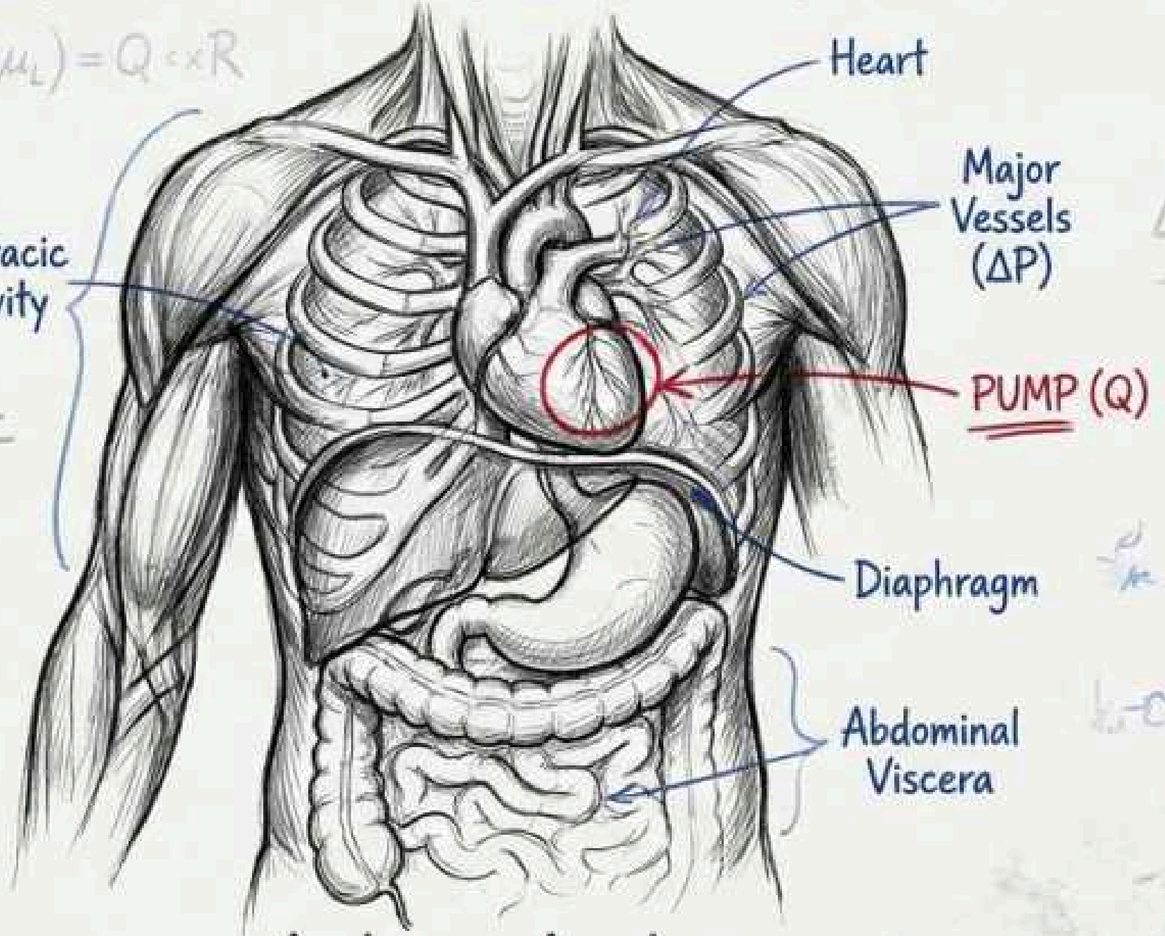
Biology 110 B: The Fundamentals of Physiology

