Welcome to The Carpentries Etherpad!

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Welcome to The Carpentries Instructor Training!

Sign in: Name (Pronouns), Institution, Email & Twitter (optional)

Please sign in so we can record your attendance.

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- Ken Lui (He/Him), UofT, kenlh.lui@mail.utoronto.ca
- Kinnothan Nelson (gmoney@umich.edu)
- Chris Young (He/Him), University of Toronto Mississauga, christopher.young@utoronto.ca
- Lilly E Linden (She/Her) Dartmouth, lilly@Dartmouth.edu
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- Dara Farrell (she//her), University of Washington (Seattle), daraf@uw.edu
- Sofia Fertuzinhos (She/Her), Yale University, sofia.fertuzinhos@yale.edu
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-

If you have a moment before we begin and have not yet done so, please fill out the pre-training survey at https://carpentries.typeform.com/to/QVOarK#slug=2023-06-01-ttt-online-EDT

You can also update your zoom name to your preferred name ifi it is not already and share your pronouns there if you like.

You can keep track of the time in your current timezone at https://timeanddate.com/worldclock.

Break times (approximate):

- 15 min at 10:30am (EST)
- 1 hr at 12:35pm (EST)
- 15 at 3:15pm (EST)

Code of Conduct:

To make clear what is expected, everyone participating in The Carpentries activities is required to abide by our Code of Conduct.
https://docs.carpentries.org/topic_folders/policies/code-of-conduct.html
Any form of behaviour to exclude, intimidate, or cause discomfort is a violation of the Code of Conduct. In order to foster a positive and professional learning environment we encourage you to:

- Use welcoming and inclusive language
- Be respectful of different viewpoints and experiences
- Gracefully accept constructive criticism
- Focus on what is best for the community
- Show courtesy and respect towards other community members

If you believe someone is violating the Code of Conduct, we ask that you report it to The Carpentries Code of Conduct Committee by completing this form: https://goo.gl/forms/KoUfO53Za3apOuOK2

REVIEWING THE CARPENTRIES EXPERIENCE AND GOALS

For the multiple choice questions below, please place an "X" next to the response(s) that best apply to you. Then find yourself a spot in the Etherpad below to write a short response to the last question.

Have you ever participated in a Software Carpentry, Data Carpentry, or Library Carpentry Workshop?

1. Yes, I have taken a workshop.x xxxxxx
2. Yes, I have been a workshop helper. xxxxx
3. Yes, I organized a workshop.
4. No, but I am familiar with what is taught at a workshop.xxxxxx
5. No, and I am not familiar with what is taught at a workshop.XXxx

Which of these most accurately describes your teaching experience?

1. I have been a graduate or undergraduate teaching assistant for a university/college course. xxxxxxxxxxx
2. I have not had any teaching experience in the past.
3. I have taught a seminar, workshop, or other short or informal course. xxxxxxxxxxxxxxxxxxxx
4. I have been the primary or responsible teacher for a university/college course. xxXxxx
5. I have taught at the primary or secondary education level.xxx
6. I have taught informally through outreach programs, hackathons, libraries, laboratory demonstrations, and similar activities.xxxxxxxxxx

Why are you taking this course? What goals do you have for this training?
This exercise should take about 5 minutes for responses, with an optional 10 for additional discussion as time permits.
I want to improve my teaching skills for the type of public I have that is very diverse in their background in and motives to be learning R packages for omics data analysis.
I want to improve my teaching practice, especially digital pedagogy and incorporating active learning into synchronous online instruction. My goal is to be able to bring new ideas back to my colleagues that we can incorporate into our instruction program as we develop more online learning programming.
I want to learn about the carpentries teaching methodology and pedagogy. I'll be interested to apply it in carpentries workshops and in my own lessons. My goal is to learn something new.
I am excited for the opportunity to learn how to more effectively teach programming skills and integrate this into my current teaching positions. Additionally, I am looking forward to becoming a carpentries instructor at my institution.
I want to learn more about how to teach effectively, taking pedagogy
and cognitive sciences into account.
Learning more skills in R programming, become a carpentries instructor at my institution
Part of my professional goals include training PIs and colleagues various technical topics. I hope to gain a solid formal understanding of how to do so effectively and how to do so in an engaging manner.
I want to continue to improve my pedagogy and think about how to teach others how to teach effectively. As an instructor you can only reach a small number of students, so your ability to have an impact is amplified if your students can also teach effectively.
I want to take my teaching skills to the next level and understand how I can better help people learn the material I am teaching them. I would like to network with others in the Carpentries, as well.
I would like to learn how to teach more effectively. I teach short courses (2 hours) to biomedical researchers. Training is part of my responsibilities at work, but it is a small percentage of my time. Also, we do not have dedicated resources to ensure that the way or methods that we are training researchers is the most effective. Visit https://lifescitrainers.org/ for short-format teaching in the life sciences. Run by

Carpentry instructor Jason Williams from Cold Spring Harbor Lab.
I want to be able to help the faculty and students I serve access training for technologies that will help streamline their research. I am hoping to learn more about live coding and good ways to teach and learn over Zoom.

I want to improve the effectiveness of my communication. I’m particularly looking for ways of delivering that improves information capture and retention (which I suspect comes from structure, but let’s find out….). I think I could handle audience engagement but unclear how good I am at providing value or making that value easy to obtain/digest

Learn instructional teaching methods and practices
I want to enhance my instructional skills as an aspiring librarian, which this role invovle many teaching elements. I believe that teaching technogies is suitable for me

Would like to get better at teaching, especially wrt live coding.
To gain experience and apply technical pedagogy to my courses and workshops for my students and local community.
I am primarily a coder but I'm very interested in improving my teaching skills, especially in scenarios where I have an audience with a diverse background or where the students are not programmers first
Learning technical skills is a steep curve for some of my colleagues that I've mentored and I want to know how to make this process easier.
I know that there is difference in how one teaches regular STEM content versus coding. I would to learn about the nuances involved.
I want to learn how I can apply active instructional practices to my own instruction.

Building Skill With Practice

https://carpentries.github.io/instructor-training/02-practice-learning
Questions:

- How do people learn?
- Who is a typical Carpentries learner?
- How can we help novices become competent practitioners?

Objectives:

- Compare and contrast the three stages of skill acquisition.
- Identify a mental model and an analogy that can help to explain it.
- Apply a concept map to explore a simple mental model.
- Understand the limitations of knowledge in the absence of a functional mental model.

The Carpentries Pedagogical Model

Acquisition of Skill

https://carpentries.github.io/instructor-training/fig/skill-level.svg *Image: Three people, labeled from left* *to right as "Novice", "Competent Practitioner", and "Expert". Underneath, an arrow labelled "Experience level" points from left to right. The "Novice" is quoted, "I am not sure what questions to ask." The Competent Practitioner is quoted, "I am pretty confident, but I still look stuff up a lot!" The Expert is quoted "I have been doing this on a daily basis for years!"*

- Novice
- Competent practitioner
- Expert

Mental Models

"All models are wrong, but some are useful."

The power (and limitations) of analogies

-- -- *Exercise: Analogy Brainstorm* -- --

1. Think of an analogy to explore. Perhaps you have a favorite that relates to your area of professional interest, or a hobby. If you prefer to work with an example, consider this common analogy from education: “teaching is like gardening.”
2. Share your analogy with a partner or group. (If you have not yet done so, be sure to take a moment to introduce yourself, first!) What does your analogy convey about the topic? How is it useful? In what ways is it wrong?

This activity should take about 10 minutes.

-- -- *Exercise: Mapping a Mental Model* -- --
1) On a piece of paper, draw a simplified concept map of the same concept you discussed in the last activity, but this time without the analogy. What are 3-4 core concepts involved? How are those concepts related? (Note: if you would like to try out an online tool for this exercise, visit https://excalidraw.com .)
2) In the Etherpad, write some notes on this process. Was it difficult? Do you think it would be a useful exercise prior to teaching about your topic? What challenges might a novice face in creating a concept map of this kind?
This exercise should take about 5 minutes.

This was difficult beause the analogy was so broad and theoretical. It is an excellent exercise in forcing me to simplify and generalize in ways that are actually helpful. A novice will likely get stuck in the details of a complex idea. +1+1+1+1
As a library instructor, I teach students to make concept maps for their research topics all the time! It was really interesting to flip it so that I'm the one making the map about my teaching. I think it would be really helpful to incorporate into my practice.
This process is similar to designing software, where you define abstract components by what goes in and what comes out, what they need and what they produce. That way multiple people can work on a project without needing deep knowledge of every single part. I find this useful in approaching a complex concept in stages.

I thought it was cool to think about problems as being not entirely linear. Concepts can have complex relationships with each other, and communicating those relationships can be difficult.
It was difficult for me to take my analogy - that seemed straightforward - and diagram it out. It was more complex than I thought at first! I think this exercise would be more helpful for me when directly applied to a subject I'm teaching (where I have implicit assumptions that everyone knows what I know).

Misconceptions

Our child might assume that ball weight and ball size can both be described by the mental model developed by playing with balls of different sizes.
Image: A concept map similar to the previous one except with "Heavy Ball" and "Light Ball" in the middle, and a red "X" over the arrows labeled "Pushes out MORE" and "Pushes out LESS"
https://carpentries.github.io/instructor-training/fig/ballwater3a.svg

It may take a while to adjust, but eventually new understanding will coalesce:
Image: A new concept map. "Ball" remains at left, and "Water", at right. "Size" and "Weight" are stacked vertically between them. Arrows from "Ball" share the label "Can have more or less." One arrow from "size to "water" is labeled "Affects pushing of"
https://carpentries.github.io/instructor-training/fig/ballwater4a.svg

The process of forcing abstract knowledge into a visual format can often reveal connections you may not have been aware of, or illuminate gaps. This can be especially useful when preparing to convey aspects of your mental model to someone else!

Misconceptions:

- Factual errors
- Broken models
- Fundamental beliefs

-- -- *Exercise: Anticipating Misconceptions* -- --
Describe a misconception you have encountered as a teacher or as a learner.
This exercise should take about 5 minutes.

- Lilly Linden - 1. All frogs need water to reproduce 2. Review articles don't go through the process of peer review
- Minyoung Wyman, I didn't realize that directed or targeted practice at a task or skill was the best way to improve.
- Ken Lui - Everytime people learnt I am doing a library science degree, they intial thought was that the only work for library workers is to shelve books, nothing elese. In fact, our profession does much more than that. People usually overlook the backend operations and other services provided by the libraries.
- Kinnothan Nelson - Learning that electricity does not actually "flow" through wires. In the learning context that there is no research based evidence for "learning styles."
- Chris Young - Fair dealing/fair use principles mean students and faculty can copy any image and text for use in the classroom/assignments/publications/presentations
- Simon Stone
    - Learning how to code takes way more time and is way harder than just using Excel for my

data

- Jentry Campbell - As a librarian I often encounter students that think that 1) everything on Google is everything on the internet and 2) any article that they can access is "free" because they found it through Google, even though the library has provided access by removing the paywall
- Jackson Hoch - When it comes to teaching evidence based searching, misconceptions that often come up especially as students become more experienced through practice is the notion of students not needing further practice on performing comprehensive searches. Especially for graduate students or even faculty who have published, it can be challenging at times to have searches examined in detail or reworked especially for review research.
- Ford Fishman
    - When I teach the library Pandas in Python, I find that students often have trouble understanding when functions or methods they run will make a new data frame or overwrite the old one. For instance, they would run a `.replace()` method, but without assigning the output to a variable or using `inplace=True`, there is no functional output to this command. They then go on assuming that their code has done what they assume it did, without checking the output to make confirm it worked.
- Bryan Scott - introductory physics is full of misconceptions, things that seem like they should be true or feel true but aren't. An example that comes up often is centripetal acceleration/force. Part of what makes this challenging to address satisfyingly is that a full explanation requires discussing non-inertial reference frames, which means students need to know and understand what an inertial reference frame is, which is only barely touched upon in a mechanics I class, usually in a mathematically complicated way (Galilean transformations) with unclear connections to other material.
- Simeon Wong - making what might seem like a minor change to an analysis (eg. different stats method or outcome measure) or plotting data in a different way might not be a minor change in the code due to limitations of the packages used or the stage in the processing pipeline where the data is computed or integrated into the analysis
- Will Cowen : Frequently I have encountered the misconception that learning new programming languages is especially difficult if you've spent your career in one specific realm, and that learners then dig in their heels because it's certainly "not worth the effort." But this projected difficulty blinds the learner from the general programming skills they already possess and making the connections to the new syntax. It's a knee-jerk reaction to difficulty at the very beginning that colors all of the instruction afterward. | I often struggle under the misconception that motivation can be encouraged in others to a significant degree, ignoring completely how difficult it is for me to do things I am not *already* motivated to do/learn.
- Kristina Bush - students think that things they find in a library database are not biased and they don't need to evaluate the information. Another one was that students think the more authors on a paper, the more biased it is.
- Alexander Smith - that the BBC (or anyone) is unbiased. Everything is informed by some central set of experiences even in orgs that claim otherwise. Really hard to see past that until you see it being claimed incorrectly and to your detriment. Funamental beliefs colliding.
- Taylor Woods - a misconsception I experienced as both a learner and teacher was that all students in a college classroom understand how to use microsoft excel; during undergrad I didn't have the prior skill level to complete labs using excel & as a graduate TA I experienced teaching labs where not all students had basic excel skills
- Kathleen Chappell - a misconception that I often see when teaching biomedical researchers how to use a computational cluster is that the training team is teaching them irrelevant skills before they get the knowledge to run their analyses. We try to make it clear that the basics (where to store files, how to request resources) are building blocks to running their analyses. The folks who take

time to learn the basics often have an easier time than those who want to "fast forward" through these topics. In my own case, I had biases/misconceptions when learning how to use HPC because of bad practices I was taught in my graduate classes.

- Allie Tatarian - when I was a grad student TA, while teaching a biochemistry discussion about protein folding, I had a student who was very adamant that only whether amino acids are polar or not affect protein folding - I was teaching about a study showing that the charge on the amino acids is also very important and she refused to believe it was true
- Nicole Brewer - The last time I worked with someone on their homework, they thought that by accessing a column of their dataframe, they were changing the dataframe. But because they didn't assign it to a variable, it didn't stick
- Emily Yaklich - In teaching an Introduction to Python course, I found that students often believe that they have to choose one programming language and become an expert in that and they have to commit to that language and not learn others. i.e. instead of learning a bit of Python, R, etc. for whatever is best suited to their data they have to choose one
- Ben King - People wanting to code programs in R, when other programming languages would be more suited. And that I have all the answers, and am perfect programmer (i'm not).
- Sofia Fertuzinhos - I definitely had to overcome the misconception that only computational people or bioinformaticians, could perform data analysis. This is an experience that I try to relay to my students in order to make them feel that it is something they can also achieve, even though they dont see themselves as computational people or bioinformatician
- Dara Farrell - I have had to overcome the misconception that some students have had that they are fundamentally "broken" or won't be able to learn what is being taught

Using Formative Assessment to Identify Misconceptions
How can you prevent hidden misconceptions from interfering with learning? Seek them out with assessment!

Formative vs Summative assessment

-- -- *Exercise: Formative Assessments* -- --
Any instructional tool that generates feedback that is used in a formative way can be described as “formative assessment.” Based on your previous educational experience (or even this training so far!) what types of formative assessments do you know about?
Go around and have each person in the group name one.

- Minyoung Wyman
- Ken Lui
- Kinnothan Nelson
- Chris Young
- Simon Stone
- Jentry Campbell
- Jackson Hoch
- Ford Fishman
- Bryan Scott
- Simeon Wong
- Will Cowen
- Kristina Bush
- Alexander Smith
- Taylor Woods

- Kathleen Chappell
- Allie Tatarian
- Nicole Brewer
- Emily Yaklic
- Ben King
- Sofia Fertuzinhos
- Lilly Linden
- Dara Farrell

-- -- *Exercise: Identify the Misconceptions* -- --
Choose one of the wrong answers to the question below and write in the Etherpad what the misconception is associated with that wrong answer.
Q: what is 27 + 15 ?
a) 42
b) 32
c) 312
d) 33

- Minyoung Wyman
- Ken Lui
- Kinnothan Nelson
- Chris Young
- Simon Stone
- Jentry Campbell
- Jackson Hoch
- Ford Fishman
- Bryan Scott
- Simeon Wong
- Will Cowen
- Kristina Bush
- Alexander Smith
- Taylor Woods
- Kathleen Chappell
- Allie Tatarian
- Nicole Brewer
- Emily Yaklic
- Ben King
- Sofia Fertuzinhos
- Lilly Linden
- Dara Farrell

Examining Your Expertise

You may not think of yourself as an "expert" but many advantages -- and pitfalls -- may apply to you.

What Makes an Expert?

-- -- Exercise: What Is An Expert? -- --

What is something that you are an expert in? How does your experience when you are acting as an expert differ from when you are not an expert?

-
- Minyoung Wyman, I try to make precise statements when talking as an evolutionary biologist vs. when I am talking about something I am not an expert in. The more I know, I tend to talk less and listen more (because I'm trying to get inside the speaker's head).
- Ken Lui
- Kinnothan Nelson - In areas for which I consider myself an expert, I usually think that I have a good understanding of the end to end process or the domain ecosystem. In areas where I am a novice I don't have this understanding and need more guidance and direction regarding basic tenents.
- Chris Young - I would say I have deep knowledge in the field of game studies, specifically preservation and curation. When I come across areas where my knowledge is lacking I tend to direct towards folks with that knowledge. Those questions usually guide me towards expanding my knowledge in those areas for future interactions.
- Simon Stone
    - I am an expert in data science. When I act as an expert in a teaching role, I try to think of questions the learners have. When I am not an expert myself, I am thinking of my own questions.
- Jentry Campbell - Honestly not sure if I would ever call myself an expert in anything (the more you know, the more you know you don't know). My students would probably say that I am an expert librarian. When acting as the authority in a teaching session I am in charge of the answers but when I am not an expert in the session I am in charge of listening.
- Jackson Hoch - I am an expert in evidence synthesis reserach or review research methods. I am always working on mutliple projects (co-authorships) in my role/consulting groups working on reserach. While consulting, I do think it's important to have confidence in one's own skills as people working with us want to learn from us and expect us to have good judgement/skill. I also though am honest about questions or things I may not know especially when it comes to subject specific questions.
- Ford Fishman
    - I am an expert at data analysis in R and Python. When I am acting as an expert, what I do comes from a place of confidence that I will come up with solutions. When I am not an expert, I tend to be a lot more hesitant in suggesting solutions.
- Bryan Scott One thing that is commonly talked about in physics is that expert physicists almost always start by drawing the picture rather than trying to start by applying a 'formula'. I've interpreted this as basically saying that when you are an expert, you start by organizing the relevant concepts, with the picture serving that role. Non-experts often practice the formula or repeat examples they've seen.
- Simeon Wong : data analysis and visualizations in MATLAB. I've found that I generally assume a strategy I've used successfully previously is the better strategy to use (because it's faster since I don't need to look it up). In a non-expert role, I'm more likely to lookup the newest or best method.
- Will Cowen : Expert in Creating Web Appliations in Ruby on Rails. One of the most important problems of translating experience here is that I understand all the parts of the framework, and the conventions that are present, so I can use those conventions as a matter of course - what I can do is assume the basics and what I produce may appear frustratingly like magic to a beginner, and there are huge gaps that are difficult for me to keep in mind without slowing down so far I fear I am being patronizing in my explanations. Yet when acting as a novice, I appreciate being shown why or how each thing works as it does.

- Kristina Bush - I'm an expert in Google forms and I ask less questions and know where to go to look for help. I may get excited and talk fast when I'm talkin about it, I also am able to think about creative uses. When I'm not an expert, I'm willing to ask questions in order to find out where to look for help.
- Alexander Smith - I'm an expert at sowing seeds (imo) and quite often find others struggling with germination rates and it's easy to forget how easy it is to mess up (usually water content/density, sometimes planting depth)
- Taylor Woods - I'm an expert in baking; when I'm acting as an expert it's much more creative & trying new things vs. when I'm not an expert and I'm trying to follow rules/instructions
- Kathleen Chappell- I am an expert in the SLURM job scheduler. I don't need to consult man pages to request jobs/resources, to see another cluster user's recent usage, etc. When I am not an expert in something computational (e.g. another job scheduler or some unix commands I don't need to use all the time), I do need to consult the documentation. When I'm teaching introductory courses about the job scheduler on the cluster, I try to step out of my shoes and explain why we're using certain commands and parameters.
- Allie Tatarian - I am an expert in biomedical database searching, especially for pre-clinical research. As an expert I don't really have to think about or look up what I'm doing, whereas as a non-expert I often take longer because I have to look things up or get help in places.
- Nicole Brewer - I am an expert in creating web applications with Jupyter Notebooks. As an expert, I may be more likely to skip over more foundational information
- Emily Yaklich - I am an expert in Python. I am a lot more confident when working and talking to others about Python, but less confident if I am working in a topic that I am not an expert in.
- Ben King - I am an expert in data analysis, when I am an expert I can talk more, and when I am not I listen more.
- Sofia Fertuzinhos - I am very good at specking 4 languages (human not computatational) so it is har for me sometimes to understand that others may no be able to make the translation between languages when I see it vey easy.
- Lilly Linden - I used to be an expert at anuran biology in south India. I always have my learning cap on.
- Dara Farrell-I am an expert in machine learning. I try to use analogies to convey concepts. When I am not an expert my analogies might be incorrect

Experts have more connections among pieces of knowledge.

Image: Three collections of six circles. The first collection is labelled "Novice" and has only two arrows connecting some of the circles. The second collection, labelled "Competent Practitioner" has six connecting arrows. The third collection, labelled "Expert", is densly connected, with eight connecting arrows. https://data-lessons.github.io/instructor-training/fig/mental_models.svg

Expertise and Teaching

Mind The Gap

-- -- *Exercise: Awareness Gaps* -- --

- Is there anything you are learning how to do right now? Can you identify something that you still need to think about, but your teacher can do without thinking about it?

- Think about the area of expertise you identified for yourself earlier. What could a potential awareness gap be?

