DIARY OF A DISCOVERY

Below are four firsthand accounts of moments of discovery. The fossil and DNA samples referred to here are all represented in the Spitzer Hall of Human Origins.

Discovering Lucy

Read aloud this description of how paleontologists Donald Johansen and Tom Gray found the skeleton of "Lucy" in Hadar, Ethiopia, in 1974:

> "... as we turned to leave [the gully], I noticed something lying on the ground partway up the slope. "That's a bit of hominid arm," I said. "Can't be," [said Tom], "It's too small. Has to be a monkey of some kind."... I shook my head. "Hominid." "What makes you so sure?" he said. "That piece next to your hand..." [I said.]... He picked it up. It was the back of a small skull. We stood up, and began to see other bits of bone on the slope. An unbelievable, impermissible thought flickered through my mind. Suppose all of them fitted together? Could they be parts of a single, extremely primitive skeleton? No such skeleton had ever been found—anywhere... In that 110-degree heat we began jumping up and down... we hugged each other, sweaty and smelly, howling and hugging in the heat-shimmering gravel... "We've got to stop jumping around," I finally said. "We may step on something."
>
> **— Donald Johansen** in *Lucy: The Beginnings of Humankind*

Tell students that they will see a cast of the skeleton Johansen and Gray found. Follow up with questions such as:

- Why were the scientists so excited?
- What was important about this fossil?
- Why must scientists be careful with the fossils they find?

Discovering Laetoli Footprints

Read aloud this description of how Andrew Hill, a paleontologist on Mary Leakey's team, discovered fossilized footprints in Laetoli, Tanzania, in 1976.

> "We had been working really hard that day and were heading back toward camp when one of our team decided to liven things up by slinging elephant dung at the rest of us. He aimed one at me, and I had to dive out of the way. I ended up flat on my face. I started to rise and saw marks in the ground. I realized they were fossilized raindrops. Then I looked around and saw ancient animal footprints all over the place. We had passed over that ground so many times before that evening, but none of us had noticed a thing. But once we saw the first prints, we could see them everywhere: fossilized tracks of rhino, elephants, antelopes, all sorts of animals."
>
> **— Andrew Hill** in *Dawn of Man: The Story of Human Evolution*

Tell students that they will see a cast of fossilized footprints of early humans found at the same site. Follow up with questions such as:

- Why did getting low to the ground reveal new information to the scientist?
- What can footprints tell us about a human or another animal?
- Why do paleontologists study all animal fossils, not just human fossils?

DIARY OF A DISCOVERY

Sequencing Neanderthal DNA Fragments

Read aloud or distribute this excerpt from a newspaper article on the work of evolutionary geneticist Svante Pääbo at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany.

> "Unleashing a new kind of DNA analyzer on a 38,000-year-old fragment of fossilized Neanderthal bone, scientists have reconstructed a portion of that creature's genetic code—a technological tour de force that has researchers convinced they will soon know the entire DNA sequence of the closest cousin humans ever had.... [T]he DNA bits from Neanderthals are so old and small that nothing has been able to fully reassemble them. Complicating matters, prehistoric bones are heavily contaminated with DNA from bacteria and from scientists who have handled them. That is one reason no extinct animal has ever had its genome fully sequenced.... To [sequence] Neanderthal DNA, Pääbo's team focused on a bone discovered decades ago in a Croatian cave.... The bone had stayed clean, Pääbo said, because "it's rather small and uninteresting and was thrown in a big box of 'uninformative' bones and was not handled much by people.""
>
> — from "New Methods Let Scientists Analyze Neaderthal DNA" by **Rick Weiss,** Washington Post, November 16, 2006

Tell students that they will see a sample of Neanderthal DNA that Pääbo's team recovered. Follow up with questions such as:

- Why is it so difficult to recover the DNA of extinct species?
- Why was this team able to succeed at sequencing Neanderthal DNA?
- What could scientists learn by comparing modern human and Neanderthal DNA?

Discovering Turkana Boy:

Read aloud or distribute paleoanthropologist Richard Leakey's account of an incredible find at Lake Turkana, Kenya in 1984.

> "We decided to explore for the first time the western shore of the lake. On August 23rd, Kamoya Kimeu, my oldest friend and colleague, spotted a small fragment of an ancient cranium lying among pebbles on a slope near a narrow gully...Carefully we began to search for further fragments of the skull and soon found more than we dared hope for. During the five seasons of excavation that followed this find, amounting to more than seven months in the field, our team moved fifteen hundred tons of sediment in the massive search. We discovered what eventually turned out to be virtually the entire skeleton of an individual who died on the edge of the ancient lake more than 1.5 million years ago. Dubbed by us the Turkana boy, he was barely nine years old when he died..."
>
> — **Richard Leakey** in *The Origin of Humankind*

Tell students that they will see "Turkana Boy." Follow up with questions such as:

- What do you think different members of a paleontological team contribute to expeditions?
- Why do you think the scientists had to search so long and in so much sediment to find the complete skeleton?
- How might scientists be able to identify that a skeleton is a youth and not a very small adult?