Day one afternoon

- Motivation and Demotivation
- Equity, Inclusion and Accessibility
- Teaching is a Skill

Motivation and Demotivation

Questions

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

Objectives

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

Motivation matters

We can do everything to facilitate the cognitive processes needed for learning but it will all fall short if the learners are not motivated.

Big part of our job as instructors is to **cultivate motivation to continued learning.**

How Can Content Influence Motivation?

Motivate learners and help build confidence by starting with:

- what is **quick to learn and immediately useful**

- **authentic tasks** - real tasks performed by someone as part of their daily work
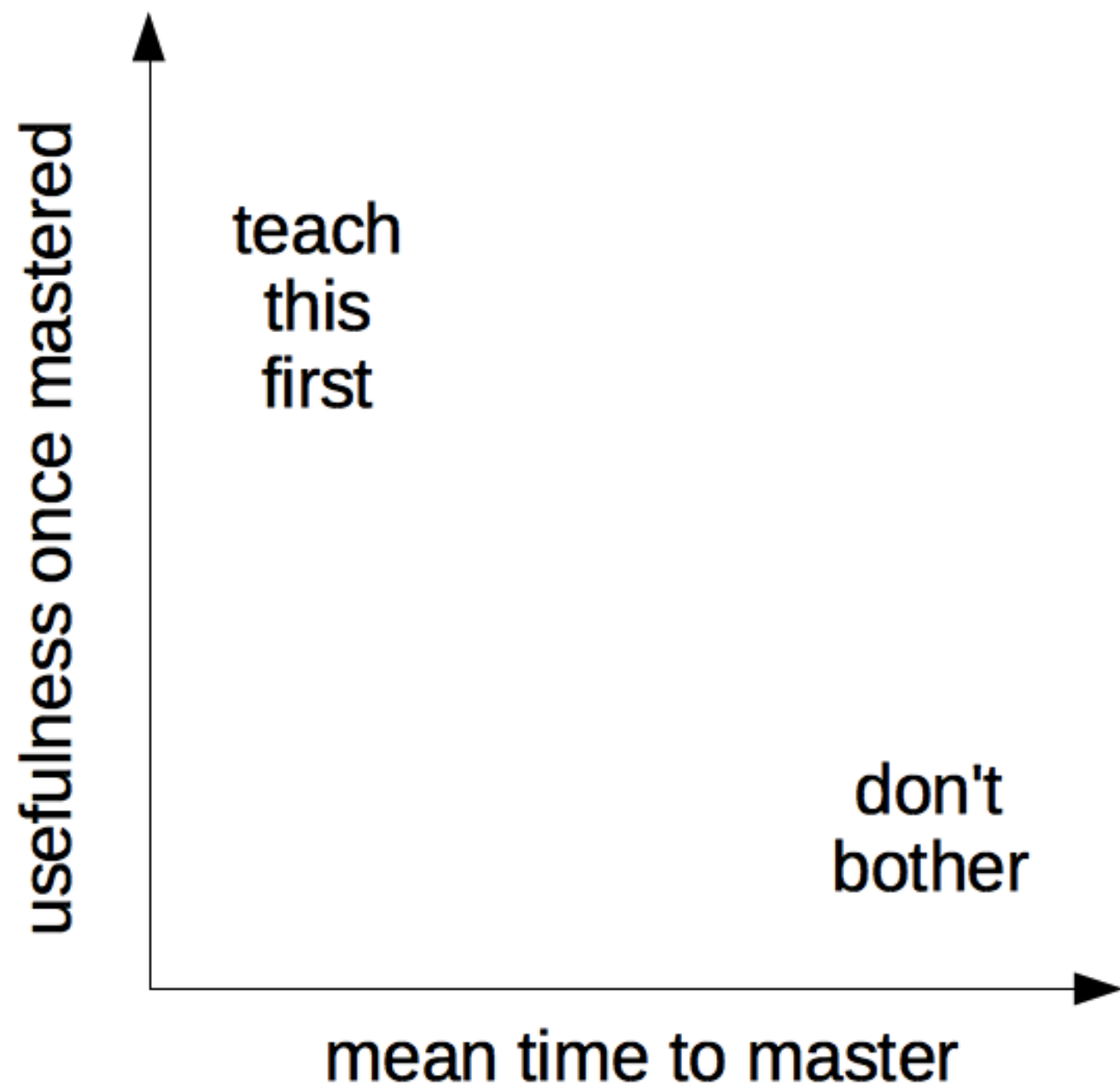
Exercise (10 min)
Authentic Tasks Think, Pair, Share

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) explain how you would use it (or a simplified version of it) as an exercise or example in class.

