DIY EXAMPLE

STAY ORGANIZED

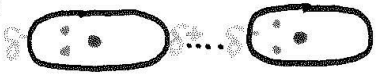
The DIY

DATE:	What are the main concepts in this lecture?	References:
TOPIC(S): Bonds & Phase Diagrams CLASS: CH 232	1. Types of Bonding 2. Influences of Vaporization 3. Phase Diagrams	Table 11.4 (pg. 466) Lecture 9

Each molec. has different types of bonds...

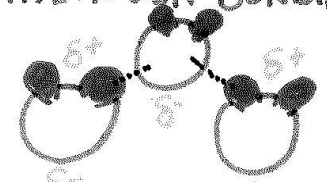
BOND STRENGTH INCREASES

DISPERSION: [ALL MOLEC]

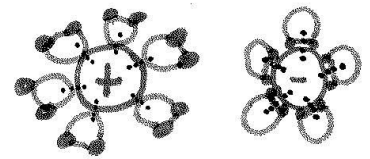


DIPOLE - DIPOLE: [POLAR]

HYDROGEN BONDING: [F, O, N]



ION-DIPOLE: [MIX OF IONIC + POLAR]



... which influences Vaporation / Fusion...

↑ VAPORIZATION RATE:

1. ↑ Temp.
2. ↑ surface area
3. ↓ Strength of bond

VOCAB: VOLATILE
characteristic describing a liquid that vaporates easily

HEAT of VAPORIZATION
amount of heat required to vaporize 1 mole of liquid

H_2O H_{VAP} = +40.7 $\frac{kJ}{mol}$

* Always positive/endothermic

$$\ln P_{VAP} = \frac{-\Delta H_{VAP}}{R}\left(\frac{1}{T}\right) + \ln B$$

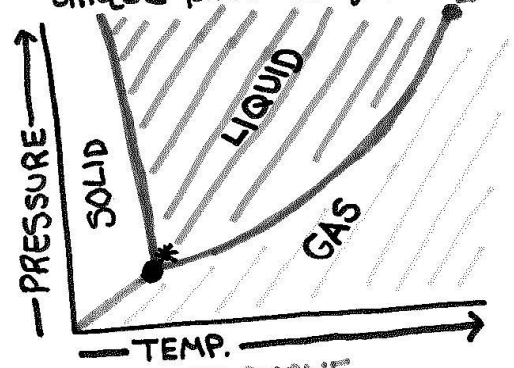
Clausius-Clapeyron equation

FUSION:

H_2O H_{FUS} = -6.02 kJ/mol

* Always negative/exothermic
* Tends to be smaller than H_{VAP} for same molec.

...giving each molec. its own unique phase diagram.



SUBLIMATION CURVE
Transition between gas and solid

FUSION CURVE
Transition between solid and liquid

VAPORIZATION CURVE
Transition between liquid and gas

* TAIPLE POINT
exact condition where all three states are stable and in equilibrium. The three states coexist.

Δ CRITICAL POINT
Condition where gas and liquid coalese to form supercritical fluid (11.5)

