**CHAPTER 10 - HUMAN EVOLUTION**

**EVIDENCE OF COMMON ANCESTORS**

**QUESTION 1**

1. B

2. A

3. D

4. B

5. D

**QUESTION 2**

1. Stereoscopic vision

2. Cranium

3. Quadrupedalism

4. Transitional fossil

5. Bipedalism

6. Foramen magnum

7. Prognathous

8. Sagittal crest

9. *Homo erectus*

**QUESTION 3**

1. Eyes-stereoscopic vision with both eyes in the front of the head/ eyes are protected by bony sockets.

Teeth-variety of teeth present for omnivorous diet

Nose-reduced or absent snout with small noses

2. Organism A. The position of the foramen magnum is towards the back end of the skull.

3. Table showing observable differences between Organism A and Organism B

|  |  |
| --- | --- |
| **Organism A** | **Organism B** |
| Small cranium | Large cranium |
| Brow ridge well developed | Brow ridge not well developed |
| Foramen magnum towards the back end of the skull | Foramen is in a forward position |
| Large jaw and more prognathous | Small jaw and less prognathous |
| Large teeth/canines | Small teeth/canines |

**QUESTION 4**

1. Opposable thumbs. Finger nails. Finger tips have ridges/fingerprints. Clavicle/collar bone allows the arms to freely rotate in the shoulder socket.

2. Table showing observable differences between the skeleton on a human and a gorilla

|  |  |
| --- | --- |
| **Human** | **Gorilla** |
| Small cranium | Large cranium |
| Short and wide pelvis | Long and narrow pelvis |
| Long legs | Short hind limbs |
| Short arms | Longer forelimbs |
| Toes lie parallel to each other | Opposable big toe/divergent big toe |

3. *Homo sapiens/*Human

4. Foramen magnum situated ventrally under the skill with the vertebral column underneath the skull.

Spine is S-shaped to provide greater flexibility and support of the body above the legs.

Pelvis is wide and cup shaped which supports the abdomen above the legs.

5. Hands are free to carry tools, food or babies

Better view of the surroundings-search of food or to avoid predators

Smaller body surface exposed to the sun-faster cooling of the body

**QUESTION 5**

1. Mitochondrial DNA remains relatively unchanged from generation to generation. Based on the Human genome project- all humans contain a mutation in their mitochondrial DNA that links all humans to a common ancestor that lived in Africa 150 000 years ago knows as mitochondrial Eve.

2. During fertilisation only the nucleus of the sperm enters the egg cell to fuse with its nucleus. The mitochondrion of the egg cell continues as the mitochondria o the zygote. This is how mitochondrial DNA is passed from mother to child, it originate from the maternal line.

3. On the Y-chromosome

**OUT OF AFRICA HYPOTHESIS**

**QUESTION 1**

1. F

Little foot Mrs Ples Karabo *A robustus A. sediba*

2. One of the richest sites of hominid fossils in the world. Some of the oldest fossils ever found were discovered there suggesting that humans may have evolved there thus the name “Cradle o Humankind”

3. Has some characteristics of *Australopithecines* and some *Homo* characteristics- appears between the two genera

4. *Homo sapiens Homo heidelbergensis*

5. *A. africanus A. robustus A. sediba*

**QUESTION 2**

1. Modern humans originated in **Africa**, fossil evidence indicates that all ***Australopithecine***  and ***Homo habilis*** fossils were only found in Africa. Approximately **2mya**, *Homo erectus* **moved out** of Africa due to **climate change**.

Reduced rainfall caused **forests** to shrink and **grasslands** to expand. This resulted in a larger number of grassland animals thus a greater available **food** source for ***H. erectus***, which encouraged *H. erectus* to **hunt** and **follow** animal migrations. At the same time the forest dwelling ***Australopithecine*** would have lost much of their habitat so their population numbers would have **declined**.

Over the next million years, ***H. erectus*** spread to the rest of the world and evolved into various *Homo species* each adapted to the different environments that they inhabited. In **Africa**  *Homo erectus* evolved into ***H. sapiens***, this probably happened in **East Africa** but fossil evidence also suggests that it could have happened in South Africa.

Around **90 000** years ago, a  **second** migration occurred by ***H. sapiens*** out of Africa. *H. sapiens* were now considerably more **intelligent** and more capable of **adapting** to environments. They competed for resources from the other ***Homo species***. Eventually all the other *Homo species* became **extinct** and *H. sapiens* **populated** the world.

2. These fossils dated back 4.5mya. They were found in East Africa in Ethiopia and Tanzania. They were also found in South Africa mainly is Gauteng. Large number of fossils discovered in Africa also support this hypothesis.

3. The mitochondrial DNA in the zygote is inherited from the mother. Any mutation in the mitochondrial DNA can be traced back to a female from Africa (mitochondrial Eve). This indicates that all women originated from Africa and from there her offspring’s radiated to the other parts of the world.

**QUESTION 3**

1. A.

Very small cranium and a very prognathous jaw

2. Table showing differences between Skull B and Skull C

|  |  |
| --- | --- |
| **Skull B** | **Skull C** |
| Small cranium | Large cranium |
| Foramen magnum near the back of the skull | Foramen magnum in a forward position |
| Rectangular upper jaw | U-shaped upper jaw |
| Larger teeth/longer canines | Smaller teeth/small canines |

3. There is an increase in cranium size. The cranium will house a larger brain. Larger brain indicates more intelligence.

**QUESTION 4**

1. S-shaped. Greater flexibility and support of the body above the legs

2. *A. afarensis A. anamensis*

3. 4.5my – 3my = 1.5 my

4. Increased skull size which is indicative of a larger brain therefore greater intelligence in order to make use of tools

5. Cultural and genetic evidence

6. A cranial capacity indicates that the organism will have a larger brain in comparison to body size which implies that they would be more intelligent. With an increase in intelligence, they were able to make tools, art, and clothing. They were able to control fire-cook meat, warmth, storytelling near the fire-development of modern language. They were able to bury the dead.