The Telford Langley School

ENSURING EXCELLENCE

Combined Biology Foundation Paper 1

Name: _____

Topic 1: Cell Biology

Topic 2: Organisation

Topic 3: Infection and Response

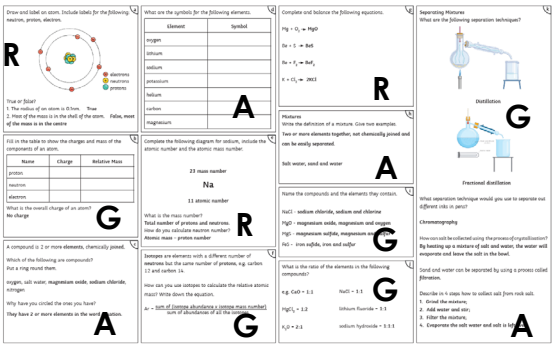
Topic 4: Bioenergetics

Exam Date: Tuesday 13th May 2025

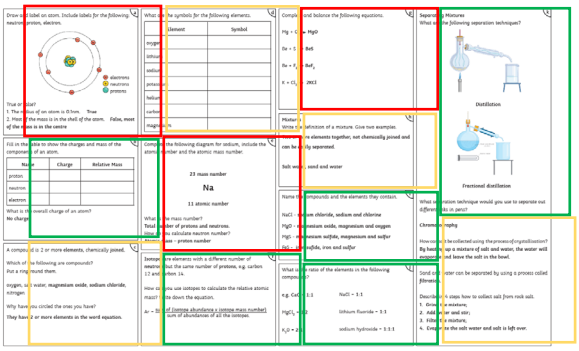
Instructions

This booklet has been separated according to the topic that will be covered in the exam.

1. Go through the revision mat for the topic and rate each box according to your understanding of that content. Use a typical RAG rating or 3 different colours of highlighter.
   For example:



OR



R = Red ☹ Low understanding

A = Amber 😐 Some Understanding

G = Green 😊 Good Understanding

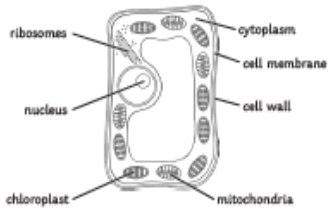
2. Cut along the dotted lines of the question card template provided. Then produce a set of revision questions and answers for that topic – you should focus on those you have rated as red or amber on the revision mat. **For example:**

Front	**Back**
What is the mass number of an atom?	The total number of protons and neutrons found in the nucleus

3. Fold along the line indicated on the following page and glue where indicated to create a storage pocket for your question cards.
4. Regularly test yourself using your question cards or ask someone to test you and return them to your storage pocket for safekeeping after each use.

a

Draw and label a typical plant cell.



Which organelle is...

- **the site of aerobic respiration?**

  mitochondria

- **the site of protein synthesis?**

  ribosomes

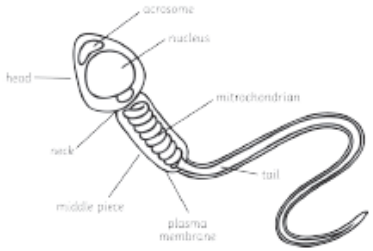
- **the site of photosynthesis?**

  chloroplasts

b

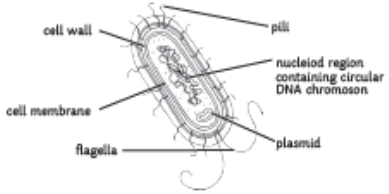
Sperm cells are specialised cells. Explain how the acrosome helps the sperm cell to carry out its function.

The acrosome contains enzymes that digest through the egg cell membrane.



c

Draw and label the parts of a typical bacterial cell.



d

Why do cells undergo mitosis?

To produce new cells for growth and repair.

What has to happen before the cell divides?

The cell grows and increases the amount of organelles, and it replicates its DNA.

What happens to the cell during mitosis?

1. Chromosomes line up in the centre of the cell and copies are pulled apart by spindle fibres to opposite ends of the cell.
2. Nuclear membranes form around the chromosomes to make two nuclei.
3. Finally, the cell splits into two identical 'daughter' cells.

e

What are 'embryonic' stem cells?

Undifferentiated cells found in the early embryo.

Name two medical conditions that could be treated with embryonic stem cells in the future.

1. diabetes
2. spinal injuries/paralysis

f

Diffusion is: (Tick the correct box.)

a. **The movement of water particles from a high water concentration to a lower water concentration across a partially permeable membrane.** ☐

b. **The spreading out of the particles of any gas or liquid from an area of high concentration to an area of lower concentration.** ☑

c. **The movement of particles from a low concentration to a higher concentration.** ☐

g

Light microscopes have objective lenses.

What is the purpose of the objective lens?

To form and magnify an image of the specimen.

h

What is osmosis?

The movement of water molecules from an area of high water concentration to an area of lower water concentration across a partially permeable membrane.

i

Name three substances that are transported into, or out of, animal cells by diffusion.

1. oxygen
2. carbon dioxide
3. amino acids

j

Name the tubes that transport the food around the plant.

phloem

k

How many chromosomes does...

- **a human skin cell contain?**

  46/23 pairs (diploid)

- **a human gamete contain?**

  23 single (haploid)

l

Name the tubes that transport water up the stem of a plant.

xylem

m

Draw and label a typical animal cell.

Which organelle is...

- **the site of aerobic respiration?**

  mitochondria

- **controls the movement of substances in and out of the cell?**

  cell membrane

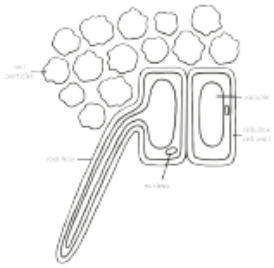
- **contains the genetic information?**

  nucleus

n

Root hair cells are specialised cells. Describe how the root hair cell is adapted to carry out its function.

It has a large surface area for the rapid absorption of water and mineral ions from the soil.



o

How do prokaryotic cells differ from eukaryotic cells?

Bacterial cells are much smaller. They don't have a nucleus, mitochondria or chloroplasts. They do have plasmids with extra DNA.

p

Plants can be cloned from meristem cells. Give two advantages of cloning plants.

1. Farmers can produce clones of a desired plant quickly and cheaply.
2. Saves rare species from extinction.

q

Describe two ways in which active transport is different to diffusion.

1. Moves against a concentration gradient (low to high).
2. requires energy

r

Describe how active transport is used by the following:

1. **plants**
   To obtain mineral ions from the soil.
2. **animals**
   To absorb nutrients (e.g. glucose) from the small intestine when they are at low concentrations.

s

Where in the body are adult stem cells found and how do they differ from embryonic stem cells?

Found in the bone marrow.

They can only turn into certain cell types, such as blood cells.

t

Write each of the following numbers in standard form.

2500 2.5×10^3

0.003 3×10^{-3}

4 200 000 4.2×10^6

0.00000006 6×10^{-8}

u

The unit centimetres is written as cm. What do each of the following units represent?

mm: millimetres

µm: micrometres

nm: nanometres

pm: picometres

v

What is the equation for calculating the magnification of an image?

$$\text{magnification} = \frac{\text{image size}}{\text{real size}}$$

w

Describe three ways that exchange surfaces are adapted to their function.