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HIERARCHY EXAMPLE

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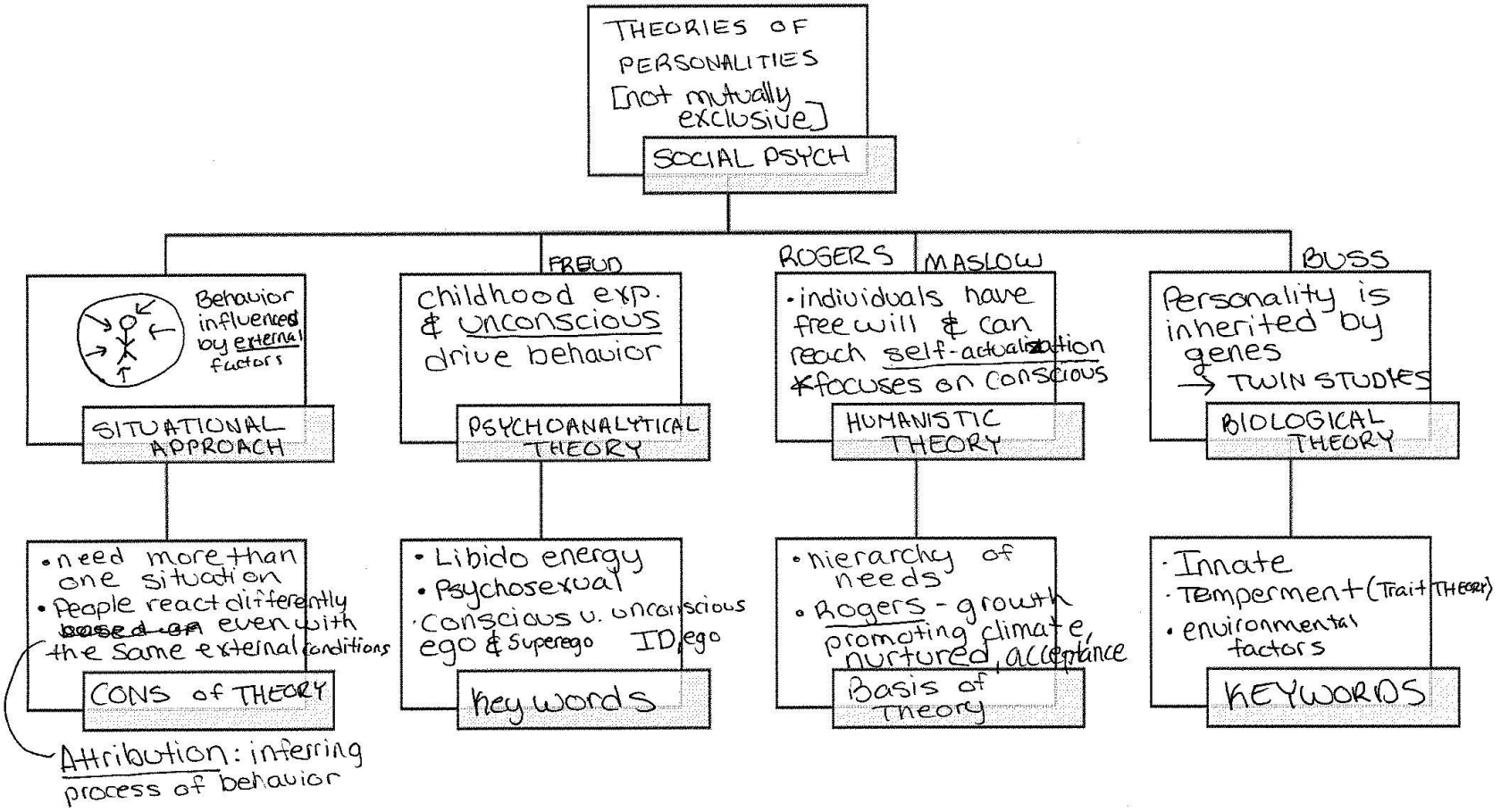
The Hierarchy

DATE:	What are the main concepts in this lecture?	Questions to Ask:
TOPIC(S): Personality Theories CLASS: PSY 202	1. Focuses of each type of theory and how they relate 2. where famous exp. studies fall 3. into the broader spectrum	What theory has been shown to be the strongest indicator of personality/behavior?



