



香港中文大學
The Chinese University of Hong Kong



香港中文大學醫學院
Faculty of Medicine
The Chinese University of Hong Kong

How to Make a “MOST SUITABLE” Courseware for Students?

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Information Technology Services Centre

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Let Them Design!

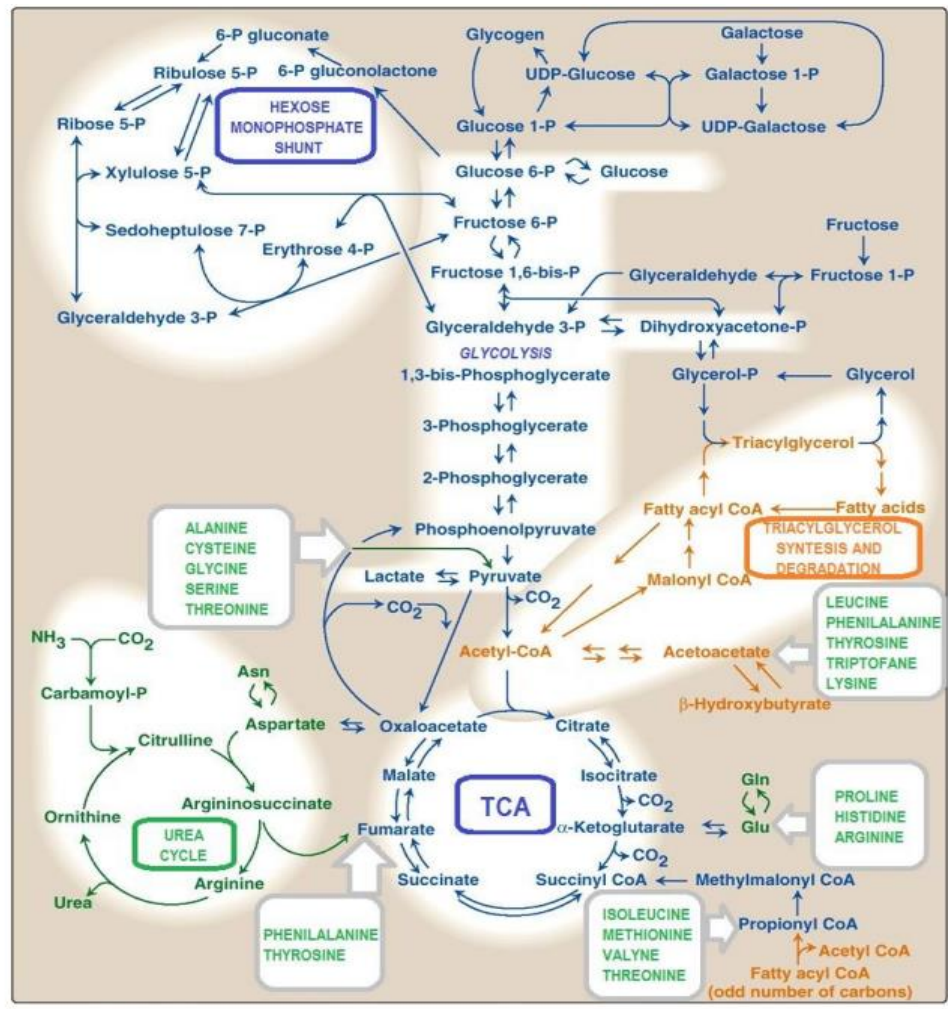
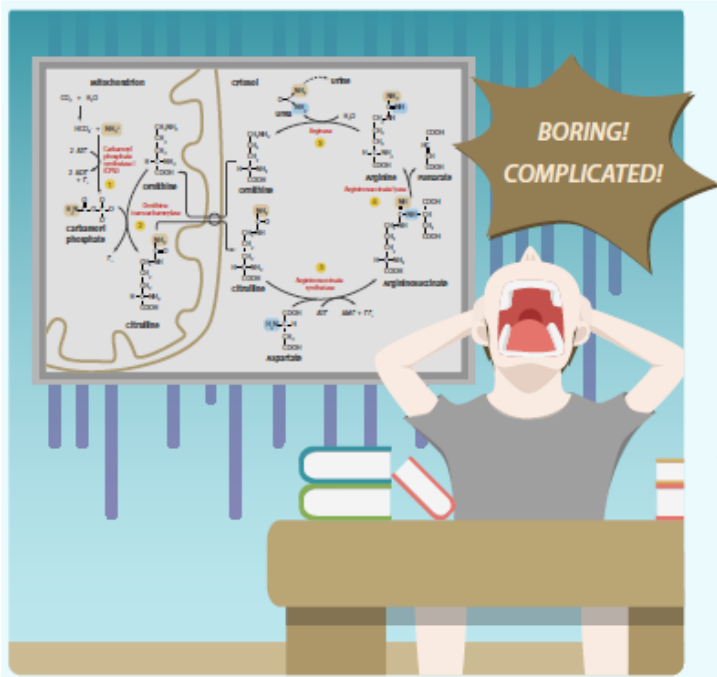
Studying Biochemical Metabolic Pathway Can be Complicated...

Abstract Concepts

Hard to Understand

Pathways Integration

Boring...



