AQA Knowledge test Unit 1 Biology
B1.1 Keeping healthy
B1.1.1 Diet and exercise
1. Complete the table to describe the uses of groups:

<table>
<thead>
<tr>
<th>Nutrient group</th>
<th>Needed for</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate</td>
<td>energy for life processes</td>
</tr>
<tr>
<td>Fats</td>
<td>energy for life processes: fats to make cell membranes: insulate bodies</td>
</tr>
<tr>
<td>Proteins</td>
<td>growth and repair - building cells: energy for life processes</td>
</tr>
<tr>
<td>Vitamins and Minerals</td>
<td>needed in small amounts for healthy functioning of the body</td>
</tr>
</tbody>
</table>

2. What is meant by the term “malnourished”?
   If your diet is not BALANCED.

3. What are some of the effects of not having a balanced diet?
   A person can become over/underweight or suffer from a deficiency disease.

4. What happens to a persons if the energy in is not balanced with the energy out?
   If there is LESS energy in a person becomes underweight.
   If there MORE energy in than out a person becomes OVERWEIGHT or OBESE.

5. What is metabolic rate and what affects it?
   Rate that chemical reactions occur in cells – affected by age, gender and level of activity.

6. What is cholesterol?
   Cholesterol is made in the liver and is needed for healthy cell membranes.

7. Describe the differences between good and bad cholesterol.
   Bad Cholesterol (Low density lipoproteins -LDL) Carry cholesterol to cells, high levels of LDLS cause fat to build up in the artery.
   Good Cholesterol (High density lipoproteins -HDL) Carry cholesterol back to liver, helps prevent cholesterol building up.
B1.1.2 How Our Bodies Defend Themselves Against Infections Diseases

1. What is a pathogen? Microorganisms that cause disease.
3. How do white blood cells help to defend against pathogens? Ingest pathogens and destroy them, produce antibodies and antitoxins.
4. How does immunity develop? Antigens – unique proteins on a pathogen cell surface, white blood cells produce antibodies to join up with antigens on a pathogen.
5. What impact did Semmelweiss’ research have? He made the doctors wash their hands in chlorine water. There was a huge decrease in the number of deaths.
6. How are painkillers useful? They relieve symptoms of an infection or illness.
7. What are antibiotics are what can they be used for? Are medicines that work inside the body to kill bacteria that cause diseases by damaging the bacterial cells.
8. What is one of the impacts of the overuse of antibiotics? Overuse of antibiotics can cause resistant bacteria to develop.
9. Why is it so difficult to treat viral infections? Viruses live inside body cells.

10. HT-Only. How do individual pathogens develop resistance?
During antibiotic treatment less resistant bacteria killed first, more resistant bacteria remain and will re-infect if full course of antibiotics not taken.

11. Describe the action vaccinations on the body? Given a weak/dead form of the pathogen. White blood cells (WBC’s) produce antibodies. Pathogen is destroyed.

12. What does the MMR vaccine protect people against? MMR vaccine is used to protect against measles, mumps and rubella.

13. Why must petri dishes be sterilised before use? To kill any microorganisms already on the dishes.

14. When using inoculating loops to transfer bacteria what must be done to avoid contamination? The loop must be heated in a flame.

15. Why must petri dishes be taped shut? To stop microorganisms getting in or out.

16. What is the maximum temperature that cultures can be incubated to in a school? Must be incubated at 25°C max.

17. Why is this? It reduces risk of growth of pathogens that might be harmful to humans.
B1.2 Nerves and Hormones

1.2.1 The Nervous System

1. What is the nervous system needed for?
   To help to coordinate and body control the body.

2. What is a receptor for?
   An organ or body part that detects a change (stimulus) in the surroundings.

3. Complete the following table, indentifying the stimuli for each detector:

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Stimuli</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eyes</td>
<td>Light</td>
</tr>
<tr>
<td>Ears</td>
<td>Sound</td>
</tr>
<tr>
<td>Skin</td>
<td>Touch/pressure/pain</td>
</tr>
<tr>
<td>Tongue</td>
<td>Taste</td>
</tr>
<tr>
<td>Nose</td>
<td>Smell</td>
</tr>
</tbody>
</table>