- Minyoung Wyman, My co-worker can write code with PyTorch without looking up the code online first. One awareness gap I have is understanding how to use genomics data in all the ways possible; I have used only a couple of ways.
- Ken Lui - I am currently learning some of the digital preservation policy development. A potential awareness gap is the important exsiting framework/terminology
- Kinnothan Nelson - I am learning API testing using a specific API gateway service and working through authentication issues. A potential awareness gap I may have in areas where I have expertise is not being cognizant of the basics that novices may have not learned yet.
- Chris Young - I am constantly learning to apply examples of game design principles in my course for students to use in their game creation assignment. An area outside my main knowledge set, but critical for the course. Also a challenge to take these numerous and complex design principles and distill them down in accessible language for the students to use.
- Simon Stone
  - I am currently learning two new programming languages (Julia, Go). I need to think a lot about how to use these languages in an idiomatic way, while the instructional materials I am working with don't.
  - In a workshop on Text Analysis using Python, a learner asked what a variable is. It made me realize that I walked into it assuming certain foundational skills, even though there was no formal requirement for them. I was not aware that people would be drawn to the session that do not already have a background in at least basic programming.
- Jentry Campbell
  - I am learning how to process survey results efficiently using Python. My teacher may not always state the modifers needed because they are repeated consistently in the code, but I don't know that yet.
  - How complex the "simple" components are in understanding information.
- Jackson Hoch
  - Something I'm learning right now is statistics for meta-analysis studies and using R (which is another reason I took this). Often I find when talking to our statisticans that they are able to "jump" between gaps much faster and at times have a difficult time simplifying language or examples used for explanation.
  - Something I'm an expert in is evidence snythesis research, but I'm also still learning. Gaps in our education I've noticed are that when sometimes I bring up suggestions, more expereinced teachers find them too simple, but often I have to explain they are things I've actually heard directly from students.
- Ford Fishman
  - I am learning about forecasting models right now. I still need to think about how to approach what types of models would be appropriate for a given time series.
  - A big awareness gap that I've found for myself is with troubleshooting code. It is something that is relatively straightforward to me, but the process of breaking down an error message is fairly foreign to novices.
- Bryan Scott I am currently learning about inference based in information theory. This approach is very different from what I'm used to, and involves thinking about constraints/optimization that I'm less familiar with. One awareness gap goes back to 'drawing the picture' - I often just draw forces without thinking about the fact that knowing what forces act on is itself a major conceptual

challenge!

- Simeon Wong :
  - teacher superpowers: identifying significance of brain regions in scientific figures. My neurosurgeon colleagues will look at a map of power on the brain and say "this is great! the regions involved are part of [ ] network and are connected through [ ] and it makes total sense!".
  - awareness gap: when showing others how to use bash, I often use keyboard shortcuts / fzf without thinking and it can be confusing to follow
- Will Cowen : learning about weather, forecasting, analysis, etc (without the degree background) - I am continuously having to look up what the different elements of charts mean, it seems like there are data points that are simply impossible to remember, which is likely because I haven't integrated the data itself well into my understanding of the larger systems. I know that an expert reads these charts and infers conclusions at a glance without having to deeply analyse the meaning of each symbol in detail. As an expert teaching, this relates well to conventions in a software framework, things I take for granted and can simply depend on without thinking about why.
- Kristina Bush - mountain biking. I still need to think about my body movements when I'm lifting my front tire to go over obstacles or when I'm jumping. Potential awareness gap: explaining basic things that I do without thinking or best practices for design that I know so well that they seem obvious and I forget have to be explained.
- Alexander Smith - Making videos. Really bad at remembering to structure the call to actions or even include them in my content but that is (in reality) the whole objective of publishing the video. Awareness gap: probably something like how fragile the stems are or how to get good soil drainage in pots for seedlings.
- Taylor Woods - currently learning spanish; I still need to think about each individual word whereas a teacher can form sentences without thinking about it; as an expert in baking an awareness gap for novices might be the importance of mis-en-place and having everything prepared & measured before you start baking
- Kathleen Chappell - Something I am learning right now is how to do fractitional stitches and embroidery. I'm confident in cross stitching (it's just a bunch of Xs!) but these different stitches are difficult for me! For my identified area of expertise (Slurm job scheduler), I have to remember to explain when I am teaching about the cluster and the job scheduler WHY we need to use it. It's easy to remember to discuss the commands and parameters, but the underlying need for some level of "fairness" in job and resource allocation is good to discuss and the idea connects with learners.
- Allie Tatarian - I have been learning some advanced Word formatting so I can help graduate students with it, and I have a hard time even finding where certain menus are sometimes. With database searching, it's easy for me to forget that students aren't as fluent in using the UI as I am, and often don't know where different buttons and links I might mention actually are on the screen.
- Nicole Brewer - right now I'm learning philosophy. I'm still trying to improve my analytical skills, which encompasses a lot of different individual strategries. I've had to press my instructor to break down for me what he is looking for when he is asking me to be analytical. I have a theoretical understanding, but not a practical one
- Emily Yaklich - I am still understanding how to utilize and optimize mathematical modeling in order to account for all of my variables of interest, and then carrying this out in R. I still need to think deeply about how I am organizing everything and then figuring out how to conduct what I want in R.
- Ben King - understanding an R package, need to learn more about underlying stats. An awareness gap here might be the ability for me to convey the findings from this package to a lay audience, who don't understand rhe analysis.

- Sofia Fertuzinhos - me as a novice in learning R - I still need to think through when I am writing code. I rely very much in copy/paste so when I have to write it I need time. Taking my previous example of expertise, as a fluent speaker in 3 languages (and functional in 1 language) I fail to be patient to understand that people don't see the similarity/root between words across languages.
- Lilly Linden - Knitting. I can't multitask when I'm knitting while I know several mentors who can. I can be a little egoistical and get impatient with learners the area that I deem myself to be an expert in, even though I have been out of touch with the field for a couple of years.
- Dara Farrell-I'm learning about a new computer vision model, and have not done computer vision before. I am working on correctly converting the inputs from one format to one needed by the model. Knowledge gaps for an expert may be not recognizing how difficult it might be to remember unfamiliar words/terminology

Switching Language

-- -- *Exercise: What do you use interchangeably?* -- --
In the Etherpad, share an example of words or notation that you sometimes use to accomplish or refer to the same thing. If possible, try to think of an example that might occur in a Carpentries workshop.

Building awareness of how you can represent the same concept in multiple different ways will help you avoid doing so without explanation while teaching.

- Minyoung Wyman, Read = DNA = strands, code=program=script,
- Ken Lui
  - function/flag/options/arguments - bash/python programming
- Kinnothan Nelson - box/cpu/node/host, ticket/request/incident,
- Chris Young - asset/script/function/database/library
- Simon Stone
  - Method/function, argument/parameter
- Jentry Campbell
  - citation/reference, library search/catalog/"the library website"
- Jackson Hoch
  - In research, database/interface are often used to describe the same thing, even though technically they are different. Even between "experts" there's confusion on how they are different. In literature, they are often used to describe the same thing.
- Ford Fishman
  - Object vs variable vs column in R is a big one. I normally use variable to refer to what a lot of people say for object in R.
- Bryan Scott argument/parameter, conditional/joint/marginal
- Simeon Wong : terminal / bash, method / function, parameters/arguments/function call, navigate/cd/go to, (statistically) significant / of interest
- Will Cowen : method/function, attribute/key, object/model, hash/object/dictionary, array/list
- Kristina Bush: JumboSearch, library database, catalog; keyword, key concept, core concept, search term
- Alexander Smith - planting, transplanting, up-potting, potting-on (annoingly, there is a minor distinction between some of them) - I might drop this gardening example.

- Taylor Woods - in R: code/script, dataframe/dataset, subset/select
- Kathleen Chappell - (1) scheduler/slurm, (2) index/database/reference, (3) interactive job/srun, (4) batch job/sbatch, (5) core/cpu/processor
- Allie Tatarian - git and version control (sort of)
- Nicole Brewer - script, program, py file
- Emily Yaklich - slurm/batch submission, terminal/command-line
- Ben King - tea and dinner
- Sofia Fertuzinhos - script/code (I'm not aware of anything else in the workld of bioinformatics that I teach...)
- Lilly Linden - ILL, borrowing it from elsewhere, Dartdoc
- Dara Farrell- row and record in SQL

What Problem?

Experts sometimes solve problems before even stopping to recognize that they have encountered one.

-- -- *Exercise: Diagnosis* -- -- *(skipped, food for thought)*
What is an error message that you encounter frequently in your work? (These are often syntax errors.) Take a few minutes to plan out how you would explain that error message to your learners. Write the error and your explanation in the Etherpad.

“Just” and Other Dismissive Language

-- -- *Exercise: Changing Your Language* -- --
1) What other words or phrases, besides “just”, can have the same effect of dismissing the experience of finding a subject difficult or unclear?
2) Propose an alternate phrasing for one of the suggestions above.
Write your examples and alternatives in the Etherpad.

- Minyoung Wyman, "It's simply X" as opposed to "remember to use X in these cases"
- Ken Lui basic, simple, easy
- Kinnothan Nelson - Here's one way you can accomplish X, Here's how I accomplish X, there are other ways as well. Let me show you what helped me learn how to do this.
- Chris Young - know what I mean? / straightforward [focus on one task to do the activity efficiently]/ direct [take path of least resistance] / obvious [we will work on this together]/ clear / accessible /
- Simon Stone
    - Obviously, as we know, clearly, very basicˇ
- Jentry Campbell
    - easy, quick, simple, basic, obvious
    - Introductory skill/foundational skill that will become easier/faster the more you do it
- Jackson Hoch -
    - "This is basic knowledge before we get to harder examples" replace with: "this knowledge we are learning now will help us to understand future examples."
    - "Does everyone understand?" - this is difficult to judge in groups as many won't want to speak up if others are not
    - "elementary"

- Ford Fishman
  - "As you can see" -> "Take a look here"
  - "A few easy steps" -> actually show the steps
- Bryan Scott trivial, it can be seen that, clearly --> I usually say 'the result is', 'there are a few ways to get here', basically just trying to get across that it's always conceptually complicated or we wouldn't be in a classroom learning it together and try to open up space for questions.
- Simeon Wong : quick search / small script / basic plot / it is clear that
- Will Cowen: only [no adjective]; small [easy to overlook]; should be quick [some solutions can be more efficient]; clearly the answer is [the answer is]; (it seems like the best solution is to avoid adjectives/adverbs as much as possible)
- Kristina Bush - easy, clearly, simply -> "this is one way to..." emphasize practice and messiness of searching for informaiton, iterative process
- Alexander Smith - just, easy, simple, **quick,** basic: hard to get an exact mapping to something better but I try and minimise the size by talking about this 'one' thing or 'a good/nice place to start' or 'relatively low-hanging fruit' or motivate by saying this is a 'first win' (rather than quick/easy win)
- Taylor Woods - "you probably already know this" --> in most cases you don't even need to say this; "I don't know what happened" --> "let's find out what that error is"; "this is likely a refresher for many of you" --> don't need to say this
- Kathleen Chappell- instead of just, how about "simply" (as in we "simply" do this? It sounds positive to me.) Another dismissive one could be "only". For a positive phrase to introduce an example, "we can move forward with the process by..."? Or "here is a common way to do..."?
- Allie Tatarian - "everyone knows..." or "you should all know..." is easy to replace with "some of you may know..."
- Nicole Brewer - "obviously" has a similar effect. I'm commonly bothered by the use of this words because it doesn't account for other people having other different knowledge or skill sets. Alternatively, it could be helpful to explain the mental leap required for the thing to be "obvious"
- Emily Yaklich - "this is straightforward" --> "this concept can be straightforward with the right set of tools" , "quickly" --> clarify that the code runs quickly vs. being able to understand how to do it quickly perhaps
- Ben King
  - Obviously, clearly, simple, easy
  - Obviously -> A common next step is ...
- Sofia Fertuzinhos - "simply do", "obvious", "naturally", probably better to use: "if you are following the exercise it might make sense at this point tha the next step is..."
- Lilly Linden
  - - "As you all already know." Avoid completely
  - "Obviously, the correct answer is"-
- Dara Farrell-this is easy, we will go through this step by step to get to our end result

"Any Questions?" --> "What questions do you have?"

You Are Not Your Learners

- Primary goals
- Concerns about time investment

You Are Not Your Learners

- Primary goals
- Concerns about time investment

The Carpentries Is Not Computer Science

Expert Advantages

The Importance of Practice (Again)

Keypoints:

- Experts face challenges when teaching novices due to expert awareness gaps.
- Things that seem easy to us are often not experienced that way by our learners.
- With practice, we can develop skills to overcome our expert awareness gaps.

Memory and Cognitive Load

Questions:

- What is cognitive load and how does it affect learning?
- How can we design instruction to work with, rather than against, memory constraints?

Objectives:

- Remember the quantitative limit of human memory.
- Distinguish desirable from undesirable cognitive load.
- Evaluate cognitive load associated with a learning task.

Types of Memory

- short-term vs long-term memory
- 7±2

-- -- *Exercise: Test Your Working Memory* -- --
This website implements a short test of working memory.
https://miku.github.io/activememory/
What was your score? If you are comfortable, share your answer in the Etherpad.

- Minyoung Wyman, 3/20
- Ken Lui - 9
- Kinnothan Nelson -5
- Chris Young - 10 (it helped that the terms were repeated on the screen) - also chunked into fruit, drink, breakfast + tofu
- Simon Stone
- Jentry Campbell - 4ish
- Jackson Hoch - 8
- Ford Fishman - 3
- Bryan Scott 7
- Simeon Wong
- Will Cowen 10
- Kristina Bush 8
- Alexander Smith - 9 (3 questionable)
- Taylor Woods - 5/6; 10 second time
- Kathleen Chappell - 7 (but I was really trying to remember them)
- Allie Tatarian 7
- Nicole Brewer - 6
- Emily Yaklich - 5/6
- Ben King
- Sofia Fertuzinhos 7
- Lilly Linden -4
- Dara Farrell

If you are unable to use this activity, ask your Trainer to implement the analog or adapted version of this test.

Strategies For Memory Management

Chunking

Image: A list of words: cat, apple, ball, tree, square, head, house, door, box, car, king, hammer, milk, fish, book, tape, arrow, flower, key, shoe. Underneath, the same words are organized into boxes with related terms e.g. cat fish milk ball and apple flower tree"
https://carpentries.github.io/instructor-training/fig/chunking.svg

-- -- *Exercise: Improving Short-term Memory with Chunking* -- --
Repeat the memory exercise you did earlier, but this time, try to form short stories or phrases, or a visual image, from the words you see.

Write the number of words you remembered in the Etherpad. How does this compare with your first attempt?

- Minyoung Wyman, 7/20 better. chunking and making phrases
- Ken Lui
- Kinnothan Nelson - 10
- Chris Young - 11 (slightly better thinking of a narrative) - I went down to the hotel breakfast which had a selection of fruit with strawberries, blueberries, apples, along with tea and juice. They also had bagels, sausage, eggs, bason, and oddly tofu.
- Simon Stone
  - It went to fast for me to make a story out of the words. Also the fixed order did not help.
- Jentry Campbell - 8 (2x before)
- Jackson Hoch - 9 (a little better). The first time I thought of pictures and I found this helps me.
- Ford Fishman 5 (+2) It was better, but probably only because 3 wasn't great. The story I made was a bit too fragmented to actually help.
- Bryan Scott 9 (a bit better)
- Simeon Wong 15 (i think writing the original list by category helped, so i only focused on the missed words on the second time around)
- Will Cowen 15 (but i lost one from the first list)
- Kristina Bush 11 - I was chunking the first time into breads, meats, etc. helped to see them in the order I was making mentally
- Alexander Smith - 4 (I think the words were harder, I clicked the link instead - less related & harder to visualise)
- Taylor Woods - 10; having them grouped into drinks, fruits, breads/carbs & bfast/proteins helped
- Kathleen Chappell - 13 (chunking into groups was easier for me, and I remembered some when writing this!) Having groups of beverages, fruits, etc. was easier as I imagined a table with a food display and it helped to job my memory
- Allie Tatarian 15, they were already chunked into type of food (beverages, fruits, carbs, proteins)
- Nicole Brewer - 9 (better!)
- Emily Yaklich - 6 (same as first attempt)
- Ben King
- Sofia Fertuzinhos 13 - instinctively I had done chunk in the previous exercise. I couldnt remember in order
- Lilly Linden - 6 (1 still questionable) The words really didn't have a thread for me to weave a story.
- Dara Farrell

Using Formative Assessment to Support Memory Consolidation

- Frequency of assessment
- Group Work
- Opportunities for Reflection
- Limit Concepts

Attention is a Limited Resource: Cognitive Load

3 types:

- Things they have to think about in order to *perform a task* (“intrinsic”).
- Mental effort required to *connect the task* to new and old information (“germane”).
- *Distractions* and other mental effort not directly related to performing or learning from the task (“extraneous”).

- -- *Exercise: Mapping Cognitive Load* -- --
Look in the curriculum that you chose to prepare for this workshop and focus on one step or task that learners will be asked to complete.
recommended lessons:
https://carpentries.github.io/instructor-training/instructor/index.html#recommended-episodes (choose one quickly, it will not stick with you for long, there is no "best" one to choose)

- What concepts will learners need to understand and hold in short-term memory in order to complete this task?
- Draw a concept map connecting these concepts. What relationships do learners need to understand to connect them?
- How many of these concepts and relationships have been introduced since the previous step or exercise?

With a partner or in small groups, discuss what you have found. Are your learners at risk of cognitive overload at this point in your workshop? Why or why not?

Group 1

Group 2

Group 3

Group 4

Group 5

Group 6

Group 7

Attention Management in Your Workshop

Using Formative Assessments for Memory Management
There are many different types of exercises that can focus attention narrowly and help to avoid cognitive overload. Carefully targeted multiple choice questions can play this role. A few more that you may wish to consider are:

- Faded examples: worked examples with targeted details “faded” out – essentially fill-in-the-blank programming blocks
- Parson’s Problems: out-of-order code selection & sorting challenges
- Labelling diagrams or flow charts (may also be organized as a fill-in-the-blank)

What to Display
 - minimal distraction by showing the code *only*, not the ntoes
 -

Keypoints:

- Most adults can store only a few items in short-term memory for a few seconds before they lose them again.
- Things seen together are remembered (or mis-remembered) in chunks.
- Cognitive load should be managed through guided practice to facilitate learning and prevent overload.
- Formative assessments can help to consolidate learning in long-term memory.

Building Skill With Feedback

Questions:
   How can I get feedback from learners?
   How can I use this feedback to improve my teaching?
Objectives:
   Describe three feedback mechanisms used in Carpentries workshops.
   Give feedback to your instructors.

Surveys
Dashboard of aggregate results: https://workshop-reports.carpentries.org/?aggregate-workshops
If you’d like have an overview of the questions asked in the surveys without having to go through all the questions, you can preview them in a text-format below:

- Pre-workshop survey: https://carpentries.github.io/assessment-archives/pre-workshop/pre-workshop.html
- Post-workshop survey: https://carpentries.github.io/assessment-archives/post-workshop/post-workshop.html

For links to our surveys from the learner view see: https://carpentries.github.io/instructor-training/06-feedback.html#surveys

The survey links above are only for you to preview the survey as part of Instructor Training. When you are teaching a workshop, make sure to share the links generated on your workshop website. Doing so will ensure that you will receive all the survey results from your workshop participants.

Image: Screenshot of a workshop website showing location of customized survey links https://data-lessons.github.io/instructor-training/fig/surveyscreenshot3.svg

Minute Cards

Example positive prompts:

- One thing you liked about this section of the workshop
- The most important thing you learned today
- A new skill, command, or technique you are most excited about using

Example constructive prompts:

- One thing you did not like or would change about this section of the workshop
- One thing that is confusing / you would like clarification on.
- One question you have

Be Explicit About Using Feedback

------- *Exercise: Give Us Feedback* -----
Minute Card for this half workshop https://forms.gle/fP6PzFAehuATD2Zv6

Key Points

- Give your learners time to fill out the post-workshop survey at the end of your workshop.
- Take the time to respond to your learners' feedback.

Icebreaker after lunch

share one thing you are proud of that you have done recently

- Minyoung Wyman, Learning about the virtues as outlined by Aristotle and Aquinas.
- Ken Lui - drive on the highway
- Kinnothan Nelson - Change my diet...for the better
- Chris Young - finished co-organizing a conference yesterday
- Simon Stone

    - I made some really good pulled pork for my family
- Jentry Campbell - I sewed some new baby blankets and gave them to a baby.
- Jackson Hoch
- Ford Fishman
    - I finished teaching a full course for the first time as a head instructor. Very rewarding.
- Bryan Scott
- Simeon Wong - climbed the via ferrata at Whistler
- Will Cowen : I completed SkyWarn Spotter training (quick and simple) and have been working through the MetEd courses at UCAR.
- Kristina Bush - I made it through a black trail on mtb that I wasn't able to get through before without walking some of it
- Alexander Smith - I tamed a stray ex-barn cat and now she's emotionally dependent on me (and I on her)
- Taylor Woods - I made it through my first outdoor run after the long winter
- Kathleen Chappell - I am proud of recently being able to manage my time effectively - have been able to work a full day and spend some quality time walking with my toddler outside before dinner :)
- Allie Tatarian
- Nicole Brewer - I'm proud of the rubric we have made for evaluating Jupyter Noteboks for the US-RSE conference. We worked very hard to try and removed bias by being specific about grading criteria
- Emily Yaklich - I went for a long bike ride in my city!
- Ben King
- Sofia Fertuzinhos - I have started giving steps to understand containerization (which is still very obscure to me)
- Lilly Linden -I am proud of finishing a large knittting project!
- Dara Farrell

Feedback

- You will teach this afternoon and tomorrow
- Checking your pace and the suitable material:
    - Feedback from learners
    - use carpentries lessons
- Measuring Cognitive load
    - usually no, but you can watch learners
- We will do 10 & 5 min breaks this afternoon and tomorrow instead of one 15
- references in the curriculum
- What questions, for me, does, especially over time, help.
- More detail/memory on any topics
    - we will keep coming back to them
    - We will see more concept maps
- unclear written activity instructions
    - we welcome pull requests, these have been iterated on for many years, but htose of us who use them most see them frequently
- Workshop logistics we will cover tomorrow
    - how to work with the lesson
    - what to/not show

- I often teach one-shot sessions that are open to people from all across campus, no (hard) requirements. People come to the sessions expecting to walk away with a new skill that they can immediately use in their work. How can we reconcile these expectations of a workshop with the goal of moving slowly and the constraint of a single session?
    - state goals up front
    - make the goal of "good enough" to work

Motivation and Demotivation

https://carpentries.github.io/instructor-training/08-motivation
Questions:

- Why is motivation important?
- How can we create a motivating environment for learners?

