

The Butterfly Effect: Anatomy of a Choice

(Year 8 - Ages 13-14)

Lesson 1 of 9

Name: _____ Class: _____

Mission Briefing: Chaos Theory suggests that a butterfly flapping its wings in Brazil can cause a tornado in Texas. Small actions lead to massive consequences. Your mission is to analyze the human body as a complex set of systems and discover how one small decision (Donation) can prevent a total system collapse.

Part 1: The Butterfly Effect (Concept Analysis)

Definition: The Butterfly Effect is the idea that small, initial events can result in vast, unpredictable differences in the future.

Task: Apply this theory to the "Donation Event."

- The Butterfly Flap (The Action): A person registers to be a donor (takes 1 minute).
- The Chain Reaction: That person saves the life of a 12-year-old girl with heart failure.
- The Tornado (The Future Impact): List 3 things that might happen in the future only because that girl survived. (Think big: children, careers, inventions).



Part 2: System Failure Protocol (Science Link)

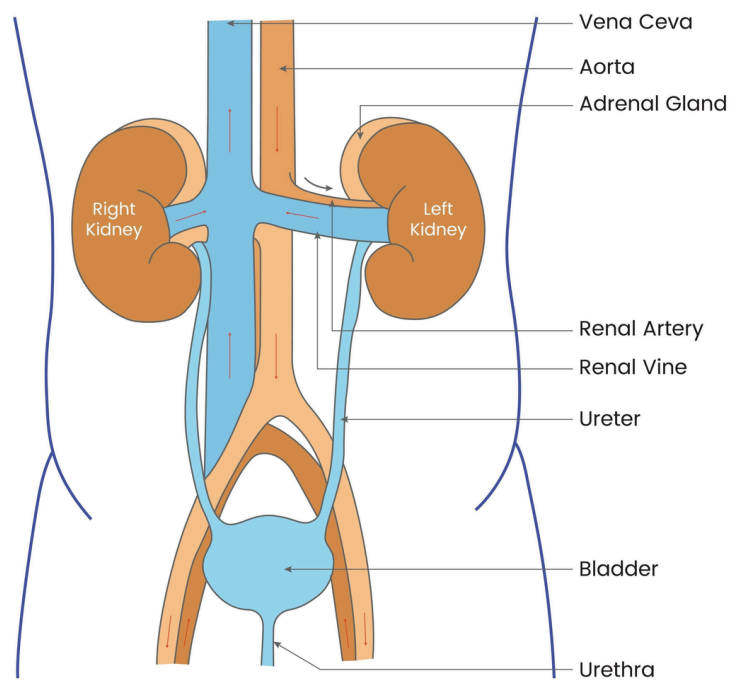
Task: You are the Systems Analyst. Diagnose the failing system and identify the "Spare Part" needed to restore Homeostasis.

Patient Symptoms	Failing System	Organ Needed
Subject A: Blood is not being filtered. Toxins are building up. Patient needs dialysis.	(Hint: Excretory)	
Subject B: Gas exchange is failing. Oxygen levels are critically low. Breathing is labored.	(Hint: Respiratory)	
Subject C: The pump is weak. Blood is not circulating oxygen to the brain or muscles effectively.	(Hint: Circulatory)	
Subject D: Nutrients are not being processed. Toxins aren't being cleared. Skin is yellow (jaundice).	(Hint: Digestive)	

