

# Multiple Choice Questions

## GCSE Biology – Cell biology

### INSTRUCTIONS

Score: /20

- Read the question carefully.
- Circle the correct letter.
- Answer all questions.

1. Which cell group does not possess a true nucleus?
  - a. Prokaryotes
  - b. Eukaryotes
  - c. Plants
  - d. Animals
2. Which of the following is a eukaryote?
  - a. Bacteria
  - b. Virus
  - c. Archaea
  - d. Sperm
3. Which of the following is found in all prokaryotic cells but only some eukaryotic cells?
  - a. Cell membrane
  - b. Cell wall
  - c. Mitochondria
  - d. Ribosome
4. Where in the cell are proteins synthesised?
  - a. Mitochondria
  - b. Vacuole
  - c. Ribosomes
  - d. Nucleus
5. Where do the majority of metabolic reactions take place?
  - a. Cytoplasm
  - b. Nucleus
  - c. Cell membrane
  - d. Ribosomes
6. How do you calculate the magnification of a magnified object?
  - a. Image size x actual size
  - b. Image size ÷ actual size
  - c. Actual size x image size
  - d. Actual size ÷ image size

7. Which of these cells contain spirals of lignin?
  - a. Palisade cells
  - b. Bacterial cells
  - c. Yeast cells
  - d. Xylem cells
  
8. What are cells called if they are adapted to perform a certain job?
  - a. Specific
  - b. Functional
  - c. Unique
  - d. Specialised
  
9. What are cells produced by mitosis called?
  - a. Sister cells
  - b. Daughter cells
  - c. Haploid cells
  - d. Zygotes
  
10. How many cell divisions occur in mitosis?
  - a. None
  - b. 1
  - c. 2
  - d. 3
  
11. A cell that has half the usual number of chromosomes is called what?
  - a. Haploid
  - b. Diploid
  - c. Homozygous
  - d. Heterozygous
  
12. What is the name of the first stage of mitosis?
  - a. Prophase
  - b. Metaphase
  - c. Anaphase
  - d. Telophase
  
13. What is the term for when a cell divides?
  - a. Cytolysis
  - b. Cytocrenation
  - c. Cytodivision
  - d. Cytokinesis
  
14. Diffusion is the movement of particles from...
  - a. a higher concentration to a lower concentration.
  - b. a lower concentration to a higher concentration.
  - c. a higher water potential to a lower water potential through a partially permeable membrane.
  - d. a lower concentration to a higher concentration using ATP.

15. Small circular pieces of DNA in a bacterial cell are called:
  - a. Plasmids
  - b. Loose DNA
  - c. Ribosomes
  - d. Enzymes
  
16. Root hair cells are adapted to absorb water and mineral ions by...
  - a. having no chloroplasts.
  - b. being transparent.
  - c. having a thick cell wall.
  - d. having a large surface area.
  
17. Respiration in the mitochondria requires which **two** chemicals?
  - a. Glucose
  - b. Carbon dioxide
  - c. Water
  - d. Oxygen
  
18. Electron microscopes are able to distinguish between two points just a few nanometers apart. This is called...
  - a. magnification
  - b. resolution
  - c. resolving power
  - d. image size
  
19. The food producer within the plant cell uses energy from the sun and converts carbon dioxide and water into sugars. This sub-cellular structure is called the...
  - a. vacuole.
  - b. mitochondria.
  - c. chloroplast.
  - d. nucleus.
  
20. The thick rigid layer that surrounds plant cells and provides support and structure is called the...
  - a. nucleus.
  - b. mitochondria.
  - c. cell wall.
  - d. chloroplast.

## PiXL Independence – Level 2

### 5 questions, 5 sentences, 5 words

### GCSE Biology – Cell biology

#### INSTRUCTIONS

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- For each statement, use either the suggested website or your own text book to write a 5-point summary. In examinations, answers frequently require more than 1 key word for the mark, so aim to include a few key words.
- It is important to stick to 5 sentences. It is the process of selecting the most relevant information and summarising it that will help you remember it.
- Write concisely and do not elaborate unnecessarily, it is harder to remember and revise facts from a long paragraph.
- Finally, identify 5 key words that you may have difficulty remembering and include a brief definition. You might like to include a clip art style picture to help you remember it.

