

BOURNE
ACADEMY

BTEC NATIONAL IN APPLIED SCIENCE

HOLIDAY HOME LEARNING

Name: _____

Summer 2026

BTEC Assignment Brief

Qualification	Pearson Level 3 Alternative Academic Qualification BTEC National in Applied Science (Extended Certificate)
Unit number and title	Preparation holiday home learning
Learning aim	To bridge some of the gap between KS4 and KS5 scientific knowledge
Assignment title	Preparation for Applied science BTEC
Assessor	Mrs S Ferrara
Issue date	June 2026
Hand in deadline	September 2026
Vocational Scenario or Context	You are a new student to the world of KS5 BTEC. Your task is to be as prepared as you possibly can be and ready to start your course in September. Your tasks are varied to represent the nature of the course you will be studying.
Task 1 (Biology Unit 1)	Complete the table listing the structure and function of different organelles with in a cell. You will need to carry out some independent research to complete this task to the required standard.
Task 2 (Chemistry Unit 2)	Complete the table featuring the different types of bonding that occurs between atoms.
Task 3 (Physics Unit 3)	Produce a PowerPoint presentation describing constructive and destructive interference of waves. This needs to include clear diagrams of the phenomena as well as complete written descriptions.
Task 4 (Research Coursework Unit 4 and 6)	Research aspirin. Make sure you follow the instructions on making cornel notes and reference your work correctly. (Follow the SLAT Sixth Form Referencing Guide V2.)

Unit/Criteria reference	To achieve the criteria you must show that you are able to:
D1	Correctly completed the table with the structure and function of a prokaryotic (bacterial) cell. The properties of bonded molecules are given and linked to their structure. Constructive and destructive interference are explained. All work referenced correctly.
M1	Correctly completed the table with the structure and function of the additional organelles in a plant cell. Diagrams of bonded molecules are correctly drawn. Wave interference is explained fully giving an explanation as to possible phenomena. Complete notes on the development of aspirin produced.
P1	Correctly completed the table with the structure and function of an animal cell. Examples of bonded molecules are shown in the correct place on the sheet. Diagrams of wave interference are shown and labelled. Limited notes on the development of aspirin produced.
Sources of information to support you with this Assignment	https://www.youtube.com/watch?v=URUJD5NEXC8 (Cell organelles) https://alevelnotes.com/notes/biology/cells/cell-structure (Cell organelles) https://www.khanacademy.org/science/biology/chemistry--of-life/chemical-bonds-and-reactions/v/ionic-covalent-and-metallic-bonds (Chemical Bonding) http://www.visionlearning.com/en/library/Chemistry/1/Chemical-Bonding/55 (Chemical Bonding) http://www.physicsclassroom.com/class/light/Lesson-1/Two-Point-Source-Interference (Waves) https://www.youtube.com/watch?v=CRhsPoTOHIU (Waves) Above are some examples of websites.

All work must be your own (not copied and pasted) and all sites used need to be referenced, including any diagrams you may wish to include.

Use the SLAT Sixth Form Guide to Referencing V2 at the back of the booklet to help.

Clearly state which activity the references are for.

BTEC BIOLOGY TASK: Researching cell components.

Eukaryotic cells make up multi-cellular organisms such as plants and animals. They are complex cells with a nucleus and membrane-bound organelles. Eukaryotic cells are approximately 10–100 µm in diameter.

Prokaryotes are single celled micro-organisms that are much smaller than eukaryotic cells. They are simple structures and do not have a nucleus or any membrane-bound organelles. They are generally 1–5 µm in diameter.

At KS5 you need a knowledge of some cell components not studied at KS4. Prior independent research will help to reinforce this new knowledge.