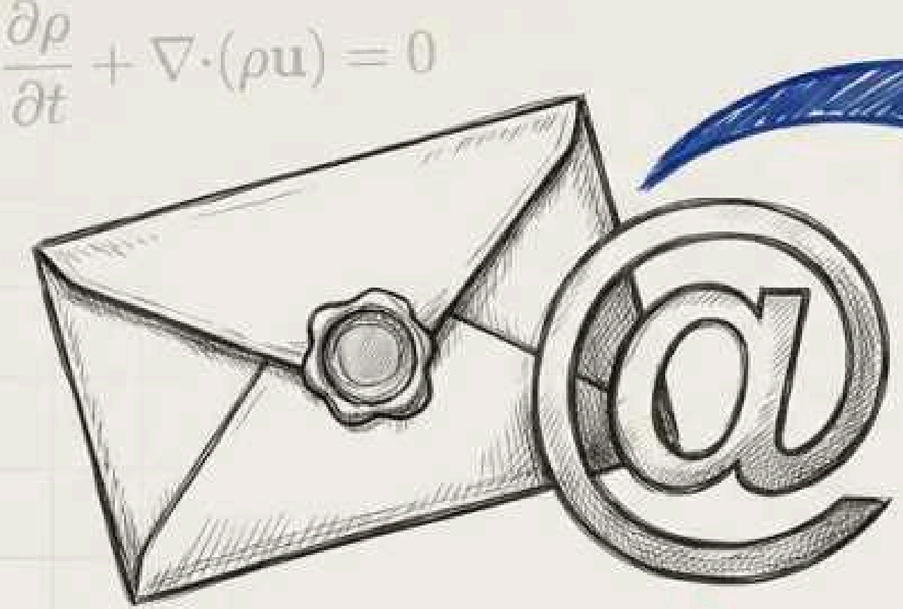
Lecture 0 — Course Overview



Anderson Academy

¶ 0.1

Questions & Feedback Always Welcome



garyanderson@mail.grokbot.com

@garyanderson

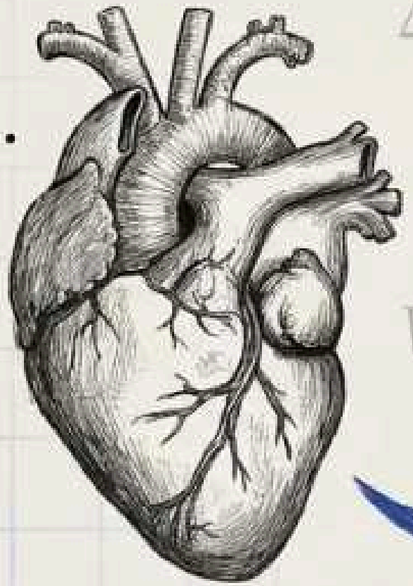
Welcome to Anderson Academy

¶0.2

- Free library of university-level courses (~1 hour each).

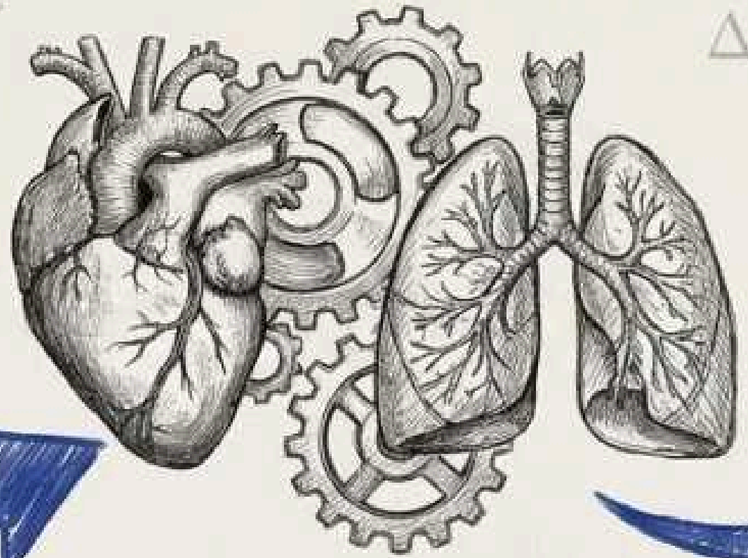
"Physiology is the science of how living bodies work."

1.



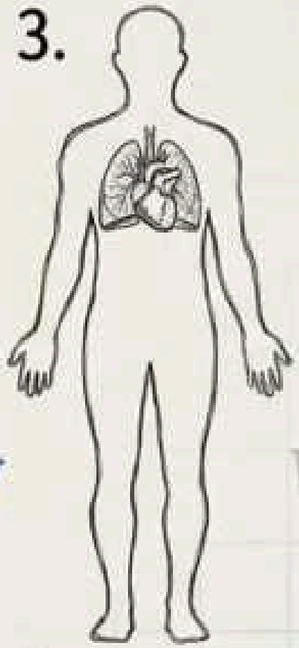
What organs do

2.



How they do it

3.



How they cooperate

$\Delta P = Q \cdot R$

$V = f \cdot \lambda$

$\Delta P = Q \cdot R$

$V = f \cdot \lambda$

The Irreplaceable Machine

¶0.3



Every second, trillions of cells are quietly solving problems.