4. What is a neurone?
   A specialised cell in the nervous system.

5. Complete the table:

<table>
<thead>
<tr>
<th>Neurone</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensory</td>
<td>Send impulses from receptors in the sense organs to the CNS.</td>
</tr>
<tr>
<td>Relay</td>
<td>The link sensory and motor neurones.</td>
</tr>
<tr>
<td>Motor</td>
<td>Send impulses from the CNS to muscles and glands.</td>
</tr>
</tbody>
</table>

6. Describe what happens in a reflex arc.
   Automatic response to a stimulus can bypass the CNS.

7. Label the parts:
   A – Receptor (reacts to a stimulus)
   B – Sensory Neuron (carries message to the co-ordinator/CNS)
   C – Relay Neuron   Gaps between neurons are called SYNAPSES
   D – Motor Neuron (carries message away from co-ordinator/CNS
   E – Effector (a muscle or gland)

8. How does the nervous system transmit information in the body?
   Via electrical signals – impulses.
**B1.2.2 Control in the Human Body**

1. What is a hormone?
   - Chemicals that help control body functions.

2. What do hormones control?
   - Things like menstruation in women as well as the changes that occur to our bodies during puberty and homeostasis.

3. Where do hormones have an effect?
   - On target organs.

4. State 3 places in the body where hormones are produced.
   - Brain, testis, pancreas, adrenal gland, ovary and thyroid gland.

5. How do hormones travel around the body?
   - In the blood.

6. What is a gland?
   - Parts of tissues and organs in the body that secrete substances e.g. hormones.

<table>
<thead>
<tr>
<th>Factor controlled by homeostasis</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water content</td>
<td>Water leaves the body by: lungs when we breathe out, skin when we sweat, kidneys in the urine</td>
</tr>
<tr>
<td>Ion content</td>
<td>Ions are lost by: skin when we sweat, kidneys in the urine</td>
</tr>
<tr>
<td>Temperature</td>
<td>To maintain the temperature at which enzymes work best for chemical reactions in the cells. Normal body temperature is 37°C</td>
</tr>
<tr>
<td>Blood glucose levels</td>
<td>Controlled by the pancreas to provide the cells with a constant supply of energy.</td>
</tr>
</tbody>
</table>

7. Describe how a person can conserve water in a survival situation.
   - Avoid exercise, stay in the shade, don’t lie on hot ground, don’t eat, don’t talk and breathe through your mouth.

8. What is the menstrual cycle?
   - The reproductive cycle in women controlled by hormones.

9. How long does the menstrual cycle last?
   - 28 days.

10. At what day in the month of the menstrual cycle is the egg released?
    - 14th

11. What is the role of follicle stimulating hormone (FSH)? Where is it produced?
    - Causes the egg to mature stimulates ovary to produce oestrogen produced in the pituitary gland.

12. What is the role of luteinising hormone (LH)? Where is it produced?
    - Triggers release of egg from the ovary produced in the pituitary gland.

13. What is the role of oestrogen? Where is it produced?
    - Stimulates the lining of the womb to develop and stimulates pituitary gland to make LH produced in the ovaries.
14. If an egg is not fertilised what happens?

The lining of the womb breaks down and the egg leaves the body in a period.

15. How do contraceptives use hormones to control fertility?

Inhibits production of FSH so eggs don't mature in the ovaries.

16. Which hormones will be included in “fertility drugs”?

FSH used to stimulate eggs to mature and trigger oestrogen production.

17. What happens during in vitro fertilisation (IVF)?

Eggs collected and fertilised in the lab then implanted

**B1.2.3 Control in Plants**

1. Describe the direction that shoots grow in, relating to the things that they are sensitive to.

   **Shoots are sensitive to light, they grow towards light.**

2. Describe the direction that roots grow in, relating to the things that they are sensitive to.

   **Roots are sensitive to gravity they grow towards the force of gravity.**

3. What is the name of the hormone in plants?

   **Auxin**

4. What is phototropism?

   **Plant growth response to light.**

5. Describe how auxin controls phototropism.

   **Causes cell elongation in the shoot.**

6. What is geotropism?

   **Plant growth response to gravity.**

7. Describe how auxin controls geotropism.

   **Stops cell elongation in the root.**

8. What do negative and positive tropisms mean?

   **Positive Tropism – towards the stimulus. Negative Tropism – away from the stimulus.**

9. How can plant growth hormones be used in agriculture?

   **Selective Weed killers – Auxin makes broad leaved plants grow out of control and die. Rooting Powder – Auxin makes cuttings develop roots quickly. Seedless Fruit – Flowers sprayed with hormones to make fruit develop but not seeds. Fruit Ripening – Farmers use hormones to control fruit ripening.**
**B1.3 The Use and Abuse of Drugs**

**B1.3.1 Drugs**

1. What are beneficial drugs? Give examples.
   - Statins, antibiotics: Medical drugs are developed and tested before being used to relieve illness or disease.