1. large surface area
2. thin walls
3. moist/good blood supply (animals)

x

Why do some people object to embryonic stem cell research?

They believe that all embryos have the potential to become a human being, so should not be used for experimentation.

y

Which has a bigger surface area to volume ratio, an elephant or a mouse?

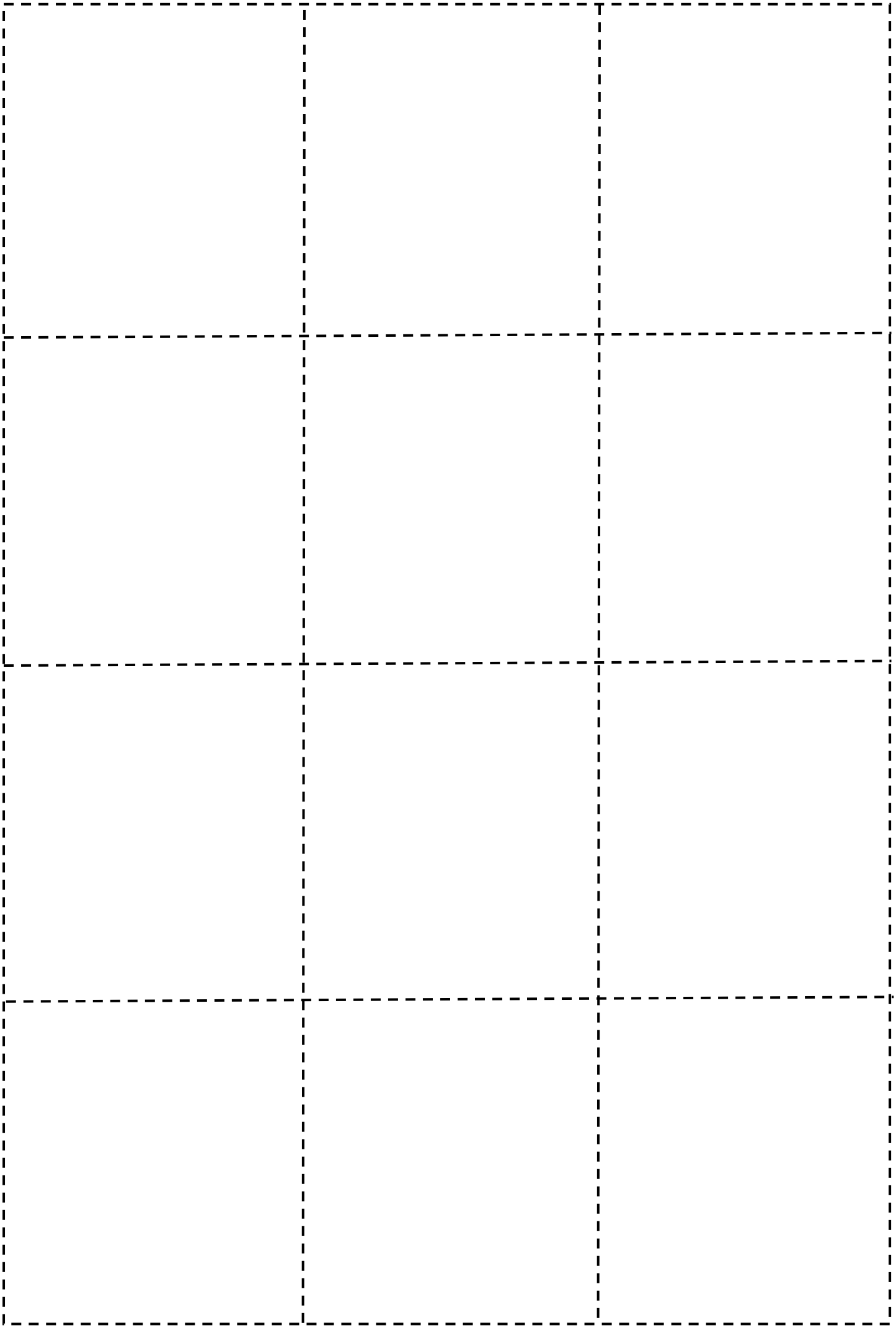
mouse

z

The width of a cell is 0.025mm; under the microscope it is 10mm

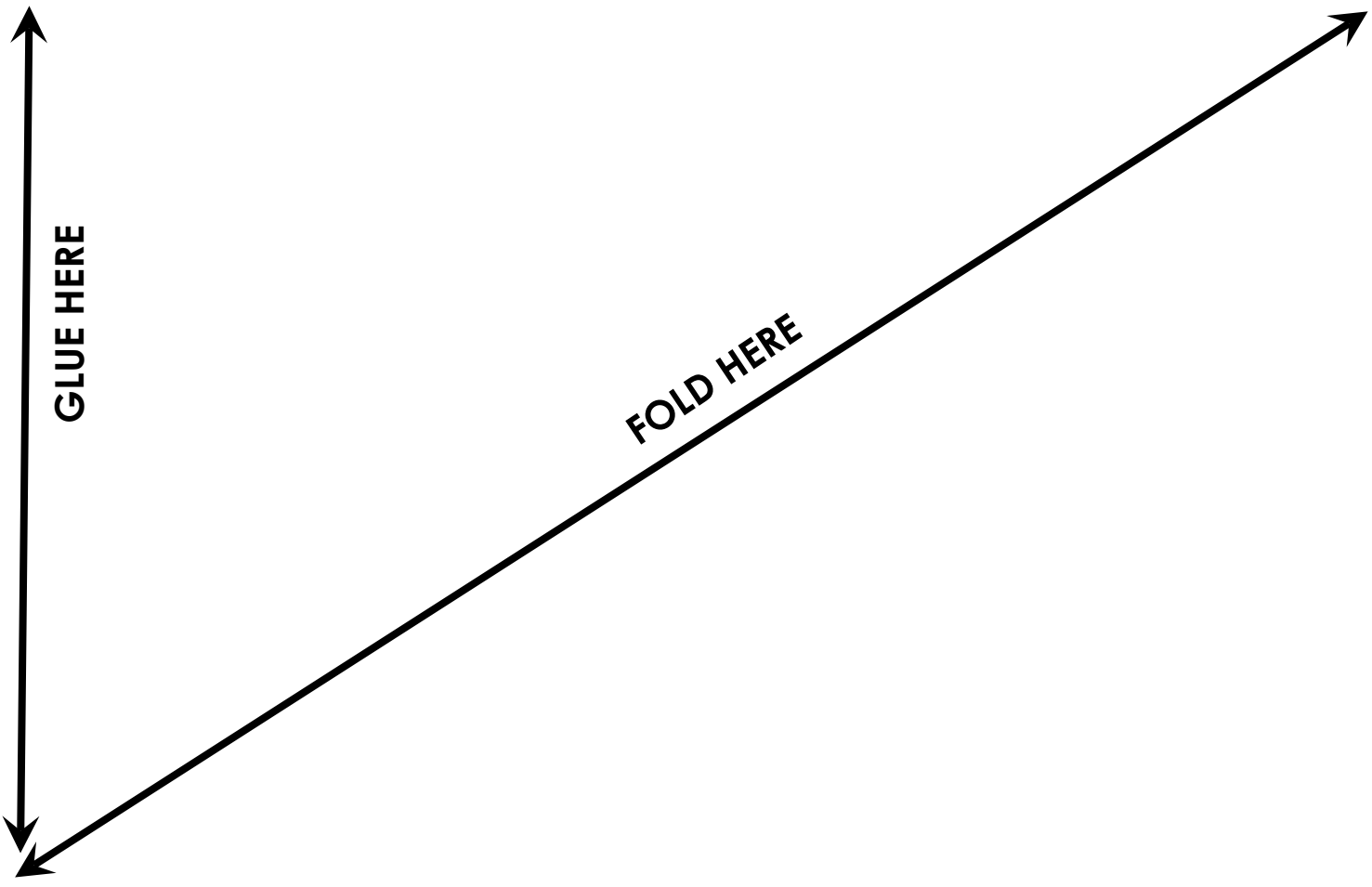
What was the magnification?