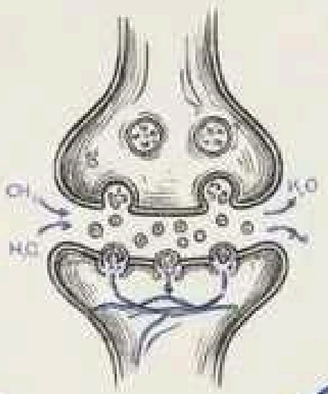
- Read health news with clarity.
- Understand medical explanations.
- Recognize the marvel of ordinary life.

Course Map

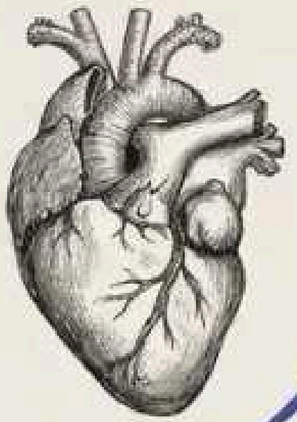
¶0.4



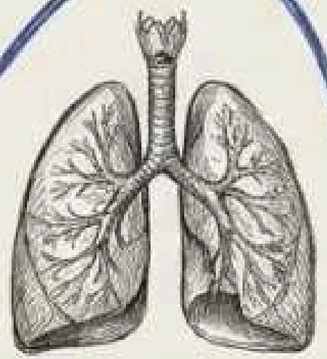
1: Homeostasis



2: Nerves & Muscles



3: Heart & Blood Vessels



4: Breathing & Gas Exchange

5: Digestion & Metabolism



5: Digestion & Metabolism

6: Kidneys, Fluids & Hormones



6: Kidneys, Fluids & Hormones

The Universal Theme: Feedback Control

¶ 0.5

Compares with a target



Body Temperature

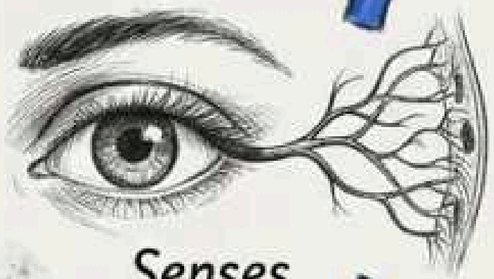
Blood Pressure

$$\Delta Q = dU + dW$$

$$\frac{\partial \mathbf{v}}{\partial t} + (\mathbf{v}\cdot\nabla)\mathbf{v} = -\frac{\nabla p}{\rho} + \nu\nabla^2\mathbf{v} + \mathbf{f}$$

$$\frac{\partial \mathbf{v}}{\partial t} + (\mathbf{v}\cdot\nabla)\mathbf{v} = -\nabla^2$$

$$S = k \ln \Omega$$





Once you recognize the pattern, you will see it everywhere.

Senses a change

Acts to bring it back

Water Balance

Blood Sugar

$$\frac{\partial v}{\partial t} = k \ln \Omega$$

The Prerequisites & Toolkit

No medical background needed. Basic arithmetic and curiosity are enough.

$dP = -\rho g dz$

Whiteboard Metric Toolkit		
Measurement	**Unit**	**Icon**
Volume	Liters / milliliters (L/mL)	
Pressure	Millimeters of mercury (mmHg)	
Energy	Kilocalories (kcal) (printed on food labels)	

$Q = mc\Delta T$

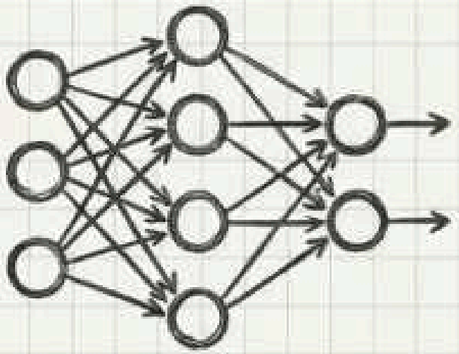
$dP = -\rho g dz$

Where a calculation helps, we will work it out together, step by step.