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INSTRUCTION MANUAL EXAMPLE

The Instruction Manual

DATE:	What are the main concepts in this lecture?
TOPIC(S): U-substitution	1. Basic u-subs.
CLASS: 252	2. Recognizing Patterns
	3. Chain Rule

Problem Example:	Steps of the Problem:
$\int (3x^2 + 2x)\, e^{(x^3+x^2)}\, dx$	How are the exponents & coefficients related?
Recognize: exponent of e is coefficient	Make a u variable that includes as much as possible
$u = x^3 + x^2$	
$dx \cdot \frac{du}{dx} = 3x^2 + 2x \cdot dx$	pretend du/dx is a fraction, multiply both sides by dx - do this so you can rewrite the original problem easier
$du = (3x^2 + 2x)\, dx$	
$\int (3x^2+2x)dx\, e^{(x^3+x^2)}$ (du, u)	Substitute u in the original formula
$\int e^u du = e^u + C$	Take derivative as usual
$= e^{x^3+x^2} + C$	Substitute the original value back in derived answer

If I get stuck on this type of problem, review or check:	Questions to Ask:
• unwind chain rule • what patterns do I recognize? • could I make it simplier?	what do I do if u does not exactly equal du? Could you do this with multiple variables?

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MATRIX EXAMPLE

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The Matrix

DATE: TOPIC(S): Cardiopathologies CLASS: anatomy	What are the main concepts in this lecture? 1. Risk factors of cardiopathologies 2. Symptoms of cardiopathologies 3. Treatment of cardiopathologies	Questions to Ask: Why do B-blockers work for some pathologies but not others?

Theory/Concept:	Definition:	Characteristic 1: RISK FACTORS	Characteristic 2: SYMPTOMS	Characteristic 3: Treatment
Coronary artery disease	vessels that provide blood to the ♡ get clogged by chlosterol causing atherosclerosis, blood can't get through	Framingham Heart study • hypertension modifable: chlosterol (LDL) fatty acids non-modifable: age, sex, race, genes	• chest pain (crushing pain) • radiated pain • nausea/vomiting • shortness of breath	• "clot-busting" meds (aspirin) • B-blockers • Nitrates • anticoagulents
Stroke (Ischemic)	75% of all strokes 1. embolism (traveling mass) 2. thrombotic (happens in spot, doesn't travel) blood cutoff by clot, brain tissue dies	• Atherosclerosis • see CAD	• numbness/weakness • Trouble speaking or comprehension	• aspirin • Thrombolitic
Stroke (Hemorrhagic)	Trauma causes vessels to break, causes cascade of brain death	• aneurysm • arteriovenous	• Trouble seeing w/ one or both eyes • Dizziness	• anti-hypertensive • head elevated • lower head pressure
Cardiomyo-pathy	Issue with valves of the ♡, causing power-failure, decreased pumping, or a blockage	• diet (↑Na+) • alcohol/drug abuse • viral infections	• increased breathing • edema • weakness	• low salt diet, • diuretics • ace inhibitors • B-blockers

