Holy Family Catholic High School

BTEC Forensic Investigation

A guide to help you prepare yourself for studying BTEC Forensic Investigation

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QUALIFICATION	**Pearson BTEC Level 3 National Foundation Diploma in Forensic and Criminal Investigation**
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Exam board and link	Pearson BTEC Level 3 National Diploma in Forensic and Criminal Investigation
Specification details	603/0246/X Forensic Science is defined as any scientific process used as part of a criminal investigation. This could be anything from dealing with remains in an autopsy room to the painstaking work involved in DNA profiling and fingerprint analysis The main purpose of the qualification is to provide learners with the knowledge, understanding and skills in key scientific principles to support progress to higher education or employment in areas of forensic and analytical science, such as job roles in laboratories, school or hospitals. The qualification covers the key topic areas of forensic investigation. In order to achieve the Level 3 Applied Foundation Diploma in Forensic Science learners are required to complete 6 units: • Principles and Applications of Science • Practical Scientific Procedures and Techniques • Science investigation Skills • Forensic Procedures in Practice • Environmental Forensics • Forensic Genetics
The BTEC course you are about to embark on will enable you to discover different ways of studying and learning. For example:	• Group/Pair work Discussions • Class debates • Student presentations • Research Projects • Media – film / music / interactive websites • Role play • Replication of studies • Independent study/reading • Extended writing • Quizzes and games

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Vocational vocabulary

A challenge for many vocational students is the comprehension of command words and the ability to respond appropriately to a range of different command words, often being unable to separate terms such as analyse and evaluate. Below are some common key terms, with explanations created as a result of research, training events and examiner reports. This should help you to get a better grasp of what each command word requires you to do.

Command Word	Meaning/Expected Skill
State	A recall-based skill for your exam; usually only constitutes a one, two or three word response. Developed explanation is not required.
Describe	Requires you to give basic facts or recall knowledge on a simple level. Examples may be required but the impact or an analysis of the issues is not required.
Identify	An exam skill requiring students to "find" pieces of information within a scenario. This is a lower order skill and does not require in depth evaluation or analysis.
Complete	Complete or in other words fill in the blanks. This could mean one of two things. Students may be required to complete calculations and place the answer in the correct place. However, it may require students to fill in missing gaps of written answers.
Calculate	Again, an exam-based command word. Some formulae given, sometimes students will have to remember a formula in order to tackle the question effectively.
Analyse	Can be both a coursework and exam-based command word. Analysing will usually require you to give multiple positive and negative impacts of a certain scenario or situation. It is useful to offer a small conclusion on your findings or thoughts.
Explain	Explain is an extension of state and in an exam would usually carry 2 or 3 marks. Rather than just stating some information, students are expected to give a reason why they believe this to be true/false etc.
Evaluate	Again, this can be an exam-based or coursework command word. Similar to analyse in the sense that multiple positives and negatives of scenarios will need to be discussed. However, in this case students may be required to make comparisons between scenarios, giving opinions on what they feel are stronger/weaker or more positive/negative given a certain scenario. A conclusion is required.

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Transition activities – Task 1

Cells (Unit 1)

The cell is a unifying concept in biology, you will come across it many times during your two years of science study. Prokaryotic and eukaryotic cells can be distinguished on the basis of their structure and ultrastructure. In complex multicellular organisms, cells are organised into tissues, tissues into organs and organs into systems. During the cell cycle, genetic information is copied and passed to daughter cells. Daughter cells formed during mitosis have identical copies of genes, while cells formed during meiosis are not genetically identical.

Plugging the gaps!

EVERYONE must read the information on this webpage (you could make more Cornell notes if you wish):

If you did Combined Science **Foundation** you also must look at these webpages (if you did **Higher,** you should already know this)

- Cell measurement - Cell structure - AQA - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize
- Chromosomes and DNA - Cell division - AQA - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize

If you did **Combined Science Higher or Foundation** you also must look at these webpages (if you did Separate Science, you should already know this) -

- Cell measurement - Cell structure - AQA - GCSE Biology (Single Science) Revision - AQA - BBC Bitesize

And take a look at these videos:

- https://www.youtube.com/watch?v=gcTuQpuJyD8
- https://www.youtube.com/watch?v=L0k-enzoeOM
- https://www.youtube.com/watch?v=qCLmR9-YY7o

Task:
Produce a one-page revision guide summarising one of the following topics: Cells and Cell Ultrastructure, Prokaryotes and Eukaryotes, or Mitosis and Meiosis.
Whichever topic you choose, your revision guide should include:

Key words and definitions
Clearly labelled diagrams
Short explanations of key ideas or processes.