Write it down on a post-it.

Pair up with your neighbour and decide where this task fits on a graph of "short/long time to master" and "low/high usefulness". Put the post-it in the right place on the board.

Actual time

Some tasks may seem easy at the first thought.

Think deeper:

- Is there some underlaying work that needs to be done in advance?

- Are you making assumptions and not realising it due to the expert awareness gap.

Ask your fellow instructor. Do they share your estimations?

How Can You Affect Motivation?

**Exercise:
Brainstorming Motivational Impacts (5min)**

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 in the collaborative document.

Invite Participation (tips)

- Establishing norms for interaction.
- Encouraging learners to learn from each other.
- Acknowledging when learners are confused.

Encourage a Growth Mindset

Fixed mindset

belief that ability or intelligence is born rather than made.

Growth mindset

belief that ability can be acquired through effort.

Encourage a Growth Mindset

Positive error framing

Encourages learners to understand errors in a positive way – as an opportunity to learn something they would have missed otherwise – **reinforces a growth mindset and helps them to stay motivated**.

Exercise (5 min)
Helping Learners Learn From Mistakes

A learner at your workshop asks for your help with an exercise and shows you their attempt at solving it. You see they've made an error that shows they misunderstand something fundamental about the lesson (for example, in the shell lesson, they forgot to put a space between ls and the name of the directory they are looking at). What would you say to the learner?

In the collaborative doc, describe the error your learner has made and how you would respond.

Encourage a Growth Mindset

- Presenting instructor as a learner

- Praising effort or improvement, not performance or ability.

Exercise (5 min) 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 performance, effort, or improvement?

1. 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!

2. You're getting to be really good at that. See how it pays to keep at it?

3. Wow, you did that perfectly without any help. Have you thought about taking more computing classes?

4. That was a hard problem. You didn't get the right answer but look at what you learned trying to solve it!

5. Look at that - you're a natural!

First, do no harm! Things you should not do in your workshop.

- Talk dismissively or with scorn about any tool or practice.
- Dive into complex or detailed technical discussions.
- Pretend to know more than you do.
- Use the J word ("just") or other demotivating words.
- Take over the learner's keyboard.
- Express surprise at unawareness.

Leveraging the power of "Yet"

A request for help might start with "I can't ___" or "I don't understand ___".

Adding the word "yet" to the end of these sentences helps emphasize that being a novice is a temporary state, and encourages a growth mindset towards progress.
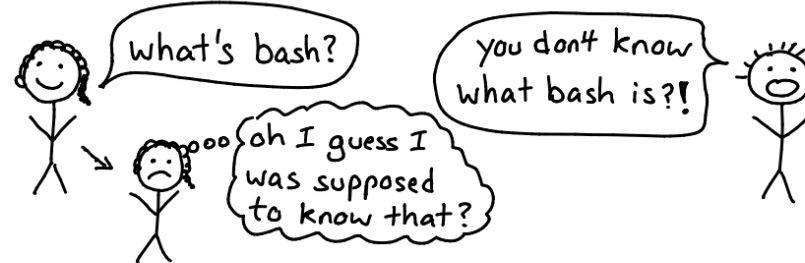
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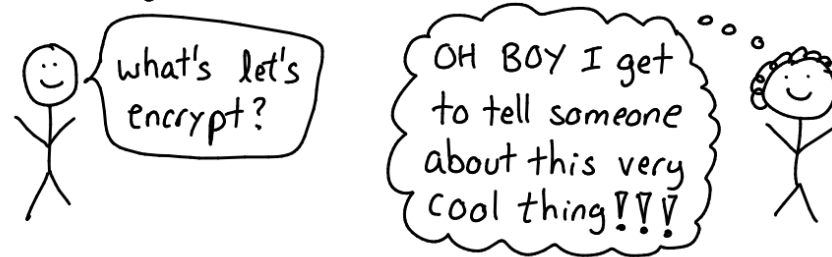
Not Just Learners

- Learners respond to an instructor's enthusiasm.
- Instructors are learning to teach (that requires motivation as well).
- Carpentries Instructors teach because they want to.

Exercise (5 min) 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.

Key points:

- A positive learning environment helps people concentrate on learning.

- People learn best when they see the utility in what they're learning and believe it can be accomplished with reasonable effort.

- Encouraging participation and embracing errors helps learners to stay motivated.

