



In Class Exercises (ICE)

One of the oldest known stone structures in the world is the Step Pyramid of Netjerykhet Djoser¹ located near Saqqara in Egypt (see Figure 1²). The Step Pyramid began as a simple bunker-like tomb (a mastaba). A small, four step pyramid was built over the original mastaba, and the final six step pyramid built over this (see Figure 2³). The final six step pyramid is 60 meters high.



Figure 1: The Step Pyramid of Netjerykhet Djoser (Zoser) located near Saqqara in Egypt.

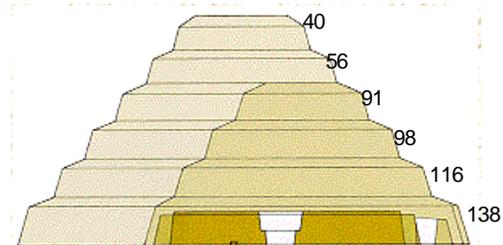


Figure 2: Stages of construction of the Step Pyramid. (The numbers are the average width of each step of the Six Step Pyramid in meters.)

- **In total, about how much stone was used to construct the Step Pyramid?**

¹ “Djoser” is also referred to as “Zoser” by some scholars.

² Image source: www.bikeabout.org

³ Image source: www.egyptvoyager.com

The Step Pyramid is thought to be the first large pyramid built in Egypt. Later pyramids (such as the Great Pyramid of Khufu⁴ - see Figure 3⁵ below) had smooth triangular sides.



Figure 3: The Great Pyramid of Khufu (Cheops) located near Giza in Egypt.

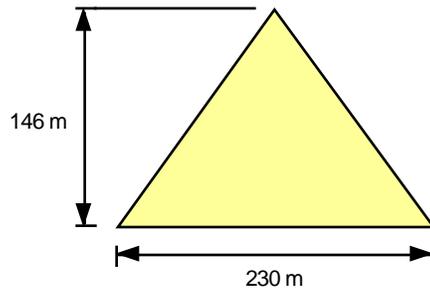


Figure 4: Side view of the Great Pyramid of Khufu (Cheops).

- **The formula for the volume of a pyramid such as this is one third of the height time the area of the base. Approximately how much stone was used in the Great Pyramid of Khufu?**

- **Suppose that you didn't know the formula for the volume of a Pyramid. How could you approximate the volume of a smooth-sided pyramid like the Great Pyramid of Khufu?**

⁴ Also known as the Great Pyramid of Cheops.

⁵ Image source: www.bikeabout.org