Course Development & Quality

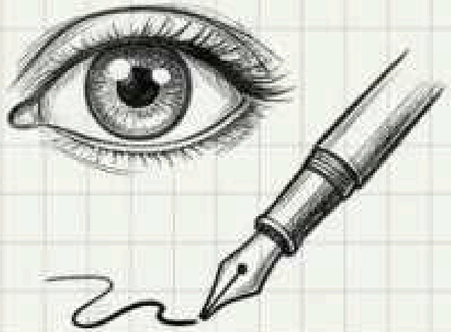
¶ 0.7

Phase 1



[AI Generation]

Phase 2



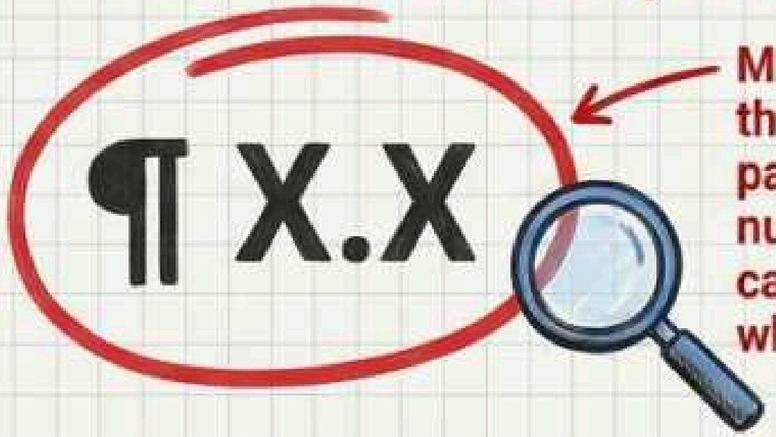
[Human Direction]

Phase 3



[Code Verification]

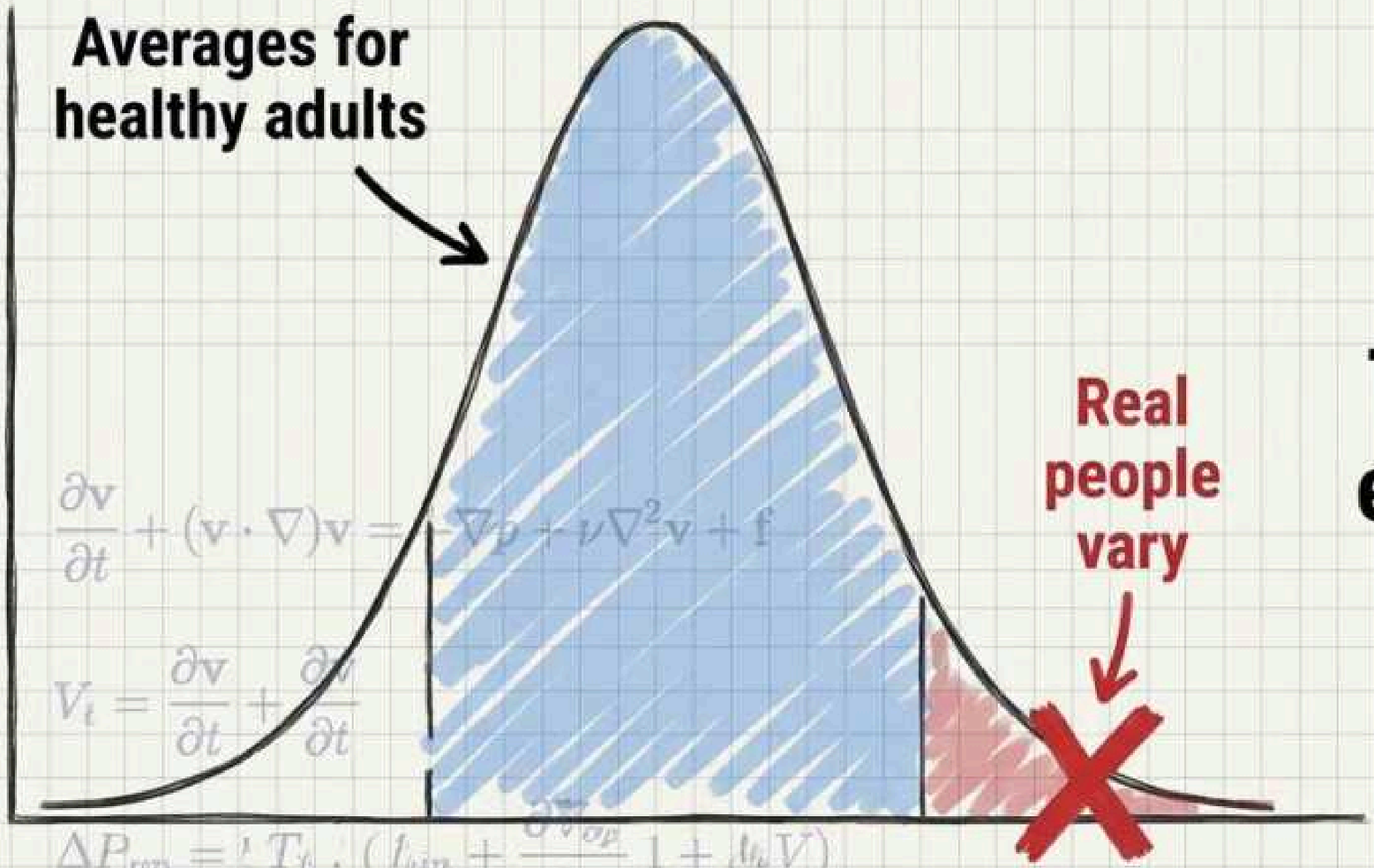
Every worked calculation checked by code.



