

Blue Sky Group – lab teaching

The following ideas emerged from a brainstorming session about how to improve the experience of online or hybrid classes involving teaching using labs. Five science faculty participated with input from Academic Computing and the Center for Pedagogical Innovation in an endeavor to innovate new approaches, with the recognition that no one solution works in all instances.

Prep

[GoodNotes](#), [Evernote](#), and [Notability](#) apps allow students to share files and notes, and to see faculty writing, including on pdfs

The [SKIES](#) app can be employed to allow student groups to visually and verbally map the stages of an experiment.

[Beyond Labz](#) offers labs in chemistry, physics and biology.

A document camera can help students see the prep

[Perusall](#) allows multiple students to annotate lab instructions

A variety of apps offer students the ability to create images together at the same time

- [JamBoard](#) (in G Suite) (difficult to use with a mouse; tablets make it easier to use)
- [Google HangOuts](#)
- Zoom whiteboard

Video demos

- [Microsoft Stream](#) – the video service in Microsoft 365 – includes faculty-made videos specific to the lab sciences that may pertain to other faculty's classes. They can be organized together.
- [Yammer](#) (found on SharePoint) is a collaboration tool that helps you connect and engage across campus and is found within Office 365.

A video-enabled bootcamp in the first week of classes can help students who don't yet have the skills necessary for the semester's lab work.

Lab

A camera can allow faculty to see what is happening in each student group's experiment

- Document cameras can work, if available (requests for cameras must be made asap due to delays in appropriation).
- The app [DocuCamera](#) can help faculty project images using a variety of devices
- Use of student smart phones or tablets – these may need a tripod and/or additional lighting by a desk lamp or ring light, and might be improved with the use of purpose-built backgrounds. This option may also require faculty to group students in order to ensure each has at least one workable camera in their group.

Students can build an experiment together while maintaining social distance by using a variety of options (depending on the limits of the specific lab work):

- Students might work outside the confines of the lab
- Each student group might use a tablet to allow them and the course assistant view a common document
- Lab groups can be placed within Zoom breakout groups
- Lab group members might use texting to communicate with one another

- Apps that give phones a walkie-talkie feature can be used.
- Dedicated walkie-talkies for labs might be employed, especially in labs that cannot allow in outside equipment
- Lab groups can use Microsoft Teams to communicate / share documents and images
- Lab groups can use [Microsoft Sharepoint](#) to create lab groups where post questions/comments / share files / images and more.

Students can communicate with the faculty member and/or the course assistant using these methods:

- A dedicated tablet using a communication app, such as [JamBoard](#)
- A Zoom call can be left open over the course of the lab so that the faculty member and/or course assistant who are “on call” can be pinged if an issue arises
- In situations in which electronic devices aren’t allowed in the lab, the course assistant can go around and collect written questions from students for faculty to project or discuss with the whole class

Scanning apps (e.g., Adobe Scan) can be used to quickly share handwritten lab notes/observations with group members, the instructor, and/or the TA

Post-lab

Student can blog about their lab work, translating their experiences to non-specialists

Create conversations among paired students about the experiment and its possible connection to Covid-19, culminating in symposium-type presentations at semester’s end

[WesCreates](#) - Student webpage for blogs / image galleries

[Microsoft Sharepoint](#) to create lab groups where post questions/comments / share files / images and more.