Objectives:

- Identify authentic tasks and explain why teaching using them is important.
- Develop strategies to avoid demotivating learners.
- Distinguish praise based on the type of mindset it promotes.

Motivation Matters

- Any technique can fall flat when learners are not motivated
- In a short workshop, motivation to continue learning independently is a critical outcome

How Can Content Influence Motivation?

- Believing that something will be too hard to learn often becomes a self-fulfilling prophecy.

Image: A stylized graph with y-axis labeled "usefulness once mastered" and and x-axis labeled "mean time to master". The upper left quadrant says "teach this first" and the lower right quadrant says "do not bother". https://data-lessons.github.io/instructor-training/fig/what-to-teach.png

-- -- *Exercise: Authentic Tasks: Think, Pair, Share* -- --
1) Think about some task you did this week that uses one or more of the skills we teach, (e.g. wrote a function, bulk downloaded data, built a plot in R, forked a repo) and explain how you would use it (or a simplified version of it) as an exercise or example in class.
2) Pair up with your neighbor and decide where this exercise fits on a graph of “short/long time to master” and “low/high usefulness”.
3) In the class Etherpad, share the task and where it fits on the graph. As a group, we will discuss how these relate back to our “teach most immediately useful first” approach.

This exercise should take about 10 minutes.: https://cuckoo.team/ttt

Short time/low usefulness:

Middle time/high usefulness:

- Creating a Python-TK GUI to perform a paramter sweep & run commands
- Melting and pivoting dataframes
- Running a specific package (e.g. DESeq2)

Long time/low usefulness:

- git branching / checking out others' code
- reviewing others' code via GitHub pull requests & commenting/approving changes (if you're a software developer, maybe you'd disagree on usefulness ranking)
- Running an RNAseq pipeline

Short time/high usefulness:

- keyword searching in library database
- Making a commit on a git repository
- File naming for easy recall
- forking a repo
- 3d plotting
- boolean indexing in python
- "For loop" and incorporating with linux applications
- Plots in base R
- simple bash script to echo data to the screen
- Heatmap of data
- Change shell prompt

Long time/high usefulness:

- Web application in Jupyter Notebooks
- Grid of data visualizations showing multiple variables in a single figure with mutliple axes
- Neural net
- Starting a Docker container
- Mastering ggplot
- Running an RNA-seq pipeline

How Can You Affect Motivation?

-- -- *Exercise: Brainstorming Motivational Impacts* -- --
Think back to courses you have taken in the past and consider things that an instructor has said or done that you found either motivating or demotivating. Try to think of one example in each case, and share your example under the appropriate heading in the Etherpad.
This exercise should take about 5 minutes.

Motivating experiences

- Minyoung Wyman, When the lecturer had a rambling style with no seeming structure, which was reflected also in his exam questions, I felt like I couldn't learn, no matter how hard I tried. The best teachers helped break down an application of a principle, which you knew would be reiterated in graded assignments.

- Ken Lui - The instructor cherished my international student identity which she found my viewpoints interesting, although none of my classmates talked about that.
- Kinnothan Nelson - Gave lots of examples and walked through steps where I had questions and encouraged more questions (motivating).
- Chris Young - connected the activity to experiences I knew (e.g., Unix Shell -> navigating your folders) / using acronyms without explaining them (e.g., ls = list, chdir = change directory)
- Simon Stone
  - Problem-based learning, where we were working towards a solution instead of just going from one thing to the next without a clear connecting thread
- Jentry Campbell - instructor was willing and open to backtracking in class to explain concepts
- Jackson Hoch
- Ford Fishman Starting class with an interesting problem to solve, or an interesting concept
- Bryan Scott explicitly state that everyone belonged in the class
- Simeon Wong asked us why we signed up for the class, and then directly connected topics from the course overview to our personal goals
- Will Cowen : encouraged divergent examples; asking for exercise results and getting something unexpected, and then really digging in so you watch them come to understand it.
- Kristina Bush - create space to experiment and fail without judgment
- Alexander Smith - Went on a how-to-present course and he opened with how much each meeting costs (no. people x wages + places) and it still justifies everything I do - don't waste someone else's time, it probably matters to them
- Taylor Woods - created a hands-on team learning environment
- Kathleen Chappell - explaning terminology at the outset of class slides to ensure that everyone had the same basic knowledge and ways to describe concepts:f
- Allie Tatarian -being open to new interpretations they hadn't considered before.
- Nicole Brewer - I was in a writing class where we were writing encyclopedia entries. We did a lot of peer-review where we gave interactive feedback where positive comments were highly encouraged alongside constructive ones. The atmosphere made me feel open to feedback and encouraged my learning
- Emily Yaklich - applications of learning to real/useful situations
- Ben King
- Sofia Fertuzinhos - it is motivating for me as a student when instructors make eye contact as a way to connect with how we students are reacting to the information
- Lilly Linden -
  - constructive feedback; space to get things wrong and learn from mistakes
- Dara Farrell-affirmation of instincts in the sense of applying previously taught material to new but similar material
-

Demotivating experiences

- Minyoung Wyman,
- Ken Lui - assignment instructions were not clear as I had no idea what to do and how to finish
- Kinnothan Nelson - Provided no feedback and insisted that I figure out the solution with no additional help (demotivating).
- Chris Young
- Simon Stone
  - An introductory workshop on parallel computing: Use of jargon that beginners would not

know

- Jentry Campbell - A class that was supposed to be an exporation of crit lit but had no foundational knowledge portion-jumped right in to jargon heavy scholarship.
- Jackson Hoch
- Ford Fishman - Physics 2: starting out the class with an integration by parts problem
- Bryan Scott - a workshop meant to introduce new people in astronomy to the field started with a lecture that assumed deep particle physics knowledge. Lots of senior people mostly talking/taking questions from their own students.
- Simeon Wong instructor quizzing students on the spot about course content that wasn't taught yet
- Will Cowen : dismissive attitude toward valid other methods rather than explaining why they are choosing to teach the method they have chosen - gives an impression that they are teaching from rote.
- Kristina Bush - mixed up tempera paint with tempura and was told I shouldn't study art history (overly punitive about small mistakes)
- Alexander Smith - I remember one lecturer showing us a proof but they skipped a load of steps and this kind of thing happened so much that it felt like there wasn't much value in being there / like I was being cheated / should go elsewhere for the info.
- Taylor Woods - cold calling on students in an inconsistent manner
- Kathleen Chappell - A computer science class on Bioinformatics was demotivating to me. I took a background in bioinformatics, but the class was geared towards computer science graduate students - so they had much stronger mathematics backgrounds than I did. The professor assumed a competency level that I did not have and it ended up I had to spend a lot of time in his office hours to understand the equations and formulas.
- Allie Tatarian - used to have a teacher who would include topics we hadn't covered in homework, of a type that couldn't be deduced from what we had learned already
- Nicole Brewer - I went to a workshop about numpy, but there wasn't a real example, we just walked through a series of common functions. I had no idea how I'd actually end up using the library
- Emily Yaklich - Learning about algorithms via lecture slides only (no examples or application)
- Ben King
- Sofia Fertuzinhos - Not addressing students questions or making space for questions
- Lilly Linden
    - - A Regession Analysis class where the professor just skipped several steps over and over again. It was really hard to keep up.
- Dara Farrell-the instructor would read verbatim from the text with little explanation

-- -- *Exercise: Choosing our Praises* -- --

Since we are so used to being praised for our performance, it can be challenging to change the way we praise our learners. Which of these examples of praise do you think are based on **P**erformance, **E**ffort, or Improvement? place a P, E, or I next to each answer

- That’s exactly how you do it – you haven’t gotten it right yet, but you’ve tried two different strategies to solve that problem. Keep it up! EEE EEEEEEEEEEEEEEE
- You’re getting to be really good at that. See how it pays to keep at it? IIIIII&EIEIIIII&EE/IEIEEE/I
- Wow, you did that perfectly without any help. Have you thought about taking more computing classes?P PPP PPPPPPPPPPPPPPPP
- That was a hard problem. You didn’t get the right answer, but look at what you learned trying to solve it!E EEEE&IEEEEEEEEEEII

- Look at that - you’re a natural! PPPPPPPPPP PPPPPPPP(BAD)P(ish)

First, Do No Harm!

Things not to do in a workshop:

- Talk contemptuously or with scorn about any tool or practice, or the people who use them.
- Dive into complex or detailed technical discussion with the one or two people in the audience who clearly don’t actually need to be there.
- Pretend to know more than you do.
- Use the J word (“just”) or other demotivating words we talked about in a previous lesson.
- Take over the learner’s keyboard.
- Express surprise at unawareness.

Not Just Learners

- Why does your motivation matter?

-- -- *Exercise: Why Do You Teach?* -- --
We all have a different motivation for teaching, and that is a really good thing! The Carpentries wants instructors with diverse backgrounds because you each bring something unique to our community.

What motivates you to teach? Write a short explanation of what motivates you to teach. Save this as part of your teaching philosophy for future reference.

- Minyoung Wyman, I like helping other dissect complex concepts and tasks (things that were hard for me) and empower them with a growth mindset (I can do this!) - which will hopefully help them in all aspects of their education, career, or personal lives.
- Ken Lui - I like to help people, to do or find things they need. I also like helping people to work more efficiently so that they have more time for ohter thhings.
- Kinnothan Nelson - To expand the knowledge and skillsets of others so that they can employ tools and methods they otherwise would not have for their work.
- Chris Young - I love learning. I learn far more from my students and colleagues than through my own self-learning. I find teaching a great way to continue to grow and share that knowledge with others who have that same passion.
- Simon Stone - I want to empower people to do the things they want to do in a competent and efficient way.
- Jentry Campbell - I enjoy helping people explore their curiosity.
- Jackson Hoch
- Ford Fishman - I think its really rewarding to see people progress and take some topic or a skill they are not super comfident or maybe have no experience in and become more confident in it.
- Bryan Scott Learning is one of the best experiences you can have, and it's deeply meaningful to be able to give that gift/share the joy with others.

- Simeon Wong - being able to script in science makes the work so much easier, repeatable, and saves time. It's been a game changer for me and I want to help others do the same. I'm motivated when people I teach get excited about what they've learned and how they will use it,.
- Will Cowen : time is precious, and there are ways that software and tools can get someone repeatable, reliable results in far less time. Teaching someone something startling or cool or helpful and watching them learn a basic skill and transform the way they think about repetitive and time consuming 'grunt work' and get excited about how much more they can now explore is a huge motivator.
- Kristina Bush - I love learning from my students and hearing about what they're passionate about. As a librarian, teaching them how to do research empowers them to see themselves as a scholar and investigate what they love.
- Alexander Smith - I enjoyed learning so much (and still do) and value what I received and want to give some of that back. There are also less pure motivators like advancement (also some people use it for marketing) but....
- Taylor Woods - passionate about R and want to help others get into R (especially those that might not have thought they would)
- Kathleen Chappell - I enjoy teaching to help others learn how to do their computational work independently. I had a mentor teach me how to do this earlier in my career, and I had a feeling of self-empowerment being able to process a lot of data on my own. I like helping others to be able to get that freedom for their own research.
- Allie Tatarian - I teach to empower learners to be able to solve problems and find high quality information to answer questions on their own.
- Nicole Brewer - I'm passionate about sharing my love of code with scientists or other audiences who are approaching coding as a secondary goal. Even if they find programming frustrating, they get to see the value of how programming actually enables them to do their work. Not everyone falls in love with it like I do, but sometimes sharing my excitement and identifying the ways their work can be made easier with coding, and some positive experiences can really change their relationship with programming. Seeing that happen gives me a lot of joy
- Emily Yaklich - I am motivated to teach because I would not be where I am today without the excellent teachers I have had in the past. Additionally, I had to learn the foundation of my programming knowledge on my own and I want to be able to provide others with the same knowledge in a more constructive group setting as opposed to struggling through it alone.
- Ben King - I enjoy exposing people who have limited understanding or previous exposure to coding what its all about and showing them the power of coding. I like to help people find out how they might use this in their own work.
- Sofia Fertuzinhos - my motivation is to make biomedical researchers believe that they can learn how to analyze their own data or at least understand the tools well enough to beter comunicate with bioinformaticians
- Lilly Linden - I learnt about the scholarship around teaching several years after I had started teaching. I am constantly learning about new ways of thinking about things when I teach. Teaching always me to learn continously. The 'aha' moments for both others and myself are strangely satisfying.
- Dara Farrell- I enjoy seeing the look of accomplishment/satisfacation when a learner understands something they were struggling with and helping them have the confidence to take things further on their own

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Equity, Inclusion, and Accessibility

https://carpentries.github.io/instructor-training/09-eia
Questions:

- Why are equity, inclusion, and accessibility important?
- What can I do enhance equity, inclusion, and accessibility in my workshop?

Objectives:

- Identify instructional strategies that are consistent with universal design.
- Recognize systemic factors that can distract and demotivate learners.
- Understand the role of The Carpentries Code of Conduct in maintaining an explicitly inclusive environment.

A Positive Environment for All

Definitions: https://www.diversity.pitt.edu/education/diversity-equity-and-inclusion-glossary

- Equity: The proportional distribution of desirable outcomes across groups. Sometimes confused with equality, equity refers to outcomes while equality connotes equal treatment.
- Inclusion: Actively engaging traditionally excluded individuals and/or groups in processes, activities and decisions in a way that shares power. Inclusion promotes broad engagement, shared participation, and advances authentic sense of belonging through safe, positive, and nurturing environments.
- Accessibility: Refers to the intentional design or redesign of technology, policies, products, and services (to name a few) that increase one’s ability to use, access, and obtain the respective item. Each person is afforded the opportunity to acquire the same information, engage in the same interactions, and enjoy the same services in an equally effective and equally integrated manner, with substantially equivalent ease of use.

The Carpentries Core Values

-- -- *Exercise: Discuss The Carpentries Core Values* -- --

- Take a moment to read through the Core Values on this page: https://carpentries.org/values/
- Choose one core value that resonates with you. What is a decision you might make in a workshop that could look different if you were actively considering the core value you chose?

This exercise should take about 5 minutes.

- Minyoung Wyman, In group homework assignments, ask students to initial their contribution. This would help them see how they were able to build the final product together (value all contributions). Although some students might have a more important contribution, I want them to see that their peers might have incremental contributions that were also necessary for the task completion.
- Ken Lui - ask for participants who English is not their first language, do they need accomodations
- Kinnothan Nelson - Community Collaboration - I would ask for feedback during the workshop on what they think would be more authentic tasks and exercises and ask what other community

members would benefit from the workshops.

- Chris Young - ALWAYS LEARNING - Taking time to listen to folks' stages of learning and adjust the lesson plan/workship accordingly based on that feedback.+1
- Simon Stone - "Always learning": Being responsive to feedback means sometimes letting go of a belief I hold myself. I might, for example, think that it is really important to squeeze that one thing into a 90 minute session, but when the feedback tells me, the contents feel rushed, I have to cut things for size and focus on what's most important.
- Jentry Campbell - "Always Learning" - Soliciting feedback frequently and responding to feedback in the moment (or the same workshop) by making necessary modifications to improve the learner experience.
- Jackson Hoch
- Ford Fishman "Access for all" In the past, I have not included installation instructions for people with older OS's. Putting this information so that it is easily available will help everyone be at the same place at the same time.
- Bryan Scott "Act Openly" + "Always learning" - adding and discusing times when I've made mistakes around the concepts, especially when they mattered, and how I responded to learning about the mistake.
- Simeon Wong "value all contributions" - affirm and invite participants to come up with their own mental models and analogies for concepts and to share with the class, particularly from different disciplines
- Will Cowen : "Empower One Another" - This might involve more time exploring use cases from the participants that are perhaps even off-label uses of a tool or package, but that might just by sharing inspire another participant in their enthusiasm for that tool.
- Kristina Bush - community collaboration - have pairs / teams work together on a problem. Each has a different role that rotates for different problems so each get to explore strengths / weaknesses and when to call on others
- Alexander Smith - Access For All. I'd go to online contributions first in a hybrid teaching format to prevent a sense of exclusion. I'd have frequent breaks / keep them a good length to avoid creating/exacerabting (health) issues for students+1
- Taylor Woods - always learning; this would be a good opportunity to trouble shoot errors in live coding exercises rather than skipping over errors
- Kathleen Chappell - "Access for All", make sure that training materials and training itself are accessible, so use captions, have alternate text for images, etc. This is specifically in reference to those who may be hard of hearing or need to use a screen reader.
- Allie Tatarian - Empower One Another - allow opportunities for peer-peer teaching, let students use their own examples or applications to shape their code as they learn
- Nicole Brewer - inclusivity and always learning - I think it is important to verbally acknowledge in the beginning of the workshop both that we are trying to create an inclusive environment and as part of that we are open to feedback. Communication is hopefully a two-way street between instructor and learners.
- Emily Yaklich - The core value I choose is "empower one another" - I think this is especially great as the courses can be made up of many different people with different expertises and backgrounds that can all contribute unique perspectives to the conversation. In order to emphasize this value in a workshop, I would highlight group work and discussions with a focus on after completing episodes ask people to discuss how they would try to apply what they have learned to what they do on a daily basis. This gives others the opportunity to learn and share from each other and the group work allows for different skills and backgrounds to be highlighted.
- Ben King - Value all Contributions - everyone is on their own journey of learning! It's super important to recognise that people learn in different ways, and people's brains work very

differently - value all contributions!

- Sofia Fertuzinhos - "Always learning" I guess I could look more activey for feedback during my workshops so more advanced learners could share alternative ways of performing a task as well as learn from beginers where they have more troubles and we can discuss different approaches to solve it.
- Lilly Linden - Always Learning - add snippets throughout the session about something that I am a beginner at; adding snippets about challenges; empahsizing that process of building on existing skills. Ask for examples from participants (perhaps an ice-breaker)
- Dara Farrell-Act Openly - share my path to learning what I'm about to teach and placing my experience in context

Accessibility

-- -- *Exercise: What Happens When Accessibility is an Issue?* -- --
Think of a time when you have been affected by, or noticed someone else being affected by barriers to accessibility. This may have been at a conference you attended where the elevator was out of service, or maybe a class you were taking relied on audio delivery of content. Describe what happened, how it impacted your (or someone else’s) ability to be involved and what could have been done to provide better accessibility in this case.
This exercise should take about 5 minutes.

- Minyoung Wyman, When I see a busted elevator, I wonder how someone with a disability may be taking longer to get somewhere.
- Ken Lui - a mass debate that requires participants to choose their side and move to the desingated area for their position. This is not very freindly to people with eyesight issue as they have no idea where the area is and other the opposite side has how mnany people
- Kinnothan Nelson - For family members who use wheelchairs, we have to scout out locations to make sure they are accessible for them, down to the specific rooms or areas we will be using.
- Chris Young - web accessible slide decks. font type, size, contrast. Seen many presentations where folks with visual impairments can't view the content. Take time to consider how to structure and design your slides for multiple visual impairments for accessibility (e.g., using sans not serif, dark text on light colour, large font, no complicated visuals, etc.)
- Simon Stone - Using red and green, or generally speaking colors, to communicate information (e.g. different variables in a line graph). Color deficiencies are very common and there are plenty of other ways to communicate the same thing: dashed lines, different markers, ...
- Jentry Campbell - Ebooks in libraries not always being userfriendly for screenreaders depending on delivered format. I work to purchase only materials that can be downloaded as an epub so they are more likely to be compatible with most screenreaders or t2s apps.
- Jackson Hoch
- Ford Fishman - Our campus has some accessibility problems, and for one student with a broken leg, they had a hard time making it to class on time because of it. Elevators would be part of the solution, but also designing some ramps would be helpful as well.
- Bryan Scott Long series of ramps down from metro platforms that end without warning in staircases rather than continuing or leading to an elevator. Very kafkaesque. Small logos for accessible stations that are only on *some* of the metro platform maps, others just deposit you without anyway to access the street. Elevators behind locked doors!