magnification = 10 ÷ 0.025 = 400



Topic 1: Cell Biology

Question Card Storage



a

Place the following structures in order from smallest to largest:

cell | organ | nucleus | tissue | organism

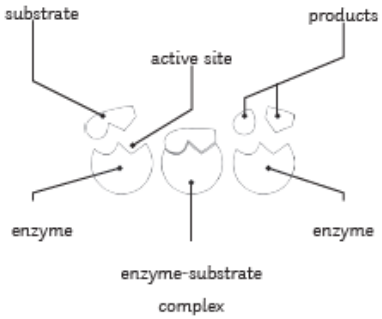
1. nucleus
2. cell
3. tissue
4. organ
5. organism

b

The small intestine is the part of the body where food is absorbed into the bloodstream.

c

The diagram below shows the lock and key model of enzyme function. Label the diagram using the following words:
enzyme, active site, substrate, products, enzyme-substrate complex.



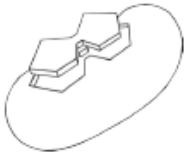
d

Define what an enzyme is.

A biological catalyst.

e

Enzymes are described as being specific to a substrate. What does this mean? Use the diagram to help your explanation.



The active site of the enzyme has a unique shape. Only a substrate with a complimentary shape can fit and bind to form an enzyme-substrate complex.

f

Bile is made in the liver and stored in the gall bladder.

Bile neutralises stomach acid to lower the pH so protease enzymes can work.

It also emulsifies fats to give them a larger surface area for lipase to work on. This speeds up digestion.

g

Describe how to carry out the test for reducing sugars.

Keywords: Benedict's, heat, colour change, blue, red.

1. Place the test sample into a test tube (about 2ml).
2. Add an equal amount of Benedict's reagent.
3. Heat in a water bath for 5 minutes.
4. The colour will change from blue to either green/yellow/red, depending on the amount of reducing sugar present.

h

What is the function of phloem tissue?

To transport food substances (dissolved sugars) around the plant. This process is called translocation.

i

The xylem tissue is composed of hollow tubes strengthened by lignin. What is the function of xylem tissue?

To transport water and dissolved minerals from the roots to the stem and the leaves. This is called the transpiration stream.

j

Describe how a root hair cell is adapted for the efficient uptake of water and mineral ions.

They have a large surface area for the rapid absorption of water and mineral ions from the soil.

k

Where, in the plant, is meristem tissue located?

Growing tips of roots and shoots.

l

Transpiration is:
(Tick the correct box.)

The movement of water molecules from a high water concentration to a lower water concentration across a partially permeable membrane.	☐
The evaporation and diffusion of water from the leaves of a plant.	☑
The movement of glucose molecules around the plant.	☐

Name three factors that affect the rate of transpiration.

Any three from the following:

- temperature;
- light intensity;
- air flow;
- humidity.

m

Describe how to test for starch.

1. Place the test sample into a test tube.
2. Add a few drops of iodine solution and mix.
3. The colour will change from orange to blue/black if starch is present.

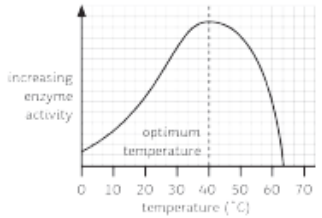
n

Describe how to test for protein.

1. Place the test sample into a test tube (about 2ml).
2. Add an equal amount of Biuret reagent and mix.
3. The colour will change from blue to purple if protein is present.

o

Use the graph below to describe how temperature affects enzyme function. Keywords: optimum, rate of activity, temperature, increase, decrease 50 °C

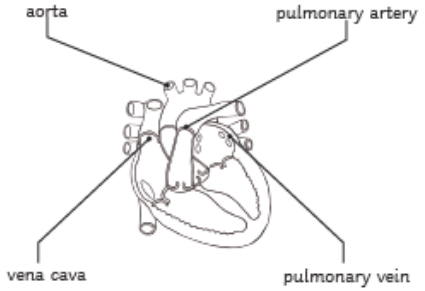


Initially, as temperature increases, the rate of enzyme activity also increases up to 40°C. This is the optimum temperature. After 40°C, as the temperature increases, the rate of enzyme activity decreases.

p

Label the following blood vessels on the diagram of the heart:

aorta, vena cava, pulmonary artery, pulmonary vein.



q

The artery carries blood away from the heart. It has thick layers of muscle for strength and elastic fibres. The walls are thick with a small lumen.

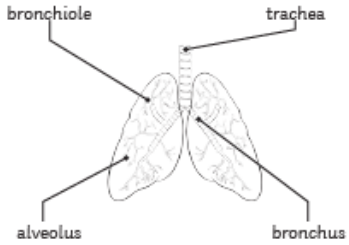
r

Why does the left ventricle have a thicker, more muscular wall than the right ventricle?

The left ventricle has to pump blood at high pressure so that it can reach all body cells. Whereas the right ventricle only has to pump blood to the lungs.

s

Label the following parts on the diagram below: trachea, bronchus, bronchiole, alveolus.



t

In coronary heart disease, layers of fatty material builds up inside the coronary arteries. Explain how this can lead to a heart attack. Keywords: fatty material, oxygen, heart attack, arteries.

The layers of fatty material block the coronary arteries and restrict blood flow to heart muscle cells. This results in a lack of oxygen and the heart muscle cells stop respiring. This can lead to a heart attack.

u

What are statins? Choose the correct answer.

They reduce the amount of LDL. ✓

They reduce the amount of HDL. ☐

They increase the amount of LDL. ☐

v

Stents can be used to treat coronary heart disease. Give one advantage and one disadvantage of using stents.

advantage: Patients recover quickly and they are effective for a long time.

disadvantage: There is a risk of the patient developing a blood clot near the stent, which can lead to a heart attack.

w

How can the valves in the heart become damaged?

Heart attack, infection, old age.

What happens when the valves become leaky?

Blood flows in two directions.

What can they be replaced by?

Biological or mechanical valves.

What could be the problems?

A blood clot.

x

A problem with heart transplants is rejection of the donor heart. What is meant by rejection in terms of a heart transplant?

