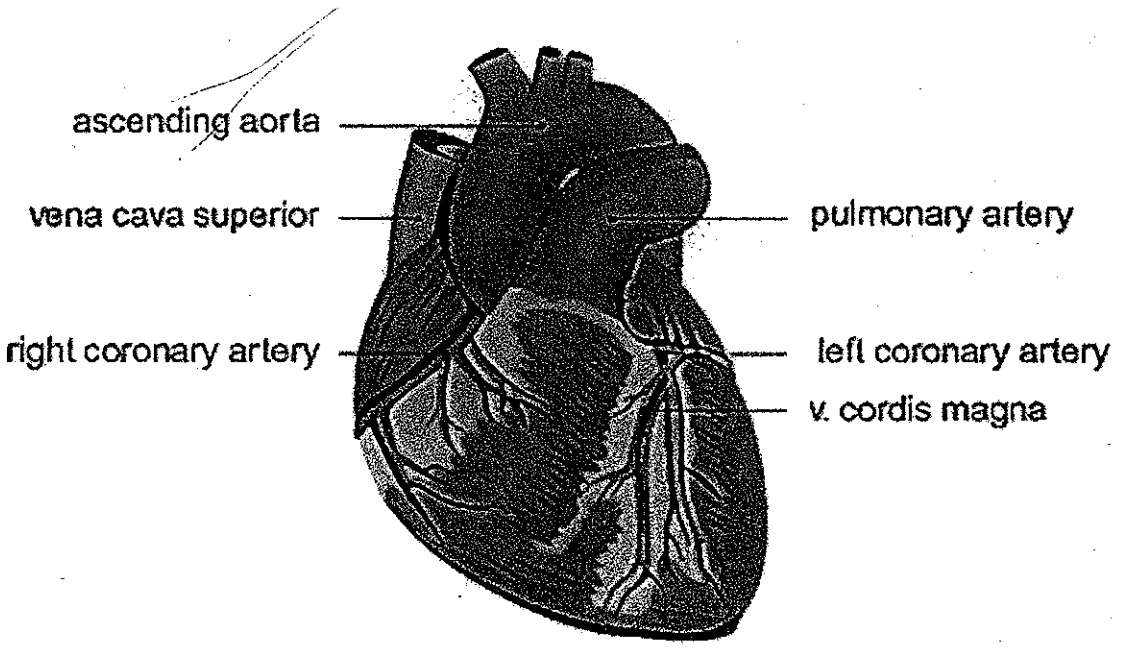
STOP TO THINK #1

READ: The tissues of your body need a constant supply of **oxygen**. Imagine what would happen if the flow of blood had stopped: the body would not get the oxygen it needs. The body's tissues can survive for only about **4 minutes** without a fresh supply of oxygen. Two organs that are especially sensitive to a shortage of oxygen **are the brain and the heart** itself.

Blood goes through your heart as it is pumped. But the blood passing through the chambers of your heart does not supply oxygen to your heart muscle. Some of the blood that leaves your left ventricle travels back to your heart through arteries known as **coronary arteries**. The coronary arteries lead to a network of capillaries in your heart muscle. These **capillaries** carry the blood that provides oxygen to your heart muscle.

If the blood supply is blocked or reduced, heart muscle can be damaged and pain results. This is commonly known as a **heart attack**. If a large enough part of the heart muscle is affected, then the heart can no longer pump blood. **Heart failure and death result.**



DO:

A. On your **"Problems of the Heart"** worksheet, think about what would happen if the blood flow were blocked in the heart.

