Assignment Discovery Lesson Plan
Out of Africa: The Real Eve

Subject
Life Science

Grade level
8-12

Duration
One or two class periods

Objectives
Students will
• review human evolution and migration from Africa; and
• make presentations showing different paths of human migration.

Materials
• Computer with Internet access

Procedures:
1. Review information about the human evolution and migration featured in the video. "Discovery Channel: Eve Explained" provides an online summary with background information; visit the Web site http://dsc.discovery.com/convergence/realeve/feature/feature.html. Below are questions to help lead the discussion.

• Who is the Real Eve? (a woman from whom all modern humans may be descended)
• Where and when did she live? (Africa about 150,000 years ago)
• What is the scientific basis that a Real Eve existed? (genetic tracking through mitochondrial DNA; new knowledge of climate and geographical changes)
• What is mitochondrial DNA (mtDNA)? (the unique DNA found in the mitochondria of living cells)
• How is mitochondrial DNA passed through generations? (Humans inherit it from their mothers.)
• How many years ago did the first hominids appear? (3.5 million)
• When did this group of hominids migrate out of Africa? (80,000 years ago) What was their migration route? (across the Red Sea into what is now Yemen)
• What were the primary causes of the migration of hominid groups? (climate and geography, such as polar caps, deserts, and volcanic eruptions)
• When did modern-day humans first migrate into what is now Europe? (50,000 years ago)
• What hominids had been living in this region for hundreds of thousands of years? (Neanderthals)
• What caused humans to evolve into different races with unique characteristics? *(adaptations to different climates)*

2. Divide the class into seven groups. Assign each group a different time period of human migration (below). Tell students they will make a brief class presentation highlighting information about the time period.
   • 150,000 years ago
   • 80,000 years ago
   • 74,000 years ago
   • 70,000 years ago
   • 50,000 years ago
   • 20,000 years ago
   • 16,000 years ago

3. Instruct each group to visit the interactive “Human Migration” map online *(http://dsc.discovery.com/convergence/realeve/interactive/migration.html.)*. Each presentation should answer the following questions:
   • Where did humans migrate to and from during this time period?
   • What evidence proves that humans lived in that region during this time period?
   • What do we know about the way these people lived? What is the evidence?
   • How did climate changes influence these people?

4. Have the groups present their findings, using a world map to show the migration paths during each period of time.

**Evaluation**
Use the following three-point rubric to evaluate students’ work during this lesson.

**3 points:** Students were highly engaged in class discussions; demonstrated a clear understanding of the concepts of human migration, mitochondrial DNA, and the Real Eve; gave a clear and thorough class presentation that answered all the assigned questions.

**2 points:** Students participated in class discussions; demonstrated an adequate understanding the concepts of human migration, mitochondrial DNA, and the Real Eve; gave a complete class presentation that answered most of the assigned questions.

**1 point:** Students participated minimally in class discussions; demonstrated an incomplete understanding the concepts of human migration, mitochondrial DNA, and the Real Eve; gave an incomplete class presentation that answered few or none of the assigned questions.

**Vocabulary**
**DNA**
**Definition:** The molecule that carries genetic information in all living things; the chemical basis of heredity
**Context:** DNA is located in the nucleus of living cells.
**hominid**
**Definition:** The family of erect bipedal primate mammals that includes modern humans (the species *Homo sapiens*) and Neanderthals and other related extinct species
**Context:** *Homo sapiens* is the only surviving hominid species.

**migrate**
**Definition:** To move from one region or climate to another
**Context:** Many scientists believe that our human ancestors migrated from Africa across the Red Sea.

**mitochondria**
**Definition:** Tiny structures in all human cells that have their own DNA called mitochondrial DNA (mtDNA)
**Context:** By studying mitochondria and mtDNA, some scientists believe that all humans may be descended from a single woman who lived in East Africa about 150,000 years ago.

**Academic Standards**
This lesson plan addresses the following standards from the National Science Education Standards:
- Life Science: Populations and ecosystems; Diversity and adaptations of organisms; Molecular basis of heredity; Biological evolution

**Credit**
Joy Brewster, curriculum writer, editor, and consultant