When the body's immune system (white blood cells) attacks and destroys the donor heart muscle cells.

y

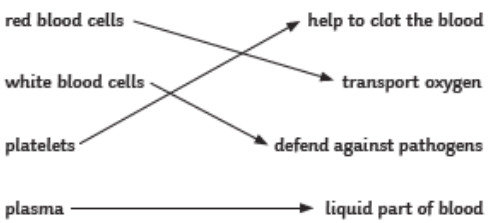
Describe two ways that the lungs are adapted for gaseous exchange.

Any three from the following:

- large surface area;
- moist lining;
- thin walls;
- good blood supply.

z

Match up the four components of the blood and their functions



a

Explain how an infection from a microorganism could lead to the development of other, non-communicable diseases.

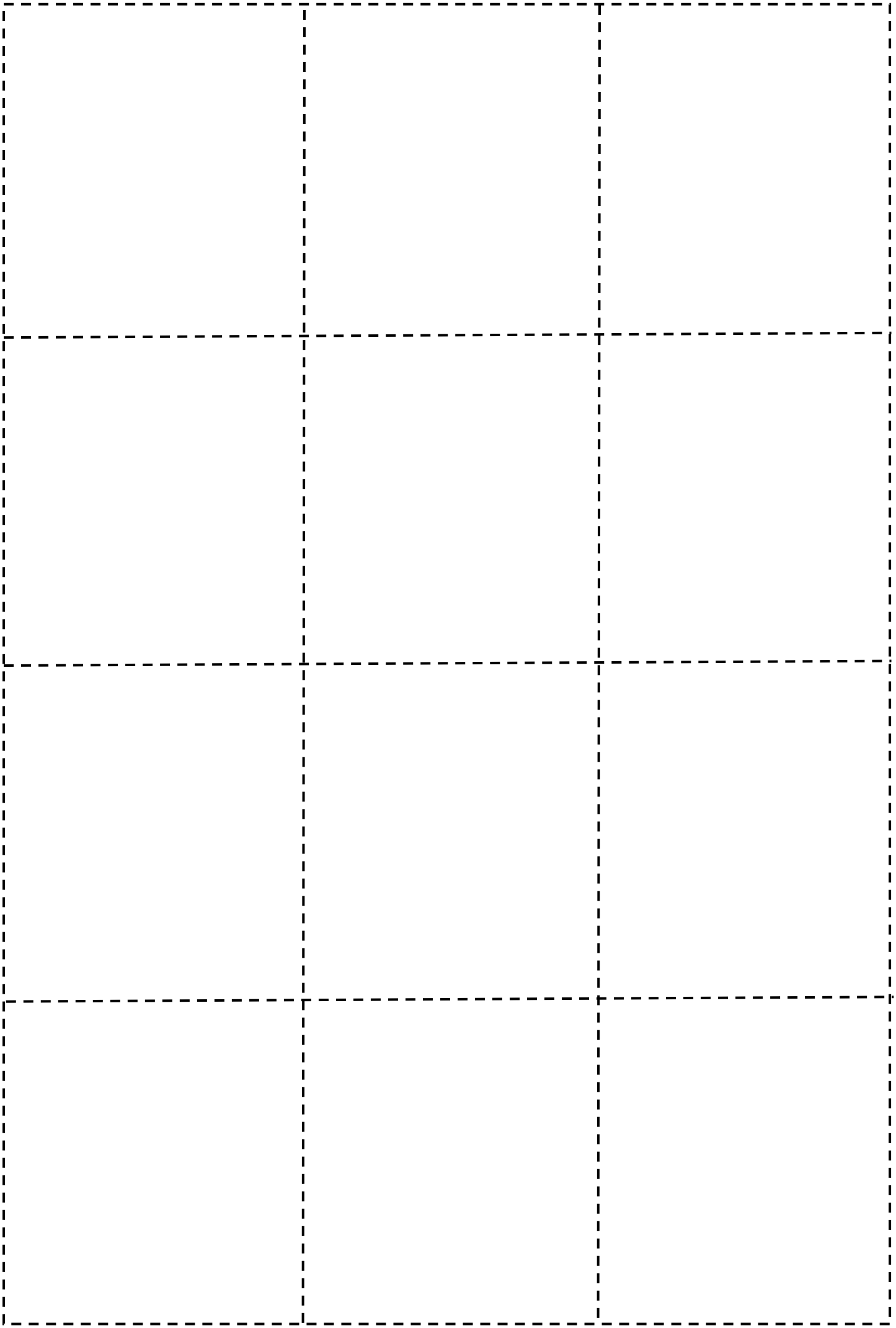
Infection from some viruses can lead to the development of cancer (e.g. HPV infection and cervical cancer). Also, infection with pathogens can sometimes trigger allergic reactions and worsen asthma, for example.

b

What is the difference between a benign and a malignant tumour?

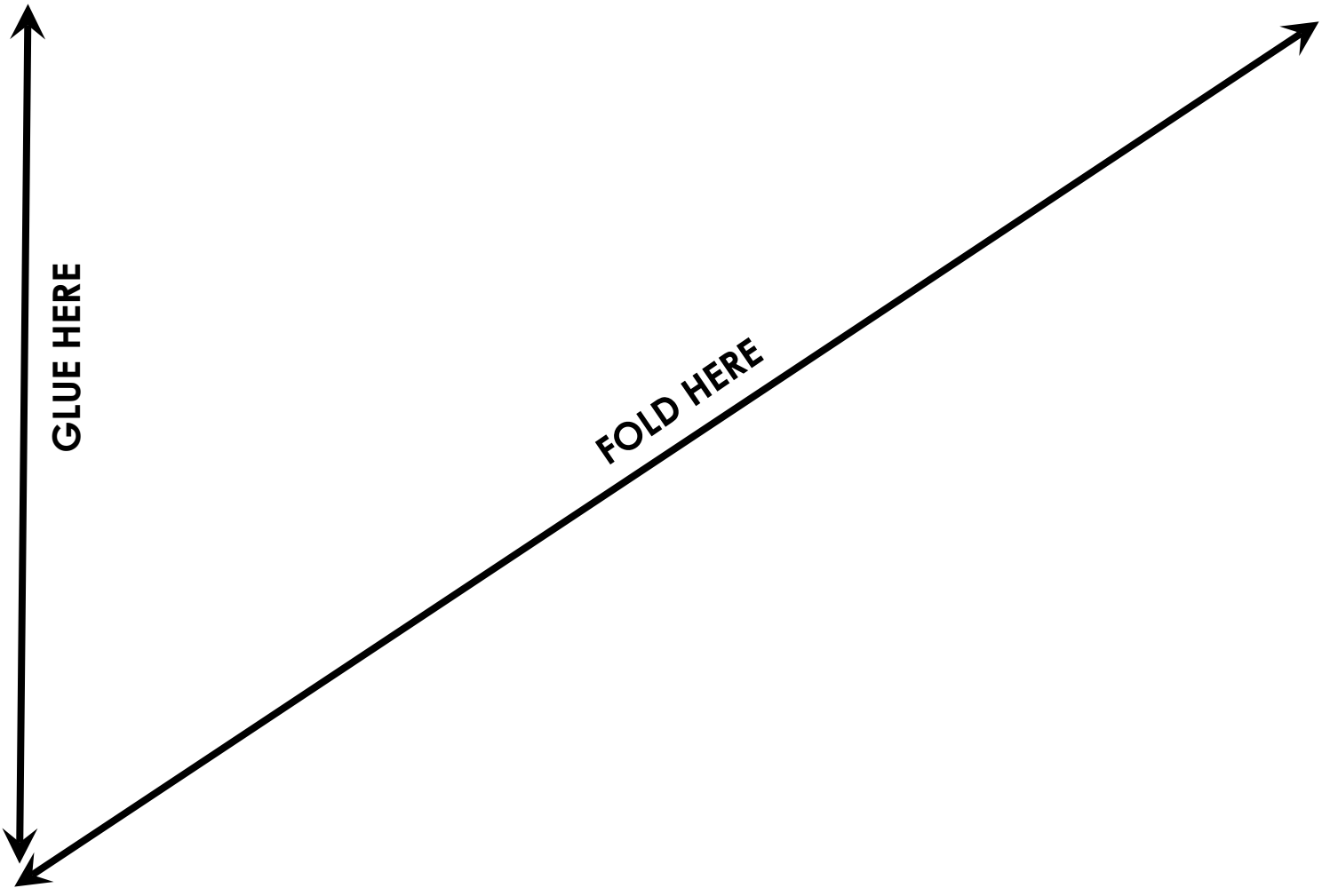
A benign tumour remains in one place and doesn't invade other tissues in the body – not usually dangerous.