- Simeon Wong - an assessment where data had to be plotted in different colours, and there was a colourblind student in the class. instead of asking for specific colours, the assessment could ask for distinct markers (whether colour or shape)
- Will Cowen : A reception in an old building with no accessiblity through the main entrance. Accessible entrance was through the kitchen and then into the reception area, which was both difficult, and made entrances by those using that pathway uncomfortably obvious. Choosing another venue that was perhaps less fancy would have made everyone feel more welcome.
- Kristina Bush - The doors at my library don't open automatically which makes it incredibly difficult for people with mobility aids or mobility challenges to enter. The main entrance also only is accessible via stairs. They need to add accessible doors and create ramps, or provide information on the website and outside of the building for people to find the entrance that doesn't require stairs.
- Alexander Smith - I have a non-standard dietary requirement which is disabiling but was ignored. Didn't eat at one, had to run out at another & missed a session. Would have been fine except it was breakfast, lunch and dinner and needs to be refridgerated. Having to negotiate this/convince people it's real makes going to conferences not worth the time investment.
- Taylor Woods - not having childcare available at conferences
- Kathleen Chappell - My wife is disabled, so we run into this occurence often. She is unable to lift more than 5-10 pounds and does not have a strong grip strength. Common things like opening and pouring a bottle of milk, or accessing medication stored in child-proof locked containers can be a challenge for her! To provide better accessibility, there can be help from others (such as a family member - but that is not something that leads to independence), or alternative options can be used (e.g. different packaging for products that's not hard to open, buying pre-cut fruits and vegetables instead of needing to cut them).
- Allie Tatarian - When I was grocery shopping once someone stopped me to rant about the new paper bags some shops are using, which either don't have handles or have handles that break off easily. These bags are difficult to carry for people with reduced grip strength, which makes it hard for people to independently grocery shop. Could be helpful if there was a disposable bag design that is both sustainable and easy to carry.
- Nicole Brewer - Virtual conferences are becoming more common, but takes a good amount of work to make the virual experience as valuable as the in-person experience. It takes a lot of intension on behalf of the organizers to make sure that the inevitable kinks are resolved and everyone who is online has an open channel of communication and isn't ignored. There are a lot of reasons virtual option could improve accessibility, but that's only realized when the option isn't an afterthought
- Emily Yaklich - I have noticed when visualizing data when people do not use colorblind-friendly palettes that it can be difficult for those with colorblindness to interpret the plots and data (this is especially bad at conferences or large presentations when questions about the data cannot be clarified)
- Ben King - I injured my back a few years ago at the gym. Some places (and some offices I have worked in) have really bad seating, which can lead to days of uncomfort. This would mean I would avoid these places and not be as involved as others who don't have the same issues.
- Sofia Fertuzinho - accessibility to lactation rooms in reasonable proximity to working space affects he ability for women to feel that their option to provide their own milk to their child is not un incovinience to the organization where they are.
- Lilly Linden - Lack of ergonomic chairs in classrooms; access to parking close to event location
- Dara Farrell-Example: students being unable to purchase their required textbooks. Accessibility: Ensuring that there are multiple are copies of the text on reserve in the library and/or considering changing to open-source texts

From Accomodation to Universal Design

Image: Cartoon showing strollers, suitcases, bicycles, carts, and wheelchairs using curb cuts
https://carpentries.github.io/instructor-training/fig/sketchplanations-the-curb-cut-effect.png

Universal Design in Learning (UDL)
The key to UDL is creating redundancies such that learners have multiple options in how they:
1) receive
2) engage, and
3) share information.

-- -- *Exercise: Activity: Applying Universal Design in Your Teaching* -- --
Consider some of the teaching tools and strategies we have discussed so far in this workshop, or others you have observed in your experience. How do these meet UDL goals of providing multiple options for learners?
Consider multiple ways for learners to:

- receive information
- engage with you, the material, and other learners
- share what they have learned

Every Little Bit Counts

Accessibility Testing

Systemic Exclusion

Stereotypes

- may be explicit (conscious and deliberate) or implicit (unconscious and automatic)
- guide what we notice about people
- guide how we interpret people's behaviors
- can facilitate quick judgements in appropriate situations (e.g. stopping a child from driving a car)
- can lead to systematically negative attitudes and behaviors towards members of certain groups

When Instructors have stereotypes about learners
When learners experience stereotypes about themselves

What can we do about our own stereotypes?

Better Together: Learning with Friends

Teaching is a Skill

https://carpentries.github.io/instructor-training/11-practice-teaching
Questions:

- How can I improve my teaching?

Objectives:

- Use peer-to-peer lesson practice to transform your instruction.
- Give thoughtful and useful feedback.
- Incorporate feedback into your teaching practices.

Lesson Study: Applying a Growth Mindset to Teaching

Jugyokenkyu or "lesson study": the power of classroom observation

-- -- *Exercise: Giving Feedback* -- --
We will start by observing some examples of teaching and providing some feedback.

Put your feedback in the Etherpad. Organize your feedback along two axes: positive vs. opportunities for growth (sometimes called “negative”) and content (what was said) vs. presentation (how it was said).

Positive
- Content

- Simple example
- Live-coded and demonstrated the functions. Also pointed directly to the lines on the screen to highlight where they were in the demonstration.+1+1+1
- real/correct example of passing functions, done live (with maybe no prep)
- live-coding
- the example was simple
- He did remember to turn to the class at certain points

- Presentation

- Teacher seems excited about teaching
- Gesturing to items of interest helps break up monotony of standing at the laptop +1
- Reads out (some) of the things they type
- Spoke directly and engaged in a short review/summary of what was just covered
- Everything kept moving - it definitely wasn't boring
- Enthusiastic
- had a sense of spontaneity, rather than reading from a script. Stepped away from the lecturn.
- dynamic
- Clear and direct speaker
- Care about content comes across
- When pointing to things on the screen, turns his head toward the audience so we could still hear
- Invited questions at the end (albeit with poor phrasing)

Growth opportunities

- Content

- Could be more focused/structured
- Could add opportunity for reflection / information digest
- Could add opportunity for formative assesment
- Appeared to fix a problem in his code, but didn't explain the problem or how to fix it
- Scaffolding
- Explaining what you're doing in each step of coding
- Make the content on the screen bigger
- give more context why would you want to do that
- Lesson should be more organized with a clear intro/overview/purpose and conclusion/summary
- potentially use comments for notes
- Unprepared examples, or seemingly so
- More focused content and use of authentic tasks

- Presentation

- Teacher needs to slow down a little bit+1 +1+1+1+1+1+1+inf
- Don't use dismissive language & tone+1+1
- Text should be made larger so it can be read +1+1+1+1
- Delivery could be more intentional & come across as less hesitant. Improving content structure may help with this.
- If the teacher turns of their phone they might be less distracted
- Talked to the screen!
- "simple", "easy"+1+1
- Some of the teacher's words were mumbled at certain points/difficult to hear. It might be helpful to keep in mind that it may be difficult for some students to hear him.
- Slow down the pace
- Live-coding font size is small and doesn't make effective use of the screen space
- Ignoring late-comers and not singling them out
- Wait for folks to get settled before starting presentation
- very fast mumbling - slow down, enunciate, and slow down some more.
- Lots of "uh"s and "I'm sorries"
- Checked in on if there were any questions at the end, but could do it more frequently when going through the functions
- used some unnecessary jargon
- Instead of "just trust me" show examples to prove the point to learners

-- -- *Exercise: Sharing Feedback* -- --
if you still need an episode: https://carpentries.github.io/instructor-training/index.html#recommended-episodes
The prep time for this exercise is intentionally short – the point is to practice giving and receiving feedback, not to create a perfect presentation. Imperfect presentations will give you more to work with!
Distributed trainings:

- Split into groups of three.
- Individually, spend 5 minutes preparing a 90-second introduction to the topic of the lesson episode you chose before the start of the training course. You will not be live coding.

- we will broadcast a "start teaching" message after 5 minutes
- Get together with your group and have one person teach their segment to the group. Keep a strict time limit of 90 seconds per person (one person should be responsible for the timekeeping).
- After the first person has finished teaching, share feedback. The person who performed should start by offering feedback on themselves. The timekeeper should help to keep feedback to about 5 minutes per person to ensure everyone has time to perform and discuss.
- we will broadcast "next person" every ~7 minutes
- Rotate roles and repeat steps 3 & 4

We will also use this timer here for each segment: https://cuckoo.team/ttt

Briefly summarize the feedback you received in the below next to your name.

- Minyoung Wyman
  - Good: Good overview of the purpose of an R function and its working parts; added pauses to help explain the concepts slowly.
  - Improve: reduce the use of "ums" while speaking; simplify the example for use-case of functions; explain a term like "debug" if it is the first time introducing the concept
- Ken Lui
  - Good: use of real-life situtations/dilemmas that people might face in managing numerous digital files, and then point out that how could the unix shell CLI could help them
  - Improve: include a bit more content that is actually also the core copenent of the course (like find... useage of loop...)
- Kinnothan Nelson
- Chris Young - Clear introduction covering the lesson plan. I took a couple of pauses to gather my thoughts which stood out in the presentation. Tried to take a high-level view, could have contextualized it a bit to demonstrate why people would be there.
- Simon Stone
  - Good: Calm presentation that inspires confidence
  - Do better: Dismissive language trying to make something seem approachable -> Instead don't downplay the work, but point out the benefits of putting in the work
- Jentry Campbell
  - Good: Clearly stated what was needed to begin, that we would all be using the same data
  - Do better (Group): Slow down a bit
  - Do better (Me): More familiarity with full lesson contents
- Jackson Hoch
- Ford Fishman
  - Enthusiastic delivery
  - Talking about next steps was good
  - Not super smooth over time
  - Could reduce numbers of um and uhs
- Bryan Scott
  - Good: well prepared (over prepared?), set goal/problem
  - need improvement: probably went too quickly, could transition out better
- Simeon Wong
  - Good: good recap and motivation, clear visuals, glossary slide
  - Personal feedback: used demotivating language "simple"
  - Group feedback: talked too fast, glossary slide too dense

- Will Cowen
- Kristina Bush
    - Good: explanation of context and previous episodes, engaging speaker
    - Do better: demotivating laguage, more complete explanation of why to use this tool, add more pauses
- Alexander Smith - Pacing and pausing was good. Needed more time to prep. Liked showing the downside of not doing it to motivate. One bit of jargon was perhaps unnecessary.
- Taylor Woods - positive: layed down the steps that would be followed throughout the workshop. Constructive: engage more with audience
    - Used a lot of engaging gesticulations, a few of which were fidgets. We talked about how in a virual environment, it may be easier to hide this habit off-screen instead of having to actively think about it
    - Very clear progression of the content and how the lesson would unfold
- Kathleen Chappell
    - Positive: Did introduce material fine
    - Constructive: reduce jargon (e.g. "working directory" was not defined), did not take the whole of the time
- Allie Tatarian - A little fast, slow down talking; avoid jargon; good recap at the beginning, and set up where you're going next well
- Nicole Brewer - positive - engaging and spoke at a digestible pace constructive:
    - Engaging and accessible presentation; knowledge about the subject
- Emily Yaklich - Introduced previous topic/what students have learned in the module before, excited about the topic, good analogy, work on being more clear when describing the details
- Ben King
    - Introduce jargon better
    - I said 'Do you have any questions...?' oops
- Sofia Fertuzinhos -
    - Wasn't in "presentation mode" when speaking felt like a conversation. Maintained eye contac
    - Good: engaging, good tone and pace, clearly described objectives of the workshop
- Lilly Linden
    - Slow down
    - don't use dismissive language - 'very clear'
    - Motivation became clear
- Dara Farrell
    - (Self) Speak more slowly and pause and breathe after mistakes; Ensure that my notes are visible to keep on track
    - Good (Group): Presented a good overview of the topic making the end goal clear and students could look forward to what they were going to learn

You can go on to the next exercise if you finish early

-- -- *Exercise: Using Feedback* -- --

Look back at the feedback you received on your teaching. How do you feel about this feedback? Is it fair and reasonable? Do you agree with it?

Identify at least one specific change you will make to your teaching based on this feedback. Describe your change in the Etherpad. Remember you will teach again tomorrow, with live coding!

- Minyoung Wyman, I agreed with the feedback although it was hard to take. I wish I knew how to get around saying "um" so much! I think that practice helps to remove the nervous feeling for me, so I think I would have to practice a little more ahead of teaching. The feedback also made me realize that I am not so good at coming up with simple examples and that I should work harder on that.
- Ken Lui -Fair! I like the
- Kinnothan Nelson - Work on delivery so that it is more authentic and doesn't feel like it's being read.
- Chris Young - Have a structure to the presentation to avoid pauses and make to make it clear why people will benefit from the lesson.
- Simon Stone - It is definitely fair. I use terms like "simple" and "easy" to make things seem approachable, but I understand that it can lead to frustration and a feeling of incompetence. I will therefore try to not use this language anymore and instead motivate by pointing out the benefits of putting in the work/effort.
- Jentry Campbell - It was fair. I enjoy constructive feedback that feels actionable.
- Jackson Hoch
- Ford Fishman I think my feedback was excellent. I think the biggest thing to change would just be having more familiarity with the timing of the section I was going over. I had a hard time with how to end the section.
- Bryan Scott I'd probably focus on structuring/transitioning a bit more. I sort of jumped in to the main part of outlining and could have scaffolded some background first
- Simeon Wong - be aware of information overload both visually and verbally. definitely helpful feedback!
- Will Cowen : tightening up some of the extraneous explanatation - I went well over time, and it could be more effective if a bit shorter.
- Kristina Bush - definitely fair and reasonable feedback. I'm going to make sure I don't use demotivating language, add pauses for emphasis, and incorporate a better example of why to use shell
- Alexander Smith - legit, I'd give the same to myself. I'd prepare in advance so I'd know what I was saying and consider the target audience (specifically for a carpentry)
- Taylor Woods - the feedback was fair and constructive; changes I would make are to maintain eye contact with audience, also I would prepare more so I didn't feel like I had to read from the screen
- Kathleen Chappell - Yes, I thought my feedback was very reasonable. I did give myself a "self assessment" and my group members also were in agreement of what I mentioned.
- Allie Tatarian - I thought it was reasonable, I've been told I talk fast before, I still need to practice more on slowing down. :) It's also very helpful when people point out jargon that you don't even realize you're using.
- Nicole Brewer - I thought the feedback was great. The most interesting comment about my presentation was my acknowledgement about how aware I was about being evaluated. It was nice to know that calling myself out like that relieved some tension, because I'm sure it would be amplified in a more demanding scenario
- Emily Yaklich - Yes, the feedback was good and helpful! I speak quickly and need to work on that!
- Ben King
- Sofia Fertuzinhos - be careful about jargon so it is accesile to everyone
- Lilly Linden - Yes (I need to make sure that I slow down)
- Dara Farrell-My fellow group members were very kind and gave positive feedback, perhaps because I didn't give any to myself (just focused on things to improve). I will continue to keep the general approach to indicating the structure, motivations and end goals of the lessons and I will

work on slowing down my speech.

Keypoints:

- Like all other skills, good teaching requires practice and feedback.
- Lesson study is essential to transferring skills among teachers.
- Feedback is most effective when those involved share ground rules and expectations.

Wrap-Up and Homework for Tomorrow

https://carpentries.github.io/instructor-training/12-homework
Questions:

- What have we learned so far?
- What needs to be done to prepare for the next part of the training?

Objectives:

- Describe overnight homework.
- Produce a paragraph, drawing, or diagram that summarizes what was taught to this point.

To prepare for our next session, please:

1. Read about centrally-organized and self-organized workshops and our handbook content on Teaching and Hosting Workshops – be sure to click through to some of the associated checklists.
    1. https://carpentries.org/workshops/#workshop-organising
    2. https://docs.carpentries.org/topic_folders/hosts_instructors/index.html
2. Prepare for the live coding exercises.
    1. https://carpentries.github.io/instructor-training/17-live.html

full details on homework: https://carpentries.github.io/instructor-training/12-homework

Questions on Homework:

- teaching practice is live coding, no slides necessary
- you are not expected to teach a whole episode in 3 minutes, you'll teach from the beginning

Minute Card for this half workshop https://forms.gle/fP6PzFAehuATD2Zv6

Welcome Back

https://carpentries.github.io/instructor-training/13-second-welcome
Questions:

- What have we learned so far?
- What will we focus on today?

Objectives:

- Review main points we discussed yesterday.
- Introduce topics we will discuss today.

-- -- *Exercise: Questions* -- --
Yesterday we asked you to read some resources about the logistics of teaching and running Carpentries workshops. Please add your questions about logistics and preparation to the Etherpad. We will answer these questions in the Etherpad during your work time and will return to this list later today.

- While the episodes are well drafted they don't really have a breakdown of the time that may be alloted to each part/section. Is that something that each instructor just estimates for themselves or are there guidlines around how long each episode should take?+1+1+1
    - Sarah(answer): this varies WILDLY, so it is up to you. Most lessons have some timing information estimated for the whole episode, but even those are off. It will depend on how many questions you get, how many typos you make, and how quickly learners compelte exercises. The important thing is to keep a pace that works for the learners at your current workshop. I have taught where I finished an entire lesson in 6 hours of instruction and others where even with 9 hours (1.5 days) was not enough to complete a lesson. In workshops, it makse the most sense to keep breaks fixed, the material is pretty fluid, up to swapping instructors
- Can a university use Carpentries materials in a paid course? (re: all instructors are volunteers)+1
    - Sarah(answer): each lesson includes a license that stipulates how it can be used (they should all be the same) here is the one in instructor training: https://github.com/carpentries/instructor-training/blob/main/LICENSE.md. You can use the materials in a course, but you cannot use the carpentries logos unless you meet additional criteria
    - I am interested in the answer to this question. It strikes me that SC is a great out-of-the box teaching solution for first time professors and instructors. I would never pass it off as my own but it would be so easy to adapt.
        - Sarah: I did use some segments of data carpentry for a univerisy course. Appropriate credit is as determined by the license
- What percentage of Carpentries instructors run workshops themselves vs. centrally organized workshops?
    - Sarah: Good quesiton, I will look for this
    - From Core Team (Maneesha Sane): That's not really a question that can be answered because instructors:workshops represents a many-to-many relationship. One Instructor can teach many workshops; one workshop can have many instructors.We could answer that question for workshops -- What percentage of workshops are self organized vs centrally organized.
    - From Core Team (Erin Becker): last year we had twice as many instructors teach self-organized workshops as centrally-organized workshops. more specificially: Last year we had 351 Self-organised workshops and 105 centrally-organised workshops if that helps.
- For organizing self-organized workshops, it sounds like even before you choose a date, you need to contact The Carpentries with a workshop request form? I'm referencing here: https://docs.carpentries.org/topic_folders/hosts_instructors/hosts_instructors_checklist.html#host-checklist
    - Sarah: you can have a date before you contact them.
- Are there instructor certificates (similar to learner certificates) for doing individual workshops or for certain milestones (e.g., "Taught 10 workshops")?

  - Sarah: we get "badges" for completing instructor traning and trainer training, but the Carpentries does not issue learner certificates, though a host may. You can see how many workshops you have taught on AMY but there are no additional recognition for milestones
- Do you have any recommendation for recruiting helpers from the University?
  - previous workshop attendees, grad students who you know use the tools,
  - Sometimes even a person who signs up for the workshop, but you realize that they are not truly a novice, but wants to skill up. Serving as a helper can be a good learning experience. For exmaple, I'm an expert in other programming languages, but actually a novice at R. I've served as a helper at R workshops to learn the language.
- For newer instructors with little coding experience, are there lessons/tools that are recommended for first time instruction that maybe easier to teach typically than others?+1+1
  - Sarah: You should teach what you are comfortable with, if you work in code even a little, you can teach it! What we recommend instead, is that you pair with a more experienced instructor or even helpers who are more experienced in programming, but maybe not in pedagogy.
- If we organize a self-organized carpentry class can we provide certificates to learners? +1+1
  - You may issue certificates for any workshop.
- What is the ratio helper: student ratio that you recommend?+1+1
  - Sue: 1:8
  - Sarah: 1:5 is usally my goal but then that gives some buffer if things go wrong
- Do instructors in centrally organized sessions get paid?
  - Sarah: travel is paid, your time is not, for non-profit hosts. For a for-profit host there is that opportunity
- The main thing for me as an instructor is figuring out how much time I alot to specific exercises, activities, and so forth in the workshop. While the carpentries plans and episodes are excellent, I'm not sure how much time to devote to certain sections, especially when some of the episodes are quite long. Is there a guide or a breakdown for these plans play out in a instruction setting?
  - see first answer
- Can you provide (or is there already) a comprehensive appendix for reference materials used by the Carpentries? Books, citiations, etc. for the frameworks and research on which your methodology/pedagogy is based?+1+1
  - THere is a legacy version of our reference page: https://github.com/carpentries/instructor-training/blob/legacy/gh-pages/reference.md we will work to get a rendered version again soon, you can follow here:https://github.com/carpentries/instructor-training/issues/1502 about more of it how it is linked in.
  - The main resource for the trainer training is the book How Learning Works: http://www.worldcat.org/title/how-learning-works-seven-research-based-principles-for-smart-teaching/oclc/468969206
- How do you as volunteer instructors get the time to teach two full day workshops in conjunction with your other day jobs?
  - Sarah: As an academic, I am allowed to do this type of work. Most carpentries instructors are are academics or librarians or academic adjacent. Some people negotiate it to their official job requirements.
  - Sarah: Many workshops are actually taught at the instructor's employer. So then it counts as a part of work clearly. Centrally organized workshops are harder, but again, often academics are able to as well as other university or research institute staff such as librarians and those in research support roles are soemtimes able to negotiate it for the purpose of cross-collaboration. I once, as a post doc, taught a workshop and added on a research talk to the trip. I have also taught at conferences.

- If you are teaching a data carpentries, but feel like the lesson plan covers thing you don't think will fit in your style and/or lesson plan (given a class' understanding), should you try to still cover it, point them to that resource for future reference, or skip it entirely and let them discover it on their own when the time is right?
  - Sarah: you can skip it if you think that is best. However, take care that that section does not serve as a dependency that will trip you up later
- Can instructors teach any of the carpentries (data, library, software), or do they usually just specialize in one of them? And can different carpentries' episodes be combined?
  - Sarah: You certify (and get a badge) in a single lesson program. You can teach any lesson that you are comfortable with. Lessons from different lesson programs can be mixed and matched together, but splicing at the level of an episode is not recommended. See the FAQ-Curriculum section for more on mix & match: https://carpentries.org/workshop_faq/#:~:text=survey%20results%20page.-,Curriculum,-If%20I%20am
- Can you create (or is there already) a central repository where instructors can contribute lessons and episodes in a standard format linked to the respective core curriculum areas?
  - Sarah: The carpentries incubator is that place! and the carpentries lab. You can see a high level overview on the website: https://carpentries.org/involved-lessons/
  - Sarah: For a more detailed, technical description see the section in the curriculum development handbook: https://cdh.carpentries.org/the-lesson-life-cycle.html
- Is the 'multiple instructors per workshop' rule enforced for self-organised workshops? How is quality assessed/maintained and does it differ in practice from centrally organised ones? --- Is it evident in the feedback, etc?
  - Sarah: In order to use the logos, you must meet the criteria: https://carpentries.org/workshops/#workshop-core
  - You could teach from the materials by yourself, but it is, by definition, not, a "Carpentries workshop" with only one instructor
- If you try to adapt a lesson to your purpose, should you communicate that to Carpentry organizers/admnistration?
  - Sarah: You do not need to report back, only follow the license for how to reuse the material. If you change it alot, it may become a new lesson and you might want to contribute it: https://carpentries.org/involved-lessons/
-
-

This activity should take about 5 minutes.