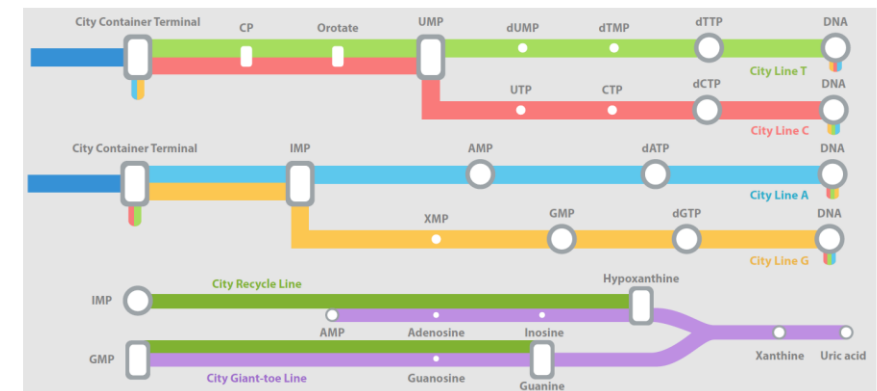
The Metabolism Metro

▶ Aims

- ❑ To stimulate students' interest in exploring human metabolic pathways
- ❑ To enable the students to understand the linkages between different pathways
- ❑ To design a courseware according to the needs of the students

▶ Overall design

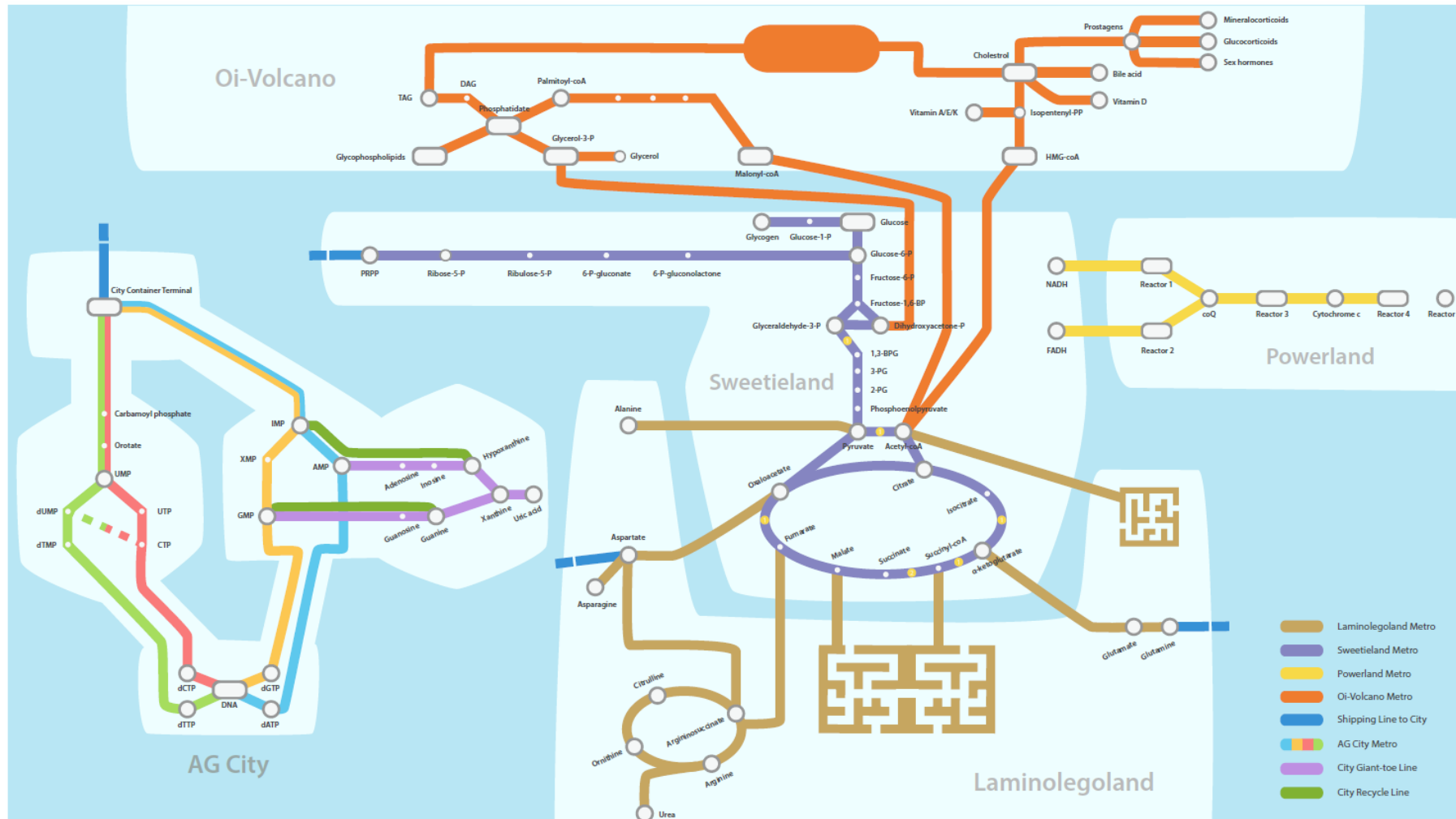
- ❑ Metabolic pathways are grouped into islands and shown on the “World Map”
- ❑ Each pathway is presented as “railway line”
- ❑ Railway lines are grouped together to form a metro map



Key Islands in the "World Map"

