

Pivot to Online

For STEM Educators

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Land Acknowledgement

We acknowledge the traditional territory on which we are gathered today:

Traditional unceded lands of the Tk'emlúps te Secwépemc within Secwepemcúlecw; the traditional territory of the Secwépemc people (Kamloops)

Unceded territory of the Squamish, Tsleil-Waututh and Musqueam Nations (Vancouver)

Traditional territory of the Lekwungen people (Songhees and Esquimalt Nations), and WSÁNEĆ (Saanich) (Victoria)

Type in the chat: where are you right now?

Introductions

Jennifer Kirkey

Senior instructor of Astronomy and Physics at Douglas College in New Westminster, BC.

Mark Paetkau

Associate Teaching Professor, Faculty of Science at Thompson Rivers University in Kamloops BC.

Derek Turner

Instructor of Earth and Environmental Science at Douglas College in New Westminster, BC.



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Poll:

How much experience do you have teaching online?



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Chat:
What are your burning questions that you
hope will get answered today?

Building Community Online

1. Introduce yourself to your students - upload a picture or short video.
2. Establish a “communication-with-students” schedule for consistency and routine.
3. Make it a habit to design for accessibility.
4. Use the tools your institution provides and recommends.

Online Course Delivery & Community Building Resources

- [UBC Recommendations for Pivot to Online](#)
- [Camosun - Remote Instruction](#)
- [Online Teaching Toolkit](#) - Quick videos/tips/templates
- [BCcampus Online Teaching Basics](#)
- [Jesse Stommel on Building Community Online](#)
- [McGill - Building Community Online Toolkit](#)
- [BCcampus Accessibility Toolkit](#)
- [BCcampus Online Communication Tips](#)
- [Discussion rubric](#)
- [How to add Google Captioning with Slides - Using Chrome](#)

Engaging Activities and Assessment

1. Think about giving students choice.
2. Non-disposable assignments.
3. Do you need the exam?

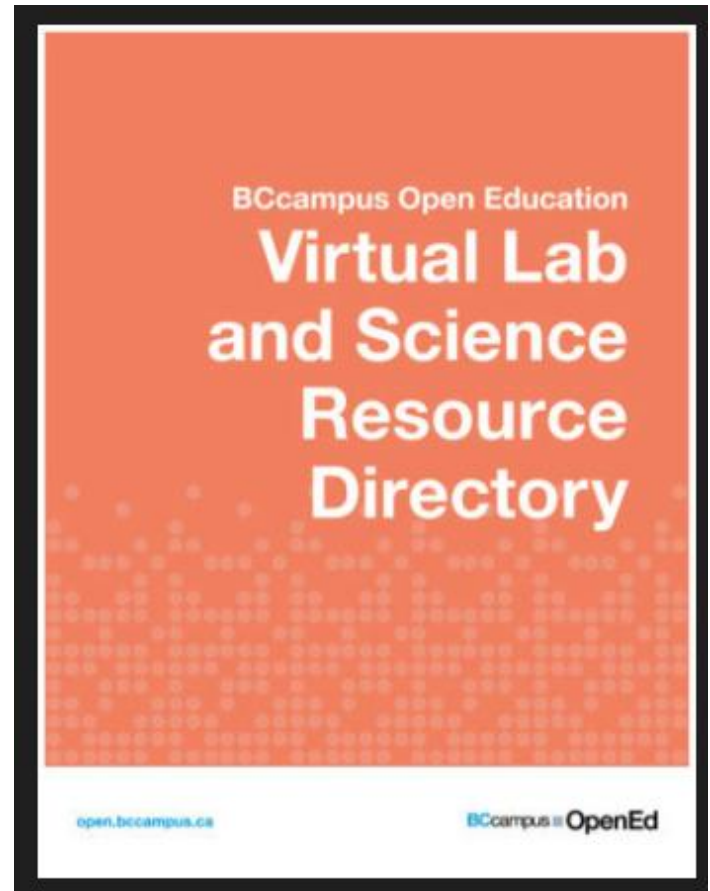
Engaging Activities & Assessment

- [Open Pedagogy Notebook](#)
- [International Student Guide](#) from KPU
- [Student Choice in Assessment – Principles and Practices](#)
- [Do you need the exam? Flowchart](#) - Giulia Forsythe
- [UWaterloo - Engaging Students in Online Activities](#)
- [Top 10 UDL Tips for Assessment | CAST](#)
- [Testing alternatives | Keep Teaching](#)
- [Universities Overcome Bumps in Transition to Online Teaching \(Physics Today\)](#)
- [University Cheating Might Be Up But Don't Just Blame Students \(CBC News\)](#)

BCcampus Virtual Lab and Science Resource Directory

Lists free science resources designed to support remote science education. This directory is updated as new resources are identified.

