

# **BTEC Medical Science**

## **Summer Independent Learning (SIL)**

### **Year 11 - 12**

Welcome to BTEC Medical Science, please complete all the following tasks ready for your first day at Brinsworth Academy. Teachers will be checking that each task in this list has been completed in the first week back in September.

1. **Watch the videos** provided and **answer the questions for tasks 1-6** using the videos to help you
2. **In a different colour pen self-assess and correct your work** using the answers at the back of the booklet and add in any missing or incorrect information. Your teacher will be checking that you have attempted the questions first before using the answers to check your work.
3. **Complete task 7** which is a video to help you identify revision strategies.
4. **Create revision resources** on the information in this booklet to help you memorise the information in preparation for an **assessment** in your first few weeks at college. You need to be able to show your teacher your revision resources.

You can either print the booklet, write on the PDF file on screen or answer the questions on paper.

# **Unit 1 – Principles of Human Physiology, Anatomy and Pathology**

## **Overview of the tasks**

### **Part 1: Structure of Carbohydrates, Lipids and Proteins**

Task 1: Carbohydrate Structure

Task 2: Lipid Structure

Task 3: Protein Structure

Task 4: Nucleic acid structure

### **Part 2: Cell Structure**

Task 5: Cell Structure

Task 6: Function of organelles

### **Part 3: Revision techniques for the assessment**

Task 7: how to revise for your initial assessment. Bring the revision resources that you have created to help you learn the facts covered in tasks 1-6.

## **Part 1 Task 1: Structure of carbohydrates**

Use the following video links to support with your answers:



[https://www.youtube.com/watch?v=dSJGCGQ\\_9vA&list=PL0Mjub5NT755dp8xUfC-yoXlbPTcjVM1i&index=7&t=0s](https://www.youtube.com/watch?v=dSJGCGQ_9vA&list=PL0Mjub5NT755dp8xUfC-yoXlbPTcjVM1i&index=7&t=0s)



<https://www.youtube.com/watch?v=wuDxoneoPnY&list=PL0Mjub5NT755dp8xUfC-yoXlbPTcjVM1i&index=5>

**What is a monomer?**

**What is a polymer?**

**Can you describe what a condensation reaction is?**

**Can you describe what a hydrolysis reaction is?**

**Can you describe how larger carbohydrates are made from monosaccharide monomers?**

**Can you list some common monosaccharides?**

**Can you describe how disaccharides are formed?**

**What are maltose, sucrose and lactose formed from?**

**Draw a diagram to show how a condensation reaction occurs between two monosaccharides to form maltose. Label the bond that forms.**

**Can you explain how glycogen and starch are formed?**

Can you complete the table to show how many carbon atoms are in each type of monosaccharide?

| Type of monosaccharide | Number of carbons | Example                         |
|------------------------|-------------------|---------------------------------|
| Triose sugar           |                   | glycerol                        |
| Pentose sugar          |                   | Ribose and deoxyribose          |
| Hexose sugar           |                   | Glucose, fructose and galactose |

## **Task 2: Lipid Structure**

<https://www.youtube.com/watch?v=TOFjqpbMZU&list=PL0Mjub5NT755dp8xUfC-yoXlbPTcjVM1i&index=3>



Video 2 from **10:50 to 12:50**

<https://www.youtube.com/watch?v=QFq9o72Qal8&list=PL0Mjub5NT755dp8xUfC-yoXlbPTcjVM1i&index=7>



Video 3

<https://www.youtube.com/watch?v=E0GEp3zgK7w>



**Can you explain how triglycerides are formed? Draw a diagram to show this happening. Label the molecules involved, the type of reaction and the types of bonds formed.**

**Can you explain why the R-group of a fatty acid may be saturated or unsaturated? What do these terms mean?**

**What are the three parts of a phospholipid?**

**What is meant by hydrophilic?**

**What is meant by hydrophobic?**

**Which part of a phospholipid is hydrophilic?**

**Which part of a phospholipid is hydrophobic?**

**What are phospholipids used for in cells?**

**What role does cholesterol have in cells?**

**Task 3: Protein structure** Watch the video: **From 7:20 – 10:50**



<https://www.youtube.com/watch?v=QFq9o72Qal8&list=PL0Mjub5NT755dp8xUfC-yoXlbPTcjVM1i&index=7>