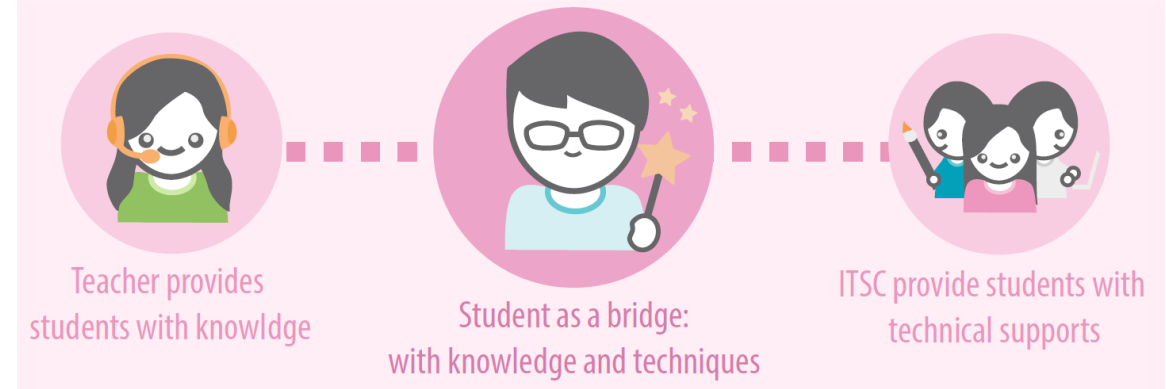


Fragmented Concepts are Integrated and Presented as a Metro Map



Our Team

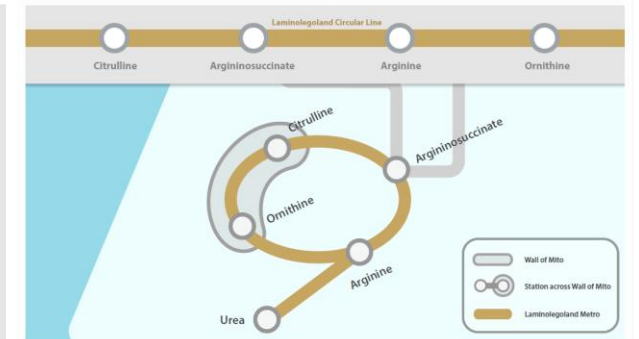
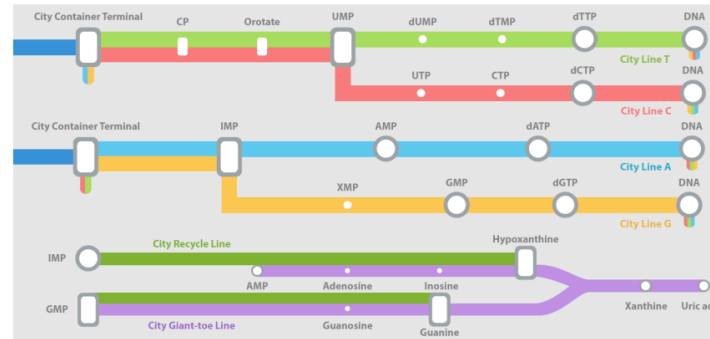
- ▶ Course teacher
 - ❑ Content of courseware
- ▶ Colleague from the Information Technology Services Center (ITSC)
 - ❑ To train student helpers on the use of different software
 - ❑ To incorporate the courseware into the student platform
 - ❑ To provide technology support
- ▶ Student helper (with Biochemistry / medicine background)
 - ❑ Learnt the course before
 - ❑ To design the courseware in a student perspective
 - ❑ With good drawing skills, interested to learn new software programs



Our Planning

▶ Phase 1

- ❑ Urea cycle in “Laminolegoland”
- ❑ The simplest pathway
- ❑ Preparation time: 6 months

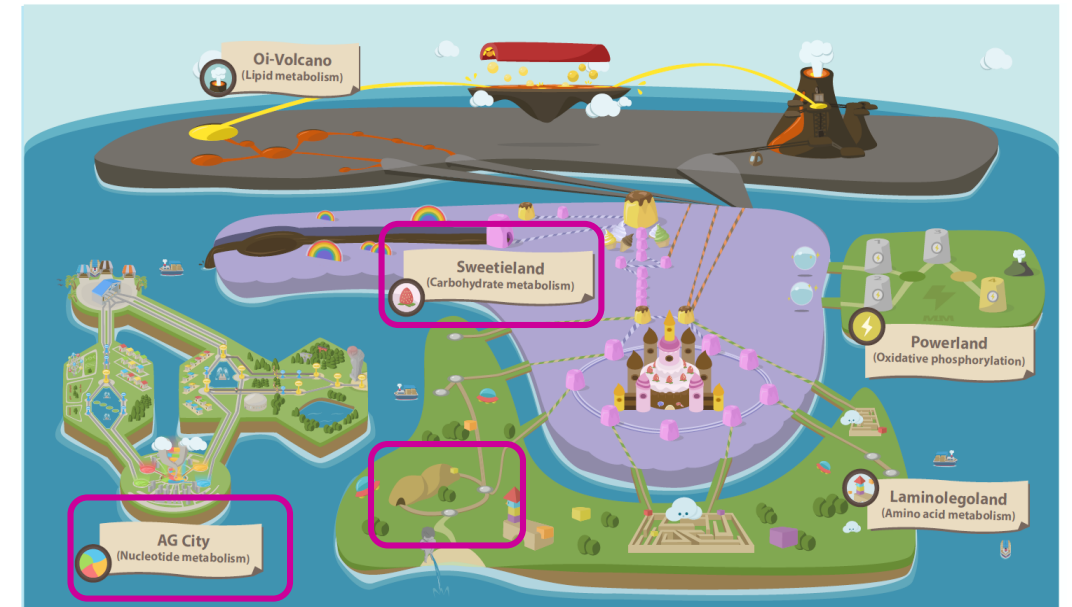
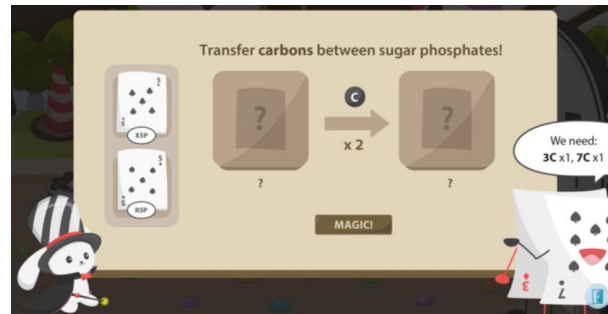


▶ Phase 2

- ❑ “AG city”
- ❑ Integration of pathways
- ❑ Preparation time: 9 months

▶ Phase 3

- ❑ “Sweetieland”
- ❑ Include interactive elements
- ❑ Preparation time: 1 year



Courseware Design

▶ Software used:

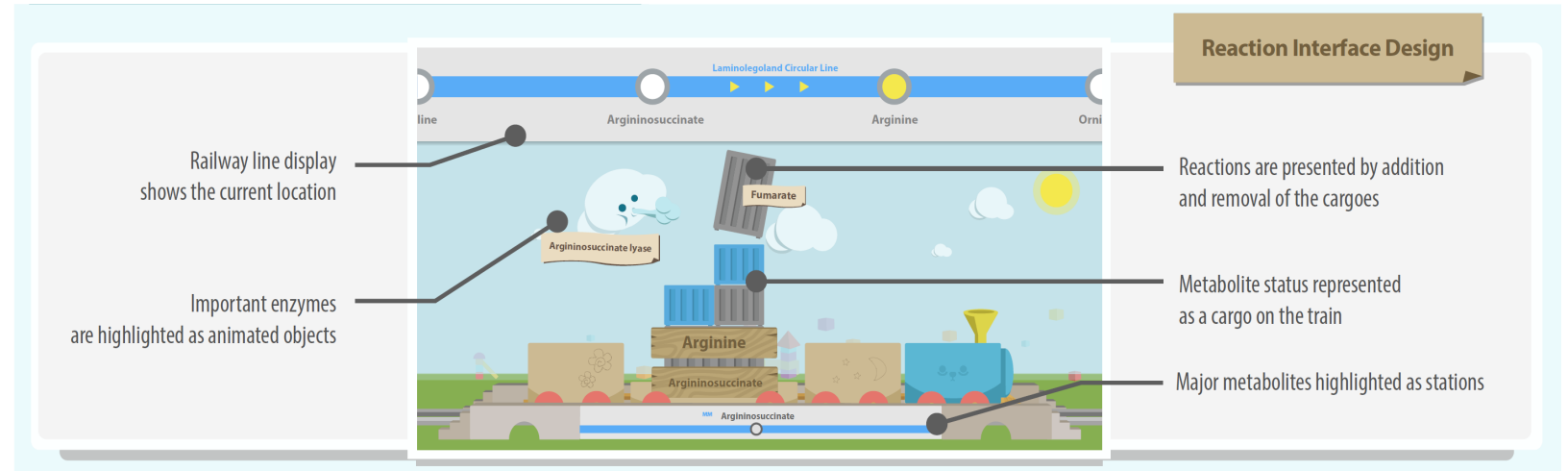
- ❑ Articulate storyline
- ❑ Camtasia
- ❑ Adobe creative suite

▶ Key features (Phase 1)

▶ Short development timeframe (≤ 1 year)

▶ Student feedback collection at the end of each phase

- ❑ Let the students involved in the improvement of the courseware



Courseware Demonstration

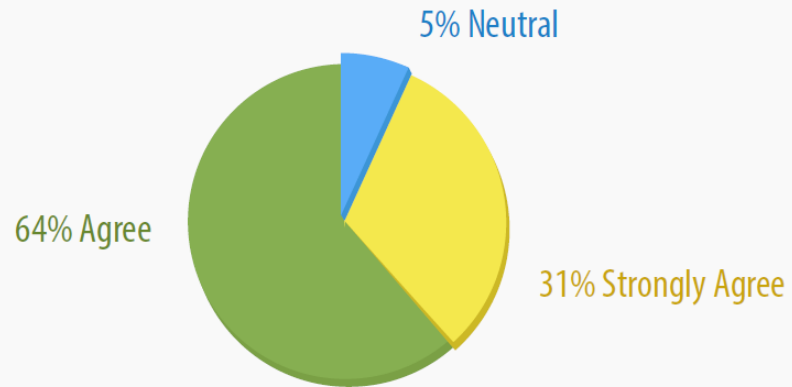


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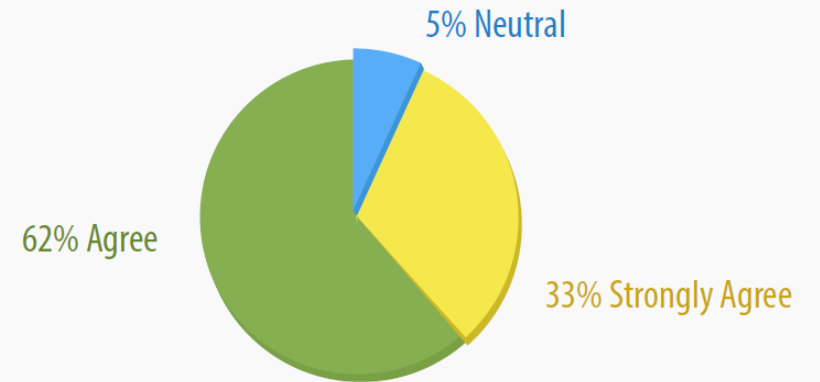


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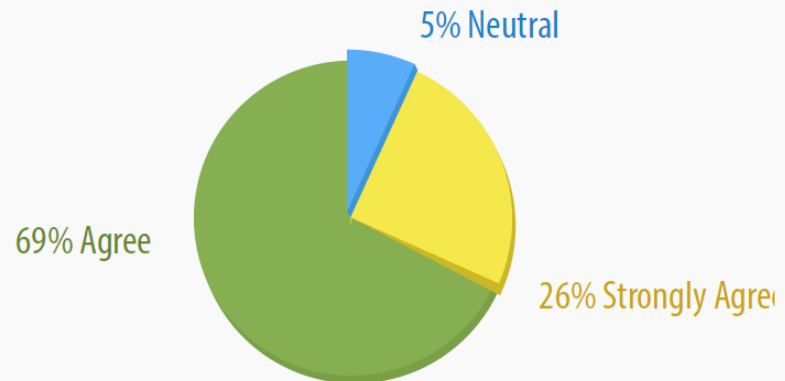
Student's Evaluation



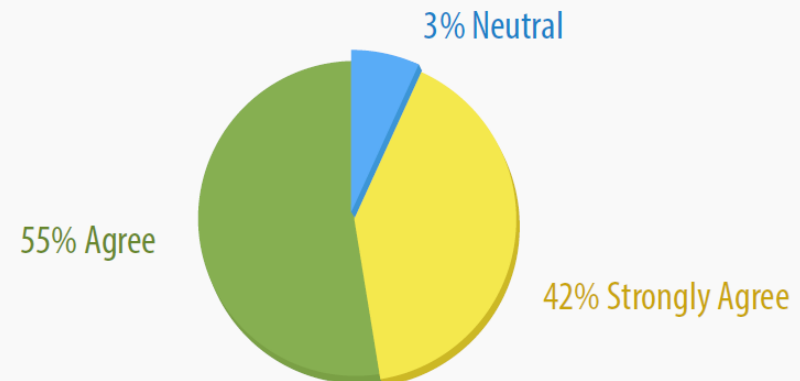
"The courseware enabled me to understand the relationships between different metabolic pathways (to understand how common metabolites participates in different pathways)."