Create a word document using the format of the table below and research the structure and function of the following organelles:

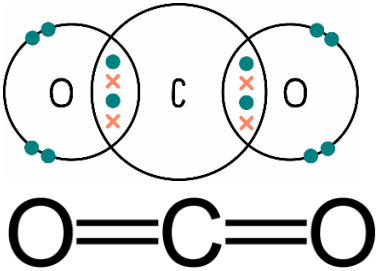
<u>Cell organelles in an animal cell.</u>	<u>Additional cell organelles in a plant cell.</u>	<u>Cell organelles in a prokaryotic (bacteria) cell.</u>
• Plasma membrane • Cytoplasm • Nucleus • Nucleolus • Rough endoplasmic reticulum (RER) • Smooth endoplasmic reticulum (SER) • Golgi apparatus • Vesicles • Lysosomes • Ribosomes • Mitochondria • Centrioles	• Cell wall • Chloroplast • Vacuole • Tonoplast • Amyloplast • Plasmodesmata • Pits	• Cell wall • Capsule • Ribosomes • Nucleoid • Plasmid

Table format example.

ORGANELLE	STRUCTURE	FUNCTION

BTEC CHEMISTRY TASK: Bonding.

Complete the table featuring the different types of bonding that occurs between atoms. At KS5 you need detailed knowledge of bonding and an understanding of why atoms bond together. Completing this table will reinforce knowledge from KS4 and add to that knowledge ready for KS5.

Bonding	Molecular	Giant Covalent	
		Diamond	Graphite
Examples	Cl ₂ , CH ₄ , O ₂ , C ₂ H ₄		
Bonding diagram			
Structure	This type of bonding normally occurs between non-metal atoms. Molecules are small (up to hundreds of atoms instead of thousands/millions).		
Properties and how they relate to the structure	Low melting points and boiling points - the atoms in the molecule are held together very strongly but there are weak forces between individual molecules. They are usually gas or liquid. Does not conduct electricity – no delocalised electrons or ions. Some are soluble in water – molecules that have a dipole will dissolve in water.		

Bonding	Giant Ionic	Giant Metallic
Examples		
Bonding diagram		
Structure		
Properties and how they relate to the structure		

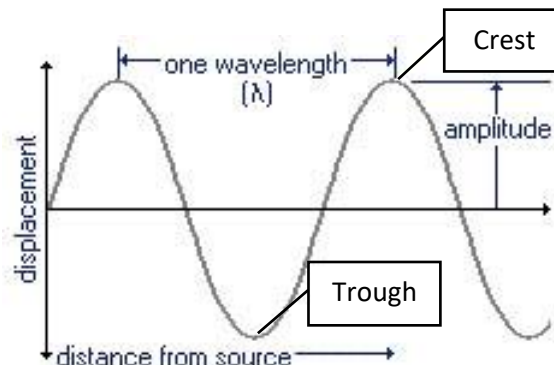
BTEC PHYSICS TASK: Wave interference.

Produce a PowerPoint presentation describing constructive and destructive interference of waves.

This needs to include clear diagrams of the phenomena as well as complete written descriptions.

For internally assessed assignments it is important that you do not plagiarise other people's work and all sources are referenced. With this in mind all work must be your own (not copied and pasted) and all sites / sources used need to be referenced, including diagrams.

At KS4 you have learnt the structure of waves and should be familiar with the following diagram.



Your task is to show what happens when waves interact with each other.

Explaining how diffraction gratings show constructive and destructive interference of waves. Describing what constructive and destructive interference are and what you would see on a screen if you shone a monochromatic light through a diffraction grating.

BTEC RESEARCH TASK: Aspirin.

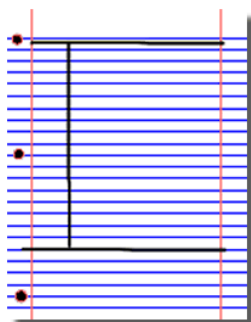
What was the history of the discovery of aspirin, how do we manufacture aspirin in a modern chemical process?

Research, reading and note making are essential skills for BTEC Level – 3 Applied science study.

For the following task you are going to produce 'Cornell Notes' to summarise your reading.