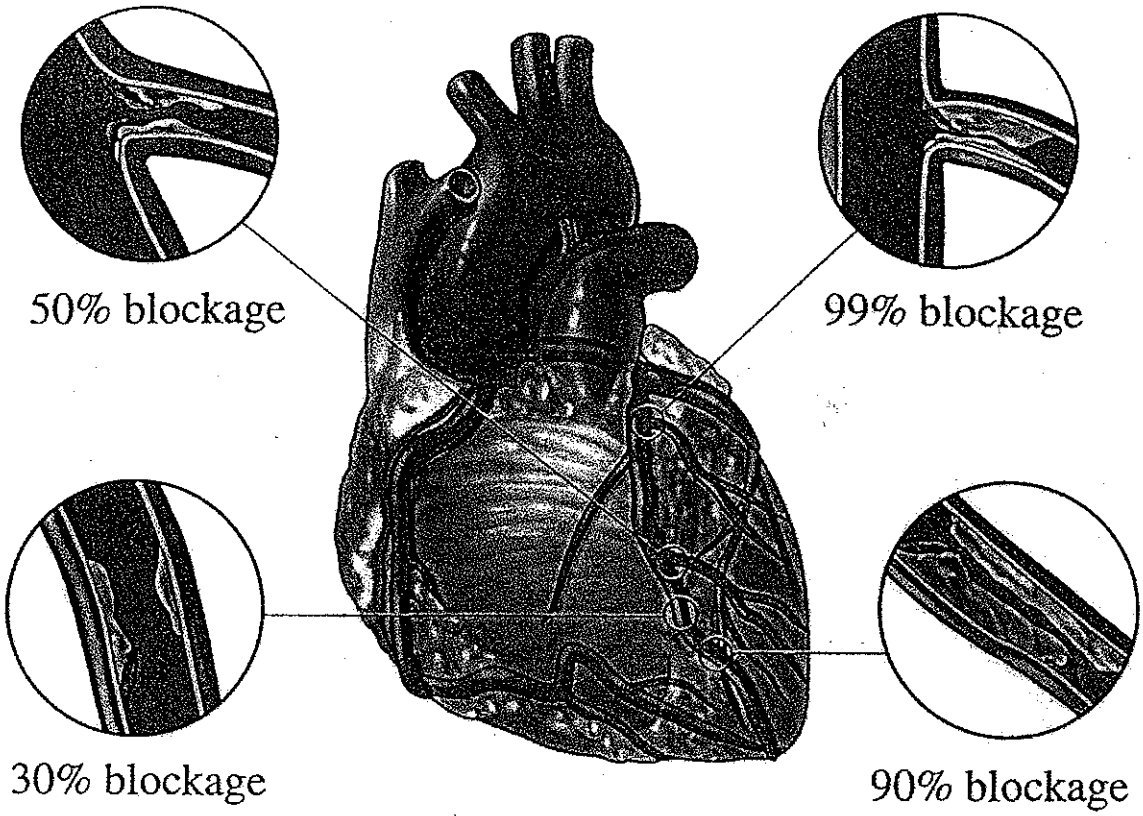
B. Shade the area of the heart muscle that would be affected if blood flow were blocked at **Point A**.

C. Shade the area of the heart muscle that would be affected if blood flow were blocked at **Point B**.

D. Which heart attack would most likely kill a person? **Circle** that heart.

STOP TO THINK #2

READ: **Arteries** supplying blood to the heart can become blocked by **blood clots** or by **fat deposits**. Look at the image below. In one condition called **atherosclerosis**, deposits of fat partially block the center of the arteries. A diet high in some kinds of fat is associated with a higher risk of this condition. People who have high levels of this fat, called **cholesterol**, in their blood may modify their diet to reduce their cholesterol level.



DO:

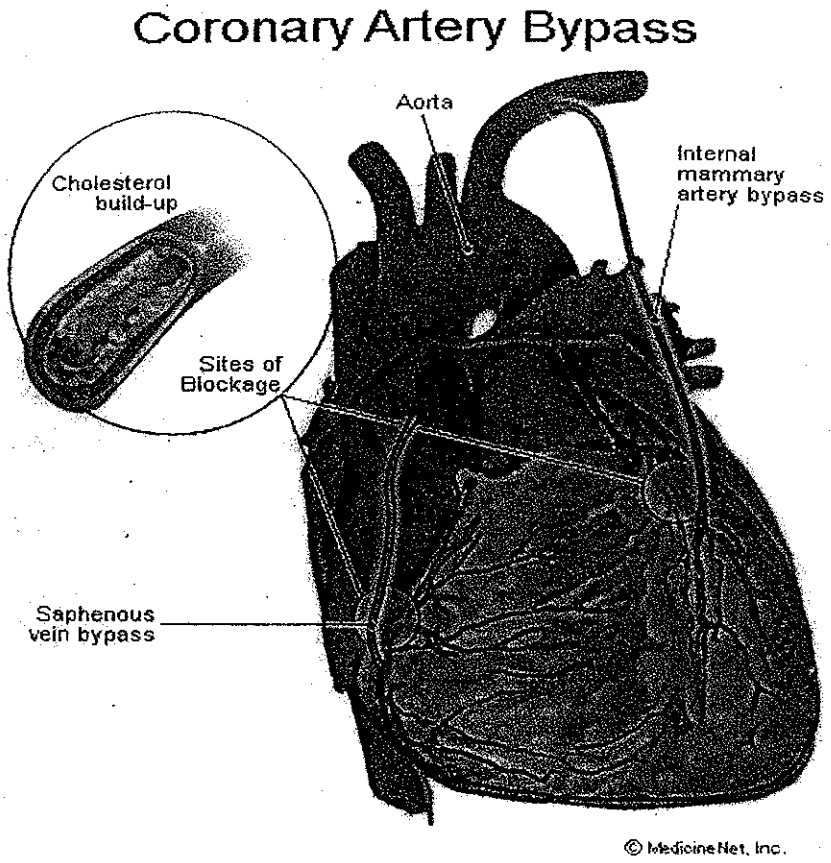
A. On your **"Problems of the Heart"** worksheet, in **Artery A**, draw a fat deposit that would block the artery just a little.

