are used in spacecraft and vehicles.

Fuel cells in spacecraft

Hydrogen-oxygen fuel cells are used in spacecraft. In addition to the strengths in the table above, the water they produce is useful as drinking water for astronauts.

Hydrogen-oxygen fuel cells must be supplied with hydrogen fuel and oxygen. This could be a problem once a spacecraft leaves the Earth. However, spacecraft in orbit, such as the International Space Station, have solar cells. These convert light into electricity, so the hydrogen and oxygen can be replaced by the electrolysis of water.

Solar cells only work when they are in the light, so the fuel cells allow electricity to be produced even when the spacecraft is in the dark.