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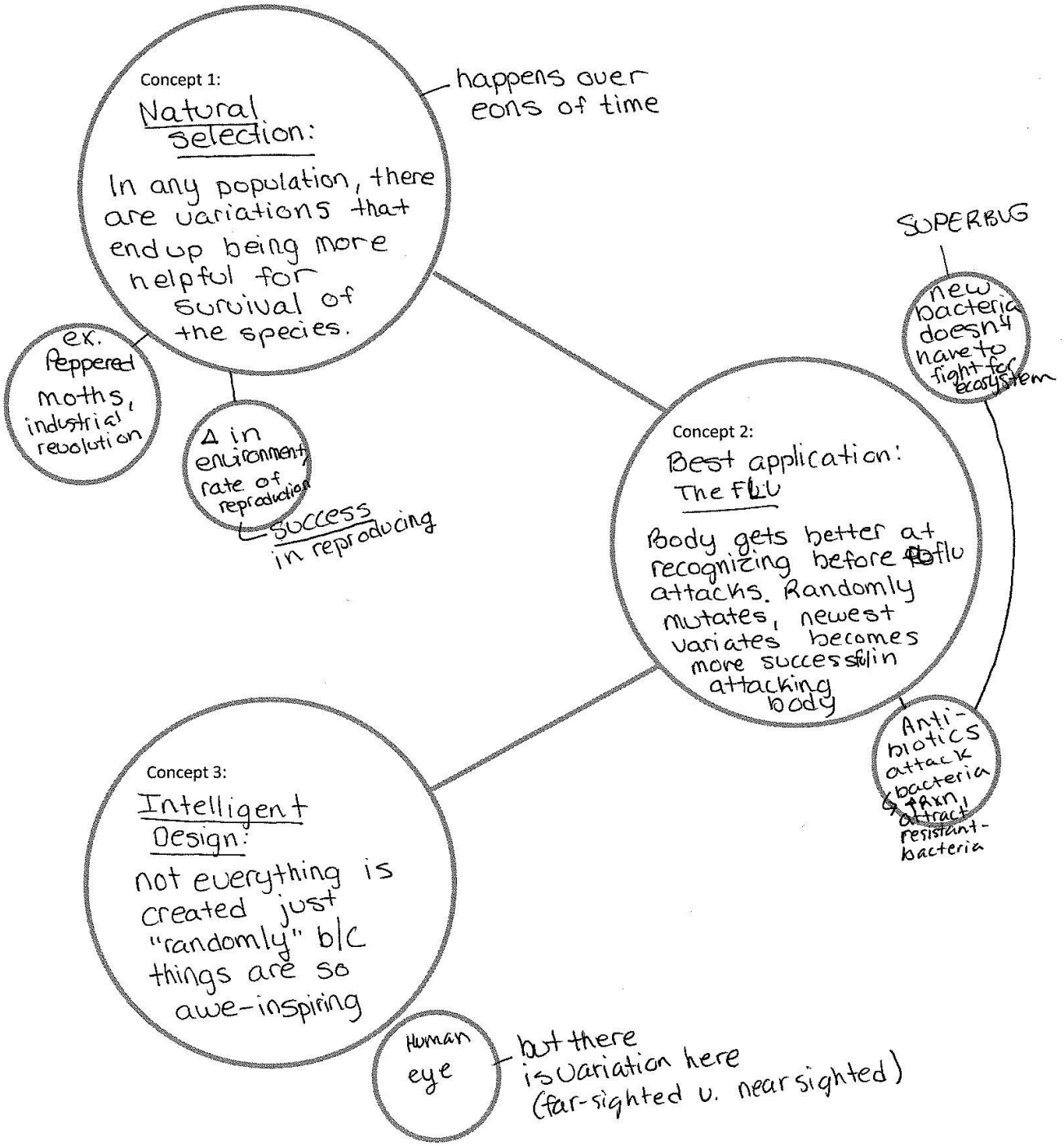
MINDMAP EXAMPLE

The Mind Map

DATE: TOPIC(S): Topics around evolution CLASS: 212	What are the main concepts in this lecture? 1. evolution vs. natural selection 2. modern day natural selection/variance 3. Intelligent Design Controversy



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OUTLINE EXAMPLE

The Outline

DATE: TOPIC(S): Birth of massive stars CLASS:	What are the main concepts in this lecture? 1. what a massive star is 2. How stars' radius get bigger 3. why Iron is the last core to form

Questions to Ask:	Class Notes:	References:
what is happening during H-Fusion?	massive = >9x Sun Review: gravity pulls hydrogen atoms together → H-Fusion (a plasma) [Happens @ 10mil K]	pg. 83
	• ↑ density, ↑ pressure (gravity) ⟹ Release energy ↓ Bigger radius	
What's the reason behind this order of elements? →	• H → He → C → Ne • every element starts fusing until it releases energy and forms the next core	Lec. 5 (5/23)
Fe is endothermic?	• keeps going until Fe_{56} ↳ you can't fuse iron to iron, requires energy * How the heavier elements form	pg. 87
why Ni w/ Fe?	• will also form Ni in Fe core	

Words & Theories to Define:	Summarize and Make Connections:
Massive Star Ignition mechanism endothermic Supernova	massive stars go through the same process as regular stars, only they have more heat/energy. B/c of the ↑ energy, more atoms can fuse, and ↑ fusion → ↑ release in energy. This keeps going until iron b/c Iron can't fuse without extra energy in. This is b/c Fe is a stable metal & fusion ↓ stability.