A malignant tumour spreads to other parts of the body when cells break off and travel in the bloodstream to form secondary tumours.



Topic 2: Organisation

Question Card Storage



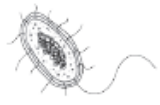
a

Circle the correct word in the definitions below and then write the following diseases under the correct group: HIV, cancer, diabetes, measles, rose black spot, heart disease.

communicable disease: Caused by pathogens and **can**/cannot be passed from one person to another.
HIV, measles, rose black spot
non-communicable disease: Can/**cannot** be passed on from one person to another.
cancer, diabetes, heart disease

b

Label the pathogens below that cause infectious diseases.



bacteria

virus

protist

fungi

c

Name three ways that pathogens are spread and match these pathogens with the correct method: cholera, flu, HIV.

1. By air: **flu**.
2. By direct contact: **HIV**.
3. By water: **cholera**.

d

How do pathogens cause disease?
Fill in the gaps.
Bacteria reproduce rapidly by **binary fission**. They may produce **toxins** that damage tissues and make us feel ill.
Viruses take over the cells of your body. They live and rapidly **reproduce** inside, this causes cell damage.
Keywords: toxins, viruses, reproducing, bacteria, binary fission

e

Simple hygiene measures are one of the most effective ways of preventing the spread of pathogens. List 5 ways we can be more hygienic below:

- **Washing hands** after using the toilet, before cooking or eating, and after contact with animals or sick people.
- Using **disinfectants** on surfaces.
- Keeping **raw meat** away from food that is eaten uncooked.
- **Coughing** or **sneezing** into a tissue.
- Keeping **agricultural machinery**, and people using it, clean to prevent the spread of **plant** diseases.

Keywords: disinfectants, coughing, plant, raw meat, washing hands, agricultural machinery, sneezing

f

List three other methods for preventing the spread of pathogens.

1. Keep infected individuals in **isolation**.
2. Destroy the **vectors** that carry pathogens.
3. **vaccination**.

g

Salmonella
Circle the correct pathogen.
bacteria, virus, protist, fungus

What are the symptoms?
Fever, abdominal cramps, vomiting and diarrhoea.

How is it spread?
Eating undercooked food or food contaminated from contact with raw meat, e.g. raw chicken.

What can we do about it?
Poultry are vaccinated to control the spread.

h

Measles
Circle the correct pathogen.
bacteria, **virus**, protist, fungus

What are the symptoms?
A fever and red rash on the skin. Can be fatal if there are complications.

How is it spread?
By air - the inhalation of droplets from coughs and sneezes.

What can we do about it?
There is no treatment, so young children are vaccinated against it.

i

Tobacco Mosaic Virus
Circle the correct pathogen.
bacteria, **virus**, protist, fungus

What are the symptoms?
Mosaic discolouration of the leaves which reduces photosynthesis and affects the growth of the plant.

How is it spread?
Direct contact between diseased plant material and healthy plants. Insects can also act as vectors.

What can we do about it?
TMV resistant strains. Good hygiene and pest control.

j

Gonorrhoea
Circle the correct pathogen.
bacteria, virus, protist, fungus

What are the symptoms?
Thick yellow or green discharge from the vagina or penis and pain on urinating.

How is it spread?
Sexual contact.

What can we do about it?
Treat with antibiotics. Use a barrier method of contraception.

k

HIV
Circle the correct pathogen.
bacteria, **virus**, protist, fungus

What are the symptoms?
Initially causes a flu-like illness. Damages the immune system so that it can't deal with other infections or cancers.

How is it spread?
Sexual contact or exchange of bodily fluids, such as blood.

What can we do about it?
Antiretroviral drugs help to stop the virus attacking the immune system. There is no cure or vaccine.

l

Malaria
Circle the correct pathogen.
bacteria, virus, **protist**, fungus

What are the symptoms?
Recurrent fever. Can be fatal.

How is it spread?
Mosquitos act as a vector, passing the protist to the human bloodstream when they feed on the blood.

What can we do about it?
Preventing the vectors (mosquitos) from breeding. Using mosquito nets and repellents to avoid being bitten. Taking antimalarial drugs.

m

Rose Black Spot
Circle the correct pathogen.
bacteria, virus, protist, **fungus**

What are the symptoms?
Purple or black spots develop on the leaves.Leaves turn yellow and fall of prematurely which reduces photosynthesis, affecting the growth of the plant.

How is it spread?
Spores are carried by water or wind.

What can we do about it?
Use fungicides to treat the plant.
Remove and destroy affected leaves.

a

Explain how your skin prevents microorganisms getting into your body.

It acts as a **barrier** to prevent **pathogens** reaching the tissues beneath. **Platelets** quickly form scabs to seal any cuts.

It produces **antimicrobial** secretions to kill pathogens.

It is covered with **microorganisms** that act as an extra barrier to entry.

Keywords: antimicrobial, microorganisms, platelets, barrier, pathogens

b

Explain how the respiratory system is adapted to reduce the entry of microorganisms.

The lining of the **nose** produces **mucus** and is full of **hairs** to trap particles in the air that may contain **pathogens**.

The lining of the **trachea** and **bronchi** produce **mucus** which is moved to the back of the throat by the **cilia** projections of **epithelial** cells.

Keywords: cilia, mucus, nose, pathogens, bronchi, epithelial, trachea, hairs

c

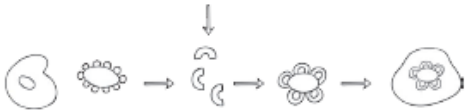
Explain how the digestive system is adapted to reduce the entry of microorganisms.

The **stomach** produces **hydrochloric** acid that destroys pathogens.

d

Describe each role of a white blood cell and explain how it protects you against disease.

Some white blood cells **ingest** pathogens, digesting and destroying them.



Some white blood cells produce **antibodies** which are chemicals that target **specific** pathogens and destroy them. An **antibody** only works for one type of **pathogen**.

Some white blood cells produce **antitoxins** that counteract the **toxins** released by pathogens.

