Smithsonian Science How? delivers real-world science into classrooms through free, interactive, live webcasts and supporting classroom resources.

FREQUENTLY ASKED AND PARTICULARLY PERTINENT QUESTIONS ABOUT HUMAN EVOLUTION
From Dr. Briana Pobiner’s webcast

Students: Didn’t fire (their new technology) cook their food?
Briana: While we see evidence for eating meat going back at least 2.6 million years ago, we don’t have evidence for people using fire to cook until about 800,000 years ago. That means that for over a million and a half years, people were mostly eating raw meat – or we just haven’t found earlier evidence for the controlled use of fire.

Students: If the bones were broken up, how would you know what bone is what?
Briana: That’s one of the hardest parts of my job! When I’m working in Kenya, the Nairobi National Museum has an excellent comparative collection of fossils that include entire bones of different animals. A broken bone is just like a puzzle piece, and I can match it up to those fossils (or bones from similar modern animals) that are like complete puzzles that have already been put together.

Students: Did humans live longer after they started eating cooked meat instead of raw meat?
Briana: Not really. All other species on our evolutionary tree had short lifespans, probably no more than about 40-50 years. It’s only our in species that adults live for such a long time; having grandparents around for many years is one of the things that make humans unique!

Students: Why are the bones different colors?
Briana: Fossils are basically rocks. When a bone turns into a fossil, the organic parts break down, leaving pores or spaces, but the inorganic parts keep their shape. Minerals in the sediment where the bone is buried make their way inside, and the bone often turns into a fossil with the color of those minerals. That’s why fossils come in so many colors – I’ve seen white, pink, blue, grey, brown and black fossils.

Students: Do you know if early humans ate fish?
Briana: Yes they did! The earliest evidence for fish butchery goes back almost 2 million years ago, and it’s possible that early humans were eating fish even before that, but if they didn’t use tools to butcher the fish we can’t say for sure that fish fossils from prehistoric sites were from fish that people ate.

Students: What kind of meat did early humans eat?
Briana: Even at close to the beginning of meat-eating which dates back to about 2.6 million years ago, early humans were eating meat from a wide variety of animals that ranged in size: from small hedgehogs and fish to big elephants and hippos. They also broke open animal bones to eat the marrow inside, which is a great source of calories and fat.

Students: How can you tell the difference between a stone tool and a broken rock?
Briana: That’s a great question, and one I get pretty often. One clue is that you usually find a lot of stone tools together, so if you find a single broken rock that you think might be a stone tool – especially if it’s in gravels in a riverbed, for instance, with a lot of other broken rocks – it’s not very likely to be a tool. Stone tools have a particular shape resulting from how flakes were knocked off of a core, and those “flake scars” as they are called are part of what gives it away.

Students: How did early humans communicate?
Briana: Since words don’t fossilize, and we don’t have evidence of writing until very recently, we have to look to other types of evidence for communication. It’s likely that like other primates, early humans used gestures (with their hands - and facial expressions are a form of communication. People also used colors made from pigments to draw on caves and rock shelters (and maybe color their own skin and hair), and we even see musical instruments dating back to at least 35,000 years ago.
Students: Where are the most fossils found?
Briana: The first ~4 million years of human evolution took place in Africa, so all of the earlier fossils are found there – mainly in Ethiopia, Kenya, Tanzania, and South Africa. Starting just under 2 million years ago we start to see early human fossils in Asia, but Europe can claim the most early human fossils, probably for two reasons: people have been fossil-hunting there for longer than any other part of the world, and because Neanderthals (who only lives in Europe and Western Asia) buried their dead, and being buried really increases the chance that a skeleton will fossilize.

Students: When did the early humans learn how to build shelters?
Briana: The first good evidence for shelters comes from a 400,000 year old site in France called Terra Amata. Scientists found holes from wooden posts and other evidence of multiple shelters there – some were almost 50 feet long!

Students: Are you 100% sure we used to be monkeys?
Briana: Humans never used to be monkeys in the sense that a living monkey evolved into a human, but we definitely share a common ancestor with monkeys. That common ancestor dates back to about 25-30 million years ago. Our common ancestor with chimpanzees, who are our closest living relatives, dates back to about 6-8 million years ago.

Students: Why did early man leave tools behind?
Briana: In a way, archaeologists mostly study garbage! A lot of what we study is what was thrown away by prehistoric people. People who made early stone tools left a lot of broken stone chips when they made their tools, and they would probably have just left their tools where they were once they were finished using them – or when the sharp edges started to get dull and they weren’t good for cutting meat and other things anymore. We don’t know if people had bags made of animal skin, for instance, since those don’t preserve very well, but people may have also left their tools behind in places where there were lots of rocks they could make tools from instead of carrying their tools around.