<https://opentextbc.ca/virtualscienceresources/>



Virtual Lab Examples

- Distributing random data sets for students to analyze data
- Have students analyze videos of the lab being performed
- At-home experiments and virtual labs: how U of T moved lab courses online due to COVID-19
- Animal biology students design an experiment about local animal behavior and collect and analyze those data
- Physics students can build pendulums of varying lengths using home materials and analyze the motion
- Chemistry students design an experimental procedure for the multi-step synthesis of an organic compound



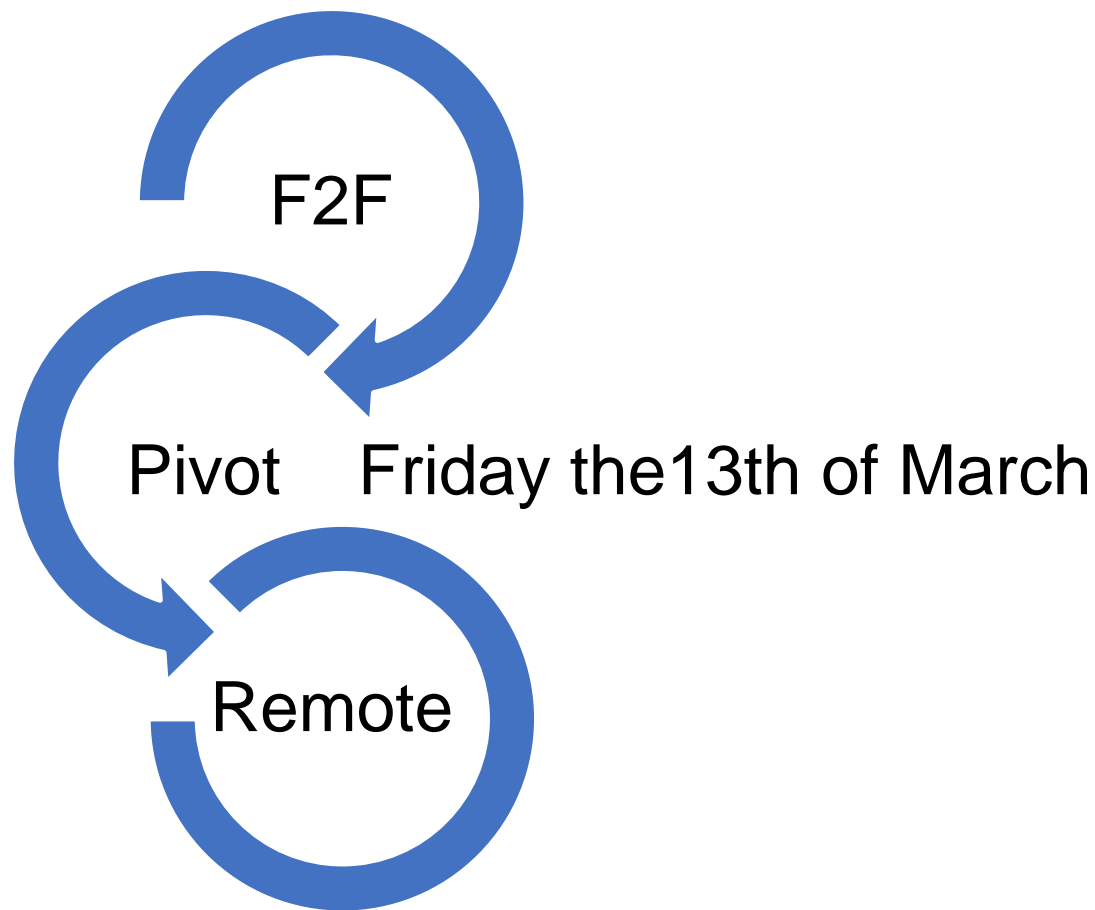
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Photo credit: Jennifer Kirkey
2015 CC0 Jennifer and the 8 inch Celestron
at Douglas College



Photo Credit: Tulane University Public Relations
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File:Ballerina @ Tulane University.jpg