The following is a guide on how to write Cornell Notes,

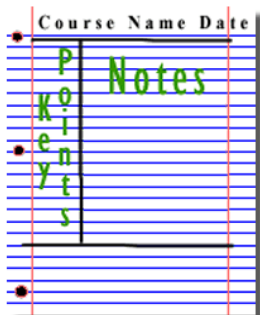
1. Divide your page into three sections like this



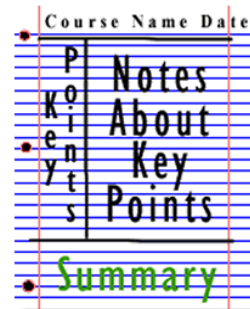
2. Write the name, date and topic at the top of the page



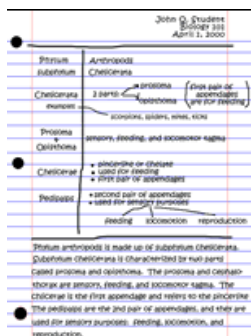
3. Use the large box to make notes. Leave a space between separate idea. Abbreviate where possible.



4. Review and identify the key points in the left hand box



5. Write a summary of the main ideas in the bottom space



You will also need to reference your work. Follow the SLAT Sixth Form Guide to Referencing V2.

(Guide is included at the back of this booklet.)

Plagiarism

Plagiarism is using the words of others without correctly acknowledging the source(s) used.

Plagiarism includes, but is not limited to, the following:

- **Copying** text directly
- Using **other peoples ideas** or theories without correct acknowledgment
- **Paraphrasing** what you have read or heard
- Using mainly quotations in your work **without any original ideas**

To avoid plagiarising in your assignments:

- Write your class notes in your **own words**
- Note exactly where you have **sourced your information** from as you collect it
- Only use quotations when really needed; you should have **very few direct quotes** in your complete assignment
- In your assignments, use the **Harvard Referencing system** to acknowledge source(s) used.

Why do I need to reference?

When producing an academic assignment, you are required to **acknowledge** the work of others by citing references in the text and creating a list of references and/or a bibliography at the end of your assignment.

By citing and referencing sources correctly, you'll show that you can:

- **Explain your ideas honestly** by giving appropriate credit to the author(s) whose work you have used to support your discussion.
- **Evaluate material** and appreciate differing views on a topic.

You'll also be required to sign a declaration that your assignment is your own work – suitable referencing means that you can do this!

TIP: As you prepare your notes or conduct research, make it part of your routine to copy the source details such as the author(s) name, date of publication, title of materials, URL etc).

To correctly reference using the Harvard Referencing systems, you need to follow **two steps**:

1. In-Text Citations
2. Reference List / Bibliography

Step 1: In-Text Citations

Briefly referring to a published piece of work in the main body of your assignment is called **citing**. Greater detail about the source would then be found in the reference list at the end of your assignment. You'll need to use appropriate language to introduce any citations in your text. E.g.

Why you might cite a source:	Example sentences:
To support your own point	X stated that X observed that
To give contrast to your point	X questioned the view that... X offered an alternative view that...
To give a new development in the topic area	X claimed that... X surmised that...
To give a theoretical view	X suggested that... X believed that...

When using a source in your assignment, you can cite the source in a variety of ways. If, for example, your source is a book written by Smith and published in 2024, your in-text references would follow one of these three formats:

- Further work (Smith, 2024) supports this claim
- Further work by Smith (2024) supports this claim
- This theory is supported by recent work... (Smith, 2024, p. 45)

If there are two authors:

- Smith and Cole (2024) outline a range of ways in which...

If there are more than two authors, use '**et al**':

- Smith et al (2024) suggest that...

Where you need to cite more than one work published in the same year, by the same author, you can cite the source as follows:

- (Smith, 2024a)
- (Smith, 2024b)

Step 2: Reference List / Bibliography

A **reference list** relates directly to the citations used within your assignment – it is an **alphabetical list** of all of the sources you have cited throughout your assignment. Each reference should include everything you need to identify the information.