Keypoints:

- Instructors guide learners to construct the proper big picture (accurate mental model) of the topic rather than focus on details.
- Instructors rely on frequent feedback from learners to monitor their own presentation of the material.
- Instructors introduce a few concepts at a time to avoid cognitive overload.
- The best way to motivate learners? Show them how to do something they can immediately put to use and be enthusiastic about it.
- Teaching is a learned skill.

Checkout Process
https://carpentries.github.io/instructor-training/14-checkout
Questions:

- What do I need to do to finish certifying as a Carpentries Instructor?

Objectives:

- Describe the final steps required to qualify as an Instructor.
- Schedule your community discussion session.

Instructor Checkout

-- -- *Exercise: Be The Expert: Checkout Q & A* -- --
In small groups, read and discuss one of the three checkout procedures described on this page: https://carpentries.github.io/instructor-training/checkout Make notes in the Etherpad:

- What points do you think it is most important or helpful for people to remember?
- What questions or points of confusion do you have, or think others might have? When you are done, report back to the full group about that stage of the process.

This exercise should take about 10 minutes: https://cuckoo.team/ttt

- Room 1: (point3-teaching demo)
  - Remember that you will prepare an entire lesson (all episodes therein) and the instructor trainer will call out what episode you will teach at 5-minute-live-demo-time.
  - Preview the rubric before you hold your session
  - Do not try to cram content into 5 minutes, maintain your cadence and style.
- Room 5:
  - Important: Prepare for an entire lesson, even though teaching session is a 5 min demo
  - Question: How many people are in a teaching demo at a time?
    - Sarah: 5 is typical, sometimes 6 are allowed.
  - Questions: The 5 min demos will be a combination of lecture/intro and live coding?
    - Sarah: It will be intro and live coding.
- Room 6:
  - Do the contributions have to accepted for them to count towards the checkout?
    - Sarah: no
  - Are there opportunities to improve if the live teaching demo doesn't go well?
    - Sarah: you will either "pass" or be invited to repeat
  - For the teaching demo, will you be starting at any given point in an episode? If so, will there be time to set up libraries and variables that were defined previously?
    - Sarah: you will be given a starting point at the start of an episode and you will also have a few seconds to setup anything you may need
- Room 3:
  - In what ways do folks contribute to lesson repos other than a comment?
    - Sarah: through pull requests, see the help wanted page
  - Are the 3 checkout steps activities, are we expected to do on a regular basis with Carpentries?

        - Sarah: they're only required once, but you are welcome to get involved in any way you want
    - For the teaching demonstration, who is the audience for that episode demonstration? Who is there?
        - Sarah: the trainer hosting, other trainees checking out, and possibly one trainer in training observing the teaching demo session.
- Room 4:
    - Is it better to use your permanent residence (citizenship) or physical residence (current location if temporarily living elsewhere for work, school)?
        - Sarah: for in person teaching in AMY, use your closest airport code that would be used for travel
    - Do we have to do follow-up training or refresher training if it has been a while since we have had our initial training sessions?
        - If so, are these follow-up or refresher training sessions free?
        - Sarah: None required, but some opportunities for community are available. If this is something you are interested in, please share, it's something the trainer community and instructor development committee want to know about.
        - Sarah: You could also join that committee.: https://carpentries.org/inst-dev/
- Room 2:
    - If the links for what we need to do were a bit more straightforward it would help ensure that things don't get lost in the shuffle.
        - This is it:https://carpentries.github.io/instructor-training/checkout.html
        - You can track your progress (with some delays of ~1 week for things to be logged) in AMY
    - Is there a data protection issue with just having all of these emails, names, etc on public etherpads? Yes
        - Sarah: yes, and the carpentries is aware and working (albiet slowly) on alternative paths, you always have the choice to use a psudonym to hold a spot and email the trainer involved to sign up for a demo or core team for other activities. These processes are old and slowly being updated. AMY was recently majorly updated and workshop signup moved there, other things will move over time.
- Room 3 again:
    - I remember y'all saying that we should be programming in the same environemnt as the students to reduce cognative load. What editor or IDE we expect students to be programming in?
        - Sarah: each lesson has a setup page for learners, you can follow it too.
        - Sarah: many instructors have a separate login or preset settings they toggle for teachign to use a standard environment, though they work in a customized environment

-- -- *Exercise: Schedule a Discussion or Demo* -- --
Visit the discussion Etherpad to sign up for a session: https://pad.carpentries.org/community-discussions
If the session you would like to attend is full, contact the discussion host and co-host to ask if you can attend.
If you would prefer to do your teaching demonstration before your discussion, visit the demo Etherpad and sign up there: https://pad.carpentries.org/teaching-demos This demo rubric is provided as a guide for Trainers evaluating potential new Instructors during the teaching demonstration.
This exercise should take 5 minutes.

What is a Carpentries Workshop? The Rules.

Using the Names and Logos
https://carpentries.org/workshops/#workshop-core

Recruiting helpers:
https://docs.carpentries.org/topic_folders/hosts_instructors/hosts_instructors_checklist.html#helper-checklist

Materials
https://carpentries.github.io/instructor-training/LICENSE.html

Reporting a 'Mix and Match' Workshop

- https://amy.carpentries.org/forms/workshop/

Instructor Certification is Comprehensive

Carpentries Jargon Review
-- -- *Exercise: Test yourself!* -- --
As a class or in groups, see how many of the following terms you can define.

- Lesson
- Episode
- Workshop
- Lesson Program
- Instructor
- (Instructor) Trainer

This should take about 5 minutes.

How to Organise a Carpentries Workshop Locally

https://carpentries.org/workshops/#workshop-organising

The Carpentries Handbook: https://docs.carpentries.org/ includes:

- templates and checklists https://docs.carpentries.org/topic_folders/hosts_instructors
- policies https://docs.carpentries.org/topic_folders/policies
- much more!

Callout: Teaching Opportunities: Local and Global
Instructors mailing list: https://carpentries.topicbox.com/groups/instructors

-- -- *Exercise: Explain to a partner* -- --
With a partner, take turns asking and answering the question: “I want to organize a workshop! What will I need to do?” One partner should ask about a self-organised workshop, and the other can ask about a centrally-organised workshop. If you have a third person, they can help out with follow-up questions or answers as needed.

When you encounter new questions during this process, be sure to write them in the Etherpad.

Leave about 10 minutes for this discussion.

- For a centrally-organized workshop, does the person requesting a workshop need to be a badged Carpentries instructor?
- Are there different checklists to follow depending on if you are having a centrally-organized or a self-organized workshop?

-- -- *Exercise: Get Connected* -- --
Take a couple of minutes to sign up for The Carpentries channels you want to stay involved with on this page: https://carpentries.org/connect/ When you are done, share a channel you find interesting or useful on the Etherpad.
This exercise should take about 5 minutes.

Keypoints:

- The Carpentries materials are all openly licensed, but names and logos are trademarked.
- Carpentries workshops must cover core concepts, have at least one certified Instructor, and use our pre- and post-workshop surveys.
- [Guidance for teaching and hosting workshops](https://docs.carpentries.org/topic_folders/hosts_instructors is provided in [The Carpentries Handbook](https://docs.carpentries.org).

Live Coding is a Skill

https://carpentries.github.io/instructor-training/17-live
Questions:

- Why do we teach programming using participatory live coding?

Objectives:

- Explain the advantages and limitations of participatory live coding.
- Summarize the key dos and do nots of participatory live coding.
- Demonstrate participatory live coding.

Why Participatory Live Coding?

Exercise: Up and Down
List some advantages (+) and challenges (-) of participatory live coding from both a learner’s and an

instructor’s point of view in the Etherpad.

Instructor advantage

- Minyoung Wyman, Less prep work if you know how to code well.
- Ken Lui - intuitive and step-by-step illustrations that make participents easier to comprehend
- Kinnothan Nelson - Allows for very directed instruction.
- Chris Young - Demonstrate in real-time how to perform some of the specific exercises for participants in the episode to view and ask questions.
- Simon Stone - Keeps the pacing slow, explain through code directly
- Jentry Campbell -You get to be with everyone at once so they can copy what you are doing on the screen.
- Jackson Hoch: Helps learners to follow along as you go. Makes questions easier since learners are following along. If coding live, you typically can plan ahead more easily by following the set plan and make connections more easily.
- Ford Fishman lets you change material on the fly or re-run segments with different examples
- Bryan Scott can adjust as needed to what learners need
- Simeon Wong
- Will Cowen: opportunity to slow down; helps keep thoughts and presentation organized; opportunity to show counter examples on the fly
- Kristina Bush - + engaging, participatory & active learning, allow for making mistakes and demonstrating growth mindset, real time demo; - can get flustered when mistakes happen, hard to practice, pacing, doesn't work as well in hybrid or digital format
- Alexander Smith - Not abstract, have something to refer to, less prep time, can demo to answer q's, *can* be more visually interesting than static slides
- Taylor Woods - engaging format to connect with learners
- Kathleen Chappell - be able to show real examples and demonstrate how things work!
- Allie Tatarian - You can be sure that the steps you are teaching will actually work
- Nicole Brewer - from the learner's perspective, live coding is better because they aren't learning just the principles, they are learning to use code in practice.
- Emily Yaklich - instructor also gets the opportunity to learn and debug and work with the material
- Ben King - from a learners POV, switching screens on small devices is challenging. Clear direction to say 'code now' and 'listen now' can be really useful. From an instructors POV, maintaining attention, enthusiasm and participation is made much easier by a quality live coding session.
- Sofia Fertuzinhos - it nakes you look human to learners. Lead by example. You have the chance to experience what the learners may be going through and that way you connect more with them.
- Lilly Linden +collborative learning reduces percieved barriers +Learners can see that everyone (even experts) make mistakes
- Dara Farrell-Better able to concretely explain certain confusing point for learners

learner advantage

- Minyoung Wyman, Great to see it in action with explanations in real time.
- Ken Lui - can ask question instantly if they don't understand some parts

- Kinnothan Nelson - Provides opportunity to link theory with pracice. Gives student ability to provide concrete feedback regarding understanding and/or misconceptions.
- Chris Young - The learner can follow along with the instructor as they complete exercises in the episode. If the instructor provides the space to do so, the learner can also ask questions as they follow along.
- Simon Stone - The pace should be more manageable, as hands-on as it can be, learning by example, seeing how the instructor navigates the IDE and deals with unforessen issues
- Jentry Campbell - You get to see what to do and where to do it-easier to replicate what you see than read about it and execute.
- Jackson Hoch I don't quite know what occured here. o
- Ford Fishman - intuition of how code was typed out and how the instructor constructs the code
- Bryan Scott active, keeps students engaged and respects working vs long term memory
- Simeon Wong - immediate application helps with knowledge retention and integration. having practiced the skills already in the workshop, they will feel more comfortable using it in practice.
- Will Cowen: slower pace means more time to absorb info; get to see how one's own system reacts to commands in a supported environment; get immediate feedback if something goes wrong.
- Kristina Bush - active learning, participatory, get to practice and benefit from cognitive advantages of this type of learning, more engaging and welcoming. Activating prior knowledge through episode scaffolding
- Alexander Smith - get's to see the whole process in real-time. Instructor can provide better explaination - they just did it! Can compare your work to the example at the front to see where you went wrong. Novices get to see the 'next-level' experience
- Taylor Woods - hands-on learning, develop skills to help in research, jobs, etc.
- Kathleen Chappell - able to type things in themselves and get real world experience. Be able to make mistakes and fix them.
- Allie Tatarian - Hands on, can compare your work to your instructor's in real time
- Nicole Brewer- From the instructor's perspective, it's easier to "show" instead of "tell".
- Emily Yaklich - get to see the code being run in real time and get to follow along
- Ben King
- Sofia Fertuzinhos - they not only learn the lines of code but also the style of a person doing it so. By seeing someone coding it may seem more achievable. Also, coding live will slow down things to a doable pace for learners (hopefully!)
- Lilly Linden +learners are likely to continue even after they make errors +Slows down the process of learning to allow for better retention and confidence in the skill being taught+Promotes a growth midset
- Dara Farrell-real-time feedback

instructor disadvantage

- Minyoung Wyman, Lots of mistakes which feel frustrating because it might get in the way of getting throught the material efficiently.
- Ken Lui - mistakes might make the instuctor feel nervous frustrating
- Kinnothan Nelson - Requires additionals preparattion and development of a standard environment.
- Chris Young - There is the potential for errors to occur if the terminal/prompt has not been configured properly. There is also the possibility for all planned exercises not getting covered if participants are struggling to keep up.

- Simon Stone - Additional cognitive load of typing and talking, improvisational skills required if something goes wrong, boilerplate code eats up time: organizing your notes and the coding environment on your screen may be challenging
- Jentry Campbell - Pacing and being sure to speak everything you're typing. Skipping bits because we've done them once in the sequence and the instructor knows they are used every time without clearly stating that is an issue I've encounted in learning.
- Jackson Hoch The pacing can be difficult. At times if instructors get too focused on the coding part, they lose the teaching element where they aren't being as interactive with explanation as they should be. There's an ability for mistakes (but this can also be a good thing).
- Ford Fishman - can be time consuming to type out certain pieces of code, as well as fatiguing
- Bryan Scott cognitive load for the instructor, more complicated task than just presenting
- Simeon Wong - talking and typing cognitive load. need to have separate lesson plan and have tried and prepared beforehand. might be interrupted by students who need help.
- Will Cowen: sometimes environments get in a strange state, providing interesting/frustrating errors; coding live can introduce unexpected errors or bugs that you have to be able to competently overcome
- Kristina Bush - hard to pace and practice, anxiety inducing!
- Alexander Smith - if it goes wrong and you get stuck that can be awkward... If a student gets stuck and the setup is different then that can be difficult. Tendancy to look at the screen rather than moving and engaging with the audience.
- Taylor Woods - lots to prepare, high risk of unexpected technology issues (low bandwith for remote instruction, computer issues/failure)
- Kathleen Chappell - hard to talk and type at the same time! issues can take time to resolve. Many learners may need assistance at the same time, which you need to account for in your lesson planning. Can forget to cover important topics or concepts if doing a live demo.
- Allie Tatarian - Technical issues can derail your lesson, and you might not have a backup
- Nicole Brewer - For the instructor, it may take more prep to get an environment set up and correctly shared, and it may be more taxing cognatively because there is mroe to keep track of
- Emily Yaklich - might forget to say something or include something in the lesson
- Ben King
- Sofia Fertuzinhos - it is stressing to code live
- Lilly Linden- Set up issues -the learners have different starting levels of comfort
- Dara Farrell-difficult to satisy the learning pace of all learners

learner disadvantage

- Minyoung Wyman, Might go a little too slowly if you know something about the topic already. May not be able to copy exactly if the instructor is using keyboard commands and shortcuts
- Ken Lui - live demonstration that cannot do a playback; they cannot go back and reviewthe steps they missed
- Kinnothan Nelson - The student generally cannot do any work independently and is dependent on the instructor and coding environment functionality.
- Chris Young - If a participant falls behind during the sesssion and the instructor does not go at a slow enough pace to keep them involved, the participant may just stop participating in the episode.
- Simon Stone - Increased cognitive load; if something goes wrong on the learner's end that works on the instructor's end, troubleshooting can be challenging;
- Jentry Campbell-pacing and not getting lost when you make an error.

- Jackson Hoch - Learners will all be running at different speeds. Some will feel it's too slow and others will think it's too fast. When focusing on the line coding, it can be difficult to draw larger connections sometimes.
- Ford Fishman - slow typers may fall behind
- Bryan Scott harder to build overall structure/attention management
- Simeon Wong - some learners are more comfortable reading a document (eg. slides / transcript) and may be daunted by having to watch & absorb live information
- Will Cowen: if you fall behind you can get overwhelmed quickly; it can be hard to listen to the 'why' when you're deeply focused on the 'what'; slow typists can get stranded frequently, leading to sapped motivation.
- Kristina Bush - software set up issues, can get left behind. Doesn't work well for hybrid. Not UDL friendly because only one way of learning content
- Alexander Smith - can get left behind and then that's it for the day really / demotivation. The share screen experience on hybrid often removes the room/presenter view which makes the experience pretty non-engaging
- Taylor Woods - skill levels; if you come in without the adequate prep/training high risk for demotivation
- Kathleen Chappell - may not be able to keep up with the pace of the lesson. If your instructor goes quickly, it can be hard to focus on typing the appropriate code and understanding the concept at the same time.
- Allie Tatarian - Hard to pay attention and type at the same time
- Nicole Brewer - if learners are unable to complete a particular step, they may fall behind because the steps are dependent on each other, whereas in a presentation style they could continue to follow along.
- Emily Yaklich - those who are moving more quickly may feel bored and those who move slower may feel like they cannot keep up. Also, hard to get a copy of the material afterwards if it is being taught live compared to a powerpoint (I know the webiste tutorials are there, but from the student perspective it might seem more difficult)
- Ben King
- Sofia Fertuzinhos - It may be hard to type and follow the instructor coding and speaking/explanation at the same time
- Lilly Linden - some learners can get flustered becuase they feel like they are competing against others to get things right, -slow learners struggle
- Dara Farrell-might be difficult to remember all sequences of commands (with applicable shortcuts) if there isn't something like a transcript or command history that is distributed after

-- -- *Exercise: Compare and Contrast* -- --

Watch this first participatory live coding demo video: https://youtu.be/bXxBeNkKmJE and this second demo video: https://youtu.be/SkPmwe_WjeY as a group and then summarize your feedback on both in the Etherpad. Use the 2x2 rubric for feedback we discussed earlier.

In the videos, the bash shell for loop is taught, and it is assumed learners are familiar with how to use a variable, the head command and the content of the basilisk.dat unicorn.dat files.

Note: Sometime sounds in the room can be poor. Turning on closed captioning by pressing the cc button will improve the accessibility of these videos.

First video

Content

- Positive
    - Really good content
    - Good demonstrating recovering from errors
    - explaining what is being done
    - Does explain the code

- Constructive
    - Increase font size+1+1
    - Would like to see him narrate what he types a little more, especially since it's hard to see+1
    - Could explain what a for loop is a little better
    - Explains the code but does so after the command is executed
    - Speaking volume low, could project more

Delivery

- Positive
    - Gives students time to write out the code
    - Not rushed, which is good. +1+1
    - Repeats explanation for what he's doing after doing it
    - slow typing+1
    - Explains what lines are doing
    - good pacing
-
- Constructive
    - Should come back to eye contact with students when not coding
    - Should read out what is being typed +1+1
    - Text should be bigger, should speak as he types, turn off notifications +1
    - Not explaining what he's doing as he's doing it
    - Distracting content in background+1+1+1
    - Speaking to his laptop, not the room +1
    - Missing a red sticky note+1+1+1
    - Going really fast
    - Not engaged with the audience
    - too many wondows open, didnt look at the audience, small fnt
    - terminal not full screen; getting notifications throughout
    - Not talking through each line character while coding
    - sitting down; not engaging with learners

Video 2:
Content

- Positive
    - Uses sticky notes to allow learners to indicate questions
    - Engages with audience (eye contact, to get a sense of how the material is being received)
    - Explains why to use a for loop

    - very big font
    - interactive. uses more than one way to convey/indicate code
    - Good job describing the purpose of for loop
    - explaining the > vs. $ prompts
    - Does point to the code to explain each section
    - Plain background with large text
    - Good explanation line by line of what's happening and why+1
    - explaining error and debugging+1+1+1
    - explained variations/possible unexpected issues and dove deeper into the content
    - After typing, takes time to go through the lines and explains with pointing.
    - Explains misc. syntax that could be confusing to new users (dollar signs, etc)
- Constructive
    - Not sure he explained what a variable is
    -
    -
    -
-

Delivery

- Positive
    - Sees the red sticky and responds +1+1
    - Checking in with learners+1
    - Moving and pointing to slides ---- dynamic +1
    - Looking at the audience+1
    - pointing to screen
    - standing - more active stance
    - interactive teaching --> getting up and walking around+1
    - Good text size, much larger! +1
    - Simple background+1
    - Speaking what he types and then explains each line and what it does
    - Standing up, connecting with learners using gestures
    - Narrating what he types +!+1
    - Gesturing at the lines as he talks about them+
    - explains what he's going to do, does it while stating what he's doing, and then reviews what he did
    - Explains typo pretty well as a learning moment
    - Standing
    - Pointing at things
    - Describes what he's doing **before** the typing
    - Verbalizes what he is typing as he types it
-
- Constructive
    - Might be more clear to use his mouse to point instead (and change mouse to a large bright pointer)+1
    - terminal still not full screen+1+1
    - Could use a laser pointer or stick pointer so his hand doesn't go in front of the text
    -

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-
- Top Ten Tips for Participatory Live Coding in a Workshop
-
- 1) Stand up and move around the room if possible. This makes the experience more interactive and less monotonous. Use a microphone if one is available to make it easier for people with hearing difficulties to hear you.
- 2) Go slowly.
- 3) Mirror your learner's environment.
- 4) Use your screen wisely.
- 5) Use illustrations
- 6) Turn off notifications
- 7)Stick to the lesson material.
- 8) Leave no learner behind.
- 9) Embrace mistakes.
- 10) Have fun!
-
-
- -- -- *Exercise: Practice Teaching* -- --

- Split into groups of three.
- Assign roles, which will rotate: presenter, timekeeper, note-taker.
- Have each group member teach 3 minutes of your chosen lesson episode using live coding. For this exercise, your peers will not "code-along." Before you begin, briefly describe what you will be teaching and what has been learned previously. Do not record this exercise.
- After each person finishes, each group member should share feedback (starting with themselves) using the same 2x2 rubric as yesterday. The timekeeper should keep feedback discussion to about 1 minute per person; this may leave some time at the end for general discussion. The note-taker should record feedback in the Etherpad.
- Trade off roles.

- This exercise should take about 25 minutes.