#### Example:

<b>QUESTION:</b>	Describe the differences between prokaryotes and eukaryotes.			
<b>Sources:</b>	<b>Website – <a href="http://www.ivyroses.com/Biology/Cells/Prokaryotic-and-Eukaryotic-Cells.php">http://www.ivyroses.com/Biology/Cells/Prokaryotic-and-Eukaryotic-Cells.php</a></b> <b>Interactive - <a href="https://www.my-gcse-science.com/aqa/biology/eukaryotic-and-prokaryotic-cells/">https://www.my-gcse-science.com/aqa/biology/eukaryotic-and-prokaryotic-cells/</a></b>			
<ol style="list-style-type: none"> <li>1. All animal and plant cells are eukaryotic, which makes all plants and animals eukaryotes.</li> <li>2. Many eukaryotic cells belong to more complex organisms so often such organisms are made from more than one cell and so we call them multicellular.</li> <li>3. Plant and animal cells are eukaryotic. They can be unicellular or belong to multicellular organisms</li> <li>4. All bacterial cells are prokaryotic, which means that all bacteria are prokaryotes.</li> <li>5. Prokaryotes are single celled, do not have a nucleus containing their genetic material (DNA) and are smaller than eukaryotic cells.</li> </ol>				
<b>Prokaryotic cells</b> Cells that do not contain a nucleus (bacterial cells).	<b>Prokaryote</b> A prokaryotic organism (a bacterial cell).	<b>Eukaryotic cells</b> Cells that contain a nucleus.	<b>Eukaryote</b> An organism that is made of eukaryotic cells (those that contain a nucleus).	<b>Multicellular</b> An organism made of many cells.

<b>QUESTION 1:</b>	Explain how the main sub-cellular structures, including the nucleus, cell membranes, mitochondria and chloroplasts in plant cells and animal cells, are related to their functions.
<b>Sources:</b>	<b>Website</b> – <a href="https://www.khanacademy.org/test-prep/mcat/cells/eukaryotic-cells/a/organelles-article">https://www.khanacademy.org/test-prep/mcat/cells/eukaryotic-cells/a/organelles-article</a> <b>Video</b> - <a href="https://www.youtube.com/watch?v=JL19uv7NT7s">https://www.youtube.com/watch?v=JL19uv7NT7s</a>

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<b>QUESTION 2:</b>	Describe and explain how a sperm cell is adapted for its function.
<b>Sources:</b>	<b>Website – <a href="http://slideplayer.com/slide/6031489/">http://slideplayer.com/slide/6031489/</a> Video - <a href="https://www.youtube.com/watch?v=7z6W2xv4upc">https://www.youtube.com/watch?v=7z6W2xv4upc</a></b>

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<b>QUESTION 3:</b>	Explain the importance of cell differentiation.
<b>Sources:</b>	<b>Website –</b> <a href="http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/living_growing/growthdevrev5.shtml">http://www.bbc.co.uk/schools/gcsebitesize/science/add_ocr_gateway/living_growing/growthdevrev5.shtml</a> <b>Interactive -</b> <a href="https://www.youtube.com/watch?v=9db44fBrWrE">https://www.youtube.com/watch?v=9db44fBrWrE</a>

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<b>QUESTION 4:</b>	Compare and contrast an electron microscope with a light microscope.
<b>Sources:</b>	<b>Website</b> – <a href="http://www.biologyexams4u.com/2012/10/difference-between-light-microscope-and.html#.WeOLXGhSzIU">http://www.biologyexams4u.com/2012/10/difference-between-light-microscope-and.html#.WeOLXGhSzIU</a> <b>Video</b> - <a href="https://www.youtube.com/watch?v=b4WOsYktdn4">https://www.youtube.com/watch?v=b4WOsYktdn4</a>

