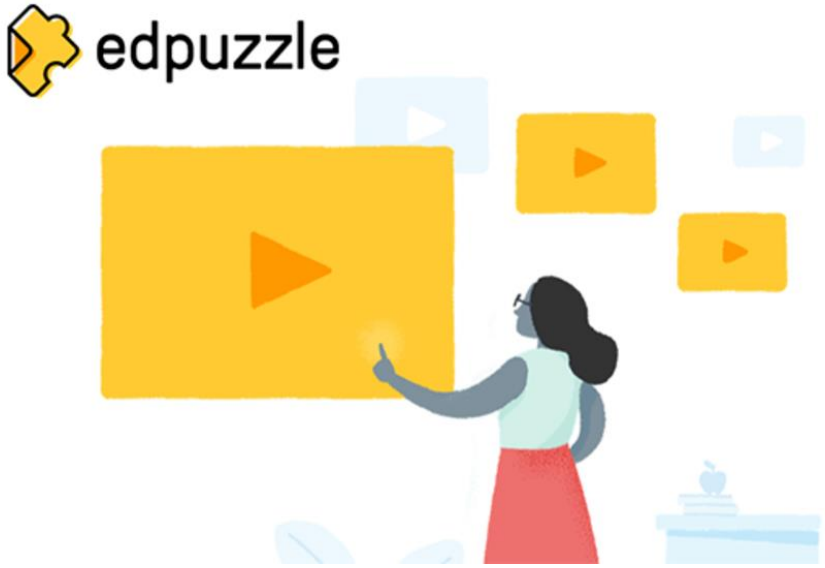
Using interactive EdPuzzle videos to facilitate student learning in a challenging STEM course



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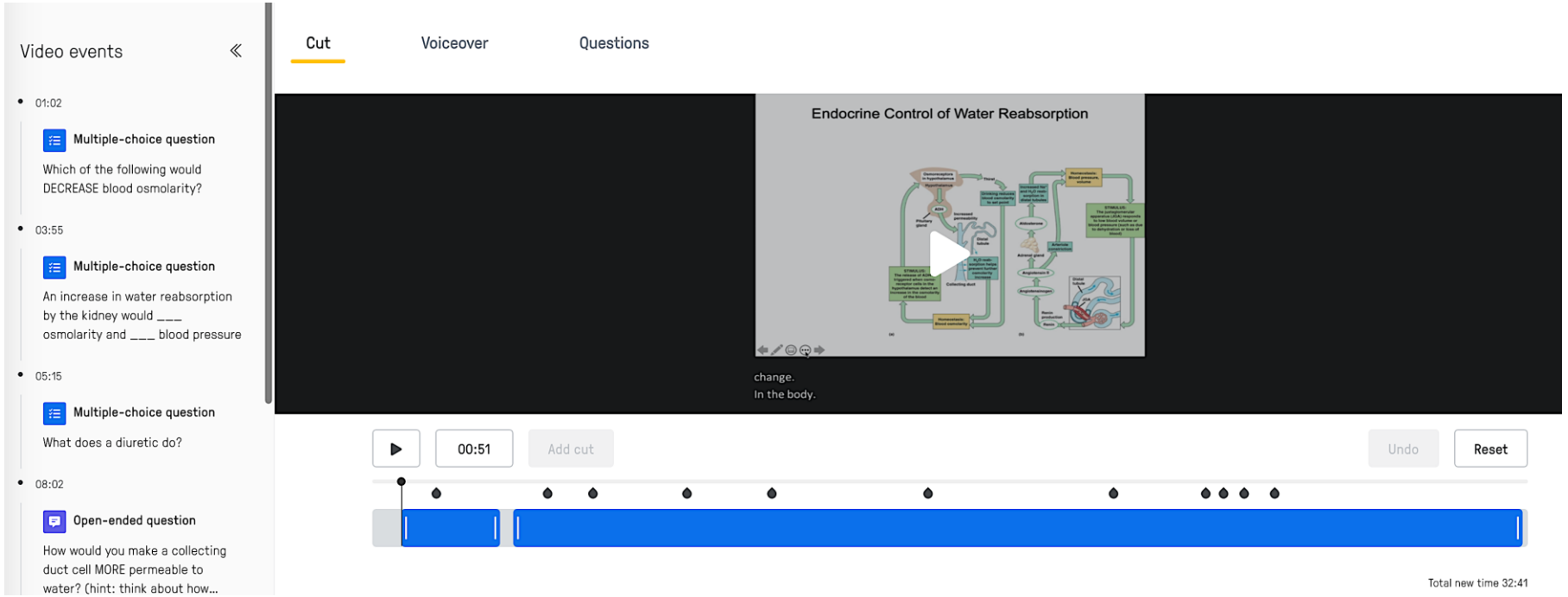
What is EdPuzzle and why am I using it?

