# Unit 21 · Human Evolution

**ANSWER KEY · FOR TEACHERS**

Full marks 35

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

## 1 Key words

1. *Proconsul* → **b.** a Miocene ape of East Africa, near the common ancestor of apes and humans
2. *Ramapithecus* → **i.** a Siwalik ape once thought a human ancestor, now part of *Sivapithecus*
3. Lucy → **f.** a 3.2-million-year-old skeleton of *Australopithecus afarensis*
4. *Homo habilis* → **a.** the "handy man" who made Oldowan tools
5. Java man → **d.** *Homo erectus* found by Eugène Dubois in 1891
6. Heidelberg man → **g.** a heavy, chinless jaw from Mauer, about 600,000 years old
7. Cro-Magnon man → **h.** early modern humans of Europe, who painted Lascaux
8. Denisovans → **e.** humans from whom Tibetans inherited a gene for high altitude

Each carries 0.5 mark. **K · 4**

## 2 Label the diagram

1. Prosimii lemurs, lorises, tarsiers
2. Anthropoidea monkeys, apes, humans
3. Platyrrhini New World monkeys
4. Catarrhini Old World monkeys, apes, humans
5. Hominoidea apes and humans
6. Hominidae orangutans, gorillas, chimps, humans

Each carries 0.5 mark. **K · 3**

## 3 Multiple choice

**i.** **b.** lemur **K · 1**

The **lemur** is a prosimian. The gibbon and gorilla are apes, and the baboon an Old World monkey: all anthropoids.

**ii.** **c.** long, prehensile tails **K · 1**

Only New World monkeys have **prehensile tails** (though not all of them do: the spider and howler monkeys do, marmosets don't). The other options describe Old World monkeys.

**iii.** **b.** no tail **U · 1**

Old World monkeys share the 2.1.2.3 formula, nails and a menstrual cycle with apes and humans. **Having no tail** is a mark of the hominoids, apes and humans.

**iv.** **c.** *Homo erectus* **U · 1**

*Homo erectus* reached Georgia (Dmanisi) about 1.8 million years ago, and later China and Java. The australopithecines and *H. habilis* are known only from Africa; *H. sapiens* left Africa far later.

**v.** **b.** a New World monkey from South America **A · 1**

Three premolars in each half-jaw (36 teeth) and a broad nose with sideways nostrils are marks of the **Platyrrhini**, the New World monkeys.

## 4 Very short answers

**a.** **K · 1**

MARKING SCHEME

✓ *Homo sapiens sapiens.*

**b.** **K · 1**

MARKING SCHEME

✓ The Neander valley, Germany, 1856.



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**c.** MARKING SCHEME U · 1

✓ Two ape chromosomes fused into human chromosome 2.

## 5 Short answers

**a.** MARKING SCHEME A · 2

✓ $2 \times (9 + 9) = 36$ teeth.

✓ The formula is for one half of each jaw, so it is doubled.

**b.** MARKING SCHEME U · 2

✓ The *Sivapithecus* face (1982) was orangutan-like: it is an orangutan relative.

✓ DNA dates the human–African ape split to 6–7 million years ago, too recent.

**c.** MARKING SCHEME U · 2

✓ No: chimpanzees make and use tools.

✓ Evidence, e.g. Goodall's termite-fishing twig (1960), or cracking nuts with stones.

**d.** MARKING SCHEME U · 3

✓ Any one difference, e.g. nose and nostrils.

✓ Any second, e.g. 36 against 32 teeth.

✓ Any third, e.g. prehensile tail, sitting pads, or where they live.

## 6 Long answers

**a.** ANSWER U · 4

| Apes | Man |
|---|---|
| partly erect; on all fours or swinging | fully erect; bipedal |
| arms longer than legs | legs longer than arms |
| big toe opposable | big toe in line, not opposable |
| foot flat | foot arched |
| backbone C-shaped | backbone S-shaped, four curves |
| pelvis long and narrow | pelvis short and bowl-shaped |
| foramen magnum towards the back | foramen magnum under the middle |
| heavy brow ridges, projecting jaws, no chin | small brow ridges, flat face, a chin |
| large canines with a diastema | small canines, no diastema |
| brain about 300–550 cc | brain about 1,350–1,450 cc |

MARKING SCHEME

✓ Any two differences, e.g. posture and arms longer than legs.

✓ Any two more, e.g. the big toe and the arch of the foot.

✓ Any two more, e.g. the backbone's curves and the pelvis.

✓ Any two more, e.g. the chin, canines with a diastema, or brain size.



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**b.** ANSWER A · 4

**Alike:** both are early members of the genus *Homo*, walked upright, made stone tools, ate meat as well as plants, and lived in Africa.

| *Homo habilis* | *Homo erectus* |
|---|---|
| about 2.4–1.4 million years ago | about 1.9 million to 110,000 years ago |
| only in Africa | Africa, then Asia (Georgia, China, Java): the first to leave Africa |
| small, about 1–1.35 m, with long arms | tall, about 1.45–1.85 m, with modern body proportions |
| brain about 500–800 cc (about 610 cc) | brain about 600–1,100 cc (about 900 cc) |
| smaller brow ridges; larger teeth | heavy brow ridges, long low skull; smaller teeth |
| simple Oldowan tools: pebbles with a sharp edge | Acheulean hand axes, shaped on both sides; more planned tools |
| scavenged meat from carcasses | hunted large animals |
| no evidence of fire | probably controlled fire, from about a million years ago |

MARKING SCHEME

- ✓ Time and place: *H. habilis* 2.4–1.4 million years ago, only Africa; *H. erectus* 1.9 million to 110,000 years ago, the first to leave Africa.
- ✓ Body and brain: *habilis* 1–1.35 m, about 610 cc; *erectus* 1.45–1.85 m, about 900 cc.
- ✓ Tools: simple Oldowan pebble tools against Acheulean hand axes.
- ✓ Food and fire: *habilis* scavenged meat; *erectus* hunted large animals and probably controlled fire.

## 7 Think

ANSWER HA · 3

Humans and chimpanzees are **cousins**, not ancestor and descendant: both evolved from a **common ancestor**, and chimpanzees have been evolving for exactly as long as we have. The shared DNA shows how **recently** that common ancestor lived: the human and chimpanzee lines split in Africa about **6 to 7 million years ago** (*Sahelanthropus*, about 7 million years old, is from just after the split).

MARKING SCHEME

- ✓ Humans did not evolve from chimpanzees: both came from a common ancestor (cousins).
- ✓ Chimpanzees have evolved for as long as we have; the shared DNA shows a recent common ancestor.
- ✓ The lines split in Africa about 6–7 million years ago.

## 8 Activity: Five stages of human evolution

(not marked)

WHAT STUDENTS SHOULD FIND

*Australopithecus*: 4.2–2 million years ago, about 450 cc, walked upright (Lucy, the Laetoli footprints). *Homo habilis*: 2.4–1.4 million, about 610 cc, Oldowan stone tools. *Homo erectus*: 1.9 million to about 110,000, about 900 cc, hand axes, fire, the first to leave Africa. Neanderthals: 400,000–40,000, about 1,450 cc, Mousterian tools, burials, adapted to cold. *Homo sapiens*: from about 300,000 in Africa, about 1,350 cc, art, language, farming from about 10,000 years ago. **Walking upright came first**, millions of years before the large brain.

| Marks by level | Knowledge | Understanding | Application | Higher ability | Total |
|---|---|---|---|---|---|
| **Marks** | 11 | 14 | 7 | 3 | **35** |



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