

## Module #1 Engagement

- Demonstration:** Select two students. Record their blood pressure and pulse rate. The first student will hold his arms directly above his head. The second student will hold two books above his head, one book in each hand. Select two other students to act as recorders to determine how long the students can remain in position. Immediately after the experiment, record the students' pressure and pulse rate.
- Discussion:** What has occurred? Why does it occur? What factors were involved?

## TEACHER NOTES

Blood pressure is an important indicator of cardiovascular health. It is determined by evaluating the force per unit area that blood exerts against blood vessel walls. Its unit of measurement is millimeters of mercury (mm Hg). Blood pressure is essential for the proper functioning of the vital organs in the body. Its measurement provides valuable information regarding the functional state of some of the essential organs in the human system. Blood pressure is determined by reading the **systolic pressure** (ventricular contraction or the force that blood exerts on the walls of the artery as the heart contracts to pump blood out) over the **diastolic pressure** (ventricular relaxation or the force that blood exerts on the walls of the artery as the heart relaxes to allow the blood to flow into the heart). Normal values fall in the range of 120/80 and 130/85 mm Hg (Systolic/Diastolic). (<http://www3.healthgate.com/hic/wcon/wcon-14.asp> or <http://noah.cuny.edu/wellconn/hiblodpres.html>) or ([http://www.who.int/ncd/cvd/ht\\_guide.html](http://www.who.int/ncd/cvd/ht_guide.html))

An instrument often used to obtain blood pressure by the auscultatory method is a **Sphygmomanometer**. The Sphygmomanometer consists of an inflatable cuff with an attached pressure gauge. The auscultatory method (<http://www.physio.mcgill.ca/vlabonline/cardiolab/auscult.htm>) involves placing the cuff around the arm and inflating to a pressure higher than systolic pressure to occlude circulation to the forearm. As the cuff pressure is gradually released, the examiner listens with a stethoscope for characteristic sounds called the sounds of **Korotkoff**, which indicate the resumption of blood flow into the forearm. The pressure at which the first soft tapping sounds can be detected is recorded as the **systolic pressure**. As the pressure is reduced further, blood flow becomes more turbulent and the sound becomes louder. However, when the artery is no longer constricted, blood flows freely and the sound can

no longer be heard. The pressure at which the heart sounds disappear is recorded as the **diastolic pressure**.

**Pulse** is the alternating surges of pressure in an artery that occur with each contraction and relaxation of the left ventricle. The pulse may be felt easily on any superficial artery when the artery is compressed over a bone or firm tissue. It can be taken at the back of the neck, around the back of the knee or at the lateral aspect of the wrist, above the thumb. To record the pulse pressure from the lateral aspect of the wrist, place your fingertips over the artery and count the radial pulse for one minute. The value obtained in one minute is the pulse rate.