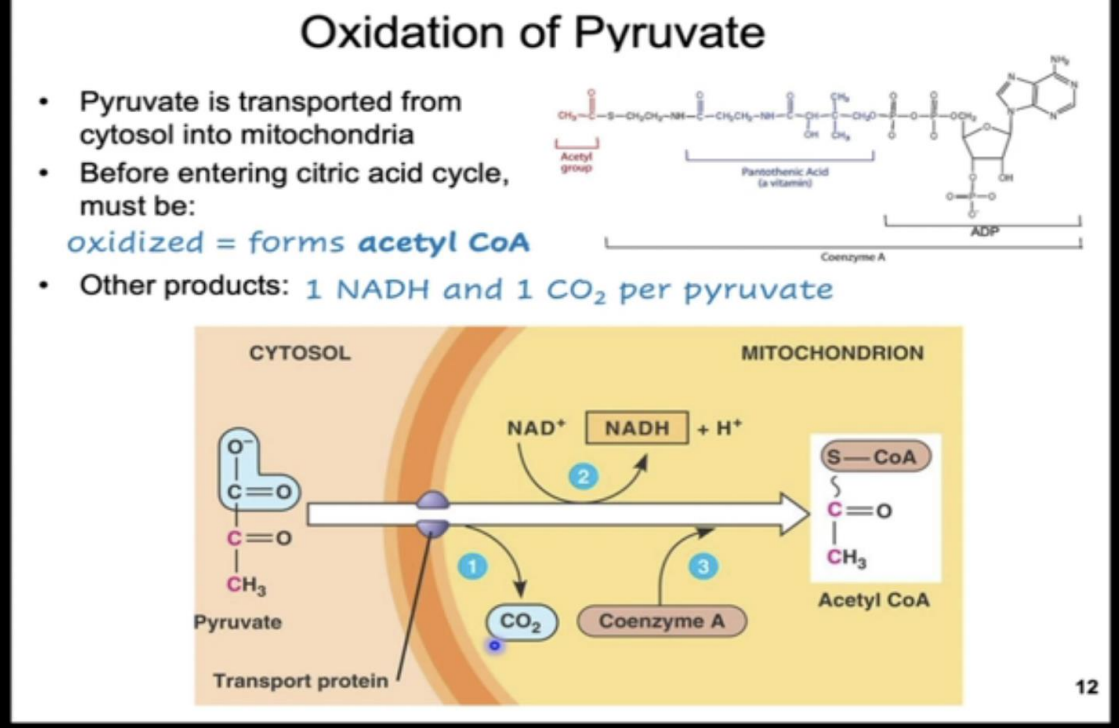
- App that allows you to record, edit, and annotate lecture videos (questions, notes)
- Used to make pre-recorded lectures for Human Physiology online
- Simulated interactive lecture format (lecture, pause, ask questions, think-X-share)
- Using in flipped classroom (online and in-person)



EdPuzzle Video Built-In Question Example

Topic 2 Lecture Video 2

Jane Khudyakov



removed as carbon dioxide So the other products of this step is 1 NADH and one carbon dioxide molecule

