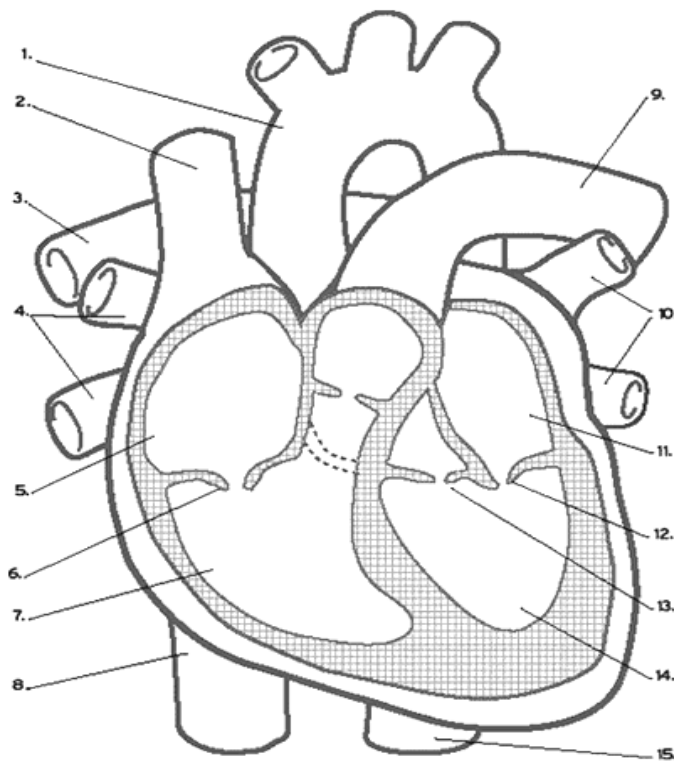


4. What is the function of valves in the heart?

5. How does the structure of arteries and veins relate to their functions?

The Human Heart

Label all parts of the heart including all valves



Using colored pencils or markers to trace the blood flow for the following into and out of the heart: Deoxygenated Blood (blue) Oxygenated blood (red)

4.2 The Heart at Work

1. In what ways can technology be used to collect and analyze cardiovascular data?

2. Why is it important to monitor the rate at which the heart beats?
3. What factors can influence heart rate?
4. What is blood pressure?
5. How do systolic and diastolic blood pressure values relate to the movement of blood in arteries?
6. What factors can influence blood pressure?
7. What is an EKG?
8. How can an EKG be used in the diagnosis and treatment of heart disease?
9. List the main headings of a scientific lab report.
10. Distinguish between an independent and dependent variable.

Heart Rate

- What makes someone's heart rate increase or decrease?
- How does a person take his/her heart rate?
- Why is it necessary to take more than one heart rate reading?

Blood Pressure

- What is normal blood pressure (numbers)?
- What are Systolic and Diastolic Pressure? What do those numbers mean for the heart?
- How is blood pressure measured? What instrument is used?
- What is known as the silent killer?

EKG

- Where is the sinoatrial node and what is its function?
- What does an EKG show? Be specific with the types of waves.
- What does an EKG not tell us about our heart?
- Label the waves on a normal EKG with P, QRS, and T



4.3 Heart Dysfunction

1. What is cholesterol?
2. What roles does cholesterol play in our cells and in the body?

3. What are LDL and HDL?
4. How are LDL, HDL, and cholesterol related to heart disease?
5. How do doctors interpret the results of a cholesterol test?
6. What is familial hypercholesterolemia and how is it inherited?
7. How can techniques of molecular biology be used to analyze DNA for the presence of the FH mutation?
8. What lifestyle changes may help a patient obtain healthy cholesterol levels?
9. What are the pros and cons of using cholesterol lowering medications?
11. How does the heart work as a pump?
12. What is atherosclerosis?
13. How can cholesterol plaques affect the overall function of the heart?

Molecular Biology Techniques

1. Which molecular biology technique is used to separate DNA fragments by their sizes?

2. What does RFLP stand for?
3. What is the goal of doing an RFLP analysis?
4. What enzyme does the cutting in RFLP analysis?
5. The gel to the right contains the DNA from a crime scene. View the results of the RFLP analysis of the DNA.

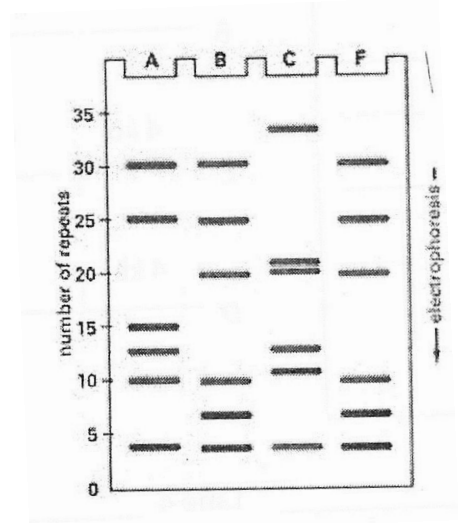
Lane A contains DNA from suspect #1

Lane B contains DNA from suspect #2

Lane C contains DNA from the victim

Lane D contains DNA from the forensic sample

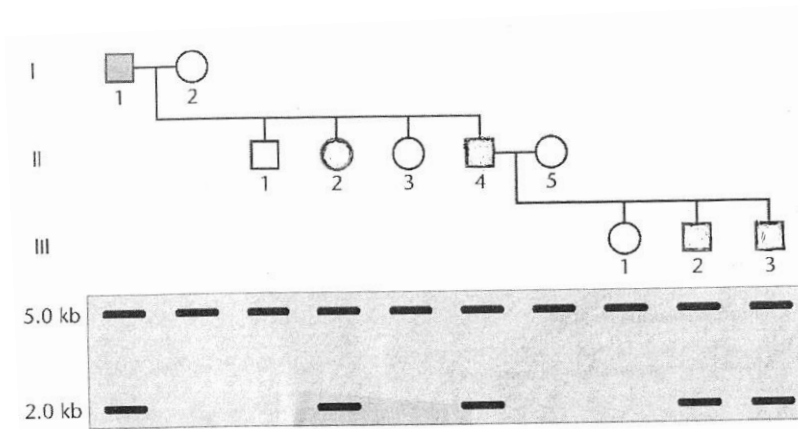
- Which suspect committed the crime?
- Which lane contains the largest band of DNA on the gel?



In the pedigree show below, individual 1 in generation I is heterozygous for a genetic disease.. Individual 2 in generation I is homozygous recessive for that same disease.

Examine the gel below the pedigree.

- Which individual(s) in generation II are homozygous recessive? _____
- Which individual(s) in generation III are heterozygous? _____



The Heart as a Pump

1. What is a Pump?
2. Why is the human heart considered to be a pump? Explain what makes it a pump?

4.4 Heart Intervention

1. What is heart disease?
3. What happens inside the heart to cause a heart attack?
4. How do doctors treat a blocked blood vessel?
5. What are risk factors for the development of heart disease?

6. How can a person decrease his or her risk of heart disease?

7. What is metabolic syndrome?