The hybrid classroom attempts to bridge the gap between the classroom and your students who are joining the class remotely.

This means:

- you and your students in class need a way to hear and see your students who are not in class, and
- your students who are not in class need a way to hear and see you and your students who are in class.

**Prioritise audio**

The priority is *audio*. Unless there is a visual demonstration, you should always think about audio first, then video.
We will make use of **Zoom** to facilitate the hybrid classroom.

Zoom is web conferencing software that has become ubiquitous in NUS. You will use a Zoom meeting to connect yourself and your students to each other, wherever they are.

### Equipment

<table>
<thead>
<tr>
<th>Staff</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internet connection</td>
<td>Internet connection</td>
</tr>
<tr>
<td>Laptop with webcam</td>
<td>Laptop with webcam</td>
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<tr>
<td>Lapel mic with a long wire</td>
<td>Earphones</td>
</tr>
<tr>
<td>Zoom</td>
<td>Zoom</td>
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<tr>
<td>Poll Everywhere (optional)</td>
<td>Poll Everywhere (optional)</td>
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</tbody>
</table>

### Procedure

<table>
<thead>
<tr>
<th>Teacher in class</th>
<th>Student online</th>
<th>Student in class</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>(2) via Zoom</td>
<td>Face-to-face</td>
</tr>
<tr>
<td>Teacher in class</td>
<td>(1) via Zoom</td>
<td>(3) via Zoom</td>
</tr>
<tr>
<td>Students online</td>
<td>(4) via Zoom</td>
<td></td>
</tr>
<tr>
<td>Students in class</td>
<td>Face-to-face</td>
<td>(2) via Zoom</td>
</tr>
</tbody>
</table>

- _Teacher in class_ communicates with
- _Students online_ (1) via Zoom (2) via Zoom (3) via Zoom (4) via Zoom
- _Students in class_ Face-to-face (2) via Zoom

**If the teacher has to teach from home, the entire class should attend the class online.**

(1) **Teacher in class** communicates with students online

1. Set up a **recurring Zoom meeting** for your class. Launch the meeting during the class.
2. **Allow your students to:**
   a. **Unmute themselves.** This is so that you do not need to go to the computer every time someone wants to speak.

   **If you want to control muting/unmuting, delegate it to a TA.**

   b. **Use a virtual background**, for privacy, in your Zoom account settings under In Meeting (Advanced).
   c. **Rename themselves**, so that they can append their name with “Online”. See Breakouts.
   d. **Text chat with others.** Refer to In-meeting security options.

**Audio:**

1. **Use a clip-on microphone**, attached to the computer running Zoom.
   a. You may use a Bluetooth earpiece that enables you to be heard in Zoom as well as hear your online students.
2. **Make sure students online can hear you**; when speaking to the class, **leave yourself unmuted**.
3. **Allow meeting participants to unmute themselves**.

**Video:**

- There are various set ups, depending on the availability of equipment.
1. If you have only one webcam, position the webcam so that it has a general view of you and the class. If the webcam is fixed to your laptop, you will have to position the entire laptop. If you have slides (or other apps) to share, share the screen from this computer.

2. If you have access to a visualiser and intend to use it, you can log in to Zoom on the computer attached to the visualiser and share the visualiser as the webcam. Spotlight the video so that it is highlighted on students screen. Mute the audio on this computer.

Coordination:

1. Assign a TA (preferable) or student to monitor for questions from students online (via audio or text). This person can:
   a. prompt you if there is an online query,
   b. answer questions about the lesson or about simple technical issues,
   c. help with (re)assigning students to breakout groups,
   d. mute all if there is audio feedback, and
1. manage Poll Everywhere Q&A, if you intend to use Poll Everywhere.
2. Record the meeting (further details) and make it available on LumiNUS, in case there are students who cannot join live.

(2) **Student online** communicates with teacher and students in class

1. Join the online meeting during your class.
2. Rename yourself, appending your name with (Online) so that everyone knows that you are joining the class remotely and can assist you if needed. This information is also useful for grouping students for breakouts.