Keywords: toxins, specific, antibody, antibodies, ingest, antitoxins, pathogen

e

Tick the correct boxes.

	Treats Symptoms	Kills Bacteria	Kills Viruses
painkillers	✓		
antibiotics		✓	

f

Write the correct keyword next to its definition: vaccine, herd immunity, antigen, antibody

Dead or inactivated form of a disease causing microorganism. **vaccine**

Unique protein on the surface of cells. **antigen**

Produced by white blood cells to recognise specific antigens. **antibody**

When vaccination of a significant proportion of the population provides protection for individuals who are not immune. **herd immunity**

g

Describe how vaccinations prevent illness.

1. Introduce small quantities of **dead or inactive** virus.
2. This stimulates white blood cells to produce **antibodies**.
3. If the live **pathogen** enters the body, the white blood cells **recognise** it and respond **quickly** so you don't get ill.

h

Fill in the missing words:

The use of **antibiotics** has greatly reduced the deaths from infectious **bacterial** diseases. However, the evolution of strains that are **resistant** to antibiotics is a concern.

Antibiotics are specific which means they only work against **certain bacteria**.

Keywords: bacterial, certain bacteria, resistant, antibiotics

i

State where the following drugs were discovered.

The heart drug digitalis: **foxglove**
The painkiller aspirin: **willow**
The antibiotic penicillin: ***Penicillium* mould**

Who discovered penicillin? **Alexander Fleming**

Why is it difficult to discover new medicines?
You need to find a chemical that kills bacteria without damaging human cells.

j

Where do most new drugs now come from?

Synthesised by chemists in a lab, but they might still start from a chemical extracted from a **plant**.

What has to happen before a drug can be used?

1. Test whether the drug is **effective** against the disease.
2. Check that the drug is not **toxic**.
3. Work out what **dose** to use.

k

Describe each process of drug testing.

preclinical testing:

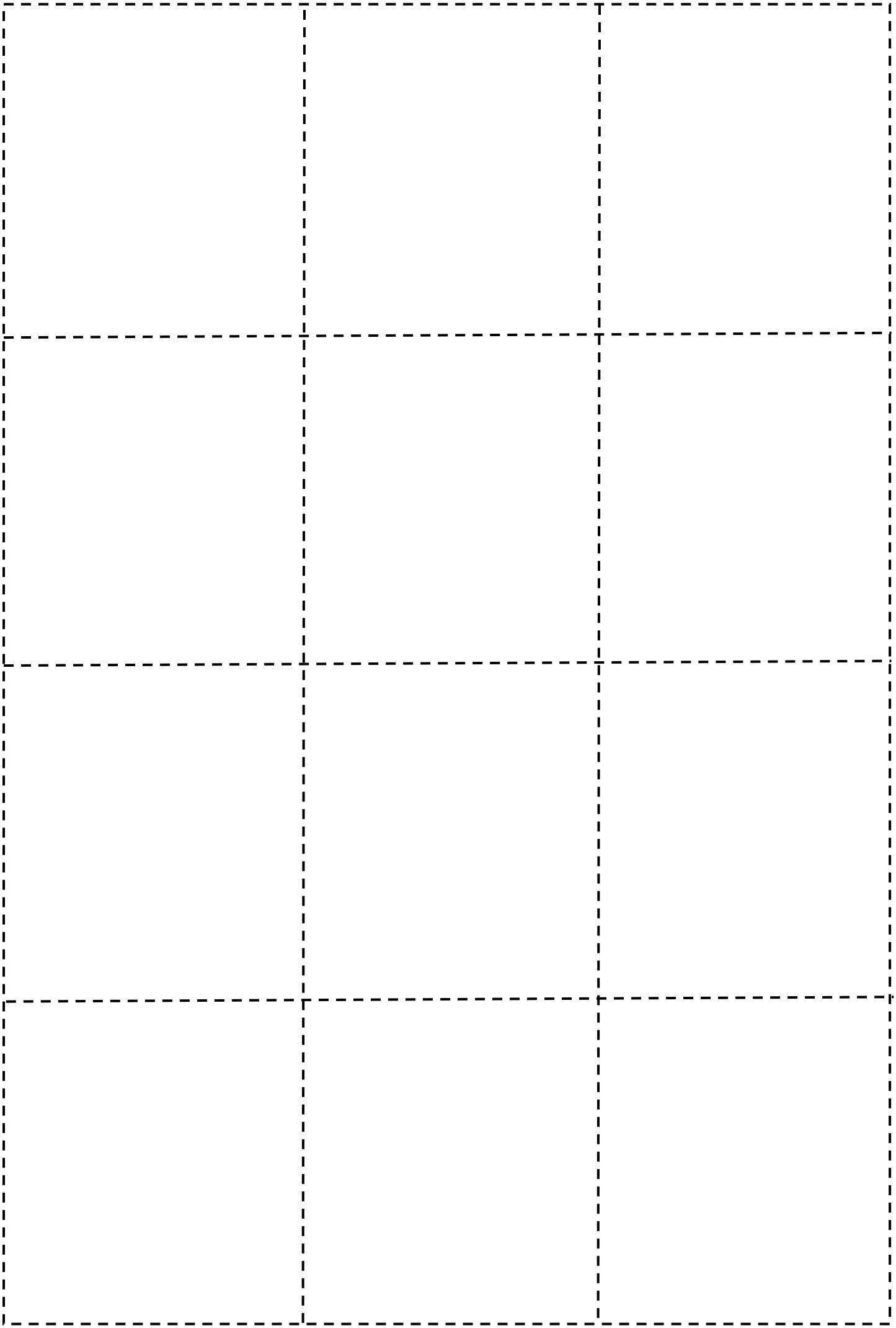
This happens in a laboratory using cells, tissues and animals.

clinical trials:

To use healthy volunteers and patients. Starting off with very low doses to check for side effects. If it is safe it is tested on patients.

