Year 13 Science: Trends in human cultural evolution

Name: _____ Date: _____

Try these without your notes first, then check the answer key.

Practice

1. Put these in order, oldest first: Mousterian, Oldowan, Upper Palaeolithic, Acheulean.

2. Which tool industry first shows a symmetrical shape planned before making?

3. The Acheulean began about 1.76 million years ago and the Mousterian about 250 000. About how long did the Acheulean last, in years?

4. Give the indirect evidence that clothing is at least 83 000 years old.

5. Name one biological change that cooking may have allowed.

Exam-style question: fire

Ash and burnt bone in Wonderwerk Cave suggest hominins were controlling fire by about 1 million years ago, and hearths are common at sites from about 400 000 years ago.

6. Describe two uses of fire other than cooking.

7. Explain how fire helped hominins move into colder environments.

8. Explain how cooking could have affected the biological evolution of hominins.

9. Discuss fire as an example of positive feedback between biological and cultural evolution, including one disadvantage of relying on it.

Fix the mistake

10. Correct this statement: "Cultural evolution is the same as biological evolution, just about tools."

11. Correct this statement: "Each tool industry was used only by one species."

12. Correct this statement: "Farming made people healthier straight away."

13. Correct this statement: "Fire was used to cook as soon as Homo habilis appeared."

Answer key (for parents and tutors)

1. Put these in order, oldest first: Mousterian, Oldowan, Upper Palaeolithic, Acheulean.
   Oldowan, Acheulean, Mousterian, Upper Palaeolithic.
2. Which tool industry first shows a symmetrical shape planned before making?
   Acheulean (the hand axe).
3. The Acheulean began about 1.76 million years ago and the Mousterian about 250 000. About how long did the Acheulean last, in years?
   1 760 000 − 250 000 = 1 510 000 years, about 1.51 million years.
4. Give the indirect evidence that clothing is at least 83 000 years old.
   DNA shows body lice, which live in clothing, split from head lice at least 83 000 years ago.
5. Name one biological change that cooking may have allowed.
   Smaller teeth and jaws (or a shorter gut, or a larger brain supported by more energy).
6. Describe two uses of fire other than cooking.
   Warmth and light at night; protection from predators; hardening wooden spear tips; a social centre where people gathered (Achieved for two).
7. Explain how fire helped hominins move into colder environments.
   Fire kept people warm without thick body hair, so they could survive cold nights and winters and live in caves in cooler regions, which let them spread to places their bodies alone could not cope with (Merit).
8. Explain how cooking could have affected the biological evolution of hominins.
   Cooked food is softer and gives more energy for less chewing and digestion, so individuals with smaller teeth, jaws and guts were not at a disadvantage, and the extra energy could support a larger, energy-hungry brain; these traits could then be selected (Merit).
9. Discuss fire as an example of positive feedback between biological and cultural evolution, including one disadvantage of relying on it.
   Using fire is a cultural change that altered selection pressures: with cooked food, smaller jaws and bigger brains became possible, and a bigger brain in turn allowed better control of fire, planning, and teaching others how to make and keep it, which spread fire use further. Each change reinforced the other, so biology and culture drove each other. A disadvantage is dependence: once bodies had smaller teeth and guts, people relied on fire and fuel to eat well, and smoke in caves and hearths exposed them to lung irritation and burns (Excellence: links cause and effect both ways and weighs a disadvantage).
10. Correct this statement: "Cultural evolution is the same as biological evolution, just about tools."
    Cultural evolution passes on learned behaviour by teaching and imitation; it changes no alleles directly and is much faster.
11. Correct this statement: "Each tool industry was used only by one species."
    Industries overlapped: early Homo sapiens and Neanderthals both made Mousterian-style tools, so link tools to the main makers, not only one.
12. Correct this statement: "Farming made people healthier straight away."
    Early farmers were often shorter, with more tooth decay and disease than hunter-gatherers, even though there were more of them.
13. Correct this statement: "Fire was used to cook as soon as Homo habilis appeared."
    The earliest likely evidence for controlled fire is about 1 million years ago, linked to Homo erectus, long after Homo habilis appeared.