"Integrating metabolic pathways into a metro map facilitated my understanding of the whole picture of metabolism."



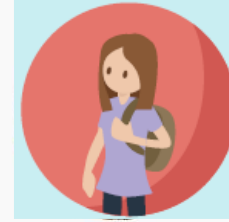
"The courseware can highlight important concepts."



"In general, I am satisfied with the courseware."

Students' Comments

The metro map was helpful because all the pathways were **all in one place**, and it has **bright colours** and **clear visual graphics**, which is **clearer and easier to memorize** than the black-and-white text-based diagrams found in most textbooks.



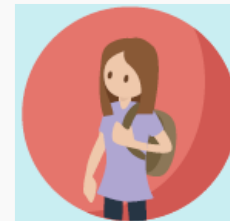
Sherie Li
Medicine, Year 2

The Metabolism Metro provides an **interesting and creative** platform for me to study biochemistry. I really love the **attractive animation** and design, which **enable me to memorise** the interactive metabolic pathways in a **more comprehensive way**.



Sam Cheng
Medicine, Year 2

AG city is really **cute and informative**, making metabolic pathways **more fun to learn** and revise. It **helps visualise** how the different chemical reactions in a way that is **easy to understand**.



Yumi Tang
Medicine, Year 2

What Could be Improved in the Courseware?

Increase the speed!

Subtitles should be added to the animations

Better if it can be more interactive

Can add a little quiz or have some exercises in the flash

**I prefer using it before lecture because
I can get a clear mind on the pathway
before learning in class**



“Let them design!”

**Student Designer
and
Design responding to students' requests**



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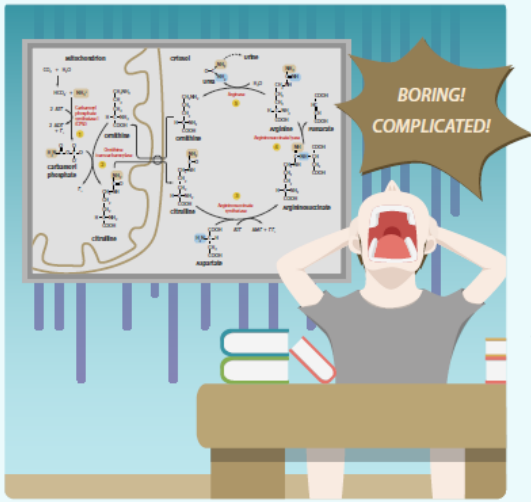


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Undergraduate learning from my perspective

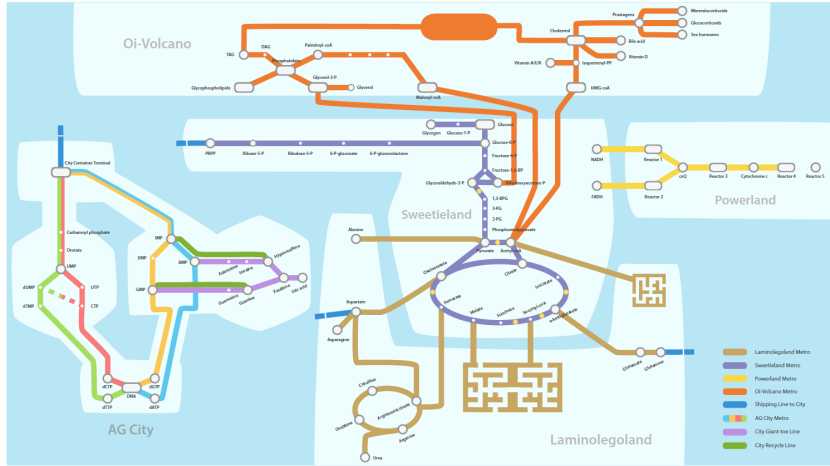
Students need:

This was exactly my face



A cartoon illustration of a student sitting at a desk with books, looking at a complex, multi-layered diagram on a board. The student has a speech bubble that says "BORING! COMPLICATED!". A green arrow points from the text "This was exactly my face" to the student's face.

1. Motivation to learn

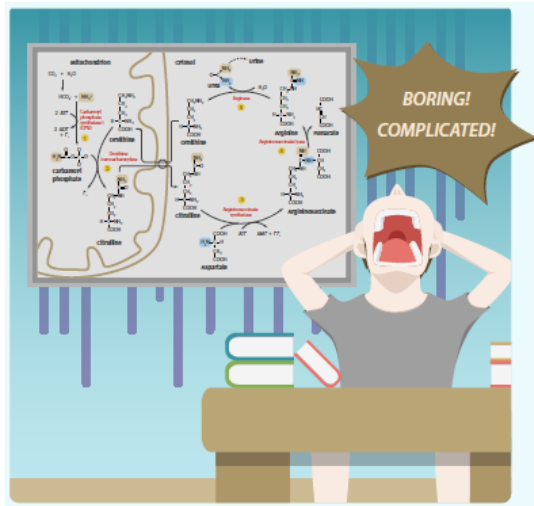


A complex, multi-colored map of a city with various districts and lines. The map is divided into several regions: Oi-Volcano, Sweetieland, Powerland, Laminolegoland, and AG City. Each region has its own set of lines and nodes, representing a complex network of knowledge or infrastructure. A legend in the bottom right corner identifies the different lines: Laminolegoland Metro (brown), Sweetieland Metro (purple), Powerland Metro (yellow), Oi-Volcano Metro (orange), Shipping Line to City (blue), All-City Metro (red), City Start Line (green), and City Bicycle Line (light green).