Room 1

(Ford):
Positive Content:

- good description of concepts, pace went well
- examples worked well

Constructive Content:

- need to enable environment before running examples
- mention how you would run the Python code outside of Google Colab

Positive Delivery:

- good eye contact (or whatever zoom equivalent is)

Constructive Delivery:

-

(Ken):
Positive Content:

- Explained ls command well

Constructive Content:

- Better familiarity with the notes (self-feedback)
- typed out some random characters into the prompt to , might be confusing for learners

Positive Delivery:

- Good pacing and cadence

Constructive Delivery:

- Using WSL looks a little different

(Kathleen):
Positive Content:

- Explained and typed at the same time

Constructive Content:

- Need to prepare more (self feedback)
- Did not explain home directory

Positive Delivery:

-

Constructive Delivery:

-

Room 2

(Emily):
Positive Content:

- Good introduction
- explained conventions

Constructive Content:

- Make typed comments as I am going along with the markdown text

Positive Delivery:

- Well-paced and slow enough

Constructive Delivery:

- Again, comments would help break up the coding itself and the explanations

(Dara):
Positive Content:

- Really good recap of what has been covered already/introduction
- Mentioned shortcuts and other helpful things to follow along and keep content interesting

Constructive Content:

- Technical difficulties a bit distracting

Positive Delivery:

- Enthusiastic

Constructive Delivery:

- Technical diffuculties made it harder to follower

Room 3

(name):
Positive Content:

-

Constructive Content:

-

Positive Delivery:

-

Constructive Delivery:

-

(name):
Positive Content:

-

Constructive Content:

-

Positive Delivery:

-

Constructive Delivery:

-

(name):
Positive Content:

-

Constructive Content:

-

Positive Delivery:

-

Constuctive Delivery:

-

Room 4

(name): Kinnothan
Positive Content:

- Nice introduction about where we are in the lesson, as if coming back from break
- Talks about what we are going to learn before we learn it

Constructive Content:

- Didn't explain astrisk. Actually did get around to it but called it a "wildcard" which might be confusing for a novice

Positive Delivery:

- Explained small mistake as it happened

Constuctive Delivery:

- Could have used pointer to show **where** we are supposed to be looking, much like we point at a screen when we are in person
- I would suggest slowing down when referencing the up arrow, so users have time to find it on their keyboard

(name): Nicole Brewer
Positive Content:

- Good introduction; goes over a nice outline of the objectives

Constructive Content:

- Code was already typed out and went back to type in and edit

Positive Delivery:

- Good pacing
- Engaged learners with questions

Constuctive Delivery:

- Went a little quickly because the code was pre-written, could be difficult to follow if learners are live-coding
- Thanks! Maybe I will have the equation written in markdown and translate that into code live

(name): Taylor Woods
Positive Content:

- Explained what we will be learning and what we learned yesterday

Constructive Content:

- explains some acronyms (chr for character)

Positive Delivery:

- Highlighted and used mouse to show where thing things she was talking about it in

Constuctive Delivery:

- Speedy because we were behind time

Room 5

Feedback to KristinaB:

Positive Content:

- good roadmap of where we are going

Constructive Content:

- Perhaps too much time on review, wanted to get to content faster. Would spend less time reviewing.
- You showed contents of start location, but didn't show contents of destination, uneven demonstration

Positive Delivery:

- defined Terms (directory/folder)
- good verbs ('move' between directories)
- explicit call for feedback

Constructive Delivery:

- What assumptions do you have of your audience. It was unclear the expectations of the audience, perhaps a bit uneven.
- Pauses absent to allow for passive feedback

(name): Will
Positive Content:

- Good review of what’s already happened
- As you recall is good motivating language

Constructive Content:

- In person, would provide more time for students to follow along and keep a glossary. Online delivery method isn't conducive to these learning aids

Positive Delivery:

- Great pacing and engaging delivery

Constuctive Delivery:

- More explanation of what happens when you open the text editor, this could be a cognitive overload moment
- Provide more time for students to follow along
- Said “simple”

(name):
Positive Content:

-

Constructive Content:

-

Positive Delivery:

-

Constuctive Delivery:

-

Room 6

(Alex):
Positive Content:

- Interesting topic, that is very useful and takes a short-time to learn

Constructive Content:

- Speaking what is typed

Positive Delivery:

- Clear comfort with topic, confident speaking about it

Constuctive Delivery:

-

(Jentry):
Positive Content:

- Clear connection to other languages
- Good setup ---> quick to get to content
- Good recovery

Constructive Content:

- Might have been nice to see the structure of the data structure (but appreciate prep time issue)

Positive Delivery:

- Good error recovery
- Went back well and corrected mistakes, and explained things in more detail where necessary

Constuctive Delivery:

- Bigger font size+1

(Ben):
Positive Content:

- Great explaination of a function taking arguments
- Great correction by getting the argument list when unsure

Constructive Content:

- Perhaps a larger font (for hybrid format)

Positive Delivery:

- Good pace & pausing for emphasis
- Demonstrated the layout of RStudio well, drawing attention to terminal at appropriate times with good explanations of what was seen

Constuctive Delivery:

- I'd love to have seen your face
- Bigger font size

Room 7

(name): Minyoung
Positive Content:

- Very clearly delivered
- Good explanation of the purpose

Constructive Content:

- font size

Positive Delivery:

- Good pace
- avoid apologizing for typos

Constuctive Delivery:

- Getting more familiar with typing and speaking

(name): Lilly
Positive Content:

- font size increase good
- explained the well

Constructive Content:

- get familiar with the episode
- Packages don't need to be in the script
- Use/teach toggle up/down

Positive Delivery:

- easy to listen to
- Pace good

Constuctive Delivery:

- Get better at typing and speaking
- practice

(name): Jackson
Positive Content:

- Great for a novice

Constructive Content:

- run the code
- Clean work space
- asked for participation from learners

Positive Delivery:

- Relaxed after a couple of seconds
- Good pace

Constuctive Delivery:

- Practice

Room 8

Sofia:
Positive Content:

- Explained context very well
- I've never used R or the environment Sofia was using, but what she was doing still made sense to me as someone jumping in the middle of a lesson :)

Constructive Content:

-

Positive Delivery:

- Sofia started by explaining what should be set up so far, and said that anyone who wasn't set up can get help from the room's helpers, which I thought was a really nice touch
- Good pace for people to follow along, and repeated concepts where necessary or helpful

Constuctive Delivery:

- Can use more smoothness in delivery that will come with more practice

(name Allie):
Positive Content:

- Allie gave a very good contextualization of where were learners in the lesson and explained the code nicely, with good clarifications at some points

Constructive Content:

- As a person that doens't know anything about bash I cant say anything about the content. Allie was very at ease which made me feel that it was correct.

Positive Delivery:

- Engaging and dynamic presentation. Even though the setting is virtual I could feel the excitemnet and ease with the teaching material

Constuctive Delivery:

- for a slow typer that I am, Allie typed a bit too fast. Also, they used the return key which was also too fast.

Keypoints:

- Live coding forces the instructor to slow down.
- Coding-along gives learners continuous practice and feedback.

- Mistakes made during participatory live coding are valuable learning opportunities.

-- -- *Exercise: Evaluate Learning Objectives* -- --
Select one learning objective from the episode you’ve used for teaching practice. Copy it into the etherpad then add numbers below your objective to address the following:

- Write your learning objective in the Etherpad.
- Suppose a learner had mastered this objective, and wanted to try something more cognitively challenging on the exact same topic (i.e. not a next step in a workflow). Identify an objective they could work towards next.
- Suppose a learner struggled to meet the specified objective. What might they be missing? Identify one more fundamental thing a learner needs to be able to do in order to be successful in meeting this objective.

- Minyoung Wyman R for Reproducible Scientific Analysis - Functions Explained - define a function that takes arguments.
    - make a function(s) that can iteratively import files with a fixed pattern in the file name (file1.txt, file2.txt, file3.txt) and process the data to output summary statistics (e.g., mean of the first column of data) on each of the files
    - Learner would have to know how to use a path and pattern matching. Learner would have to learn about grep(), gsub(), and paste() functions.
- Ken Lui -
    - Objective: Use shell commands to work with directories and files
    - If they know how to do this, they should be able to change to a specific directory and use the `ls` comand with flags to showcase some customized information
    - They might have messed up different comands and therefore could not get the result.
- Kinnothan Nelson
    - **Learning Objective:** Write a loop that applies one or more commands separately to each file in a set of files..
    - **Next Objective:** Writing shell scripts using loops and previous learned commands and controls structures.
    - **Fundamental Learning Requirement:** Learners need to understand the basics of working, files, directories, basic commands.
- Chris Young - "The Unix Shell"
    - Objective: Explain when and why command-line interfaces should be used instead of graphical interfaces.
        - Next objective: introduce the learner to some of the commands that demonstrate why a learner might use a commend-line interface to complete a task more efficiently and accurately than a graphical user interface.
        - One more fundamental: The episode provides one example of why someone would use a CLI versus GUI. I think providing some more examples would benefit the novice learners. We could then have a discussion where learners speculate on what they could do or hope to do in the episode. It gives them a goal to strive towards as they are likely taking the workshop to achieve said goal, eventually.
- Simon Stone "Software Carpentry: Programming with Python" -
    - Objective: Correctly write for loops to repeat simple calculations.
        - If they know how to do this, they could tackle a list comprehension next
        - If they struggled to meet this objective, they may have not understood what a list is

        and how indexing works. "Unrolling" the for loop and manually getting each element by index might help to clarify this.

- Jentry Campbell
    - Libraries SQL Ep 2.: Understand how to build queries, using SQL keywords such as DISTINCT and ORDER BY
    - Learner 1: Create a complex query that selects distinct items ordered by two variables. Also explore what the limits of ordering is.
    - Learner 2: Understanding what DISTINCT actually means, and the difference between ascending (gets bigger) and descending (gets smaller)
- Jackson Hoch
    - Objective: "
    - "Employ the ‘pipe’ operator to link together a sequence of functions."
    - For students that understood this concept/instructor examples, I would move them to the challenge section where they are able to work on an example.
    - For students who have trouble understanding the "pipe" operator, I would run through more examples and possibly revisit the nested functions which lead into this section.
- Ford Fishman
    - "Programming with Python: Storing multiuple values in a list"
        - Objective: Append values to an existing list
            - I would want the learner to try to append several values to a list. This way, they can see how to add a lot of values to the list at a given time
            - The learner might be missing that they need to initialize the list before trying to append to it. Therefore, they might need to master initializing lists first.
- Bryan Scott Data Carpentry: Intro to Python Starting With Data
    - Objective: Access and summarize data stored in a DataFrame.
        - characterizing the statistics of the data stored in the dataframe using built in methods
            - what about parts of datasets?
            - an understanding of how methods/attributes of objects relate conceptually to the objects themselves
- Simeon Wong The Unix Shell ep 6: Shell Scripts
    - "Write a shell script that operates on a set of files defined by the user on the command line"
    - mastery: write a shell script that defaults to a set of files, but can be overridden by the user on the command line
    - essentials: bash arguments (could separate this from file iteration to break down the concepts), variables, fixed shell scripts
- Will Cowen: Version Control with Git ep 4: ~~A new hope~~ Tracking Changes
    - 1 (objective): "Distinguish between descriptive and non-descriptive commit messages."
    - 2 (mastery): Share your commit messages with a peer, see if they understand the story of what has happened with your file over time and can describe it accurately back to you.
    - 3 (difficulty): Make six changes and write commit messages for each. Print the log as we have shown, and read back the story it tells about your file. How would you change the lines of the log to make the story more useful to yourself in the future?
- Kristina Bush - Libraries: Working with Files and Directories: "Use commands to move/rename, copy, and delete files"
    - mastery: use wildcards to rename, move, and copy files to a new directory
    - difficulty: the learner may be struggling to understand where they are in the directory or

    the filesystem. I would encourage them to practice using pwd, ls, and cd to move around their filesystem before moving on to using more advanced commands. Try incorporating pwd and ls into every step to assess and check location before using more advanced commands.

- Alexander Smith - Explain what a for loop does. Correctly write for loops to repeat simple calcs.
    - Confident:
        - I'd get them to try and calculate a value/performing operations by looping over the list of numbers? Or maybe sticking to something smaller like incrementing a variable.
    - Stuck:
        - They might have missed the link between the iterator variable getting its value and manually typing the list index in the print statement. I suspect this might need repeating with an example where the variable is assigned a number and then used e.g. print(odds[num]) and then using the for num in <whatever>:.... Might need a helper's attention
- Taylor Woods
    - Read a dataframe in R and describe its structure
    - Mastery: the learner could use their own datasets or find new datasets on the internet to work with dataframes that have more complex structures (e.g., including date-time variables)
    - Struggle: an issue could arise if the user did not install the tidyverse package which contains the functions to read and explore dataframes in R used in the lesson. To work around this, similar functions in base R could be used that don't require loading tidyverse
- Kathleen Chappell - The lesson I chose was "Version control with Git", and the episode "Tracking Changes". The learning objective is to be able to work with a git repository to modify, add the modified files and commit the changes with a helpful commit message. An objective someone who had mastered it could be to look back at old changes in the log and see which commit messages worked for them. They could brainstorm how to implement adding and comitting files in their own work. For those who are having difficulty, we could see if there is any underlying misconceptions they have or missing information they need. Perhaps go over how files aren't tracked by git until they are added, and they are "staged" when added, and added to the repository history when committed. They also may be missing files or saved changes to those files and cannot add them to the repository. Essentially, take a status check of those who are struggling and try to meet them where they are to move them forward.
- Allie Tatarian - For tracking changes in git: Go through the modify-add-commit cycle for one or more files. If someone has mastered this, we could talk about HOW to modify-add-commit in a way that is most useful for other team members and your future self. For people who are struggling, we could talk about the git model - where and how things are staged, and how git works - the more foundational ideas behind the modify-add-commit cycle, or they could need more foundational help with bash.
- Nicole Brewer - "Programming with python: Creating Functions" - One objective is to set default values for function parameters. I could text this knowledge by asking the student to modify an existing function so that a specified parameter has a specific default. Then I could ask then to run the function with implicit default parameters. One way they could get tripped up is that they might still explicitly use the default values in the function call. To overcome this I might encourage them to still run that code to make sure that when we do remove the defaults from the function call that the output is still the same.
- Emily Yaklich - objective: "Perform basic mathematical operations and summary statistics on data in a Pandas DataFrame. (python)"

    - 1. For moving forward, I would suggest maybe application of more complex statistics on the dataframe or choosing specific rows/columns to perform the statistics on. Additionally, plotting of the statistics is a next step as well.
    - 2. For a learner who is struggling to meet the objective, I would suggest taking a step back and really understanding the dataframe structure as well as how it can be used in Python which I believe will help in understanding how to summarize the dataframe statistically.

- Ben King - Understand how to subset rows and columns from a dataframe using dplyr. Something more challenging would be; how to subset rows and columns based on multiple conditions in dplyr. Or, how to subset a dataframe based on columns containing a string. If they struggled, they may not understand the concept of a dataframe, with columns and rows sufficiently, so we could back them up, explain that concept and the concept of tidy data again.
- Sofia Fertuzinhos - Lesson: Data Analysis and Visualization in R for Ecologists, Episode: starting with data- Learning objective: Loading the survey data - The learner might want to explore more arguments within the function read.csv(). The leaner would need to feel confortable looking into the specifications of this function which I would suggest them geting familiar with the help section in RStudio or exploring the website tidyverse and explore their explanantions of the different arguments.
- Lilly Linden - successfully loading Survery data. - advanced - try to load data from different sources
    - If not successful - break down the syntax understand what each part of the code does and trying again to load the data
- Dara Farrell- Write and build queries.
    - Writing more complex queries (combining commands) or identify possible query errors and how to fix them. Bonus: I might let them explain what they've done with others who might also want to work on something new on the same topic in a small group
    - A learner might be struggling with remembering or understanding the commands themselves. I'd provide a list of commands and what they do, as well as a diagram to show what a command might do; maybe a Venn diagram approach e.g. SELECT * is the whole set and SELECT year is a subset.
    - Combining queries might be difficult to visualize. I think a Venn diagram approach might also be useful here, breaking down each component of the query.

Beware the Urge to Complicate

Prepare to Use Formative Assessments

Metacognition: learner awareness of their own process and progress can support continued effort beyond the workshop

-- -- *Exercise: Where are your Checkpoints?* -- --
Have a look at your learning objective again and identify *where* in the lesson that objective should reasonably be achieved. Share below if you found that clearly or had trouble finding that.

- Minyoung Wyman I found it towards the beginning of the episode, almost immediately, but in the context of the lesson it was halfway in. I will know if it was met if I see the students stop asking questions.

- Ken Lui
- Kinnothan Nelson - The learning objective is found in the third activity of the episode. I was able to find it but it would be nice if there was an indicator (possibly just for instructors), that an excercise relates to one of episodes' learning objectives.
- Chris Young - "The Unix Shell"
    - Objective: Explain when and why command-line interfaces should be used instead of graphical interfaces.
        - It needs to be covered at the very beginning because it justifies why learners take the episode within the lesson. It is there at the beginning, so it's in the right place. However, as it's a very broad objective there needs to be more examples than the one provided. The instructor may use it as an ice-breaker with learners to find out more about why they are learning the Unix Shell versus a GUI that may be cost-prohibitive, slower, and less efficient. Entering into a dialogue with the learners would be a method for verifying the objective has been met.
- Simon Stone "Software Carpentry: Programming with Python" -
    - Objective: Correctly write for loops to repeat simple calculations.
        - About 1/3 of the way through the episode the general pattern for a for loop is summarized. At the latest, the learners should have achieved the objective here. Since some specific examples came before this definition, some learners may have already been able to generalize those and achieved the objective sooner.
        - Thinking about it more closely, the objective is a bit vague, actually. What is "a simple calculation"? Is calling a single function in a for loop enough? Or would they have to be able to manipulate the elements in the list? Or do an aggregation of some kind? If it's just about the syntax, then the above is the right checkpoint. But if it's about competently applying the for construct, it may be later in the episode or even only after doing the suggested exercises.
- Jentry Campbell - It is a combination of two subepisodes in the episode, the first is the subepisode on unique values, the second is the subepisode on sorting. Very clear. If they can complete the query and structure the challenge query at the end, they can do it. If they can recall it later, the learning objective has actually been met.
- Jackson Hoch -
    - This would be completed prior to data visulization episodes as it is important setup for that. It would come in the section on data manipulation.
    - A way to know if students understand pipes would be to run through examples and leaving time for questions/feedback. I know if it is met if the majority of students are able to run through the challenge section of the episode with understanding and doing the majoirty of the challenge section on their own with little to some help.
- Ford Fishman
    - "Programming with Python: Storing multiuple values in a list"
        - Objective: Append values to an existing list
            - Should be somewhere in the middle, there are clearly things you need to learn first, but it's a pretty core part of lists.
            - I will know the objective has been met if when asking the learners how to add items to the end of a list, they use .append() correctly with that list.
            - It was a little hard to find bc it wasn't emphasized too strongly. It was a little further down than I was expecting, as well
- Bryan Scott the objective is framed in terms of applying it to computing the statistics of the dataframe, while the objective is to summarize the content of the data. This is a fairly complicated and integrative task, so it's pretty late in the episode, and requires mastery of df attributes.

- Simeon Wong
    - Achieved with `bash middle.sh pentane.pdb`
        - Can test with "how can we run octane.pdb instead?"
- Will Cowen - After the first and again after the second commit, better on the second commit at about 40% complete, which allows us to compare multiple messages. This might be a good time to introduce a bad commit message as a counter example and ask for corrections, or to ask for bad counterexamples from the class.
- Kristina Bush - it's in the lesson, clear. It's at the end of the episode, students use mv to rename text files as the book title. The activities for rm and cp are not as defined, look more like additional exercises for extension. They could be formalized to give the students better self-assessment of these skills.
    - The learners will all be able to use ls to show that the two text files have been renamed to gulliver and optiks. Use sticky notes to show when complete. For extended, students can use ls to show a new directory called backups and then cd into backups and ls to show the copies of the text files.
- Alexander Smith - Python - Repeat a for loop: Above the diagram showing a mapping, there are a few examples of using a for loop and then a general form. Could ask some little question playing on that structure, 'so if I do x here, what will happen?' to confirm
- Taylor Woods
    - It's clearly shown in the lesson; it's located about halfway through the episode, before learners move on to the next objective
    - There are checkpoints to identify if learners have me the objectives, if they haven't, they won't be able to move on to the next steps of the episode; it will be difficult to assess if learners have met the objective if they don't let you know that they were unable to load/read the dataframe so it might be useful to ask learners to confirm by asking how many rows, etc the dataframe has
- Kathleen Chappell - The main object of "Go through the modify-add-commit cycle for one or more files." is very early in the episode. However, the later objectives (useful commit messages and understanding where files are stored) I would say require reading the whole episode. I think the lesson objectives would be achieved if the learners can answer the challenge questions.
- Allie Tatarian - around halfway through the episode, the learners should have successfully gone through the modify-add-commit cycle. I will know they have met the objective if they have successfully modified and committed their file.
- Nicole Brewer - my internet is stuggling and I'm having trouble answering this question without looking at the episode
- Emily Yaklich - clear to find! it is under the clearly marked heading "Calculating Statistics From Data In A Pandas DataFrame". Additionally, I will know the learning objetive will have been met through the "challenge" questions. If learners can answer those they will have mastered the objective
- Ben King - it was placed after subsetting using other methods in R. Both methods are important to know, so I think it is an appropriate place to learn this. This objective would be understood within the lesson, as the lesson had been chunked appropriately.
- Sofia Fertuzinhos - the exercise was easy to see and in the apporpriate place before learners move on to the next learning goal.
- Lilly Linden - very early on in the episode. After the first bit of code. Take a pause and look around the room both virtual or real for confirmation. On zoom, ask for the green check, in a room look for nods, make sure that helpers signal that it's okay to proceed.
- Dara Farrell-At the point of thr Challenge question, learners would have covered that objective. I'd be able to assess their understanding by their responses.

This exercise should take about 5 minutes.

