

## Tips for Effective Online Office Hours

The following is a series of tips for conducting effective online office hours using Adobe Connect. When done right, it is an exciting and dynamic way to involve students. Please take a moment to read this list, as it will accelerate your progress towards mastering this new teaching format.

1) Carefully look over the next due set of homework before beginning your office hours, since that is what students will most likely have questions about. Explaining requires a high degree of understanding, and you don't want to be trying to figure out physics while also trying to communicate using technology you are not yet completely familiar with.

2) Before you begin fielding students' questions, make sure you have the pdf file of the next due homework (without solutions!) loaded into an Adobe Connect share pod. If you need to create a new share pod, go to Pods->Share->Add New Share. From the drop-down menu in the share pod, select "Share Document" and then browse for the pdf on your hard drive. Save all of the relevant pdf files from Quest onto your hard drive before beginning an online office hours session.

3) Start answering a student by asking them what they have done so far on a problem, or what general approach they think should be applied. Bringing the student into the problem solving process makes it less likely you will be "pumped" for answers. Try to find a good balance of efficiently getting to the root of a student's question without giving everything away all at once. Your teaching strategy can be highly dependent on the skill level of the student in question.

4) On multiple T/F questions, such as

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VelConceptMI01x047

018 10.0 points

Which of the following observations give conclusive evidence of an interaction?

- A. Change of velocity, either change of direction or change of speed.
- B. Change of shape or configuration without change of velocity.
- C. Change of position without change of velocity.
- D. Change of identity without change of velocity.
- E. Change of temperature without change of velocity.

List all that apply separated by commas.

have the student indicate which choices he thinks are correct. I like to use the ellipse tool to highlight these proposed choices (using blue, for example). Then, you can talk about each of them in sequence, using the pointer tool to show which you are talking about at any given time.

Ch1-HW2-preview.pdf

016 (part 2 of 3) 10.0 points  
What is  $d_y$  in meters?  
Answer in units of m

017 (part 3 of 3) 10.0 points  
What is  $d_z$  in meters?  
Answer in units of m

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If the electron continues to travel at the average velocity, find where it will be in an additional  $6 \mu\text{s}$  :

$$\vec{d} = \langle d_x, d_y, d_z \rangle.$$

What is  $d_x$ ?  
Answer in units of m

023 (part 5 of 6) 10.0 points  
What is  $d_y$ ?  
Answer in units of m

024 (part 6 of 6) 10.0 points  
What is  $d_z$ ?  
Answer in units of m

BallMI01x092  
025 10.0 points  
At a certain instant a ball passes location

$$\vec{r} = \langle 7, 19, -17 \rangle \text{ m}.$$

In the next three seconds, the ball's average velocity is

$$\vec{v}_{\text{avg}} = \langle -11, 36, 11 \rangle \text{ m/s}.$$

2 / 4 | 146% | Sync

If a particular choice the student made is not obvious (or is wrong), ask why he thinks it is true. Try to prompt the student so you are not just giving everything away. It may be helpful to indicate incorrect choices made by the student (in red) or correct choices he failed to identify (in green) after you have

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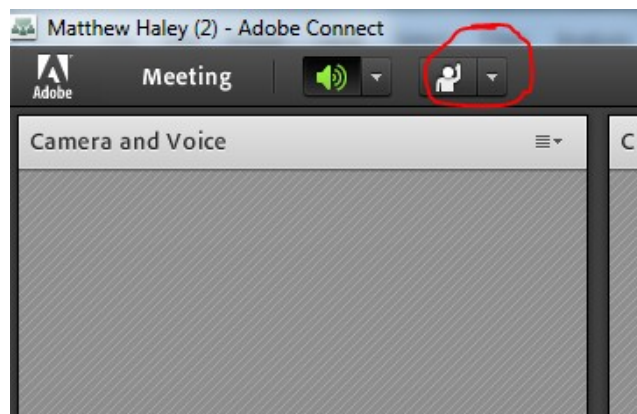
discussed them.