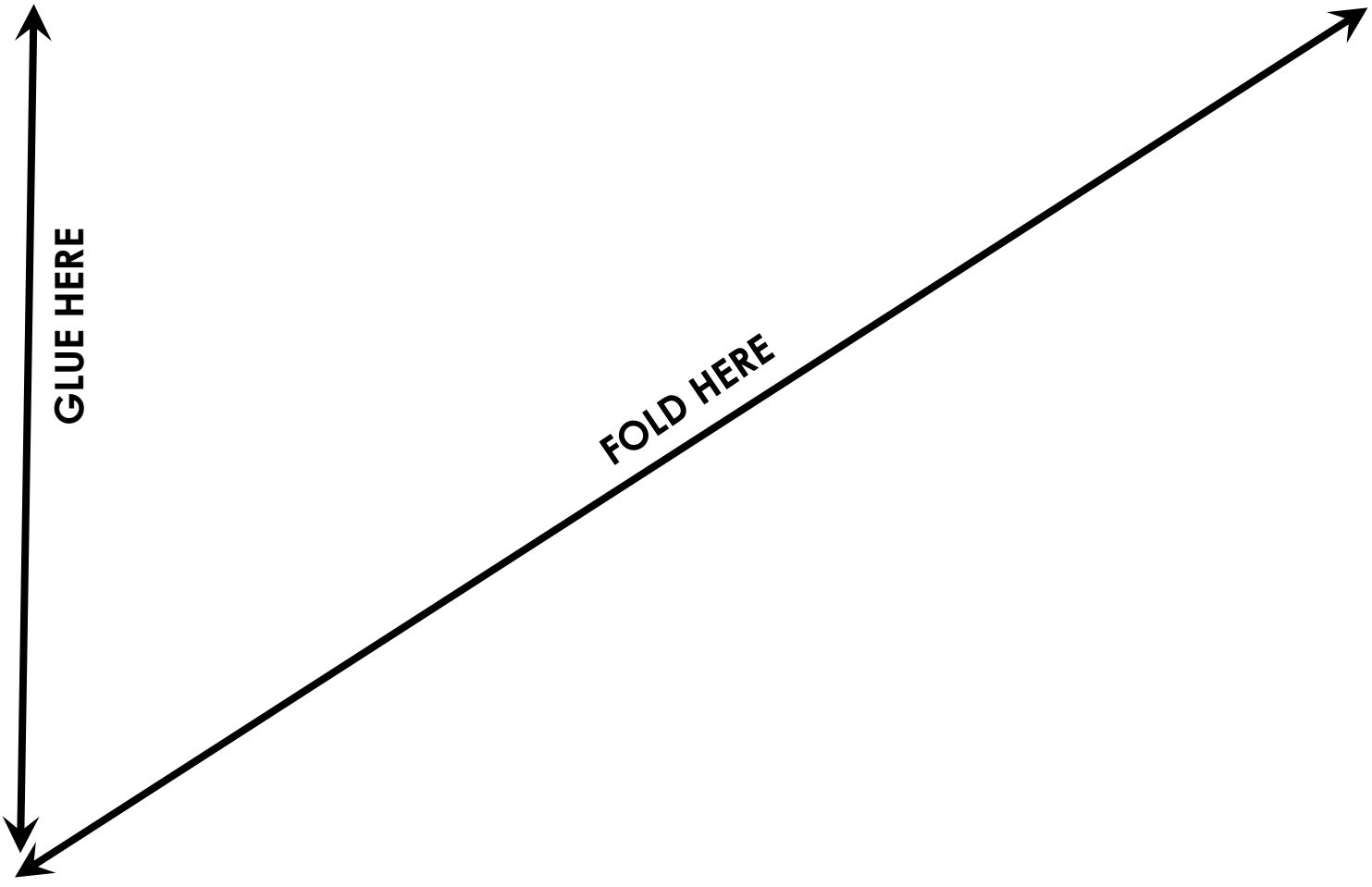
double-blind trials:

These tell you how effective a medicine is. Neither the patient or the doctor know whether the patient has been given a placebo or the real drug.



Topic 3: Infection and Response

Question Card Storage



a

Complete the word equation for photosynthesis.

sunlight

carbon dioxide + **water** → **oxygen** + glucose

b

Join the chemical formula to the correct chemical name.

CO_2	oxygen
H_2O	glucose
O_2	carbon dioxide
$C_6H_{12}O_6$	water

c

Choose the correct answer:

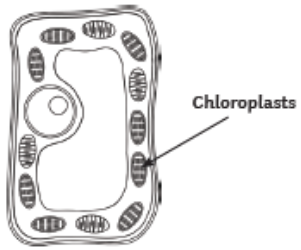
Photosynthesis is an exothermic/**endothermic** reaction.

Fill in the blanks:

In photosynthesis, **energy** is transferred from the **environment** to the **chloroplasts** by **light**.

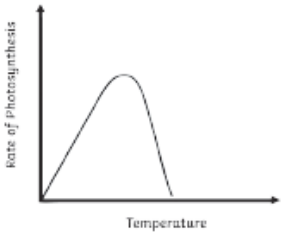
d

On the diagram of a plant cell below, label the part of the cell where photosynthesis happens.



e

Draw a line on the graph to show how temperature affects the rate of photosynthesis.

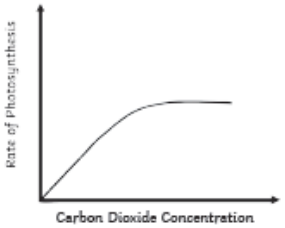


Explain how temperature affects the rate of photosynthesis.

As the temperature increases, the rate of photosynthesis **increases**. When the temperature gets too high, the enzymes that control photosynthesis **denature** and the rate of photosynthesis **decreases**.

f

Draw a line on the graph to show how carbon dioxide affects the rate of photosynthesis.



Describe how carbon dioxide affects the rate of photosynthesis.
Increasing the concentration of carbon dioxide will **increase** the rate of the photosynthesis until **another factor limits the rate**.

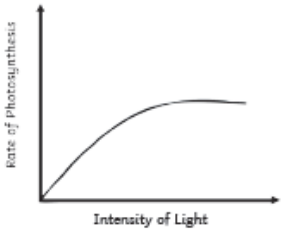
g

How does the rate of photosynthesis affect the biomass of a plant?

The more photosynthesis, the more biomass the plant makes, so the faster it grows.

h

Draw a line on the graph to show how light intensity affects the rate of photosynthesis.



Describe how light intensity affects the rate of photosynthesis.

Increasing light intensity **increases** the rate of photosynthesis until **another factor limits the rate**.

i

Use the keywords to complete the five ways that glucose produced in photosynthesis could be used.

1. For **respiration**.
2. Converted into insoluble **starch** for **storage**.
3. Used to produce **fat** or **oil** for **storage**.
4. Used to produce **cellulose**, which strengthens the **cell wall**.
5. Used to produce **amino acids** for **protein synthesis**. To produce **proteins** plants also need **nitrate** ions that are absorbed from the soil.

Keywords: cellulose, nitrate, starch, amino acids, respiration, storage, proteins, cell wall, oil, fat, protein synthesis

j

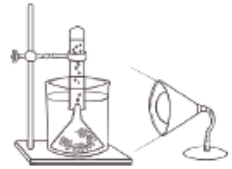
Explain how the amount of chlorophyll in a leaf affects the rate of photosynthesis.
The less chlorophyll in a leaf, **the less photosynthesis**.

Give two reasons there may be less chlorophyll in the leaf.

1. **If the plant has diseases, like tobacco mosaic virus or rose black spot.**
2. **If the plant does not have enough minerals, like magnesium.**

k

The illustration shows a method for investigating the effect of light intensity on photosynthesis.



How could you measure the rate of photosynthesis using this equipment?
Count the number of bubbles released in a given time (e.g. per minute).

Circle the independent variable in this experiment from the list below.

- Number of bubbles;
- volume of gas;
- **distance of the lamp from the pondweed;**
- volume of water;
- temperature of the water.

We often add a heat shield to the apparatus shown, what is the purpose of this?

To absorb any **heat** given off by the **lamp** so that we can control the **temperature** of the pondweed.

Why do we need to control some variables in an experiment?

To make sure it is a **fair test** and so that we can collect **valid** results.

a

Respiration is an **exothermic**/endothermic reaction that takes place in the **mitochondria** of cells.

The more active a cell is, the more mitochondria it needs. Name two cell types that have lots of mitochondria.
muscle cells, sperm cells, ciliated epithelial cells, phloem companion cells

Respiration transfers **energy** into a form we can use for living processes.