B. In **Artery B**, draw a fat deposit that would block over half the blood flowing through the artery.

C. Which of the two arteries (A or B) would be more likely to become completely blocked if a small blood clot came through the artery? **Circle** that artery.

STOP TO THINK #3:

READ: There are two common treatments for blocked arteries in the heart. In one treatment called **coronary bypass**, the surgeon inserts a segment of a **vein** – removed from another part of the body – around the blocked artery. This lets the blood flow through another pathway, **bypassing the blocked artery**. In another treatment called **angioplasty**, the surgeon inserts a tube with a **balloon-like device** into the partially blocked arty. The balloon is the inflated to stretch the artery. After the balloon is deflated and removed, **the artery will be more open** than before.



DO:

A. On your **"Problems of the Heart"** worksheet, imagine that test reveal that a person has a blockage developing in the artery at **Point X**.

B. On **Figure 4**: color in the Bypass and arteries beyond the bypass to show if the blood will flow.

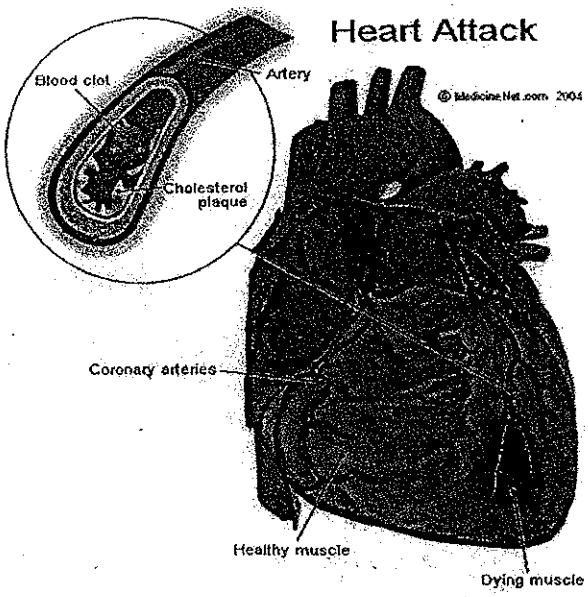
C. On **Figure 5**: color in the Bypass and arteries beyond the bypass to show if the blood will flow.

D. Does Figure 4 or 5 show a successful bypass surgery? **Circle** that heart.

STOP TO THINK #4:

READ:

High Blood Pressure and Heart Disease: As the strongest muscle in your body, your heart first pumps blood though your arteries. This pumping action creates pressure within your blood vessels. High blood pressure forces the heart to work harder to pump blood through the circulatory system. This can cause the heart muscle to become enlarged and weakened. It also strains the arteries, causing them to lose their ability to stretch. They become harder and less elastic. This is known as "hardening of the arteries." This process occurs with age, but it is more common in people with high blood pressure. With damaged arteries, blood clots or deposits of fat are more likely to form. When the arteries that supply the heart are damaged, a heart attack can follow. (A similar type of attack, known as a stroke, can happen if the arteries to the brain are damaged.)



In most cases, researchers do not know exactly what causes high blood pressure. Several factors, though, seem to increase a person's chance of having high blood pressure. Factors that increase the chance of an illness are called risk factors. Risk factors for high blood pressure include the person's age, weight, race, gender, and body type; whether the person smokes cigarettes; how much alcohol the person drinks; the person's diet and amount and frequency of exercise; and heredity (whether the person's parents or grandparents have high blood pressure). Older people, people with a family history of high blood pressure, people of African descent, and men in general have a higher risk of high blood pressure and other types of heart disease than other groups. Being extremely overweight, living an inactive life style, drinking large amounts of alcohol, and, in some people, eating a diet high in salt are associated with a greater risk of high blood pressure.

Smoking and Heart Disease: Cigarette smoking increases the risk of death from heart disease because of its impact on several risk factors. Smoking can increase because blood pressure, increase the formation of fat deposits in the arteries, and increase the chance of blood clot formation in the arteries. A smoker is also less likely to survive a heart attack. The smoker's lungs are not as efficient in absorbing oxygen from the air and thus provide less oxygen to maintain the heart.

DO:

A. On the back of your "Problems of the Heart" worksheet, use complete sentences to answer the two questions:

   a. How does high blood pressure relate to heart disease?

   b. How does smoking relate to heart disease?