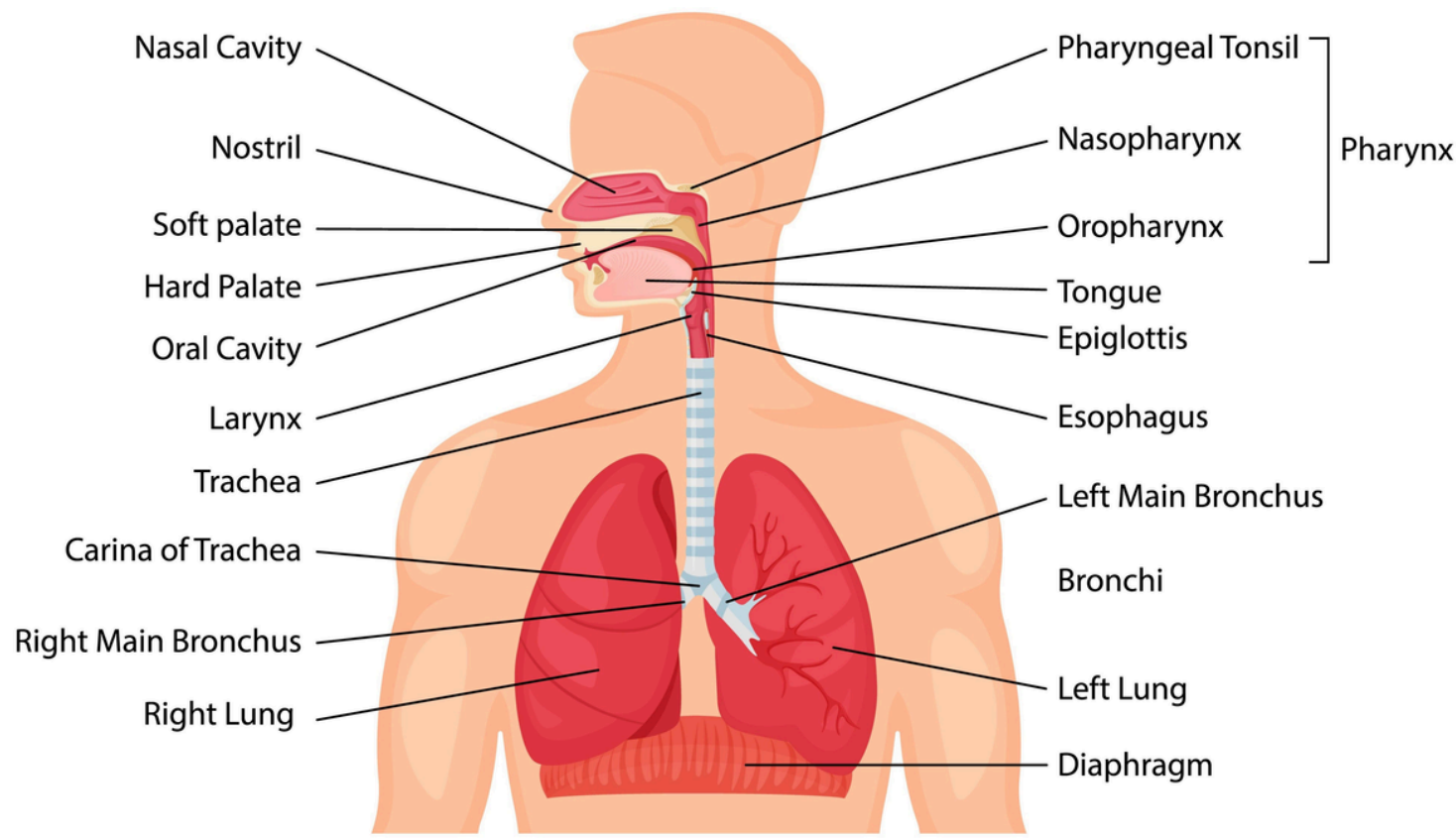


Reference Diagrams: Use these diagrams to help identify the location and function of the failing organs.

