Guidelines for Adapting Lab Curricula

Guiding questions	Important considerations
1. Core ideas and skills requirements What are the (3-5 total) core ideas or goals that ground the lab curriculum? What related accreditation and/or departmental skills standards that must be met?	• Consider what has to stay/what can go; consider if department or course policy can be re-written to accommodate the adapted lab experience. • Draft a short vision or goal statement for the lab. • Establish real-life connections with revised goals (e.g., simulated computer models are common in industry, so students gain experience in this type of production/interaction). • Respond to overarching curricular requirements (e.g., science communication skills are critical to progressing into [x] course in the major).
2. Learning outcomes What are the learning outcomes (5-10 total) aligned with these core ideas and revised for a remote/hybrid lab environment? Are they clear and straightforward to students?	• Align the learning outcomes for the alternate environment. • Be specific with the achievable outcomes and skills/tasks that are included in (or unique to) the modified version of the lab experience. • Decide skill-based standards for meeting these outcomes. • Start to consider what type(s) of online adaptation might best support these outcomes (e.g., providing datasets & model kits).
3. Assessment, activities, and feedback How will the students demonstrate that they are making progress toward these outcomes? Are these assessments designed to give students timely feedback that help them meet the outlined skills standards? Are these designed to operate in the adapted learning environment?	• Define what the activities and assessments ask students to *do* (e.g., check their knowledge, generate a hypothesis, draw something, analyze data, describe previous research, watch a visualization). • Consider the necessary assignments (and which ones aren't necessary); ensure that you are providing regular intervals for feedback. • If using lab kits, take into consideration safety of students carrying out the experiment in their home space. • Adapt the submission formats (e.g., media files, doc or pdf, excel) to fit an online environment (and pre-plan a narrow selection of these pre-tested submission formats). • Time the duration of the activities and ensure it's an appropriate amount of work!
4. Lab learning environment Where is the hub for the lab experience and related activities? Are all resources and materials needed for the students to complete the lab and meet outcomes housed here? Is there a clear cadence and/or sequence through the activities established via the learning environment?	• Establish one central place for all materials and submission drop boxes for the lab (shared among all sections, if feasible). • Create a visual of the sequence or progression through the lab that students will experience in any given week (or other block of time). • Define how various instructors/TAs/etc. will interface with this environment and maintain it; create a schedule as needed.
5. Materials and technology	• Situate the lab within the lecture materials (if attached to a course) or within the discipline; provide more context,

Do materials contextualize the lab activities? Are they appropriately connected to other parts of the class/course materials? What materials can be reused and what materials need to be made anew?	points of reference, and background resources than may seem necessary. • Streamline the materials and equipment needed for each activity: don't overcomplicate or over-add materials or technologies. • Keep outside applications to one source per skill/type of activity (e.g., use Phet for all simulations). • For new materials, high production value does not mean better (your drawing of a synthesis reaction may be more effective than a complicated simulation).
6. Interactions What interactions will students have with each other (pairs, small groups) and with the instructional team? What is the rationale for these interactions?	• Integrate pair and group interactions that model the scientific process and real-life disciplinary applications. • Define the rules of the game for group work and peer interactions: how they will/should work together in the adapted environment. • Decide what absolutely should be synchronous or in-person (if possible) and why; provide a limited set of options for how to do this and maintain consistency across sections.
7. Student support Is there a regular, established mechanism for students to ask questions (to each other and to their instructor)?	• Given that TAs often do a lot of student support: Provide guidance to TAs for how to operate in this environment, what their role is in these interactions, and how to appropriately foster student group work. • Consider a drop-in help model where multiple members of the instructional team share office hours or blocks of time to invite student questions and offer help; schedule these as frequently as possible. • Reconsider what "instruction" roles look like online: some student support duties may entail creating problem set keys or a short discussion board post to address emergent student misconceptions. Not all support looks like interfacing with students.
8. Student experience, communications, and navigation How are students oriented to the lab and the online space? Are clear expectations communicated upfront? Are these accessible to students?	• Develop a short orientation module (Module 0) specifically for the lab component/course. • Ensure that the first 1-2 experiments/submission processes model the rest of the semester to establish a routine. • Create an opportunity for students to test technology requirements (dummy submission). • Set routine, concrete, repeatable deadlines. • Keep as many activities asynchronous as possible to ensure greater access and flexibility. • Maintain academic integrity via sound activity/assessment design and inquiry-based approaches (where applicable), rather than strict time windows for completion (responds to accessibility and also technology load/bandwidth realities).

Categories adapted from Quality Matters Standards for Higher Education Rubric
https://www.qualitymatters.org/sites/default/files/PDFs/StandardsfromtheQMHigherEducationRubric.pdf