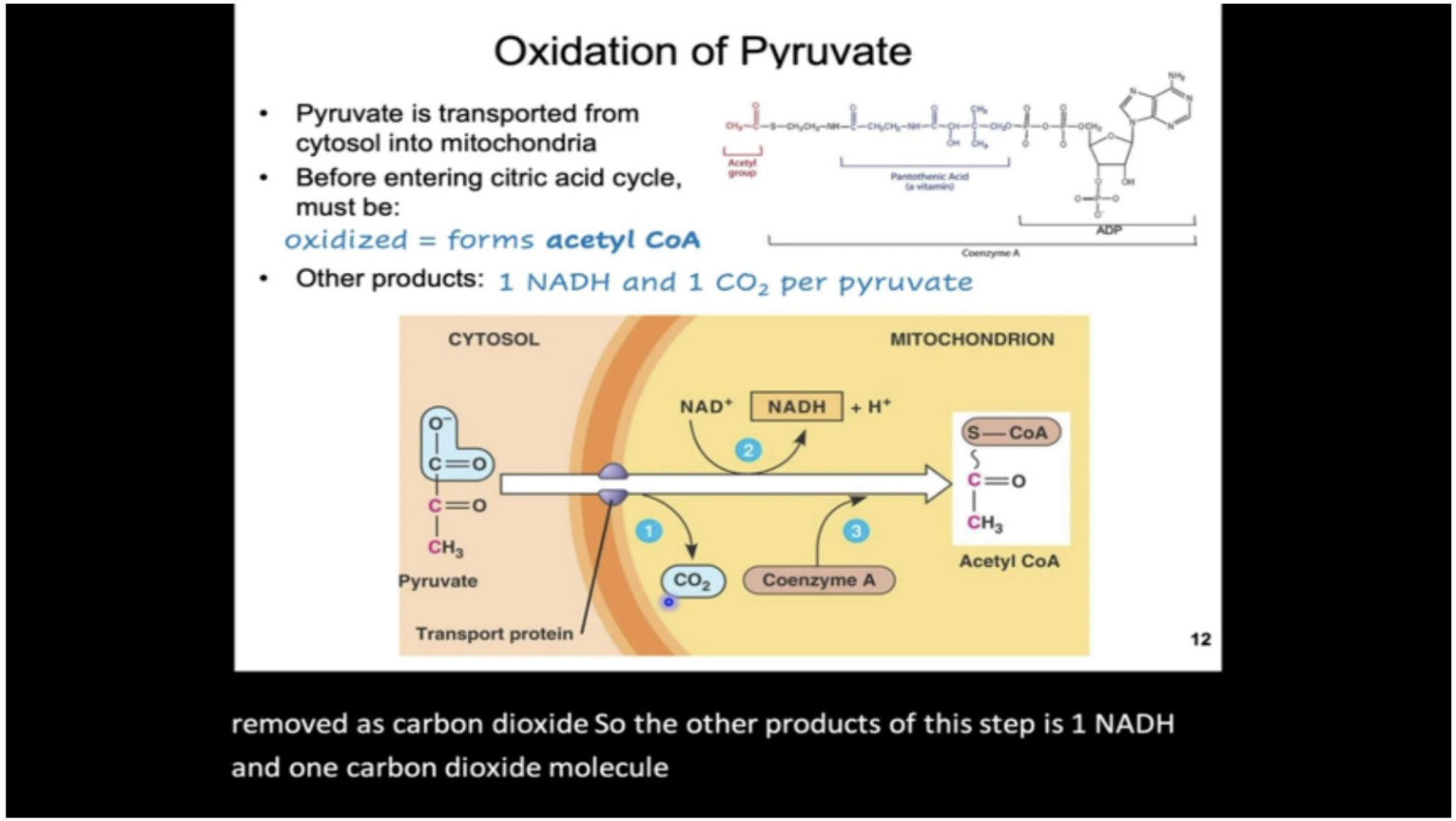
MULTIPLE CHOICE QUESTION

Where do you think the CO_2 goes after it is generated in this step?

- [ ] it is removed in the urine
- [x] it is stored in the liver
- [ ] it is used to regenerate glucose
- [ ] it is exhaled from the lungs

Rewatch Skip Submit

EdPuzzle Video Built-In Question Example



MULTIPLE CHOICE QUESTION

Where do you think the CO_2 goes after it is generated in this step?

- it is removed in the urine
  CO_2 is a waste product and it is removed from the body by being exhaled from the lungs.
- it is stored in the liver
  CO_2 is a waste product and it is removed from the body by being exhaled from the lungs.
- it is used to regenerate glucose
  CO_2 is a waste product and it is removed from the body by being exhaled from the lungs.
- → it is exhaled from the lungs
  CO_2 is a waste product and it is removed from the body by being exhaled from the lungs.