2. Describe what a good medicine is.
   - Effective, safe and stable.

3. What is a placebo?
   - A pill that does not contain the drug

4. What is a double blind trial?
   - Drug trials where neither doctor or patient knows who has the real drug.

5. What are recreational drugs? Give examples.
   - Drugs may also be used recreationally as people like the effect on the body e.g. coffee, nicotine, cannabis, heroin.

6. Describe the difference between legal and illegal drugs.
   - Legal drugs are recreational or medicinal drugs that have been tested and are not criminal. Illegal drugs are drugs that are against the law to make and use.

7. What are statins used for?
   - Drugs that lower the bad cholesterol in the blood.

8. Why can cannabis be harmful?
   - Cannabis smoke contains chemicals which may cause mental illness in some people.

9. Why do people use cannabis?
   - As a recreational drug because they like how it makes their body feel.

10. What is Thalidomide?
    - A drug that was used in the 1950’s to aid with morning sickness it cause deformities in the limbs of unborn babies.

11. What was thalidomide banned?
    - Because it caused deformities.

12. What impact can the misuse of drugs have on the body?
    - It can lead to dependency and addiction as well as mental and physical health issues also linked to social issues.

13. Why is the overall impact of legal drugs much greater than illegal drugs?
    - Millions more people use legal drugs like tobacco and alcohol so the impact is much bigger.

14. What is addiction?
    - The body can’t function properly without the drug.

15. What is withdrawal?
    - The symptoms people feel when they stop using drugs, pain, cravings, sweating etc.

16. Athletes are banned from using drugs to enhance their performance. What are the impacts of the Anabolic Steroids.
    - Muscle growth, change in sexual characteristics and increased aggressive behaviour.
B1.4 Interdependence and Adaptation

B1.4.1 Adaptations
1. What do plants compete for?
   Light, carbon dioxide, water, oxygen and nutrients.
2. What do animals compete for?
   Food, water, shelter, mates and territory.
3. What is an adaptation?
   How organisms are suited to their environment.
4. What is an extremophile?
   Organisms that have adaptations for living in extreme conditions.
5. What adaptations may an organism have to allow it to survive in artic conditions?
   Small surface area to volume e.g. Ears. Insulation – blubber (thick layer of fat under skin), fur coat Fat layer also provides a food supply during winter.
6. What adaptations may an organism have to survive in dry environments?
   Large surface area to volume to lose heat through skin. Big ears- lose heat. Thin fur, little body fat.
7. Why is camouflage important?
   So predators and prey can’t see each other easily.

B1.4.2 Environmental Change
1. Give some examples of non-living changes in an environment.
   Temperature increase/decrease, availability of sunlight, water, oxygen or carbon dioxide.
2. Give some examples of living changes in an environment.
   Availability of food, predation, disease.
3. Describe how lichens can be used as air pollution indicators.
   Sensitive to changes in air pollution so absence shows there is pollution.
4. Describe how invertebrate animals can be used as water pollution indicators.
   Some invertebrate animals cannot survive in polluted water their presence or absence shows if water is polluted.
5. Give examples of non-living indicators that demonstrate environmental changes.
   Oxygen, CO₂ levels, temperature and rainfall.
6. Why are bees important?
   For pollination of plants.
**B1.5 Energy and Biomass in Food Chains**

**B1.5.1 Energy in Biomass**

1. What process do plants use to collect energy from the sun?  
   **Photosynthesis.**

2. What are producers?  
   **Organisms that make their own food e.g. plants.**

3. What are consumers?  
   **Organisms that eat other organisms.**

4. What is biomass?  
   **The dry mass of living material in an animal or plant.**

5. Why is the amount of energy contained in the biomass of organisms reduced at each stage of the food chain?  
   **For the organisms life processes. E.g. keeping warm, movement.**