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<b>QUESTION 5:</b>	Describe the cell cycle including the stages of mitosis.
<b>Sources:</b>	Website – <a href="http://www.biology.arizona.edu/cell_bio/tutorials/cell_cycle/cells3.html">http://www.biology.arizona.edu/cell_bio/tutorials/cell_cycle/cells3.html</a> Interactive - <a href="http://www.sumanasinc.com/webcontent/animations/content/mitosis.html">http://www.sumanasinc.com/webcontent/animations/content/mitosis.html</a>

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# PiXL Independence – Level 3

## Science in the News

### GCSE Biology – Cell biology

#### Fake news

Sensationalised news stories have been around for some time, but with the mass growth of social media, the problem seems to have grown in recent years. At the very least, the US Presidential election has certainly highlighted the impact that misleading information can have. [www.tiny.cc/fakenews2](http://www.tiny.cc/fakenews2)

At home, the Brexit vote also suffered from the circulation of misleading news stories. [www.tiny.cc/fakenews3](http://www.tiny.cc/fakenews3)

Therefore, the ability to identify real information, track it back to the source article and make your own judgement is a very important skill. This activity will help you develop that skill.

#### Can we drink too much water?

News article: <http://news.bbc.co.uk/1/hi/england/bradford/7779079.stm>

NHS article: <http://www.nhs.uk/conditions/dehydration/pages/introduction.aspx>

Discussion article: [http://www.nbcnews.com/id/16614865/ns/us\\_news-life/t/woman-dies-after-water-drinking-contest/#.WeNOd2hSzIU](http://www.nbcnews.com/id/16614865/ns/us_news-life/t/woman-dies-after-water-drinking-contest/#.WeNOd2hSzIU)

Real article: [http://purchon.com/biology/?page\\_id=173](http://purchon.com/biology/?page_id=173)

#### Task 1:

You need to produce a 1 page essay on water and the effects of drinking too much or too little.

Essay section	Activity
Introduction	Discuss why water is essential to our body and where we get water from.
Describe	Describe what osmosis is and the factors that can affect how your cells absorb water.
Explore	Explain the effects of drinking too much water. Discuss the implications of water intoxication. Explain the effects of not drinking enough water. Discuss the implications of dehydration.
Evaluate	“Everyone should drink two litres of water a day.” Evaluate this statement.

## Sports drinks- vital for hydration or just a waste of money?

News article: <https://www.theguardian.com/lifeandstyle/2009/jul/27/sports-drinks>

NHS article: <https://www.nhs.uk/news/food-and-diet/sugar-and-water-as-good-as-a-sports-drink-says-study/>

Discussion article: <http://www.mensfitness.com/nutrition/what-to-drink/sports-drinks-vs-water>

Real article: <https://www.webmd.com/fitness-exercise/features/drink-up-sports-fitness#1>

### Task 2:

You need to produce a 1 page essay on the advantages and disadvantages of drinking sports drinks.

<b>Essay section</b>	<b>Activity</b>
<b>Introduction</b>	Describe what sports drinks are and why people drink them.
<b>Describe</b>	Describe the advantages of drinking sports drinks during or after exercise and explain why people drink them in these situations.
<b>Explore</b>	Describe the disadvantages of drinking sports drinks.
<b>Evaluate</b>	Explain your opinion of sports drinks and justify your reasons.