2. Big picture of knowledge

Undergraduate learning from my perspective

Students need:



1. Motivation to learn

Workload of UG students
is usually heavy



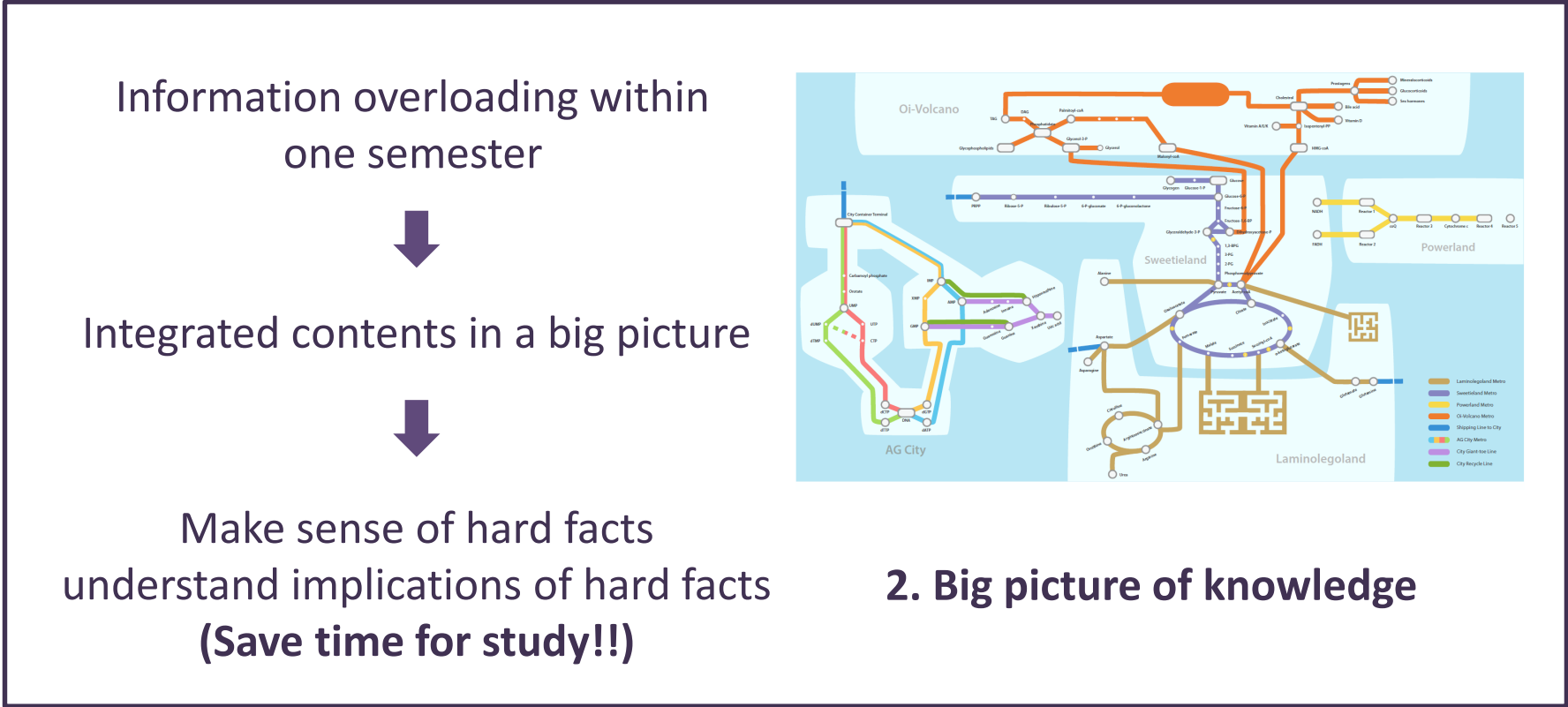
Motivate through graphics



Attract more attention to
course contents

Undergraduate learning from my perspective

Students need:



A Typical Development Timeline

Hand drafting

AI: Adobe Illustrator AE: Adobe After Effect AS: Articulate Storyline

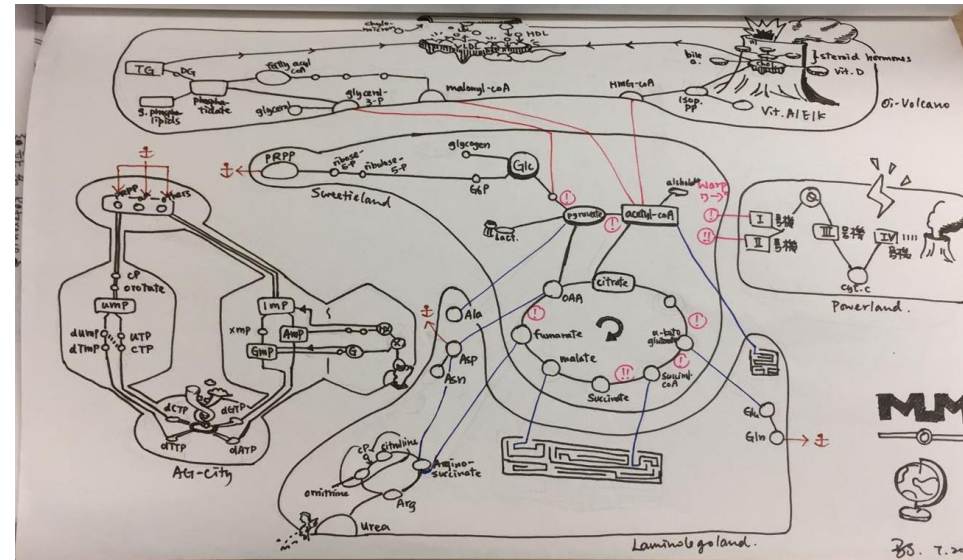
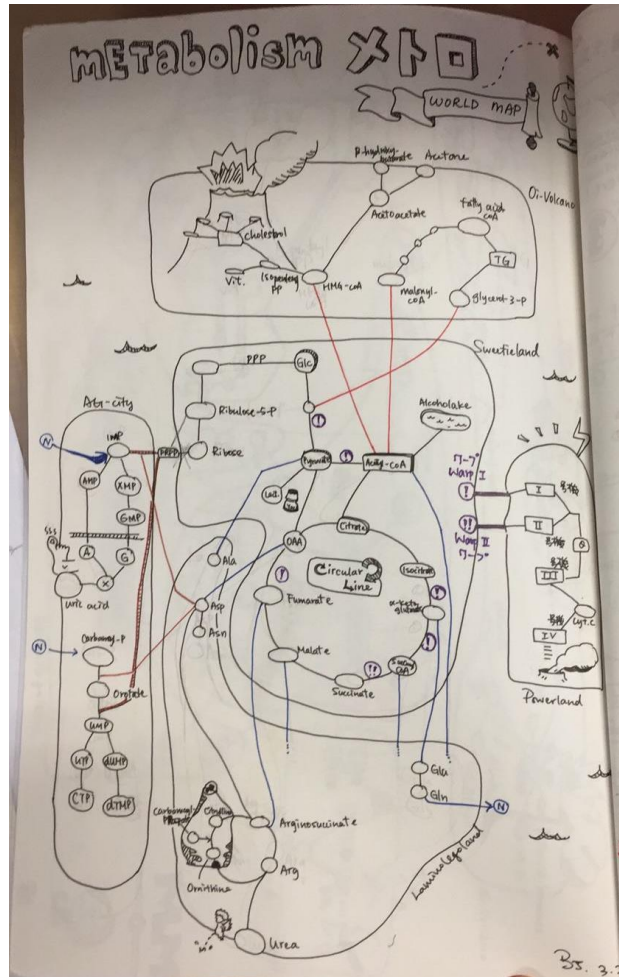