Mistakes can slip through. Every paragraph is numbered so you can tell us exactly where an error is.

A Word of Caution

¶ 0.8



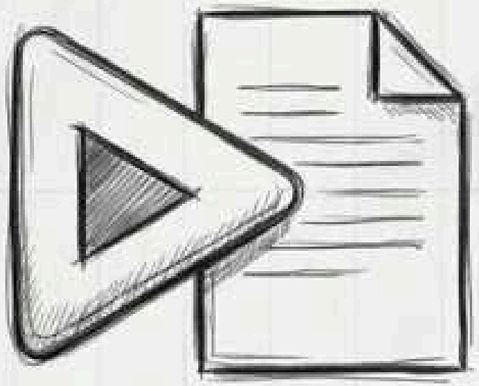


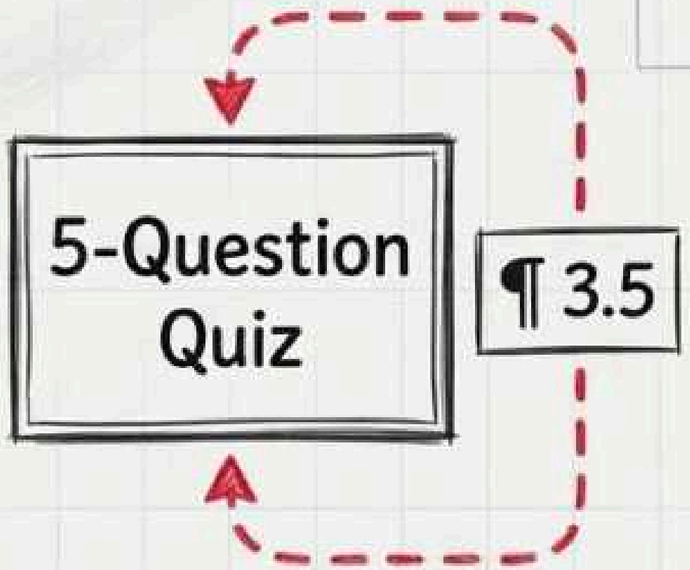
This course is for education. It is not medical advice.

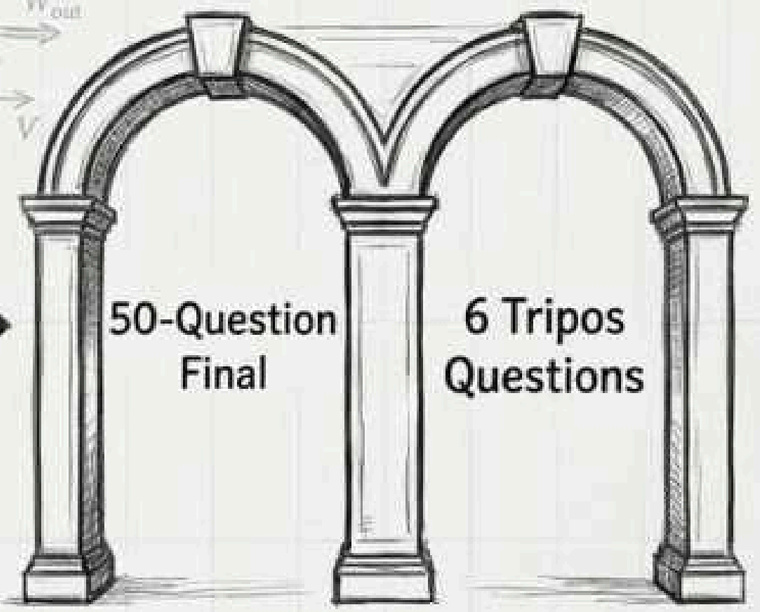
Cannot diagnose or treat. If you have a health concern, speak with a qualified clinician who can examine you.

