

USING D2L AS A BLENDED LEARNING PLATFORM FOR SNC1D AND SPH4U

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Futurists predict that those who work in jobs that require lower education and lower skill sets have a higher chance to have their jobs lost or restructured while those that require greater education or are highly skilled will be less affected. There is a growing urgency now because the discussion has moved from the theoretical to the observable. It is in this backdrop that Michael Fullan proposes a rethink of the delivery of education and a retooling of its goals and its measurable outcomes to create a school system that will properly serve Ontario's students in the years to come. Fullan's main concern is not that the current system can not produce students who will thrive in the new economic structure. His main concern is **that** the current educational system will never produce enough of these students unless it rethinks its pedagogy and embraces technology to allow increased individualization and relevance of education to today's learner. He calls this convergence of pedagogy, technology and the necessary skills to enable change as the Stratosphere. **The** main focus of my catalyst is to explore the benefits and potential transformative instructional properties of blended learning using the Ministry of Education's elearning platform D2L to fulfill Fullan's vision.

The second goal of the catalyst was to build digital instructional capacity in my school. Demonstrating this catalyst to the staff facilitated implementation of blended learning through training in PLC groups, mentoring and peer tutoring. Teachers are particularly interested in D2L's powerful analytical capabilities which creates a powerful pedagogical tool making assessment "for, as and of learning" more efficient. Staff were introduced to the SAMR process and learned how blended learning is more than a digital substitution for traditional methods but represents a revolutionary tool to totally redefine how curriculum is delivered.

Blended learning can be an important tool in fulfilling the goals of the Ministry's Achieving Excellence Document and it is the very embodiment of 21st Century Learning. Blended learning offers the potential of personalize learning for every student in the school. By being able to control some of the pace of instruction as well as the timing and location, students can take control over at least a portion of their learning. The social collaboration tools of D2L can also give voice to students who are inhibited to use theirs in class. Students can receive an one-on-one learning experience when they need it, but also partake in group projects when that would be best for their learning. Studies show the power of this kind of personalized learning. In 1984 Benjamin Bloom's study of just -in-time tutoring showed that the academic performance of the average individualized tutored student was about two standard deviations above the average of a student in a standard high school class.

I heavily modified the existing courses offered by D2L for Grade 9 Academic Science (SNC1D) and Grade 12 University Physics (SPH4U). I broke up the large blocks of learning text into smaller "chunked" lessons. Each lesson had a standard format with the big ideas of the lesson stated first, followed by a short lesson supported by an embedded video either created by myself or downloaded from the web. If possible an interactive activity from the Ontario Educational Resource Bank (OERB) would be downloaded and embeded. At the end of each lesson a word wall would be displayed, formative and summative assignments would be listed, if possible the tie I wore for that listed would be shown (I like nerdy ties) but most importantly of all a small formative quiz of the concept learned in the lesson would be available. The student would have four attempts at the quiz. Feedback was automatically given to the student through D2L either by showing which questions they got wrong or by

embedded videos showing how to correctly do the question. The students also got feedback from me after I reviewed the results of the formative quizzes before the unit test and retaught concepts that the statistical analytics of D2L indicated the students were having problems with.

I have had more experience with using D2L with SPH4U and have used it for 3 years in a blended learning role. Each year the students are becoming more comfortable with using the platform and the average mark in the class has risen by six percent in that time period. I have started to use D2L with my grade 9 class and have found that the higher performing students are the ones who use and benefit from D2L the most.

Sample Components of a lesson

A: Big Ideas



Part A: Overview

In this activity, you will develop an understanding of the flow of energy through an ecosystem and you will investigate photosynthesis and respiration as complementary processes.

Big ideas:

- During photosynthesis, green plants use the Sun's energy to convert carbon dioxide and water into sugar (chemical energy) and oxygen.
- During cellular respiration, sugar and oxygen are converted into carbon dioxide, water and energy.
- All organisms undergo cellular respiration.
- Producers make their own energy-rich food compounds using the Sun's energy.
- Consumers obtain energy by feeding on other organisms.
- Humans depend on photosynthesizing organisms for food and oxygen.
- Every species occupies a unique ecological niche.
- Feeding relationships between organisms can be represented by food chains, food webs, and trophic levels.
- Energy is continuously being lost to the environment by all living organisms.
- Higher trophic levels always have less energy available to them.
- Ecological pyramids can be used to display energy, number, and biomass relationships.

(https://connex.stao.ca/sites/default/files/media/stao_big_ideas.jpg)

Lesson

Limiting Ecosystems: Energy

The amount of energy in an ecosystem (biome) is dependent on:

- How much sunlight it receives.
- Seasonal changes in the environment (precipitation, temperature, etc.).
- The availability of organic nutrients.

These conditions control what type of ecosystem can form (tropical rainforest vs. desert). These types of ecosystems are called biomes.

The amount of energy that is transferred along a food chain decreases considerably from trophic level to trophic level. Only about 10% of the energy available at each trophic level is converted to new biomass. The other 90% of available energy is used as energy for respiration and body functions, or it is lost as waste.

This decrease in available energy for new biomass limits the number of organisms at higher trophic levels resulting in fewer individuals of a species as you move along.



An Energy pyramid

(https://connex.stao.ca/sites/default/files/media/stao_2.jpg)

OREB

Ecosystems: Photosynthesis and Respiration

Home
Replay

The delicate balance sustained between plants and animals is more than just the obvious feeding relationship. It also involves the interaction both plants and animals have with their mutual environment. The energy plants give to animals as food comes originally from the sun. The carbon dioxide that plants absorb from the air comes from animals exhaling. The oxygen in the air we breathe is produced by plants. In this activity you will see how each of these processes takes place.