6. What does a pyramid of numbers show?  
   **How many of each organism you have in each step of the food chain.**

7. What does a pyramid of biomass show?  
   **The biomass of each organism in a food chain.**

**B1.6 Waste Materials from Plants and Animals**

**B1.6.1 Decay Processes**

1. Why do materials decay?  
   **Recycle of resources caused by decomposers.**

2. What conditions cause decay to occur fastest?  
   **Warm, moist and a good supply of oxygen.**

3. What are the main two types of decomposers?  
   **Bacteria and fungi are the main groups of decomposer.**

4. Why is the decay process important?  
   **To recycle resources in the environment and get rid of waste materials.**

5. What are the main waste products of decay?  
   **Carbon dioxide and water.**
B1.6.2 The Carbon Cycle
Carbon dioxide is removed from the environment by green plants by PHOTOSYNTHESIS. The carbon from carbon dioxide is used to make CARBOHYDRATES, FATS and PROTEINS to make up the body of plants. Plants release carbon dioxide to the atmosphere by RESPIRATION Plants are eaten by animals, animals are eaten by other animals. Animals release carbon dioxide to the atmosphere by RESPIRATION
When plants and animals die some animals and DECOMPOSERS feed on their bodies. These organisms release carbon to the air when they RESPIRE Carbon dioxide is released to the atmosphere from wood and fossil fuels by COMBUSTION.

10. What is the process shown by:
   A RESPIRATION
   B PHOTOSYNTHESIS
   C DECAY/DECOMPOSITION

B1.7 Genetic Variation and Control
B1.7.1 Why Organisms are Different
1. Where in a cell do we find genetic information?
   Nucleus

2. What is a chromosome?
   Structure in the nucleus made of DNA that contains many genes.

3. What is a gene?
   A section of DNA that makes codes for a protein.

4. What is a gamete?
   A sex cell e.g. sperm, egg, pollen.

5. What is genetic variation? Give examples.
   Passed on from parents in your genes E.g. Eye colour, gender, shape of nose

6. What is environmental variation? Give an example.
   Due to the way of life E.g. Scars, accents, hair length

7. Give examples of variations that can be both.
   Height, weight

8. How many chromosomes do humans have?
   46 single or 23 pairs.
**B1.7.2 Reproduction**

1. What is sexual reproduction?
   
   *Where two parents are involved, mixture of genes is created.*

2. What is asexual reproduction?
   
   *It involves only one parent. So there is no genetic variety (CLONES).*

3. Describe the following cloning techniques:

   **Tissue culture:** Tissue sample scrapped from the parent plant, grown in nutrient agar and treated with auxins then developed into tiny plants.

   **Embryo Transplant:** A developing embryo is removed from an animal and the cells split apart. The cells are grown for a while before being implanted into separate host mothers

   **Adult Cell Cloning:** A nucleus is removed from an egg cell and replaced with a nucleus from another animal’s body cell. Then the egg cell is placed in another female to develop.
**B1.8 Evolution**

1. What is the name of the theory of evolution proposed by Charles Darwin?
   
   **Theory of evolution by natural selection.**

2. Why did people object to Darwin’s theory?
   
   Religion, people believed god made the world, not enough evidence and there was no way to explain inheritance as genetics was not known about.

3. How did Lamarck’s theory differ from Darwin’s?

   He thought organisms acquired the advantageous characteristics during their life and passed them on.

4. Why is it important to study the similarities and differences between living organisms?

   These studies help us to understand the evolutionary relationships between different organisms.

5. Describe the process of natural selection.

   **Variation** – populations of organisms have variations.

   **Over-production** – produce more young than will survive to adulthood.

   **Struggle for existence** – competition for survival between the organisms

   **Survival** – those with advantageous characteristics are more likely to survive

   **Advantageous characteristics inherited** – better adapted organisms are more likely to reproduce successfully passing on the advantageous characteristics to their offspring in their genes.

   **Gradual change** – over a period of time the more individuals with the advantageous characteristics in the population.

6. What does an evolutionary tree show?

   **Relationships** between different organisms and where they originated from.

7. What is a species?

   **A group of similar organisms that can breed to produce fertile offspring**

8. What is classification?

   **Grouping organisms to show how closely they are related.**