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Transition activities – Task 2

Atomic Structure (Unit 1)

Ideas about atoms have changed over time. Scientists developed new atomic *models* as they gathered new experimental evidence.
John Dalton published his ideas about atoms in 1803. He thought that all matter was made of tiny particles called *atoms*, which he imagined as tiny spheres that could not be divided.

Plugging the gaps!

EVERYONE must read the information on this webpage (you could make more Cornell notes if you wish):

If you did Combined Science **Foundation** you also must look at these webpages (if you did **Higher,** you should already know this)

- Atomic structure and the periodic table - GCSE Combined Science Revision - AQA Trilogy - BBC Bitesize

If you did **Combined Science Higher or Foundation** you also must look at these webpages (if you did Separate Science, you should already know this) -

- Physical properties of transition elements - Transition metals - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize

Task:
Produce a one-page revision guide summarising <u>one</u> of the following topics: Atomic structure, Arrangement of electrons or the Layout of the periodic table and periodicity
Whichever topic you choose, your revision guide should include:

Key words and definitions
Clearly labelled diagrams
Short explanations of key ideas or processes.

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Transition activities – Task 3

Waves and Communication (Unit 1)

Waves are one of the ways in which energy may be transferred between stores. Waves can be described as *oscillations*, or *vibrations* about a rest position. For example:

- sound waves cause air particles to vibrate back and forth
- ripples cause water particles to vibrate up and down

The direction of these oscillations is the difference between longitudinal or transverse waves.
In *longitudinal waves*, the vibrations are parallel to the direction of wave travel. In *transverse waves*, the vibrations are at right angles to the direction of wave travel.

Plugging the gaps!

EVERYONE must read the information on this webpage (you could make more Cornell notes if you wish):

If you did Combined Science **Foundation** you also must look at these webpages (if you did **Higher,** you should already know this) -

- Waves - GCSE Combined Science - BBC Bitesize

If you did **Combined Science Higher or Foundation** you also must look at these webpages (if you did Separate Science, you should already know this) -

- Longitudinal waves - Transverse and longitudinal waves - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize
- Sound waves - Sound waves - AQA - GCSE Physics (Single Science) Revision - AQA - BBC Bitesize

Task:
Produce a one-page revision guide summarising one of the following topics: Longitudinal and transverse waves or Wave Properties
Whichever topic you choose, your revision guide should include:

Key words and definitions
Clearly labelled diagrams
Short explanations of key ideas or processes.

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Transition activities – Task 4

Analytical Techniques – Preparation for Coursework (Unit 2)

Research the following analytical techniques and include what the procedure identifies, how the procedure is performed, what the results of the procedure look like, how the results are interpreted and the limitations of the test.

- Titration
- Calorimetry
- Colorimetry
- Chromatography

Plugging the gaps!

EVERYONE must watch the videos on this playlist (you could make more Cornell notes if you wish):

If you did Combined Science **Foundation** you also must look at these webpages (if you did **Higher,** you should already know this) -
The mole - Higher - Calculations in chemistry (Higher) - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize

If you did **Combined Science Higher or Foundation** you also must look at these webpages (if you did Separate Science, you should already know this) -

- Relative formula mass - Calculations in chemistry - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize
- Atom economy - Atom economy, percentage yield and gas calculations - AQA - GCSE Chemistry (Single Science) Revision - AQA - BBC Bitesize

Task:

- **Produce a one-page revision guide summarising <u>one</u> of the topics listed above (Titration, Calorimetry, Colorimetry, Chromatography)**

Whichever topic you choose, your revision guide should include:

Key words and definitions
Clearly labelled diagrams
Short explanations of key ideas or processes.

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TED Talks

A forensic anthropologist who brings closure for the "disappeared"	In Guatemala's 36-year conflict, 200,000 civilians were killed — and more than 40,000 were never identified. At the Forensic Anthropology Foundation of Guatemala, Fredy Peccerelli and his team use DNA, archaeology and storytelling to help families find the bodies of their loved ones. It's a sobering task, but it can bring peace of mind — and sometimes, justice.	
King Richard III: Solving a 500-year-old cold case	In 1485, King Richard III of England was killed in battle and hastily buried in Leicester. But during the English Reformation, his remains were lost ... for five centuries, until a cross-disciplinary team from the University of Leicester set out to relocate them. In a delightfully detailed talk full of archaeology, forensic science, royal genealogy and the occasional history pun, geneticist Dr. Turi King tells the story of how the team found and identified the bones of the last of the Plantagenets.	
How vultures can help solve crimes	Can a bird that symbolizes death help the living catch criminals? In this informative and accessible talk, forensic anthropologist Lauren Pharr shows us how vultures impact crime scenes -- and the assistance they can provide to detectives investigating murders.	