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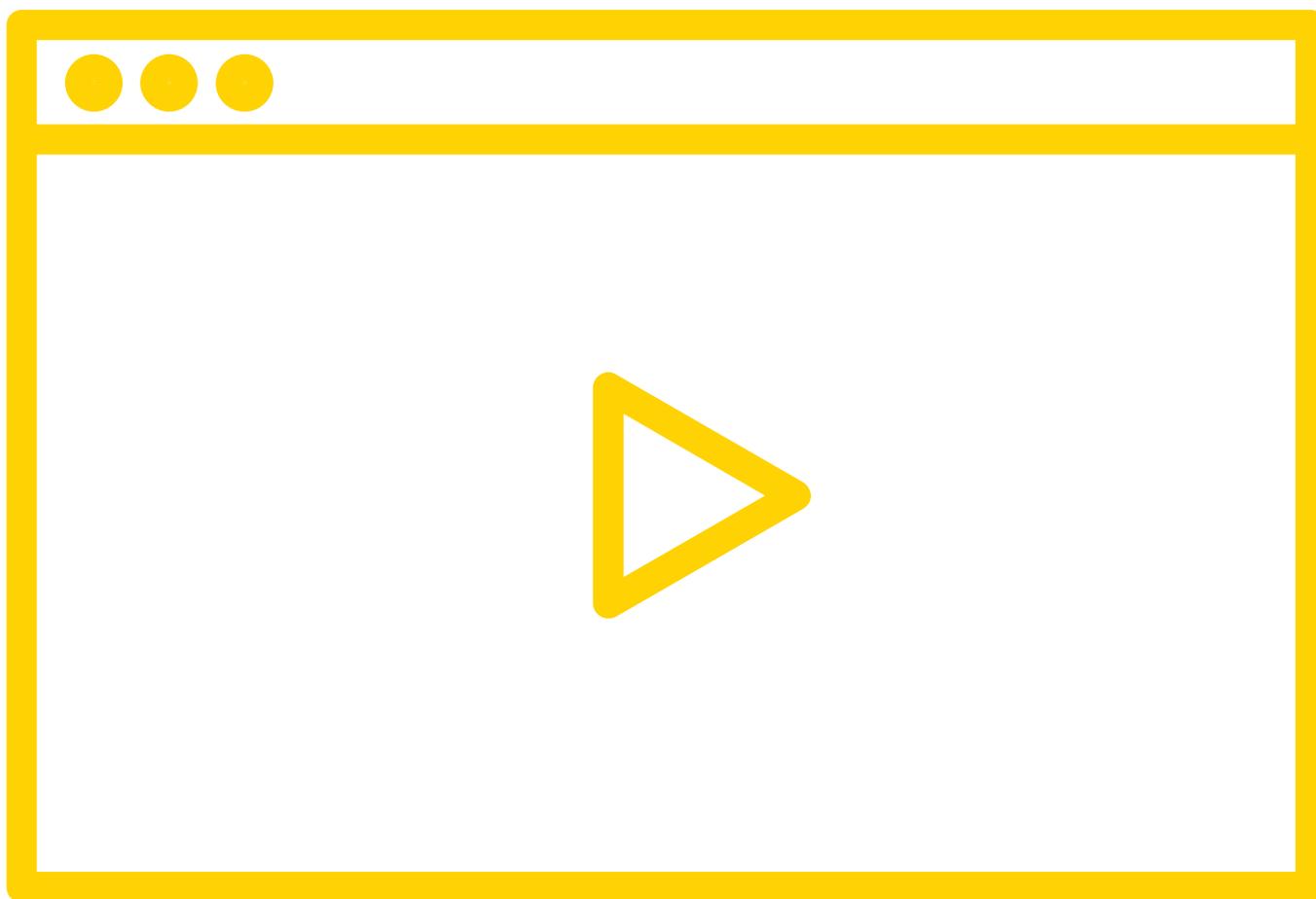
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Summary

Part F: Summary

Textbook Chapter	Cumulative Assignment	Formative Assignments	Unit Test	Schematics
2.1 & 2.2 - 31	L2L 2.1 & 2.2 - 31	L2L 2.1 & 2.2 - 31 L2L 2.1 & 2.2 - 31 L2L 2.1 & 2.2 - 31	Photosynthesis Respiration Hydrolysis Synthesis	

(https://connex.stao.ca/sites/default/files/media/stao_4.jpg)



WATCH THE VIDEO

02:15 min

([//www.youtube.com/embed/s0cJorxIwfl?width=800&height=450&iframe=true](http://www.youtube.com/embed/s0cJorxIwfl?width=800&height=450&iframe=true))

RESOURCES

- ▶ Interview with Michael Fullan, author of Stratosphere ([//www.youtube.com/embed/Yzt9h-atH5k?width=800&height=450&iframe=true](http://www.youtube.com/embed/Yzt9h-atH5k?width=800&height=450&iframe=true))
- 🔗 Daphne Koller: What we're learning from online education (http://www.ted.com/talks/daphne_koller_what_we_re_learning_from_online_education)
- 🔗 Peter Norvig: The 100,000-student classroom (https://www.ted.com/talks/peter_norvig_the_100_000_student_classroom)
- ▶ ENTER & E2: 21st Century Learning (<http://www.youtube.com/watch>)

ELEMENT

- 🔗 Technology Enabled Learning ([/expert-elements/technology-enabled-learning](http://expert-elements/technology-enabled-learning))

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