-- -- *Exercise: Assessment is for Everyone* -- --
How might you apply formative assessment to:
a) verify that that achievement has been met by all and
b) make learners aware of their accomplishment?
Keep in mind that formative assessment can take many forms, including multiple choice questions, other exercises, spontaneous questions and calls for sticky notes. Write some notes or thoughts about this process in the Etherpad for discussion.

- Minyoung Wyman Ask them to recreate on a variation. I liked the Etherpad to put down one character responses next to a set of choices
- Ken Lui
- Kinnothan Nelson
    - a) Have checkpoints using sticky notes (in person)/or reactions (Zoom). Ask learners to complete exercise as checkopoint/exit ticket that demonstrates the learning objective that has recorded output .
    - b) Ask learners to describe what they have learned or what skills they now have they they previously did not.
- Chris Young - Ask the learners for more examples of why you would use CLI versus GUI. It's likely a motivation for why the learner is taking The Unix Shell lesson. They can be made aware of their accomplishment following the discussion by highlighting some of their examples.
- Simon Stone - Parson's problem, exercises involving turning an unrolled loop into a for loop, debugging deliberately buggy for loop examples
- Jentry Campbell - Put up a called table and ask them to write the query that will generate that table; write a query with blanks and ask them to fill them in compare with partner
- Jackson Hoch -
    - a) Sticky notes, run through challenges or examples in episodes and pause to see if people or groups are getting same results with understanding.
    - b) To make students aware of their accomplishment you can show correct responses after all have tried. Describe how what was learned will help for future knowledge/examples.
- Ford Fishman I think I could do both a) and b) with a quiz question to check to see if the correct syntax was used, and then go through the different choices and explain why each was correct/incottect.
- Bryan Scott I might ask students to check that they've completed an operation on a dataframe by looking at summaries of the dataframe. Not only does this reinforce the specific objective, but it (hopefully) builds confidence that they can do all the tasks up to this one and *know* they got them right.
- Simeon Wong - ask students whether their screen output matches. maybe tie the usefulness of functions to their motivations from the pre-session survey?
- Will Cowen - a multiple choice selection might offer opportunity to review both good and bad messages, vote on the best commit message and explain why we chose it?
- Kristina Bush - sticky notes, peer-to-peer check ins with next door neighbor to check for understanding, get thumbs ups in zoom, examples from students
- Alexander Smith - ask about the general case or get them to program an example and give them a result to compare to, if you do x what happens? (Hopefully y). Gauge response. --- + Could return to the objectives, especially if its a step towards an end goal like finioshed building a component/stepping stone.
- Taylor Woods - in the dataframe, you could ask learners to verify the number of rows in the

dataframe, etc; or ask them to pull out a specific value from a row x column

- Kathleen Chappell - verify everyone was able to complete the commands/exercises using thumbs up/green check in Zoom; using sticky notes in person; asking for responses to question/examples
    - to make learners aware of their achievement, summarize what we have done so far and let them know that they have made great progress
- Allie Tatarian - Pause and check that learner's are at the same step I am, or are seeing the same message as me after some step. If they are at the step and seeing the same message, I can let them know that that's an accomplishment. If anyone is stuck, I or a helper will know to spend a little more time on the topic.
- Nicole Brewer - ask students to raise their hand when they get finished with that part of the exercise and then to make learners aware of their accomplishment, ask them the difference between the last iteration of the exercise and this one, so they know the significance of what they just did.
- Emily Yaklich - sticky notes, ask for questions
- Ben King -
- Sofia Fertuzinhos - sticky notes - ask learners to tell me their favorite function to survey a dataset. What information they think it would be important for them to know about their dataset.
- Lilly Linden - On zoom, ask for the green check, in a room look for nods, make sure that helpers signal that it's okay to proceed. Verrbally add, "this is the most important step for this particular episode. Now we get to explore this data and learn more about dataframes which is one of the objectives of this episode.
- Dara Farrell-use a tool in which they answer a question and the answer is only shown if they are correct

Prepare to Cut

- Keep breaks on time
- Watch out for dependencies
- Leave time to wrap up your workshop
- Do not speed up
- Communicate with your team
- Communicate with your learners

Review the Instructor Notes

Review Prior Feedback

- Repetition vs Reflective Practice

Connect With Your Team

-- -- *Exercise: Minute Cards Revisited* -- --
Minute Card for this half workshop https://forms.gle/fP6PzFAehuATD2Zv6

Clarifications based on your feedback:

- still unclear about badge/certificate, can we give one/either to learners after a carpentry workshop?
    - The carpentries issues badges in AMY for trained instructors, trainers, and lesson maintainers
    - Anyone can issue a certificate if you want, but the carpentries does not track learners at workshops
- Also unclear about the difference between workshop and lesson program
    - a Workshop is an event (typically 2 days)
    - a lesson program is a group of curricula. examples are Library Carpentry, Software Carpentry and Data Carpentry
- Seems to be a fine line between natural mistakes (typos) and foreseeable ones (didn't install dependencies).
    - You can always test that a dependency is installed in advance, but the behavior of a dependency may change in a surprising way.
- Is there a comprehensive curriculum map for the Carpentries curriculum? Is there mapping of Carpentries curriculum to skill devleopment?
    - not a map, but there is a lit of the curricula. and this page compares them a little bit. https://carpentries.org/workshops-curricula/
- How do you adequately plan in terms of pacing? I have taught trainings that end early, training that goes way over time, etc. It's hard to figure out on the spot what to cut. Do you plan for this in advance?
    - this develops over time and you can plan for it some. You can identify and mark up a printed copy of the lesson, or render your own fork with extra instructor notes. Thsi is the part of prep
    - You can also teach with more experienced instructors when you start and learn a lot from them.
- How involved do we need to be with the carpentries community once we become certified instructions?
    - Nothing is required, but all is welcome

More Practice Live Coding

https://carpentries.github.io/instructor-training/20-performance
Questions:

- How did you change your teaching in response to feedback?

Objectives:

- Use feedback to improve your teaching.

-- -- *Exercise: Round Two* -- --

- Before splitting into groups, read the rubric that is given to Instructor Trainers as a suggested framework for evaluating the online teaching demonstration sessions that are part of Instructor checkout.

https://carpentries.github.io/instructor-training/demos_rubric.html . (Note: demos are not scored, so this rubric is for advisory purposes only.) What questions do you have?

- Return to your groups and repeat the previous live coding exercise, re-teaching the same content as before. This time, the presenter should incorporate changes based on feedback received, and everyone should try to ‘level up’ their feedback using the rubric for teaching demos.
- When you are finished, add some thoughts on this process to the Etherpad: What did you change? Did it work better or worse with the change? How might you do it if you were to teach it again?

timer: https://cuckoo.team/ttt

- Minyoung Wyman I made different mistakes this time (saying "Just" too much, and getting flustered and a little less organized). But I self-corrected when I noticed I was going to make the same mistakes.
- Ken Lui - I try to enlarge the terminal window and the font, for better illustration
- Kinnothan Nelson - I slowed down my pace, provided more context. I also reviewed the prerequisite content to get a better understanding of where/how the episode fit within it.
- Chris Young - (From Nicole) You started by asking if everyone's environemnt looked the same and to say so if not. You explained the dollar sign, which can be confusing. I thought that the comparison of 'cd' to the 'regular' UI helps solidify the concept in the students minds. One thing for next time is that you used the term 'bash' and 'command terminal' (or something like that) and didn't clarify about those being (practicaly) synomomous. I took more time to explain the command and what the learners are seeing on the screen. I covered a few commands compared to the the last training session, but spent the 5 minutes focusing on just the one command. (Jackson): Did a good job with pacing and describing how session fit into prior session. I think there could have been a little more explanation of the objectives for this lesson at the beginning.
- Simon Stone - In the first round I tried to situate the 3 minutes into what it would look like in an actual session (like outlining an exercise I would do, but not actually do it for time constraints). That was a bit too abstract, so this time I did 3 minutes of instructions instead, which I think was better to follow.
    - Jentry Campbell - Font size was maybe too big. Listeners also wanted to more context but conceeded that probably came from the last episode. I still could have added a short "and as a reminder, here is the structure of our database." My data table in the DB Browser went wonky as well which led to some additional troubleshooting.
    - "and as a reminder..." is super clutch
- Jackson Hoch - explained the last session well but I could have benefitted from a little more overview about what we were about to learn. Didn't forget to explain that comments start with a "number symbol" which was an accessibel explaination. You also used the word "assign" variables. I like to say "save" at least once becasue that's a more familiar word. (self feedback) - I think what went well was the pacing and most explanations. What could be worked on is discussing objectives for lesson more at the start.
- Ford Fishman I was more set up with my IDE environment. I would next time remove some of the descriptive text around my code so that it wouldn't distract from the learners following along.
- Bryan Scott I feel like rubrics that are less proscriptive tend to work a bit better for evaluation since they reflect more of the diverse approaches/perspectives. This one feels a bit more like a 'checklist' than the kind of rubric I'm used to.
- Simeon Wong - was less ambitious with the content and was able to provide a more focused treatment. still rushed a bit but a lot less than before. narrated use of shortcuts.

- Will Cowen: I had some better control of my language, without depending on some shorthand like "just" or "simply"; I was more conscious of pausing, and of explaining where we are going and how we're getting there.
- Kristina Bush - I focused on more active explanations of the review content and demonstrated each step. I also incorporated more pause moments for formative assessment to make sure my students are in the same place. I think that it went better than the previous round.
- Alexander Smith - Focused on fixing one piece of feedback and stumbled on the related area. I'd probably actually want to prep how I'd address the feedback rather than on-the-fly. If I had to go again right now, I'd revert until I had time to consider it better.
- Taylor Woods - got some really good feedback that I would implement next time, including some tips on how to keep code/hints in a separate document that I can reference rather than having some helper lines on the console that might be distracting for learners
- Kathleen Chappell - (self feedback) Disorganized as compared to previous time running through the demo; Used "just" a lot; Mistake: was in wrong directory and did not have a git repository!
- Allie Tatarian - I didn't "reset" my environment after my first teaching session, so I had to backtrack and undo some things as I tried to teach, which is potentially confusing; will have to be careful that everything is a clean slate when I teach new sessions.
- Nicole Brewer (From Jackson) Did a good job going over objectives/clear explanations. I would aim to live code just a little more during the session. (From Chris: Very clear with the content, took time to go through and explain each point using examples--I find those examples really useful. The only question I have is were the Jupyter notebook files provided along with the scripts? And if so, will the learners expect to have that documentation while they go through it?)
- Emily Yaklich - I think I improved on my previous feedback, but new feedback came up, so it was good to know other things I can improve on as well. Will definetely be more mindful of errors and outlining how I solve them in real time
- Ben King - I explained my code with more context. Also, I tried to explain an unintentional error in full detail once it happened, to give more context.
- Sofia Fertuzinhos- (self) it went worse on the contextualization of learners. However, the pacing was good and the manual typing and explanation was better.
- Lilly Linden -Better introduction to the begining of the session; I was more familiar with episode and sequece of syntax, I felt very confident on the second run. Comfortable with making an error and involving class in troubleshooting. Feeling more comfortable about the pace. Hearing the "its okay to be glacially slow" was helpful.
- Dara Farrell-(self) technical issues again (think this is a bandwith issue). When presenting (in real life) I usually do a tech runthrough at the presentation location to work out issues prior. Work around (to practice) was to present without sharing my screen and described the screen. (group) forgot to highlight the overall objectives this time. Otherwise positive.

Keypoints:

- (Reflective) Practice makes perfect.

Working With Your Team

https://carpentries.github.io/instructor-training/21-management

Questions:

- What are the challenges of managing a heterogeneous classroom?
- What should we do if there is a Code of Conduct violation?
- What does it mean to be a co-Instructor?
- How does an instructional team prepare for a workshop?

Objectives:

- Identify potential challenges of teaching learners with very different backgrounds and skill levels.
- Locate resources to direct your response if someone at your workshop violates the Code of Conduct.
- Identify workshop roles and responsibilities for your team.
- Use The Carpentries workshop website template instructions to start creating a website.

Never Teach Alone

The Instructional Team

- A *Host* who organizes the workshop logistics
- Two or more *Instructors* who plan and execute workshop instruction
- *Helpers* who support learners during the workshop

Hosting
https://docs.carpentries.org/topic_folders/hosts_instructors/hosts_instructors_checklist.html#host-checklist

Helpers

- help learners with setup and installation
- answer questions during exercises
- monitor the room to spot people who may need help (indicated by a sticky note or otherwise)
- monitor the shared notes and either answer questions there or remind the Instructor to do so during breaks

https://docs.carpentries.org/topic_folders/hosts_instructors/hosts_instructors_checklist.html#helper-checklist

Co-Teaching Models

- Team teaching: Both teachers deliver a single stream of content in tandem, taking turns the way that musicians taking solos would.
- Teach and assist: Teacher A teaches while Teacher B moves around the classroom to help learners.

Carpentries Classroom Practices

- Starting with the Code of Conduct
- Participatory Instruction & Hands-off Help
    - Learners Use Their Own Machines (or what they will use in their actual work; eg a cloud service provided by the learner's institution)
- Sticky Notes
    - Accessibility of Sticky Notes (not red & green; tip: use a pastel & a bold)
- Formative Assessment
- Breaks (ideally with snacks)
- Feedback

Sticky Situations 1: Learners at Many Levels

-- -- *Exercise: What Are the Challenges?* -- --
What are some of the challenges you might expect when teaching learners with a broad range of expertise? Add your thoughts in the Etherpad.

- Minyoung Wyman Trying to remember to help the beginners or people having difficulty. It's easy to get carried away with enthusiasm by talking to only the advanced students.+1
- Ken Lui - some learners, due to their prior coding experience, might have a better snese of what's happening while some might find it difficult with no piror background
- Kinnothan Nelson - Getting a pace that works for most learners may be difficult when there is a wide range of experience. You may also have to use varied methods of instruction and explanation to help learners depending on their experience.
- Chris Young - Participants will come to the lesson with knowledge at certail technical skill levels which means you'll have to strike a balance between slowing down for folks that are struggling and keeping on schedule for folks that keep up with the content.
- Simon Stone -
    - Different expectations of what they get out of the session
    - Pace may be too slow for the more advanced learners
    - More time will be spent on the beginners' issues
    - Beginners may be intimidated by the more advanced learners and not ask questions or point out their issues
    - Advanced learners may not ask questions they have because they don't want to slow things down further
    - In activities, the advanced learners might charge ahead and deprive the beginners of an opportunity to think things through on their own and come to a solution
- Jentry Campbell - Some are bored and some are overwhelmed. Different desired outcomes. +1
- Jackson Hoch -
    - The Goldilocks Principle - Some will feel it's too slow and others will feel pacing is too fast. At the same time, you're attempting to get pace "just right" for most participants.
    - Describing how what is being learned can be used on personal projects people bring with

them

- Ford Fishman - More difficult to understand if points are being understood by true novices. You might lose some more advanced learners early on before the material gets to a point where they would truly be challenged.
- Bryan Scott different conceptual models for how to solve problems. Novices, competent practitioners, and experts all have different mental models for the content, so explanations that work for one group may be less useful to other groups.
- Simeon Wong - newer learners may become discouraged when they see advanced learners picking up on the content quicker. advanced learners may become unmotivated if pacing is too slow.
- Will Cowen: advanced learners will forge ahead and ask questions about topics not appropriate to the level of the class; less-advanced users may get frustrated by repeatedly falling behind and may sap momentum
- Kristina Bush - some learners get left behind and others are bored, both ends of the spectrum may leave unsatisfied or discouraged
- Alexander Smith - people will run ahead and become distractions to the rest of the group
- Taylor Woods - differences in pace: more experienced can move quickly whereas novices might need more time
- Kathleen Chappell- learners at a high level may get bored if we go at a pace that is slow enough for those with the least experience to keep up. If we ramp up the pace to have some of these more experienced learners engage more, we may need to have a helper sit with each learner who is at a low expertise level.
- Allie Tatarian - hard to set a pace that will work for everyone
- Nicole Brewer - the pace will have to be on the slower end to accomodate newer learners. It may be difficult to avoid interesting and relevant questions that take us off track or off schedule. Event selecting what content to present in the first place is difficult!
- Emily Yaklich - learners with different levels of computational skills vs. a high level of skill (not knowing how to pull up the terminal vs. being very proficeint in a different programming language)
- Ben King - A broad range of expertise will mean a broad range of desired pacing. Going at an appropriate speed will be important, as will making sure everyone is caught up.
- Sofia Fertuzinhos - Different expectations. It is harder to keep everyone engaged, to find a good pacing to deliver the workshop.
- Lilly Linden - The student who is impatient and want to rush ahead; the student who is self consious and won't ask a question even if they are stuck; time management when one or more learner needs extra support
- Dara Farrell-managing pacing; variations in preparedness (some may have not set up programs before)

Tips:

- there are extra exercises you can work on
  - identify the simplest ones as "priority" and label others as "extra"
- if you might want to be an instructor, pay attention to our teaching practices
- you can help people around
- you can also promote someone to being a helper, "I noticed you seem to have some prior experience, would you like to switch to the helper role?"
- Assign a personal helper for someone struggling most
- communicate the level very clearly. name the specific skills and tasks, eg use learning outcomes

Sticky Situations 2: Code of Conduct Violations

A critical function of the Code of Conduct is to ensure that our community does not tolerate or encourage the persistence of harmful behaviors. In order for the code to work well, incidents must be reported. Note that it is not the responsibility of the reporter to determine whether a Code of Conduct violation has occurred; when in doubt, it is best to report an incident and allow the Code of Conduct Committee to make that determination.

-- -- *Exercise: Know Your Resources* -- --
1) Take 5 minutes to read through the Code of Conduct Incident Response Guidelines:
https://docs.carpentries.org/topic_folders/policies/incident-response.html

2) Discuss what you have read in small groups. As questions arise, you may wish to refer to our complete Code of Conduct section in The Carpentries Handbook:
https://docs.carpentries.org/topic_folders/policies/index_coc.html or to the Transparency Reports released by The Carpentries Code of Conduct Committee:
https://github.com/carpentries/executive-council-info/tree/master/code-of-conduct-transparency-reports

- What kinds of things could your instructional team agree upon in advance of your workshop?
- What questions do you have about CoC enforcement?

3) Write some notes in the Etherpad.

- Minyoung Wyman Report in a timely fashion.
- Ken Lui
- Kinnothan Nelson - What actions are instructors specifically authorized and/or expected to take when and indicent occurs, and what events qualify as incidents?
  - if you feel unsafe as the instructor, you can even walk out
  - you can ask someone to stop some sort of behavior
- Chris Young - notes for group: agree who will report on behalf of the team. Have someone documenting while the event is going on. Go through the CoC together before the event and see if anyone has questions on procedures and reporting.
- Simon Stone - The document conjures an idea of pretty extreme incidents. I think a more likely scenario, e.g., learners in a group being exclusive or disruptive, might be more helpful.
  - this is known. we are open to feedback and specific examples here
- Jentry Campbell A lot of these violations seem to focus on the extreme, but noticing and handling the smaller/less visible violations is more likely.
- Jackson Hoch - The most important thing is to report an incident if it occurs. We did discuss what if someone is breaking rules of conduct without being intentional that aren't to extreme, like continual interruption?
- Ford Fishman - Are there records of breaches of code of conduct kept? How often does this occur?
- Bryan Scott how to intervene and what the responsibilities of each instruction are, esp. in situations that 'look like' mediating between two parties+1
- Simeon Wong - we discussed trickier situations (eg. learners who are non-neurotypical who need accomodations or cultural barriers) and learners who take offense at being assigned a helper

- Will Cowen: the distinction between "acute" and "fill out this form" still feels somewhat squishy. It can be hard to understand the level of response to an offender as an instructor.
- Kristina Bush - this document could benefit from more specifics about the type of incident that each action is a response to. Or have a document of responses to use when addressing certain types of behaviors.+1
- Alexander Smith - what level of intervention should be performed by intrusctors / what tools? Pre-agreed responses to certain incidents. +1
- Taylor Woods - as a team, make sure everyone's aware ahead of time about the code of conduct and incident reporting system; for online incidents when to remove from the session
- Kathleen Chappell- I am wondering what the code of conduct violations would specifically be? Answering my own question here: https://docs.carpentries.org/topic_folders/policies/code-of-conduct.html#code-of-conduct-detailed-view
  - I think the instructional team should review the CoC (especially those who aren't badged instructors and may not be aware of its contents). Then plan what to do if a violation happens.
  - How does the CoC need to be enforced? If we see a violation or are made aware of a violation, do we immediately stop the lesson and remove the person behaved in an unacceptable manner?
    - You can use your discretion of whether you need to interrupt instruction, but definitely report when you can or direct the other person to report
- Allie Tatarian
- Nicole Brewer
- Emily Yaklich
- Ben King - good reporting guidelines.
- Sofia Fertuzinhos - I felt that the scenarios described seem so extreme that it was hard for me to follow. As a group we discussed more based on behaviours that will affect the goru of learners. We discussed per example a situation of a student that had been inidcated to the institution as having a developmental problem that made him anware of interrupting too much the class and wheather it would help using a question at the registration step giving the oportunity to the person to indicate need for specific accomodations.
  - this is appropriate, you can also ask the host to provide an aid in that event
- Lilly Linden - just knowing that there is a prescribed process in place and that it is important to follow it. Have either of you experienced anything violations of the code of conduct?
  - Sarah: I had a trainee in an instructor training workshop push back in inappropriate ways on feedback both to me and (I learned later) to other trainees. It caught me off guard, so I did not respond right away, but did the incident response form later after discussing with my co-trainers for the session. Thank you for sharing that, Sarah.
- Dara Farrell-Can you pull someone into a separate breakout room (I think this is a call-in) or in the moment say that it is a violation to all the group (I think this is a call-out) if it is a very clear violation. It can be really damaging if the incident isn't addressed in the moment (depending on what it is) and only addressed by asking someone to fill out a form later.
  - yes this is perfect. it is important to do that. You can also move someone to the waiting room
  - breakout room or waiting room is important instead of kicking them out, kicking them out they cannot join back later, it is permanent

breakout rooms will end at 2:44 eastern

Planning Together

-- -- *Exercise: Teaching Together - Nuts and Bolts* -- --

With a partner, imagine that you are planning a workshop together. For this exercise, you may assume that your workshop has a separate, designated Host.