# PiXL Independence – Level 4

## Scientific Posters

### GCSE Biology – Cell biology

#### INSTRUCTIONS

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#### Scientific Posters

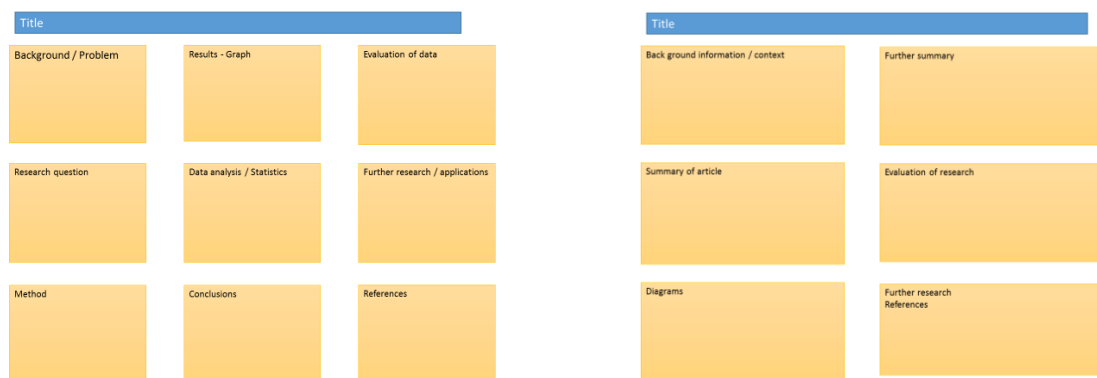
Scientists communicate research findings in three main ways. Primarily, they write journal articles much like an experiment write up. These are very concise, appraise the current literature on the problem and present findings. Scientists then share findings at conferences through talks and scientific posters. During a science degree, you would practise all three of these skills.

Scientific posters are a fine balance between being graphically interesting and attracting attention and sharing just the right amount of text to convey a detailed scientific message. They are more detailed than a talk and less detailed than a research paper.

Use this information to help structure your poster – [www.tiny.cc/posterskills](http://www.tiny.cc/posterskills) (that's Poster Skills not Posters Kill!) More detailed guidance is available at: [www.tiny.cc/posterskills2](http://www.tiny.cc/posterskills2)

#### Creating your poster

It is easiest to create a poster in PowerPoint; however, you need to add custom text boxes rather than using the standard templates.



Posters need to be eye catching, but readable from a distance. If you use PowerPoint, start with a 4:3 slide (for easier printing, it can then be printed on A3) and use a 14-16 pt font. The first box could be larger to draw people in. You can use a background image, but pick a simple one that is of high quality. Select 'text box fill' and select 'change the transparency' to maintain the contrast and partially show the picture.

You can experiment with different layouts and you should include images. Avoid a chaotic layout. Posters are read from top left column downwards.

Remember to include the authors and references.

Finally, look at the examples given on the University of Texas website which also offers an evaluation of each. [www.tinyurl.com/postereg](http://www.tinyurl.com/postereg)

## Cells types.

### Background

All living things are made up of cells. The structures of different types of cells are related to their functions. Eukaryotic cells have features in common, such as a nucleus, cytoplasm, cell membrane, mitochondria and ribosomes. Plant and algal cells also have a cell wall, and often have chloroplasts and a permanent vacuole. Prokaryotic cells have different structures to animal and plant cells.

### Source articles:

[http://www.bbc.co.uk/schools/gcsebitesize/science/add\\_edexcel/cells/cells2.shtml](http://www.bbc.co.uk/schools/gcsebitesize/science/add_edexcel/cells/cells2.shtml)

<https://www.ck12.org/biology/prokaryotic-and-eukaryotic-cells/lesson/Prokaryotic-and->

[Eukaryotic-Cells-BIO/](https://www.ck12.org/biology/prokaryotic-and-eukaryotic-cells/lesson/Prokaryotic-and-)

<https://www.cliffsnotes.com/study-guides/biology/biology/the-biology-of-cells/prokaryote-and-eukaryote-cell-structure>

<https://www.ck12.org/book/CK-12-Biology-Advanced-Concepts/section/11.13/>

### Use other sources as necessary.

<https://www.youtube.com/watch?v=fLThq5t4Ku0>

### Task:

Produce a scientific poster on the differences between prokaryotes and eukaryotes.

<b>Recall</b>	State what eukaryote and prokaryote mean.
<b>Describe</b>	Describe the functions of the organelles within a prokaryote and a eukaryote.
<b>Compare</b>	Compare the different types of prokaryotes and eukaryotes and how they are specialised for their function.
<b>Evaluate</b>	Explain how prokaryotes can be used in industry.