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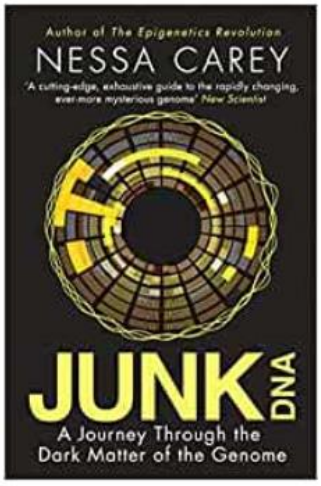
Book Recommendations

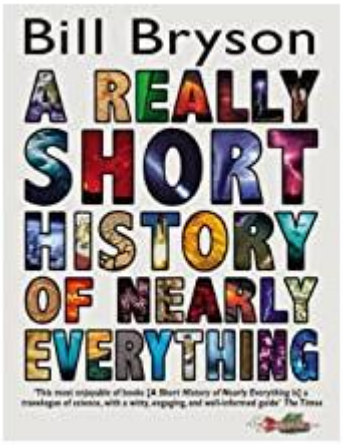


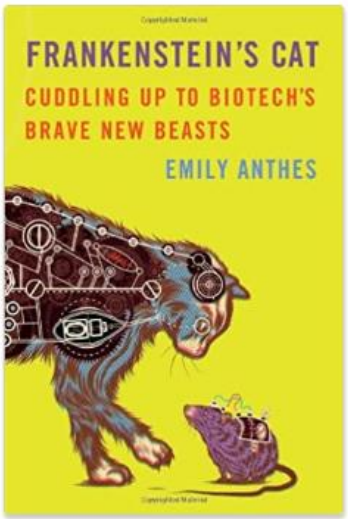
Junk DNA

Our DNA is so much more complex than you probably realise; this book will really deepen your understanding of the work you will do on Genetics.

A Short History of Nearly Everything

A whistle-stop tour through many aspects of history from the Big Bang to now. This is a really accessible read that will re-familiarise you with common concepts and introduce you to some of the more colourful characters from the history of science!





An easy read...

Frankenstein's cat

Discover how glow in the dark fish are made and more great Biotechnology breakthroughs.

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Blogs/Soundbites and more

Dr Hannah Fry and Dara Ó Briain investigate everyday mysteries sent in by listeners

BBC Radio 4 - Curious Cases

Brian Cox and Robin Ince host a witty, irreverent look at the world through a scientists eyes

BBC - The Infinite Monkey Cage

An incredible mix of breaking science news and deep analysis, this podcast is science journalism at its best. The Guardian's science team bring you the current topics and fascinating interviews from the worlds of science and technology — all wrapped into a magazine style format.

Science Weekly | Science | The Guardian

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Movie and TV Recommendations

Here are some films and programmes that highlight the use forensic science in solving crimes - great watching for a rainy day!

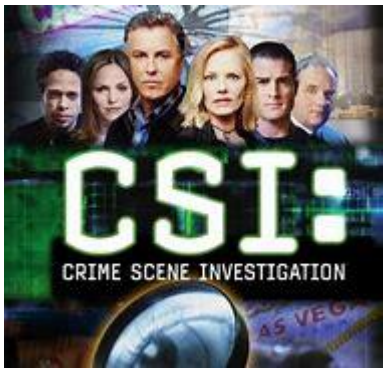
Bones (2005-2017)

The series is very loosely based on the life and novels of forensic anthropologist Kathy Reichs who also produced the show. The show revolves around solving federal legal cases by examining the human remains of possible murder victims.

CSI: Crime Scene Investigation (2000-2015)

The start of a huge franchise of spin off programmes, CSI became a huge phenomenon during its original broadcast

Mixing deduction and character-driven drama, *CSI: Crime Scene Investigation* follows a team of crime-scene investigators employed by the Las Vegas Police Department as they use physical evidence to solve murders.



For the brave…

Sleepy Hollow (1998)

A cult classic.

The plot follows police constable Ichabod Crane (Depp) sent from New York City to investigate a series of murders in the village of Sleepy Hollow by a mysterious Headless Horseman.