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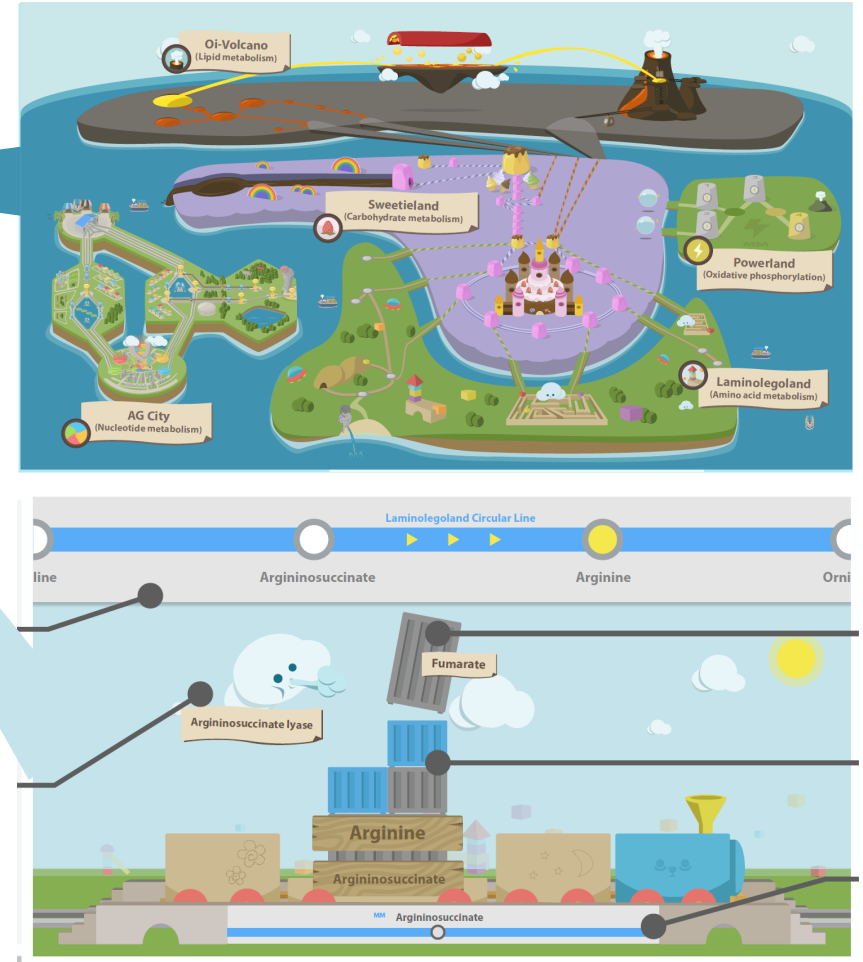
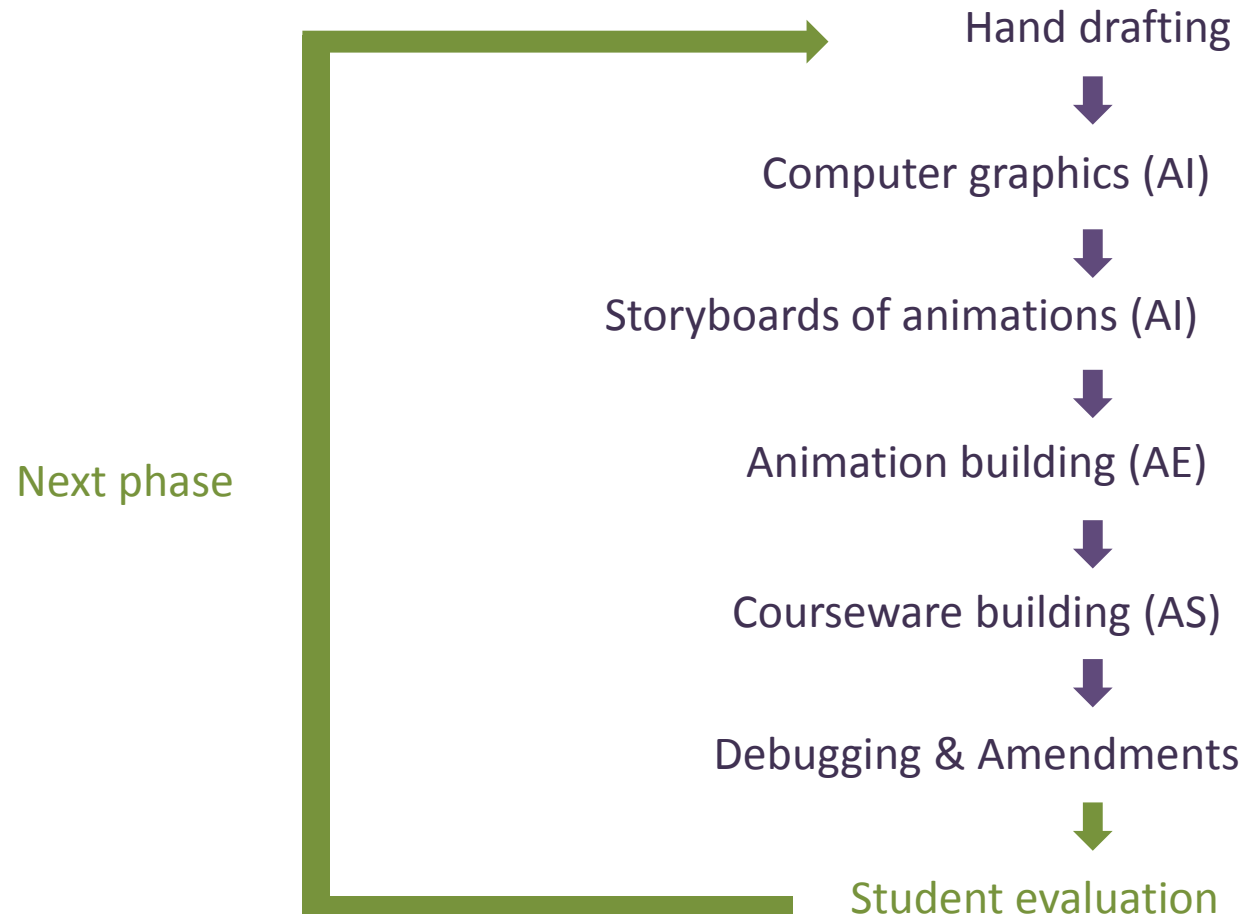