**Audio:**

1. Mute yourself when not speaking.
2. Make sure you are connected to audio so that you can participate in the class.
3. If you want to speak, raise your hand virtually in Zoom and wait to be called upon.
   a. Unmute yourself when you are asked to speak.
   b. Remember to mute yourself once you are done speaking.
   c. Do note, depending on the situation in the classroom, your voice might not be heard by the teacher. If so, ask a classmate to relay the question or use text chat to type your question/contribution instead.

**Video:**

1. Start the webcam in Zoom. If there are bandwidth issues in the physical location, stop the webcam.

(3) **Student online** communicates with students online

1. If needed, you can text chat with other students online.
2. If you are placed into breakout rooms, you can unmute your microphone and speak freely.

(4) **Student in class** communicates with students online

Join the online meeting during your class.

**Audio:**

**IMPORTANT**

Mute your microphone when you are not speaking. Otherwise, there may be feedback.

1. **Earphones work best** so that you can listen to the conversation in class as well as classmates online.
   a. Keep an earphone in one ear to hear your online classmates, the other free to listen to the in-class discussion.
2. If you do not have earphones, **do not use speakers**. This will be distracting to others in class and may contribute to feedback.
3. **Mute your microphone** when you are not speaking.
4. Help your online classmates to **relay questions and comments**, if necessary.

**Video:**

1. Start the webcam in Zoom. If there are bandwidth issues in the physical location, stop the webcam.

**Modifications and special situations**

**Poll Everywhere**

Poll Everywhere allows your students to **ask text questions in class**. You can use Zoom's text chat for this, but Poll Everywhere is more powerful. It allows all your students to ask questions in a neutral manner - those who are not in class are not disadvantaged - and students can **upvote questions**. If you have someone to support you in class, s/he can moderate the questions. (You can do this yourself, but you will need another computer.)

**Breakouts (small group discussions)**

To use Breakout Rooms, you must enable Breakout Rooms in your Zoom account settings under In Meeting (Advanced).

Teachers might require students to go into small groups for discussion. We recommend that the students in the classroom form groups in class, and the students online go into breakout rooms in Zoom.
Typically, Zoom randomises the breakout room allocation. As the online attendance may vary from week to week, it does not make sense to pre-allocate groups either. Instead, you (or your TA) can manually rearrange the groups so that the online students are grouped together.

Students in class can ignore the online breakout rooms.

### DIY Visualiser

If you need a visualiser but your room is not equipped with one, you can use your phone as a visualiser. This works best if you have a phone mount.

- For iPhones and iPads, Zoom accepts either as a screen sharing source.
- For Android phones and tablets, make sure you have the Zoom app on your device and log in to the current meeting from the device. You will appear twice in the Participants list, one login on the desktop/laptop, one login on your phone. You can then share your Android device's screen to the meeting.

In both cases, once you have started screen sharing, switch to the Camera app on your phone, mount it on the phone mount and point it towards paper that you can write on. Now you have a DIY visualiser.

### Potential pitfalls

#### Online students feel left out

It is easy to leave out online students in a hybrid classroom.

Tips:

1. **Teaching staff**
   - Remember to check in with the online students. Encourage them to ask questions in Zoom text chat or raise hands to their webcam or in Zoom.
   - Remind those in class to mute their microphones when not speaking.
   - If you are able, provide a neutral platform for students to ask questions. We recommend Poll Everywhere.

2. **Students in class**
   - Help your classmates to highlight questions or virtual hand raises to your teacher.
   - You can also relay text chat questions to your teacher.

#### Limited bandwidth

Campus wi-fi is relatively robust. However, it is not designed for multiple people joining web conferences within a confined space. Additionally, in this mode, web conferences will be taking place concurrently across campus.

If there are bandwidth issues, everyone should disable the webcam on their computer, *including the teacher*. This will significantly reduce the amount of bandwidth required. The only visual should be the shared screen from the teacher’s computer.

#### Audio feedback

With multiple microphones and speakers in a confined space, the chances for disruptive audio feedback is high.

Everyone in the meeting (even those joining from outside the classroom) should be disciplined with their use of audio. When not speaking, microphones should be muted.