Rewatch Skip Continue

EdPuzzle Video Assessment

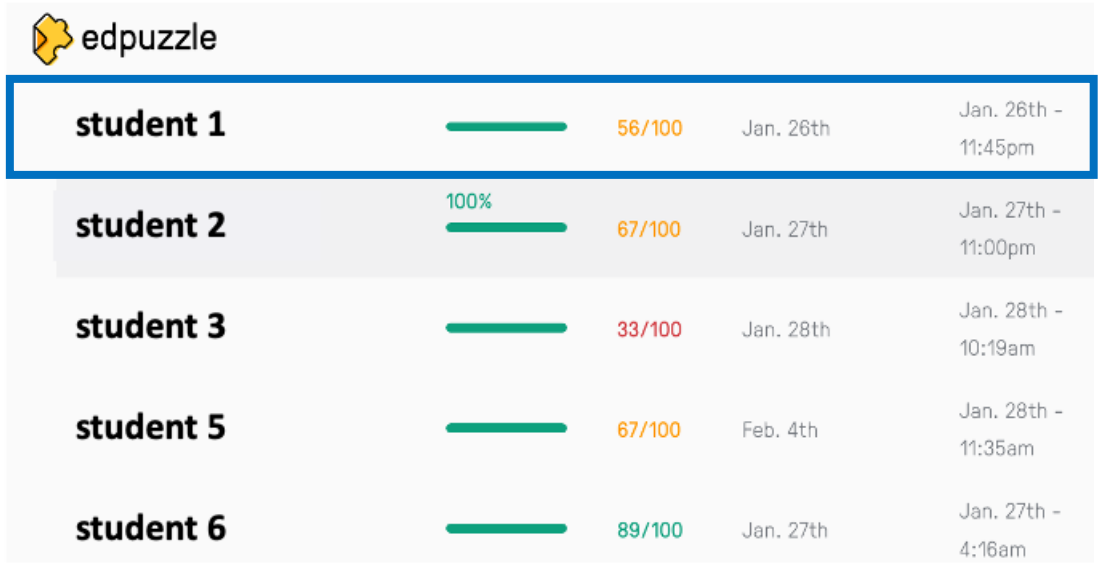
Multiple choice question

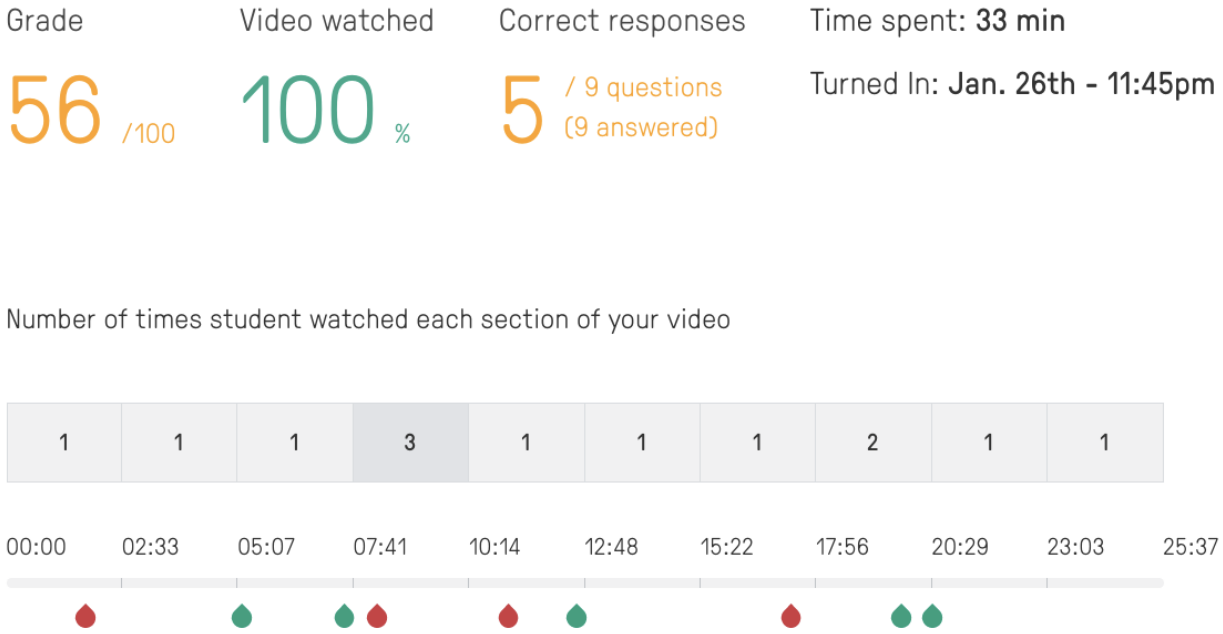
63 out of 94 right

Where do you think the CO_2 goes after it is generated in this step?

- ✗ it is removed in the urine
- ✗ it is stored in the liver
- ✗ it is used to regenerate glucose
- ✓ it is exhaled from the lungs

EdPuzzle Video Assessment





EdPuzzle Video Assessment

Why do you think cells of the thyroid gland and cells of the parathyroid glands make different hormones? What makes these cells different?