Physicists invented the World Wide Web



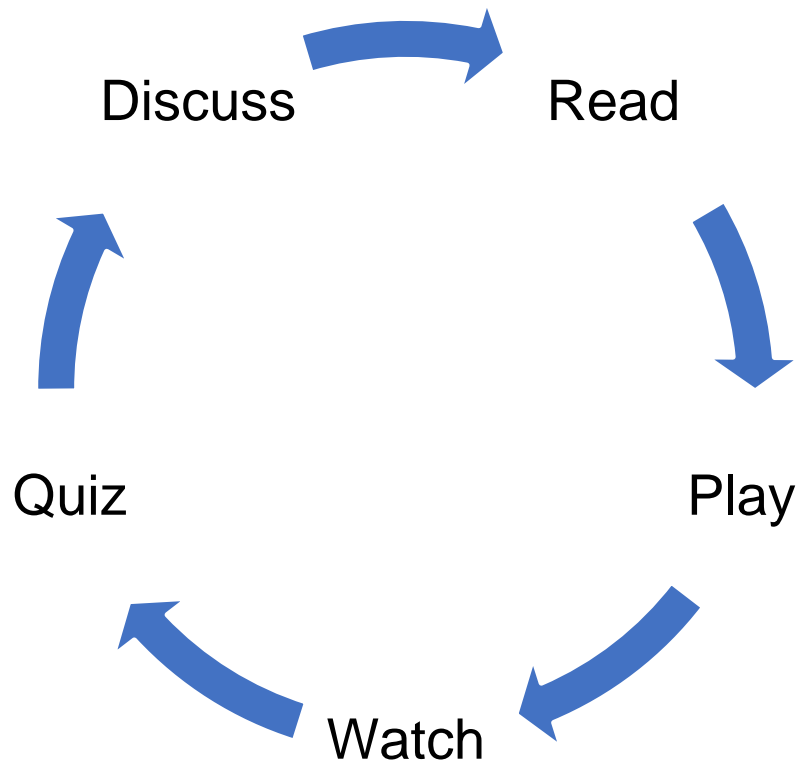
Photo Credit: Max Braun , 2008 Where the WEB was born.jpg CC BY-SA 2.0
https://www.lhc-closer.es/taking_a_closer_look_at_lhc/0.cern_where_the_web_was_born



Photo Credit:

Wikimedia Commons Jurvetson CC-BY-SA 2.0

https://commons.wikimedia.org/wiki/File:Soap_bubbles-jurvetson.jpg



Online Labs

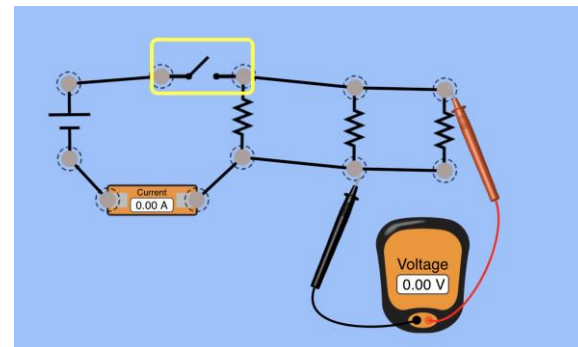
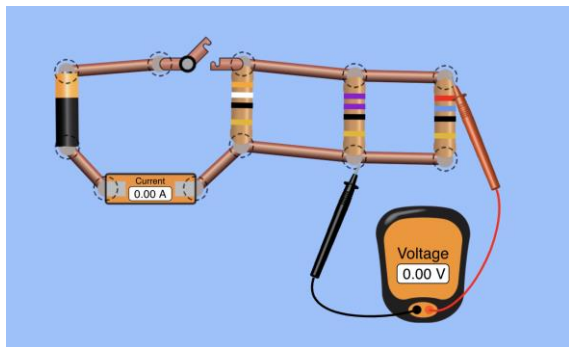
- Take an online quiz at the start of the three hour lab period
- Gather data via simulation or video
- Analyze data (raw data sometimes provided)
- Ask questions during the lab period
- Submit lab report as a PDF the next day

PhET – John Travoltage

- <https://opentextbc.ca/virtualscienceresources/>
- https://phet.colorado.edu/sims/html/john-travoltage/latest/john-travoltage_en.html



Phet- Circuit Lab



https://phet.colorado.edu/sims/html/circuit-construction-kit-dc-virtual-lab/latest/circuit-construction-kit-dc-virtual-lab_en.html

Assessments

- Proctoring software does not work (easy to hack)
- Open book tests
- Many shorter tests so less time to get online answers
- Randomize questions
- Randomize the numerical values inside the questions
- Oral exams
- Group projects



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Pivot(al)

Mark Paetkau

Associate Teaching Professor, TRU

March 2020

3 upper level courses:

- Webinar...polling, whiteboard & **Oral final exam**
- 10 min videos and seminars/office hours, weekly hand-in & **Online Final**
- One lab course – last two labs used simulations & canceled lab exam

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Flipped classroom

- 10 min core-concept videos, lectures become interactive seminars

Set Schedule

- Weekly hand ins, weekly online problems (low stakes)
- avoid assigning too much!