5) Using a mouse (as opposed to a laptop touchpad), headset, and webcam will enhance your teaching effectiveness. I don't usually use a microphone, but it can be helpful for giving a conceptual explanation of a problem.

6) If a student's question concerns his VPython code not working, have him email you his code and figure out what's wrong before you start trying to answer his question. Point out to the student which line(s) of code is (are) incorrect by copying and pasting the line(s) into the chat window. Then ask the student if he can identify the problem with his code. You may want to use Lyx to write the physics equation that the student is attempting to translate into Python code. Lyx will be discussed later in this document.

7) If you need to draw a diagram that is not convenient to draw directly onto the homework pdf (if there is not enough space, for example), you may want to open a new share pod and turn it into a "whiteboard". Go to Pods->Share->Add New Share, then use the drop-down menu in the pod to select "Share Whiteboard". You can use this pod as a drawing space and hide it when you want by clicking the top right menu and selecting "Hide". You can cycle through numerous whiteboards using the left and right arrows at the bottom left of the whiteboard share pod. This is useful for returning to earlier diagrams you have drawn when a student asks the same question another student previously asked.

8) The "raising hand" mechanic is very useful. Notice its icon on the menu bar:



This is so students can line up in a queue if many of them have questions. Point this out to the students repeatedly during the first few office hours you host. Also, don't try to answer two questions at once! It's way too difficult. Make sure you have fully answered one student's question before moving on to the next student.

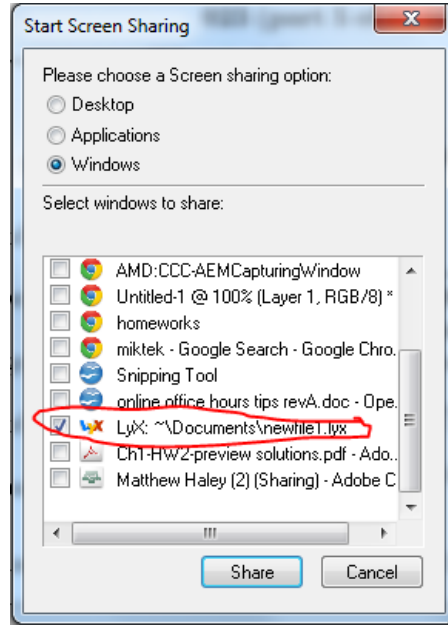
#### 9) How to Share Lyx Using Adobe Connect

A WYSIWYG (What You See Is What You Get) Latex editor will add a level of concreteness to your explanations and should be considered mandatory for helping students with physics online. I will describe a particular editor I recommend called Lyx. Firstly, you should install it. It can be found here:

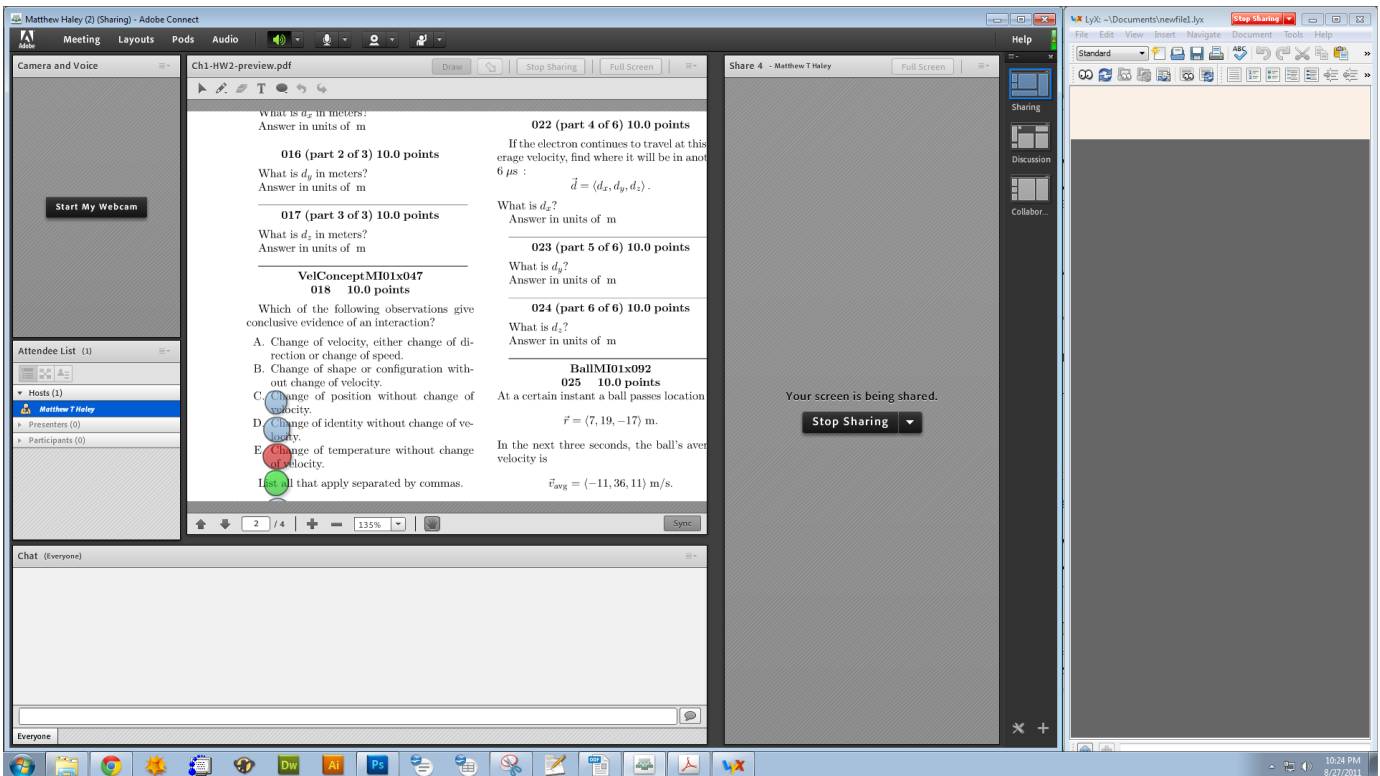
<http://www.lyx.org/>

For some reason this installation can take a while (~20 mins), so install it way ahead of time before your first office hours. You may have to separately install MiKTeX if the Lyx installation is not working. Once you have Lyx installed, run the program and you should be able to share it from Adobe Connect. To do so, run Lyx and open an empty document. Then, using an empty share pod in Connect, select "Share My

Screen” from the drop-down menu. **Make sure you select “Windows” as the screen sharing option—** the other choices will not be useful for this task.