Cells in the thyroid gland produce enzymes that convert tyrosine to T3 and T4. Cells in the PTH gland do not produce these enzymes. PTH is actually a protein hormone, so cells in the parathyroid gland make it just like they make other proteins (transcription of the PTH gene followed by translation of the PTH protein.

Student 1

The parathyroid gland and the thyroid gland make different types of hormones because of the cells that composed them and what nutrients they need to produce their hormones. The thyroid gland uses iodine to produce T3 and T4 to regulate metabolism, while the parathyroid gland uses Ca2+ ions to regulate calcium ion concentration. Therefore, they have different receptors attached to their cells.

high effort, mostly correct

- of 100

Comment

Student 2

Each of these cells probably make different hormones in order to more efficiently regulate Ca2+ levels in the blood. Regarding what makes these cells different, it is most likely the receptors that bind to the hormones that induce them to produce a response.

high effort, correct

- of 100

Comment

Student 3

different enzymes

lower effort, correct

- of 100

Comment

Student 4

d

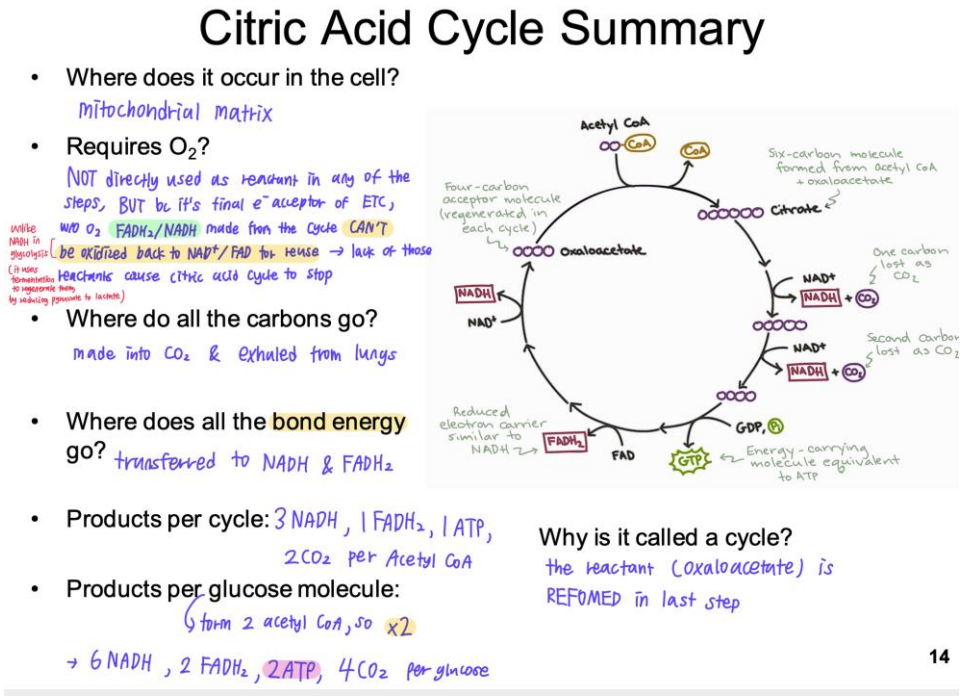
no effort

- of 100

Comment

Students like EdPuzzle videos because …

- … they allowed me to **take more time to digest the material**.
- … I was **able to pause** and **re-watch** parts of the lecture that I was unsure about.
- … I **did not have to rush** at taking lecture notes. They made **taking notes less stressful**.
- … they allowed me to **test my knowledge** on new and old material throughout the semester.
- … the lectures **were not too long**.
- … they were **graded based on completion**, which reduced pressure on me and helped me focus on learning.
- … they had a due date. Making these lectures assigned **helped me to stay on top** of the class material.
- … they let me **set my own schedule** and incorporate them into my schedule in a way that **worked for me**.



Fall 2020, Spring 2021, Fall 2021 course evaluations

I like EdPuzzle videos & flipped teaching because …

- It makes teaching live more fun, less exhausting, and less time-consuming.
- Students still get lecture content even if they miss class (sick, traveling, etc).
- I can tell when/which students fall behind, even in a large class.
- I can spend class time interacting with students, who ask more questions.
- It shifts office hours, which not all students can attend, to scheduled class time.

Drawbacks to EdPuzzle & Flipped Teaching

- Requires some amount of student **self-efficacy**, **motivation**, and **time management**
- Many students rush through videos just before class, some fall behind and ”binge”
- Some students think the videos take too much time
- Some students don’t come to class to review and practice material and ask questions