How to Use Each Lecture

¶ 0.9







Watch or Read

Test & Trace Back

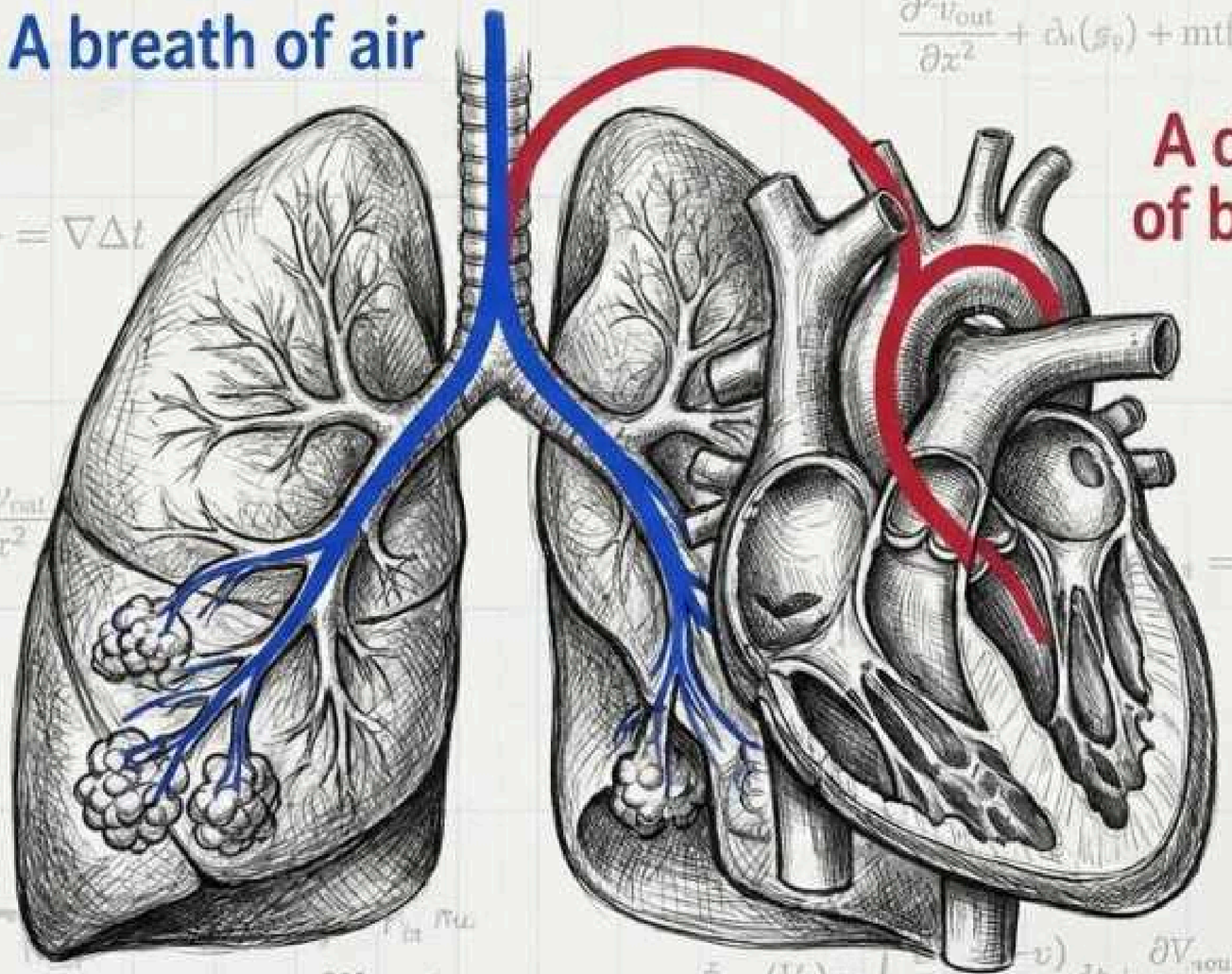
Final Examination

The Ultimate Study Strategy

¶ 0.10

Explain it aloud to a friend or an empty room. Where you stumble, return to the transcript.

If you can trace a path—a breath of air or a drop of blood—you understand it.



¶ 0.11

The Central Idea of Physiology



"Staying the same while everything changes."

Let us begin.

Questions? garyanderson@mail.grokbot.com | X: @garyanderson