A **bibliography** list refers to work that has been read to support your assignment, but not directly quoted within the text/writing, so would not be shown in your reference list.

To correctly acknowledge sources of information in your Reference List / Bibliography, you should generally use the following format (*see **Appendix** for further examples of different sources*):

Author (Year Date) 'Title of item', Title of Overall Work (Item type/information), Publisher information, location of publisher.

Appendix:

The following are examples of how to reference commonly used sources:

Books

In-Text Citation: (Author(s), Year of Publication, Page Number)

Full Reference: AUTHOR (Year of Publication), *Title of Book*, Place of Publication, Publisher

E.g.

KADOLPH, S.J. (2007) *Textiles*. New Jersey: Pearson Prentice Hall

CAPON ET AL (2009) *Managing Marketing in the 21st Century*. New York: Wessex.

Printed Journal Articles

In-Text Citation: (Author, Year of Publication)

Full Reference: Author (Year of Publication) 'Title of article', *Title of Journal*, volume [abbreviated to vol.], number [abbreviated to no.], page number(s) [abbreviated to p.]

E.g.

KOTLER, P. (1964) Marketing Mix Decisions for New Products, *Journal of Marketing Research*, Vol. 1 (1), p. 43-49

E-Journal Articles

In-Text Citation: (Author, Year of Publication)

Full Reference: Author (Year of Publication) 'Title of article', Title of Journal, volume [abbreviated to vol.], number [abbreviated to no.] [online]. Available at URL (Accessed date)

E.g.

KOTLER, P. (1964) Marketing Mix Decisions for New Products, *Journal of Marketing Research*, Vol. 1 (1) [online]. Available at <https://journals.sagepub.com/doi/abs/10.1177/002224376400100108> (08 September 2024)

Newspaper or Magazine Articles

In-Text Citation: (Author, Year of Publication)

Full Reference: Author (Year of Publication) 'Title of article', Title of Newspaper, date, page number.

E.g.

BROWN, P. (2002) New foot and mouth outbreak suspected. *Guardian*, 27th Feb, P.1.

TV Programmes

In-Text Citation: (Title of Programme, Year of Broadcast)

Full Reference: Title of Programme (Year of Broadcast) Channel, date of transmission

OR if accessing on a streaming service:

Title of Programme (Year of Broadcast) Channel, date of original transmission [Online]. Available at URL (Accessed date)

E.g.

Planet Earth 2 (2016) BBC, 6 Nov 2016 [online]. Available at <https://www.bbc.co.uk/iplayer/episode/p048sflc/planet-earth-ii-1-islands> (09 Sept 2024)

YouTube Items

In-Text Citation: (Title of Item, Date Uploaded)

Full Reference: Title of Item, (Date Uploaded) YouTube video, added by Name of uploader [Online]. Available at URL (Accessed date).

E.g.

My Nursing Lab (13th April 2016) YouTube video, added by Pearson Higher Education [Online]. Available at <https://www.youtube.com/watch?v=HQn6SkFzrwl> (24 April 2016)

Live Performances and Plays

In-Text Citation: (Title of Play, Year of Performance)

Full Reference: Title of Play by Author (Year of Performance). Directed by Director [Venue, Location. Date seen].

E.g.

An Inspector Calls by J.B. Priestley (2009) Directed by STEPHEN DALDRY. [Arts Theatre, Cambridge. 11th May]

Websites

In-Text Citation: (Author, Year of publication/last updated)

Full Reference: Author (year of publication/last updated). Title of Website [Online]. Available at URL (Accessed date).

E.g.

JONES, J. (2016/12th January) Pearson qualifications [Online]. Available at <http://qualifications.pearson.com/en/qualifications/btec-nationals.html> (Accessed 18 April)

*If your type of source is not listed, please review other Harvard Reference guides. For example:

https://qualifications.pearson.com/content/dam/pdf/BTEC-Higher-Nationals/Advanced-Practice-in-Early-Years-Education/2016/Specification/Pearson_Guide_to_Harvard_Referencing.pdf

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.