- How would you prepare to teach a workshop together?
- How would you coordinate with other members of your instructional team (e.g. Host, Helpers)?
- What kinds of things will you do to support each other during the workshop? What won't you do?

Record some notes, and share your thoughts with the group. This exercise should take about 10 minutes.

Room 1

- Provide prep materials to helpers and co-instructors
- Confirm and review Lesson and episodes with team (host in Github)
- Split time between co-instructors equitably
- Clearly define workshop roles and responsibilities
- Develop Workshop Run of Show/Itenerary (use tools such as sessionlab(https://www.sessionlab.com/) for management)
- Test software and live coding environments and provide to stud ents ahead of time
- Clearly identify hosts, instructors and helpers (backgrounds when online, name tags when onsite)

Room 2

- Set up a channel for communication (e.g., instant messager on slack/teams)
- Create a schedule or flow document for the helpers (what to anticipate and will be covered) so that helpers can anticipate what will be covered and plan

Room 3 (Jentry & Emily)

- Dividing content by episode, see what needs cut - create schedule/outline
- An editable shared location (Google Doc, Git, something else...) to communicate and coordinate
- A slack channel for immediate communication
- Maybe a rehearsal if needed, tech rehersal required
- Do Live: Pay attention, give feedback at breaks, interrupt with immediate fixes (screen not showing, text too small); Don't Live: Zone Out

Room 4 (Ben and Kathleen)

- Which lesson to teach, who is teaching what, what content to teach from the lesson
- Email probably wouldn't be best; Slack channel (or alternative) could work
- Virtual class: answer questions in chat, support person who is teaching, paste content in Etherpad; In-person class: while person A is teaching, person B can assist folks with red sticky notes; Either: keep time for breaks
- Don't: talk over each other, stop following along in case you need to help out or take over teaching

Room 5 (Min and Allie in zoom room 1)

- Coordinates who does the lessons and clarify break times and locations
- Enumerate duties for helpers; ask the helpers to identify people who need extra assistance

- Host gets you the surveys to figure experience levels
- Ask host to remind participants to install software ahead of time
- Don't call out the instructor for skipping parts of the lesson or interrupt the instructor

Room 6 (Ford & Alex) --- Sorry if you were here, try door no. 9

- We'd agree on who's taking which bit of the ciricurlum
- And on any deviations or specific techning implementations
- Coordinate on slack (?) or similar --- Maybe a google drive for doc sharing. Etherpad for planning?
- Secret signal for if I freeze/need help with an explanation
- Not undermining the other instructor by oiverplaying their errors

Room 7

- In-person; Level of the learners and what their goals are
- Pre-workshop meetings 91/2) to review outline of workshops
- work out how to disagree as experts
- Time managemnet - one person should be in-charge

Room 8

- Preparation:
  - Split up the materials into parts where one person takes the lead and the other does support
  - Get together before the actual event and let the lead run the support through their section
  - Coordinate the tools being used (e.g. pick an editor, Windows vs Mac, ...)
- Coordinate with team:
  - Establish some sort of async communication channel to keep tabs on the prep progress (Slack, email)
  - Brief helpers on carpentries philosophy, goals, and methods
    - Do a mini-session as an example
- What to do and not do during the session:
  - Back each other up
  - Don't talk over each other
  - Check in with the other teacher: "Would you add anything to this?"

Room 9 (Chris and Sofia)

- There would be A LOT to discuss in a preparatory meeting. Who teaches what, comfortability of interchanging between instructors and adding comments, determining what content is covered, and how much time is spent on each activity or episode.
- How to address machine specificities if relevant for what is being tought. How to organize helpers to address these specificities

Room 10 (Kristina and Nicole)

- Regular meetings leading up to the even to make decisions and get on the same page
- defined roles - one leading and one assisting at any given time, trade off throughout the workshop
- Assistant role to act as a mediator between the lead and the audience. Keeping track of where

everyone's at so the mediator doesn't have to keep that in full focus.
- Decide how we want to provide feedback to each other
- How and when do we interupt each other? Mistakes: interrupt with an inquizative approach. Also okay to interupt when there are a lot of sticky notes to suggest a pause and reset.
- Communicate expectations in advance with helpers and host

Room 11

- divide lessons in the workshop, but teach a cohesive lesson; be prepared with those lessons you are not actively teaching
- for host, coordinate esp. the IT setup, ensure internet access, etc.; coordinate breaks and esp. lunch. Can lunch be a group activity somewhere? Can food be allowed in the session space?
- Cheatsheets for helpers; awareness of curriculum and familiarity with Carpentries style. Understand how familiar helpers are with the underlying content.
- In support - work out in-lesson reinforcement (do you like when a coinstructor chips in unbidden?)
- co-instructor timekeeping!
- Do you want a coinstructor to approach the lecturn, or to send messages in other ways, raising a hand, etc.

Launching your Workshop: The Introduction

"primacy effect": a tendency to remember things presented at the beginning of a list or event

-- -- *Exercise: What is in an Introduction?* -- --
Get into small groups (3-4 people) and discuss the questions below. Take notes on your answers in the Etherpad.

- What do you hope to accomplish in a workshop introduction?
- What information do you need to include in an introduction to accomplish these goals?

Group 1

Group 2

Group 3

Group 4

Group 5

Setting up a Workshop Website

-- -- *Exercise: Practice With The Carpentries Infrastructure* -- --
For this activity, your Trainer will put you in groups, but you may choose whether to work together or independently. If you work independently, you can still use your group as a resource to ask questions as they emerge.
Go to the workshop template repository: https://github.com/carpentries/workshop-template

- **If you have a GitHub account** (or don't mind creating one) and are comfortable doing so, follow the directions to begin creating a workshop website using your local location and today's date.
- **Alternatively**, have a look at the video tutorial linked on the instructions page. With any time remaining, check out the websites for upcoming Carpentries workshops on our website: https://carpentries.org/upcoming_workshops/
- Add your questions and thoughts on this process to the Etherpad.
- If you created a workshop website, add the link to your website (not the repo) there as well.

- Minyoung Wyman helpful video tutorial: https://minyoungjyi.github.io/2023-06-02-columbia/
- Ken Lui
- Kinnothan Nelson
- Chris Young - The process to create a lesson template is pretty quick. How long does it usually take to get all the content in there from one of the lessons? Or do you just copy the template of that specific lesson plan?
- Simon Stone - Oops, I deleted it already
- Jentry Campbell
- Jackson Hoch
- Ford Fishman
- Bryan Scott
- Simeon Wong https://dtxe.github.io/ttt-template-test/
- Will Cowen: https://willcowen-dartmouth.github.io/2023-06-02-willcowen-dartmouth-online/
- Kristina Bush - an attempt was made
- Alexander Smith - password, what password?
- Taylor Woods
- Kathleen Chappell - https://kthlnktng.github.io/2023-07-02-demonstration/
    - whoops - named this based upon the repo name given in the video, not using my location.
- Allie Tatarian https://allie-tatarian.github.io/2023-06-02-Tufts-online/
- Nicole Brewer
- Emily Yaklich
- Ben King

- Sofia Fertuzinhos
- Lilly Linden -lolz, haven't logged into GIT from my work laptop;just realized that the verification code went to my previous work email that I can't access. So, I'll probably have to start again later. Swell! I had a fun username too...
- Dara Farrell

break is 3:25pm-3:40pm eastern

Launches and Landings

https://carpentries.github.io/instructor-training/23-introductions
Questions:

- How do you actually start a workshop?

Objectives:

- Connect goals of an introduction with options for content and delivery.
- Practice a short introduction.
- Identify worthwhile elements of a workshop conclusion.

Launching your Workshop: The Introduction

"primacy effect": a tendency to remember things presented at the beginning of a list or event

-- -- *Exercise: What is in an Introduction?* -- --
Get into small groups (3-4 people) and discuss the questions below. Take notes on your answers in the Etherpad.

- What do you hope to accomplish in a workshop introduction?
- What information do you need to include in an introduction to accomplish these goals?

Group 1

- Set the tone
- lower barriers
- Address anxieties regarding the materials
- Stating the goals
- General outline
- Making myself approachable
- Conveying excitement about the material, e.g. by giving a specific example from your own research/work
- Break the ice early, e.g.
    - Introductions (instructors and helpers)

Group 2 (Minyoung, Kathleen, Lilly, Dara)

- code of conduct
- Tell audience about instructor background
- Ask for some introductions (ice-breakers?)
- Being energetic
- goals of the workshop
- Timeline
- how/ to ask for help

Group 3 (Nicole, Jentry, Sofia, Alex, Chris)

- Providing expectations of the learners prescence in this space.
- Rough schedule
- Goals and objectives clearly outlined so students know what to expect
- Providing the documentation ahead of time to participants so they know what to expect
- Thank you for coming to class!
- Establish an inclusive space, review code of conduct
- Reemphasizing to learners why they are here - reminding them (the hook)

Group 4 (Simeon, Allie, Will, Taylor)

- Humanize yourself, make yourself approachable
- establish the tone of the workshop; expectations and experience level; what the format will be
  - it's supposed to be fun
  - Interactive, not just someone telling you stuff
- objectives: "at the end of this workshop, we hope you'll be able to" & also listening to what learners want to get out of the course
- Icebreaker for small group

Group 5 (Jackson, Ford, Kristina, Kinnothan)

- your context and level of experience, how much experience with carpentries
- humanize yourself
- make students confortable asking you for help
- All helpers introduce themselves too
- Cover logistics, CoC, Breaks, how to provide feedback, communicate with/get help from instructors etc
- Check in with students, what do you hope to get out of this? How are you feeling today, etc
  - helps to show different levels of experience and create community

After 5 minutes, come together, and combine ideas as a large group.
Finally, compare your ideas with the list of topics below. Did you miss anything? Did you come up with something that is not listed below?

Learning Objectives For your Introduction

After the introduction learners should:

- be able to predict the type of instruction
- know what will be taught
- understand what will be required of them
- believe that they can learn from the workshop

The instructional team should:

- know of who is participating in the workshop and what their expectations are
- have an initial impression of how learners respond to participation prompts and what will be needed to encourage them to engage

Setting the Stage

- attire
- physical environment
- time before class
- introducing yourself
    - introductions for everyone
- doubts
- seeding a classroom community
    - icebreakers: https://carpentries.github.io/instructor-training/instructor/icebreakers.html

Teaching Your Trajectory: Workshop 101

- Describe the prerequisites (if any).
- Share the schedule and logistics
- Communicate the workshop structure
- Communicate your expectations for learners, including:
    - how to follow the Code of Conduct
    - ways to ask for help
    - ways to give feedback to the instructional team
- Collect and share baseline data on learners
- Share some advice for success
- Whet learners' appetites for workshop content

-- -- *Exercise: Practice Your Introduction* -- --
Imagine you have completed instructor training and you are about to teach a full lesson around the material you have been practicing teaching today.

- Write out some notes, covering a few of the topics described above:
    - Introduce yourself effectively
    - Clarify learning objectives and expectations
    - Set the tone for the workshop
- Return to your groups of 2 or 3 and each give 2 minutes of your introduction. (5-6 min)
- After each introduction, briefly share feedback, reserving extensive discussion for after all have had a turn to present.

This exercise will take about 15 minutes.

When you are done share if this made you feel more prepared, more worried, or if a new question came up:

- Minyoung Wyman More prepared
- Ken Lui
- Kinnothan Nelson - Focus introducton on content, and make the introduction more welcoming by including yourself as a member of the Carpentries community.
- Chris Young - it was helpful to learn from each other and hear how each of us approached the introduction
- Simon Stone - More prepared. Especially not forgetting the procedural stuff (how will we teach, the sticky note system) is something I need to remind myself of.
- Jentry Campbell -More prepared.
- Jackson Hoch - I felt more prepped. It was esp. important to discuss expectations.
- Ford Fishman I'm realizing how much thinking about all of these things matter in an introduction.
- Bryan Scott I always have a good idea of what to say, then usually trip over myself saying it! That probably just means practicing how to start.
- Simeon Wong - so important to practice! and be aware of terminology.
- Will Cowen: certainly more prepared, and conscious of energy level. Good to see how many peices there actually are to cover.
- Kristina Bush - it was helpful to learn from each other because we each remembered different bits and emphasized different elements.
- Alexander Smith - Nice to see what I missed from others but would be good to have a pre-set checklist to read off for some items
- Taylor Woods - much more prepared and got good ideas for parts to incorporate in the introduction
- Kathleen Chappell - More prepared and also more worried at the same time! There is a lot to remember to say! I forgot to mention the logistics (e.g. breaks) which people will want to know about.
- Allie Tatarian - I feel a little more prepared! I feel like a good introduction is a way for the instructor to get pumped to teach, too!
- Nicole Brewer - I learned how I can tie my background and my story into advise about success.
- Emily Yaklich - made me feel more prepared!
- Ben King
- Sofia Fertuzinhos - I benefited from listening to my colleagues first and was able to cover some things such as, saying my name. One thing that I have to pay attention to not overload learners with the course overview.
- Lilly Linden - I'm realising the importance of pacing ...basically slowing down.
- Dara Farrell

The Art of a Smooth Landing

-- -- *Exercise: Brainstorm: Making the Last Moments Count* -- --
You have made it to the end of your workshop! Everyone is exhausted and their brains are full. You could cover more content… or you could use the last few minutes in another way.

In the Etherpad, write down one thing you could do at the end of a workshop. What is the value of spending time on that thing? If you have time after writing down your idea, read through the others in the etherpad. If you have another idea that has not been written down yet, add it to the list.

This exercise will take about 5 minutes.

Keypoints:

- A planned introduction is key to creating a functional workshop environment.
- Conclusions support reflective practice and set the stage for continued learning.

Putting It Together

https://carpentries.github.io/instructor-training/24-practices

Questions:

- How are the teaching practices we have learned used in our workshops?

Objectives:

- Organize your knowledge of teaching practices and create a plan for using these practices in a Carpentries workshop.

-- -- *Exercise: Organize Your Knowledge* -- --

Use a concept map or other visual organiser of your choice to connect some of the concepts below. You don’t have to use them all! How are the terms you have chosen to include related to each other?

Work on this on your own. There is no “right answer” – this is about you building up a mental model, moving from “novice” to “competent practitioner”.

If you feel you have finished organizing your thoughts, try the next exercise.
This exercise should take about 5 minutes.

Topics List (non-exhaustive)

- novice, competent practitioner, expert
- mental model
- formative assessment
- expert awareness gap
- short-term and long-term memory
- cognitive load
- motivation
- demotivation
- error-framing
- life-long learning
- feedback
- lesson study

- Code of Conduct
- concept maps
- Multiple Choice Question (MCQ)
- peer instruction
- going slowly
- “just”
- accessibility
- sticky notes
- one-up, one-down
- pre- and post-workshop surveys
- participatory live coding
- introductions

-- -- *Exercise: Parting Thoughts* -- --
If you did not think about these issues when organizing your topics in the previous exercise, now consider:

- How would you describe your mental model of teaching?
- Can you identify why each topic above applies to teaching for the Carpentries?

When you are done share what form your reflection took (concept map, table, etc) or a link to it if you wish. If you have any final questions, share below

- Minyoung Wyman I still find the concept map to be a difficult thing to employ. I understand that nodes should be nouns (persons, or abstract ideas), but the direction of the arrows confuses me. So, is it novice -> formative assessment or formative assessment -> novice? I guess it can be either depending on the relationship described (verb). This flexibility is overwhelming because my mind wants more order.
    - you are correct that it can be either, but the goal is to think through which order helps you the most
    - also concept maps are hard. hopefully useful and useful fo rmany, but definitely hard.
- Ken Lui - I like to draw flowcharts + bullet point checklist to guide what I need to do in the eaching.
- Kinnothan Nelson - My mental model is based on showing the relationship between each component and how it fits into creating the teaching/learning ecosystem. Yes, each of the items either sets or impacts the teaching and learning environment, or is directly a part of the teaching or learning process.
- Chris Young - my map was more of a clustering of related terms around the activities of learning, like participation, failure, objectives, accessibility, and so forth. Lots of overlap between terms.
- Simon Stone - hand-written notes and lines
- Jentry Campbell - lines and shapes and scrawls.
- Jackson Hoch - My map was hand drawn on paper. (I'm a multi-dimensional learner, but do well with visual learning.) I tried to pair terms that made the most sense to me. Like motivation is tied to pace and feedback/participation.
- Ford Fishman I tried to use powerpoint to make some boxes of concepts into a concept map. I struggled to find clean relationships between even the handful of concepts I picked.
- Bryan Scott Concept maps are both a big part of how I organize my learning and how I outline lectures
- Simeon Wong - tried to connect how the concepts influence or relate to the implementation of the

other. my new understanding & mental model of teaching is definitely different from the more didactic style I previously felt comfortable with

- Will Cowen: a concept map, a wild assembly of sticky notes and lines (a real Charlie in the Mailroom scenario). Illegible handwriting aside, the attempt at organization is helpful, and somewhat dynamic. Groups of things are deeply interrelated with other groups.
- Kristina Bush - messy, cyclical. Tried to capture the iterative, lifelong nature of learning (about teaching and from teaching, reflective practice, etc.)
- Alexander Smith - hand-drawn (which was a messy mistake --- what was the online tool you mentioned yesterday? Definitely using this next time) excalidraw
- Taylor Woods - my mental model was an interative process; as I added new concepts, I realized I needed to go back and add more to the beginning
- Kathleen Chappell - my "map" was more of a list of lists of related concepts. Like a grouping for "ways to give feedback", grouping for things I should remember when teaching moving forward (reduce saying "just", examine awareness gap), etc.
- Allie Tatarian - concept map online
- Nicole Brewer - my mental model showed the most structure around the introduction, body, and conclusion. Many concepts are linked to all three of these components, which goes to show how important repetition and reflection is.
- Emily Yaklich - When organizing my thoughts into a mental model of concept map, at first I tried to keep it as organized and clean as possible, but I noticed that a lot of concepts were interconnected and a lot of lines were drawn between topics. I think this was great to reflect on everything I learned!
- Ben King - my mental model was fairly simple, i left out most of the elements and focused on a few key ones. If I keep my brain clear, then my lessons should also be clear.
- Sofia Fertuzinhos Hand-wrote the topics and then tried to connect them. the main theme is how I see my teaching carpentries using live coding, being a life-long learning where I will rely a lot on feedback in the fseveral forms such as recently learned sticky notes as well as pre- and post workshops surveys.
- Lilly Linden - I'm not sure that a concept map is what I would use for this.
- Dara Farrell

Final Questions

- (
- Can you share some ways to get students back and engaged with content after the course is over. The best way to learn to code is to do it yourself over and over - how can we encourage students to go out and find something to work on in their own time.+1 Sometimes I will suggest that people look around the room and find a study buddy, maybe their new. best friend that sat next to them.
- Is there an official list or repository of Carpentry approved tools? Is there a process for proposing the adoption of new tools? +1
    - If an institution prefers different tools (eg VScode), can workshops be adapted to use those?+1yes they can, but don't call it an official Carpentries workshop (don't use the name or logos)
-
- I know in general we are thinking about workshops with 2 instructors and 2 helpers. But do you have any suggestions for workshops where you do have that much assistance? I am oftening running workshops solo or with one person to help. This is hard, so keep the number of learners low (< 10). If you have 2 people, you can allow more people than that.

One up, one down

1. many things, trying to pick one. I appreciate that we learned a lot about the values of the Carpentries.
2. many of the exercises felt like sink or swim, we had to make do. The exercises felt too rushed sometimes.
3. I appreciated the opportunities to receive feedback. It reinforced things I can work on and are actionable.
4. If you had some helpers for this instructor training, that might have helped the two of you a lot (e.g. able to pop into different groups)
5. The instructions that were provided in advance were comprehensive and I felt prepared.
6. The number of exercises could be reduced. Sometimes we need more time to think about the exercises or questions. It would be great to combine some exercises or give us more time.
7. One thing I liked was that all of that stuff with the code of conduct sounded scary, but it was really about being a nice and respectful human being. I liked that.
8. More breaks would be helpful. It was kind of a marathon.
9. It was good that everyone taught a lesson that they were comfortable in. It was good to see the Carpentries applied to diverse lessons.
10. The morning slowed us down because of technical issues. the afternoon was good.
11. I thought you did a good job of adapting to technical issues and being able to pivot.
12. When we had activities when we needed to read before we talked as a group, I felt awkward being put in a breakout room while reading. Better to have separate reading time.
13. The material was broadly applicable and that was really motivating since I will be writing my own tutorial.
14. I like that the groups changed and we got to meet different folks, but because we met new people each breakout there was no time for an icebreaker or introductions.
15. I think that this exercise (one up one down) is a good way to get immediate feedback because people might not fill out a survey.
16. My expectations weren't set for the breakouts, we jumped to another topic before discussing where we are. It was jarring.
17. You both a really great job presenting and it's a credit of the methodology to show how well you work together without knowing each other. We're using the methodology and we're seeing things demonstrated that we will use later.
18. There's a lot of material and a lot of links, many nested within links. It can be difficult to navigate at times.
19. I really appreciated was when we discussed the teaching methodology especially your expectations of how the course was going to run and expectations of the learners. This also fit into setting the stage for how things were going to run. The things we were talking about and learning were applied.
20. I really like some of the specific things you told us to say, or do's and don'ts. I would like to know more of those tips and tricks to help get the class open and running smoothly.
21. The atmosphere that was cultivated was very open in the breakout rooms and main room - very open and welcoming.
22. I thought some of it was a bit light. Going into more depth about the teaching, or resources or reading. A lot of breakouts and less info.
23. I liked the opportunity to see how people presented. That was really valuable.

-- -- *Exercise: Post Workshop Surveys* -- --
Assessment is very important to us! Please take the remaining time to complete the ~5 minute post-workshop survey: https://carpentries.typeform.com/to/cjJ9UP#slug=2023-06-01-ttt-online-EDT