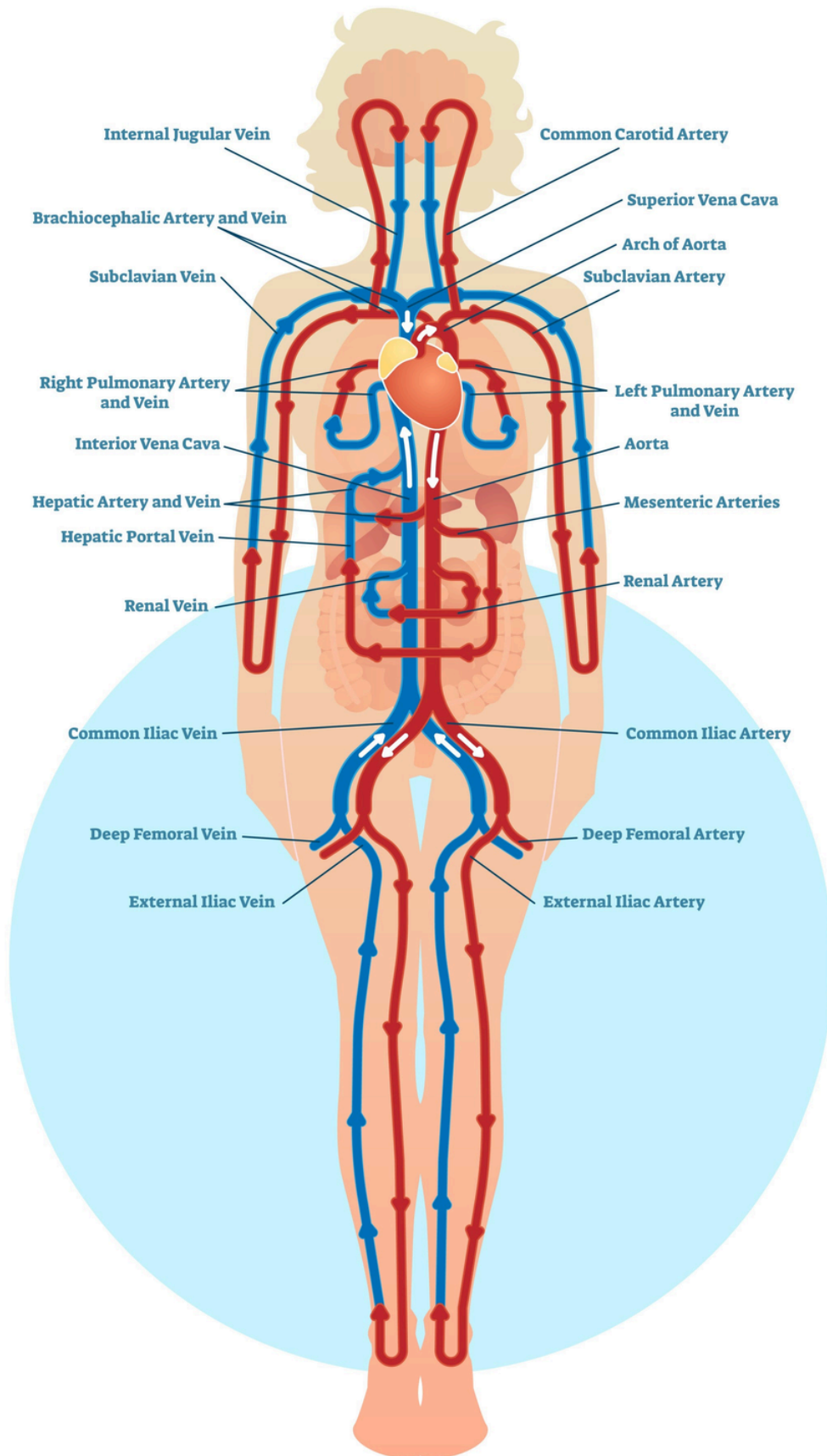
Human Excretory System



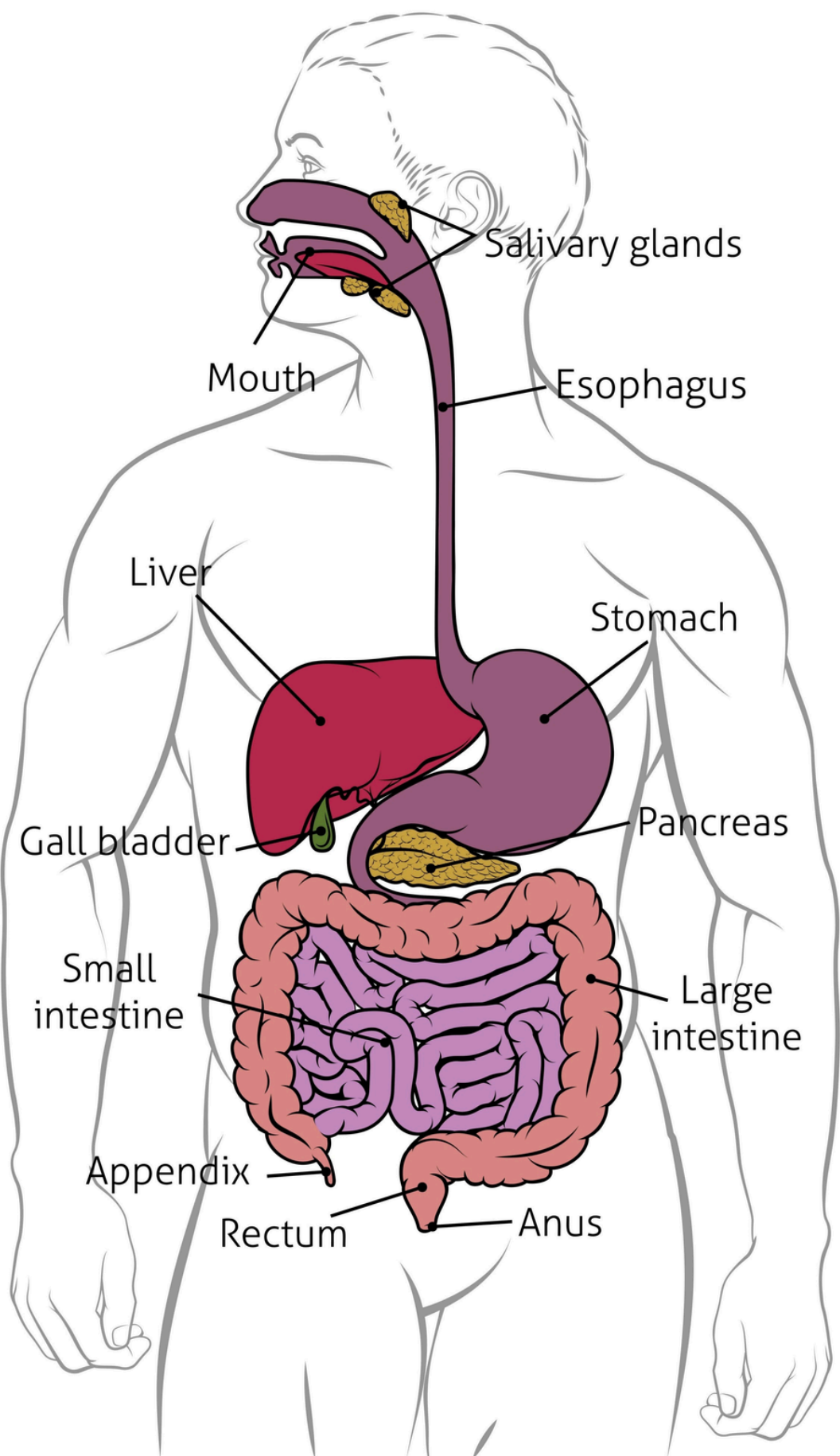
Respiratory system



Human Circulatory System



Digestive System:



Part 3: Biological vs. Conscious Altruism

Definition:

- Biological Altruism: Instinct (e.g., protecting your own baby or a bee stinging to save the hive).
- Conscious Altruism: Choice (e.g., helping a stranger you will never meet).

Reflection: Why is Organ Donation considered a "Conscious" choice rather than just a biological instinct? Why is it harder to do?

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Part 4: The System Restore

Diagram: Imagine the human body is a machine. Draw a simple flowchart showing what happens when a "New Part" (Organ) is introduced to a failing system.

Flowchart Template:

- 1. State 1: System Failing (Chaos)
- 2. Action: _____ (The Transplant)
- 3. State 2: _____ (Equilibrium/Homeostasis Restored)

Conclusion: In your own words, how does the donor act as a "System Restore" button?