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Hand drafting occupies at least 1/3 of the time (very important)



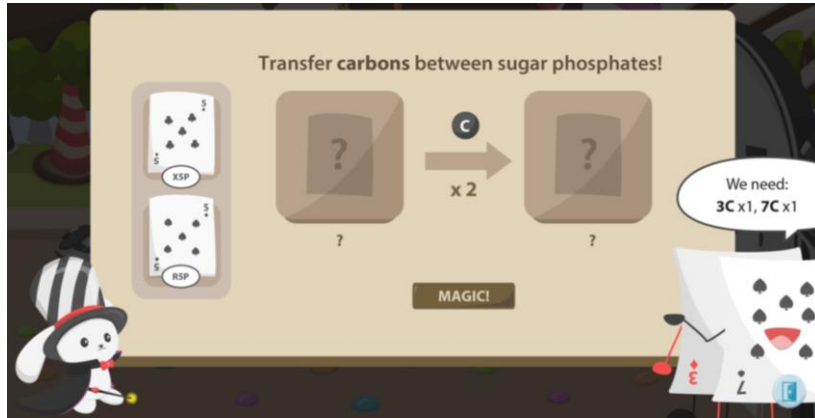
A Typical Development Timeline



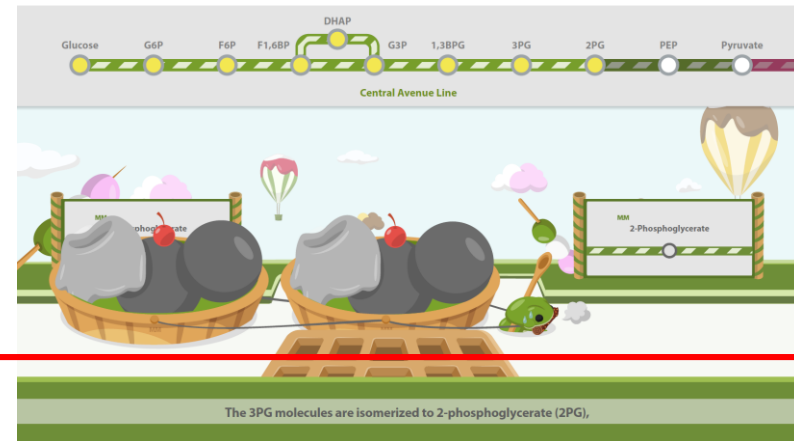
AI: Adobe Illustrator AE: Adobe After Effect AS: Articulate Storyline

Responding to Students' Requests

“Better if more **interactive**. Can add quiz/exercise.”



“Better if there are **subtitles**”



“Animation **too slow**. Increase the speed!”



We **increased speed 2-3x**

“Can I **skip/exit** from the animation?”



Review **UI** (User interface)

“Good if there is an **integrated map for revision**.”

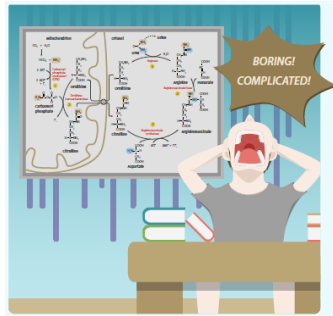


Revision package to be developed

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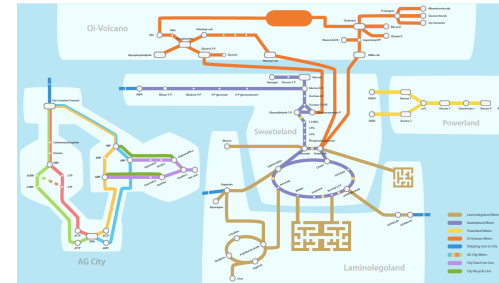
We need a courseware that ...

is interesting



1. Motivation to learn

can provide insights
in addition to lecture materials



2. Big picture of knowledge

Acknowledgement

- ▶ This courseware is supported by:
 - ❑ Phase 1 “Laminolegoland”: Teaching Development Grant (TDLEG)
 - ❑ Phase 2 “AG City”: Office of Medical Education (OME)
 - ❑ Phase 3 “Sweetieland”: Courseware Development Grant Scheme (CDGs)
 - ❑ Phase 4 “Powerland”: Micro-Module Course Development Grant (MMCD)

Thank you!



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