Define and use Communication

- Forums before email

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Exams

- Oral exam very efficient for testing practical skills (but exhausting)
- Online delivery, formula sheet, AD waiver
- specific question format AND final feedback question...

Synchronous Labs

- (with timed async provision)
- Students spend too much time on async labs

March 2020

Exams – Academic integrity

	Student	Poor	Good	Excellent
Probability of occurrence		low	med	high
Probability they will benefit				

March 2020

Exams – Academic integrity

		Student	Poor	Good	Excellent
		Probability of occurrence	low	med	high
		Probability they will benefit			
		Mode of Academic Dishonesty			
		Share	Copy	Web/Notes	Fraud
Student	Excellent	low	low	low	low
	Good	med	low	high	low
	poor	low	high	high	high

Starting from ground zero?

<https://ecampusontario.pressbooks.pub/remotecourse/front-matter/quick-start-guide/>

Moving to remote courses – Quick start overview

Suggestions (see guide for explanations, options)		Method/Tool
	1 Identify the essential learning outcomes or topics. At the end of the course, what MUST learners know, be able to do, and value? Cut the rest. Break LOs into modules/sections.	PDF Post in Brightspace
	2 How will you share content ? For example: curate or record short video lectures (2 – 15 min) or post text with main content. Use videoconference time to address more complex ideas and work through problems. For synchronous ^a options, also record the session to make available asynchronously ^a .	Asynchronous ^a : record videos, post on YouTube and link through Brightspace Synchronous ^a : Adobe Connect / Teams / Zoom
	3 Offer practice with feedback These can include: optional practice sets with answers (async.), group work on problem sets during videoconference (sync.), using a response system.	Async: PDFs with answers Brightspace quizzes Sync.: Adobe Connect / Teams / Zoom & Echo360 / Menti
	4 Identify methods for assessment that focus on learning. Consider weekly interactive quizzes (async.), collaborative, open-book exams.	Brightspace quizzes Exams administered as Brightspace “assignments”
	5 Identify methods for communicating with students. Tell students what to expect, e.g., that you respond once daily to email and have office hours on Mondays 1 – 2 pm.	Brightspace announcements, Email, Teams / Zoom
	6 Teaching assistants can run DGDs ^b , forums, make videos, or answer questions in the chat during classes.	Brightspace forum, Adobe Connect / Teams / Zoom , DGDs, Email
	7 Support students by being flexible and providing resources. Equity and wellness are major issues both for online learning and because of the pandemic. Students have not chosen to learn this way and may not have the needed tools or skills.	Ask students, consider alternatives, provide resources

^a Synchronous: everyone present at the same time, e.g., videoconference; asynchronous: students/professors contribute at their own pace and time (e.g., email, discussion forum); can still have deadlines. ^b DGD = Discussion group / Groupe de discussion (i.e., tutorials).
• Do what you can: it doesn't need to be perfect (is there such thing?) but it can still be a good learning experience, given this need for remote teaching.
• The Teaching and Learning Support Service (TLSS) provides support for many of the tools identified, especially Brightspace.
• There are excellent, detailed resources on creating remote courses. This guide is simply meant to be a quick way to get started.
• Suggestions welcomed! Icons from Freepik and Eucalyp from Flaticon.

In higher education:
Pivot

From Teaching
to
Providing Opportunity...



**DON'T
PANIC**

Dan Gerhard / Attribution
https://commons.wikimedia.org/wiki/File:Don%27t_panic.svg



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Derek Turner

Earth and Environmental Science
Douglas College



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Q & A

Any great ideas to share?

Unmute your mic and share aloud;
or share in chat!

Upcoming Events

- [Facilitating Learning Online](#) – FLO
- [FLO Bootcamp](#) (July 13-16)
- [Fun FLO Friday](#) (June 26)
- [Adapting to Covid-19: Dealing with Burnout](#) (June 30)

[BCcampus Events](#)

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