From Bill Nye’s video clip on Blood Circulation, you will learn what William Harvey discovered in the 17th century.

### Circulatory System

Contractions of the heart generate blood pressure and heart valves prevent back flow of blood in the circulatory system.

Your body is made of trillions of cells.
- Each cell needs oxygen and nutrients.
- As your cells carry out their functions, they need to get rid of wastes like carbon dioxide.
- To do this, your body has a transportation system.

The circulatory system transports blood throughout the body, delivers essential substances to cells, and removes wastes.

The circulatory system consists of the heart, blood vessels, and blood.

What pumps over two million liters of blood per year and weighs only 300 grams?

**The Heart**

The heart is a hollow organ found in the middle of your chest.
It is made mostly of cardiac muscle tissue.

The heart contracts to pump blood throughout the body.

- Contractions happen when muscle tissue shortens.

The right and left sides of the heart have separate functions.

The right side of the heart collects oxygen-poor blood from the body and pumps it to the lungs where it picks up oxygen and releases carbon dioxide.

The left side of the heart then collects oxygen-rich blood from the lungs and pumps it to the body so that every cell in the body has the oxygen it needs.

How the Heart Works
The heart has four chambers.

Each chamber has a one-way valve at its exit.
- A valve is a flap of tissue that prevents the backflow of blood.
- When each chamber contracts, the valve at its exit opens.
- When a chamber relaxes, the valve closes so that blood does not flow backwards.

When the atria contract, blood is squeezed into the ventricles.

The heart contracts (or beats) in two stages.
- Blood enters the atria first.
- The left atrium receives oxygen-rich blood from the lungs.
- The right atrium receives oxygen-poor blood from the body.

In the second stage, while the atria relax, the ventricles contract together.
- This pushes blood out of the heart.
- Blood from the right ventricle goes to the lungs.
- Blood from the left ventricle goes to the rest of the body.
Then the heart muscle relaxes before the next heartbeat.

- This allows blood to flow into the atria again.

1. Oxygen-poor blood (shown in blue) flows from the body into the right atrium.
2. Blood flows through the right atrium into the right ventricle.
3. The right ventricle pumps the blood to the lungs, where the blood releases waste gases and picks up oxygen.
4. The newly oxygen-rich blood (shown in red) returns to the heart and enters the left atrium.
5. Blood flows through the left atrium into the left ventricle.
6. The left ventricle pumps the oxygen-rich blood to all parts of the body.

Click to see a review from Encarta on Blood Circulation.