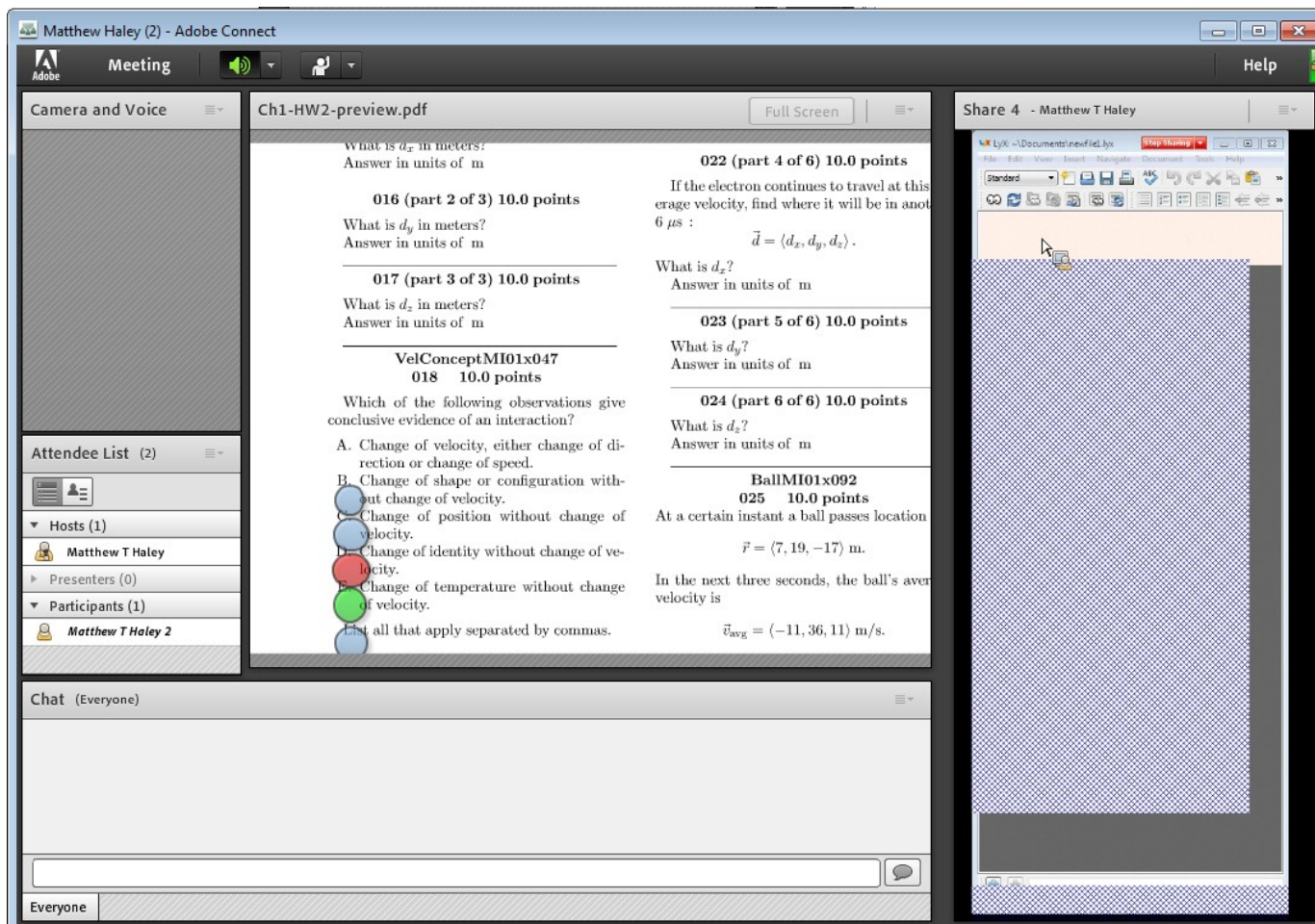


Now arrange your desktop like so:



The two windows visible are Adobe Connect and LyX. The share pod on the right hand side of Connect will appear to the students as your LyX window. **Students can only see a shared application if you can**

see it. This is why you should arrange your windows so that Lyx is always visible to you, as the picture above allows for. If part of the Lyx window is occluded by another window overlapping it, the students will see a crosshatched region where something lies on top of the Lyx window:



## 10) The Most Important Lyx Functions

Here are a few handy tips for using Lyx. Firstly, Ctrl-Shift-M will open an equation window for you, which is really the only thing you will need out of Lyx for the purposes of online office hours. Occasionally I will write a line of text above an equation, such as “Case 1”, or “Energy Conservation”, etc. I will list the most important commands here. Note that these commands apply only in equation mode.

Ctrl-Shift-m, opens equation box for equation mode

Alt-m, ( or < or [, etc, creates delimiters

\frac, begins a fraction. Use space to begin, tab to go to denominator, then space to end

\vec, for vector decoration

\hat, for hat decoration

\_ , for subscript

^ , for superscript

\delta, and etc. for lowercase greek letters

\Delta, and etc. for uppercase greek letters

\int, for integral sign, then \_ and ^ for limits of the integral

\rightarrow, a right pointing arrow

`\leftarrow`

`\implies`, an implication arrow

All of these are standard Latex commands, so any Latex reference guide you find on the internet should have more information in the same vein if you need it. This list should be almost everything you need to know, though.

11) You will become very adept at online office hours after a few tries—it just takes a little practice!