Join the type of respiration to the correct definition to show how respiration can take place.

aerobic	using oxygen
anaerobic	without oxygen

b

Complete the word equation for aerobic respiration.

glucose + **oxygen** → **carbon dioxide** + **water**

Complete the formula equation for aerobic respiration.

$C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$

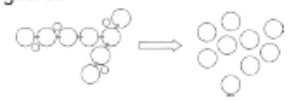
c

Give three reasons that organisms need energy.

1. For **chemical reactions** that build bigger **molecules**.
2. For **movement**.
3. For keeping **warm**.

d

The illustrations show the macromolecules in the foods that we eat. Put the keywords into the correct boxes to identify the molecules they are broken down into.
Keywords: fatty acids, sugars/glucose, amino acids, glycerol



carbohydrates → **sugars/glucose**

lipids → **fatty acids and glycerol**

proteins → **amino acids**

The small dots on each of the larger molecules represent the catalysts that help to break down the food. What are these called?
enzymes

Why is respiration important in this process?
The **enzymes** need the **energy** that is **released** from respiration to carry out their job.

e

Complete the word equation for anaerobic respiration in plant and yeast cells.
glucose → ethanol + carbon dioxide

What is anaerobic respiration in yeast called?
fermentation

Why does this process have economic importance?
It is used to make alcohol and bread.

f

What is metabolism?
The sum of all the **reactions** in a cell, or the body.

Metabolism includes the synthesis of new molecules. Complete the sentences to identify some of the molecules that are made in plant and/or animal cells.

1. Glucose is converted to **starch**, **glycogen** and **cellulose**.
2. Glycerol and **three** molecules of fatty acid are used to form **lipids**.
3. Glucose and **nitrate** ions are used to form **amino acids**, which are used to form **proteins**.

What happens to excess proteins in the body?
They are broken down to form **urea** for excretion.

g

Explain what happens to your heart rate when you exercise.

- Your heart rate **increases** so that **more** oxygenated blood is carried to your muscles.
- Therefore, more **oxygen** and **glucose** reach the cells.
- The rate of **respiration** can increase to transfer more **energy** for muscle **contraction**.
- **Carbon dioxide** is removed from the muscles at a faster rate.

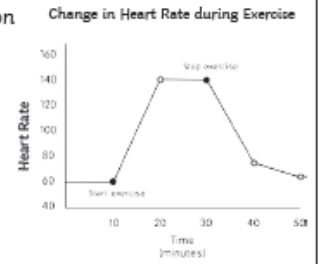
h

Explain what happens to your breathing rate when you exercise.

- Your breathing rate and breath volume **increase**.
- The rate at which **oxygen** is brought into your body is **increased**.
- The rate at which **carbon dioxide** is removed is **increased**.
- This means more **oxygen** is available to be transported to cells for **respiration**.

i

The graph shows the effect of exercise on heart rate.



How long did the person exercise for?
20 minutes

How much did their heart rate increase during exercise?
80 beats per minute

j

When does anaerobic respiration happen?
When your body can't supply oxygen to the muscles fast enough.

Complete the word equation for anaerobic respiration in muscles.

glucose → lactic acid

Why is anaerobic respiration not as efficient as aerobic respiration?
The glucose molecules are not completely broken down, so much less energy is transferred.

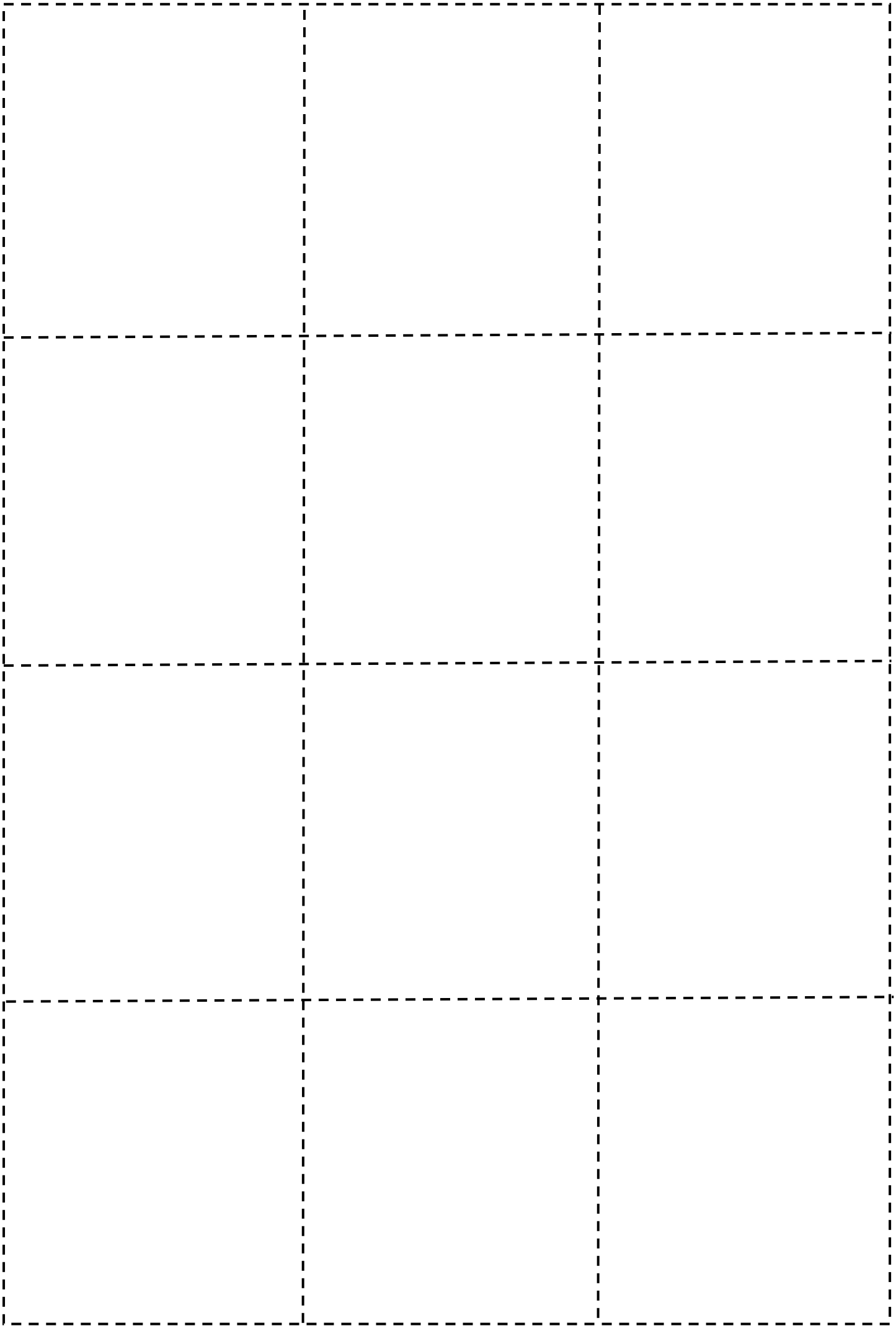
k

Explain what happens to your muscles during long periods of vigorous activity.

There is a build up of **lactic acid** which contributes to muscle **fatigue**.

Muscles stop **contracting** effectively.

An **oxygen debt** is created.



Topic 4: Bioenergetics

Question Card Storage