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STORYBOARD EXAMPLE

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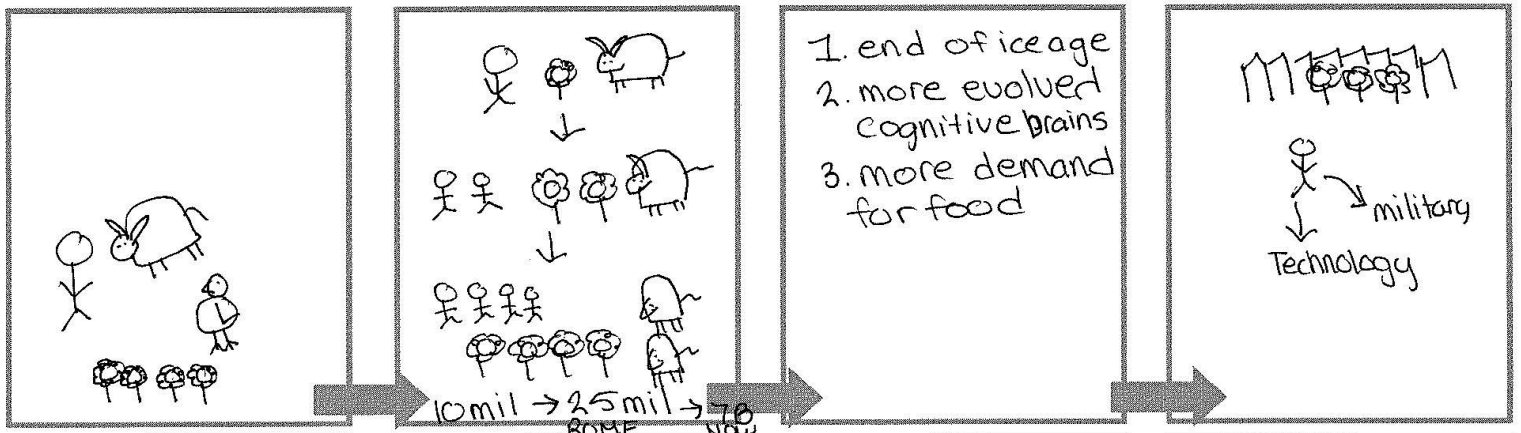
The Storyboard

DATE:	What are the main concepts in this lecture?
TOPIC(S): Origins of agriculture CLASS:	1. How ag. was born 2. Benefits of being born 3. WHY THEN & WHERE



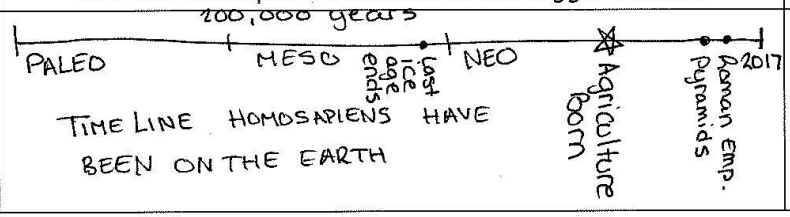
Birth of agriculture:
- Domesticated animals
- Made animals more robust
- Made plants, harvest more predictable

FIRST BENEFIT:
more robust + predictable food means more reproduction

WHY BORN THEN:

WHERE:
Syria, China, Andes, Midwest, Savannah

SECOND BENEFIT:
Specialization, Conflict dominance Property

Questions to Ask:	How the Concepts are Related to the Bigger Picture:	References:
what was the domestication process like? How did ice age affect ag. more specifically?		Chapter 5, Lecture 7+8

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