**What is the general structure of an amino acid?**

**How do two amino acids form a dipeptide?**

**Describe the following protein structures:**

**Primary Structure**

**Secondary Structure**

**Tertiary Structure**

**Can you describe the role of hydrogen bonds, ionic bonds and disulfide bridges in the structure of proteins?**

**Task 4: Nucleic acids**

Watch the following videos:

<https://www.youtube.com/watch?v=Mh0uieUVubw>





<https://www.youtube.com/watch?v=HRga77i64nY>

What are the three parts of a DNA nucleotide?

What are the three parts of an RNA nucleotide?

Draw and label a DNA nucleotide

What are the four different organic bases that can be present on a DNA nucleotide?

Give two differences between a DNA nucleotide and an RNA nucleotide.

What type of bond forms between nucleotides to form a polynucleotide chain?

What are the different types of RNA?

Describe the structure of DNA



What is meant by complementary base pairing?

## **Part 2 – Cell Structure**

### **Task 5**

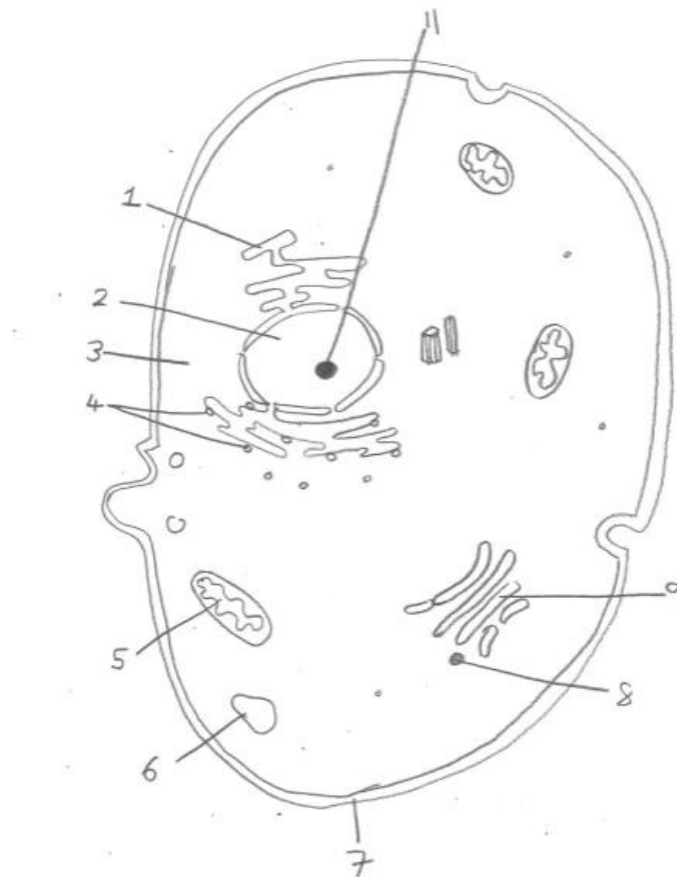
Watch the following video. Then answer the following questions.



[https://www.youtube.com/watch?v=cfEFw4dcEFw&list=PL0Mjub5NT757WwL\\_BTIZzW09IJYk5ChQn&index=4](https://www.youtube.com/watch?v=cfEFw4dcEFw&list=PL0Mjub5NT757WwL_BTIZzW09IJYk5ChQn&index=4)

**Use the following to label the animal cell**

**nucleus, nucleolus, mitochondria, rough and smooth endoplasmic reticulum (ER), Golgi apparatus, vesicles, lysosomes, 80S ribosomes, centrosomes, cytoplasm**



**Task 6: What is the  
function of: nucleus  
and nucleolus**

**mitochondria**

**rough endoplasmic reticulum**

**smooth endoplasmic reticulum**

**golgi apparatus**

**vesicles**

**lysosomes**

**80S ribosomes**

### **Part 3 – How to revise**

#### **Task 7**

Watch the following video. Use some of the techniques suggested to prepare for your initial assessment.



<https://www.youtube.com/watch?v=wrDOoBuP9A8>