Equity, Inclusion, and Accessibility

Questions

- Why are equity, inclusion, and accessibility important?
- How can I 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.
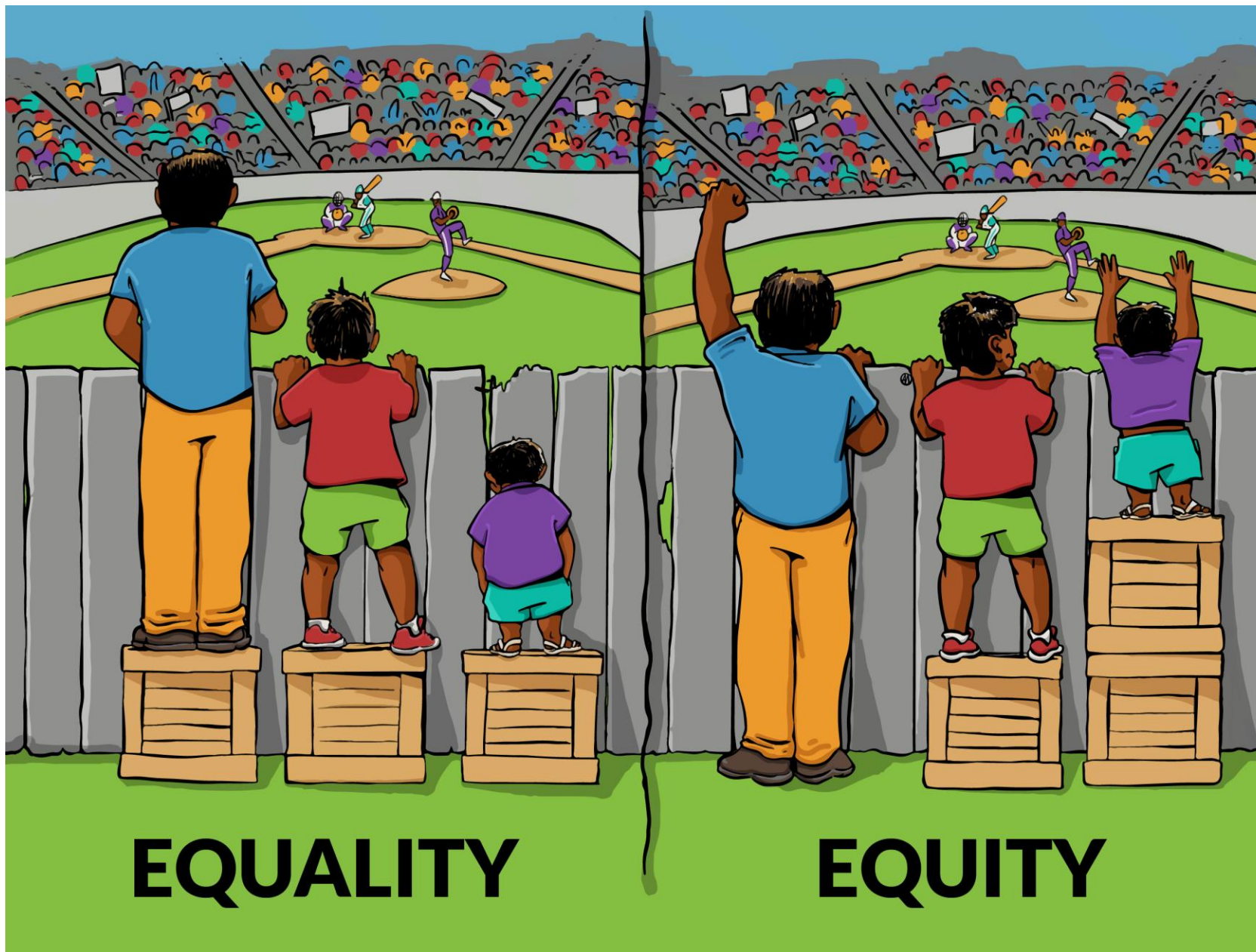
Let's Define

Equity

Inclusion

Accessibility

Equity

The **proportional** distribution of desirable outcomes across groups.

Sometimes confused with equality, equity refers to outcomes, while equality connotes **equal** treatment.

EQUALITY

EQUITY

https://interactioninstitute.org/illustrating-equality-vs-equity/

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 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.

Accessibility

Exercise (5 min): 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.

Pair up.

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.

Accessibility

When organising a workshop, **think** of accessibility **in advance**, **don't wait for participants to tell you about their needs**.

Many people will not feel comfortable requesting accommodations in advance.

From Accommodation to Universal Design

Accommodation puts the onus on the individual with the need.

By contrast, "**universal design**" means creating something to be maximally usable by all people (or as many as possible) without additional changes.

THE CURB-CUT EFFECT
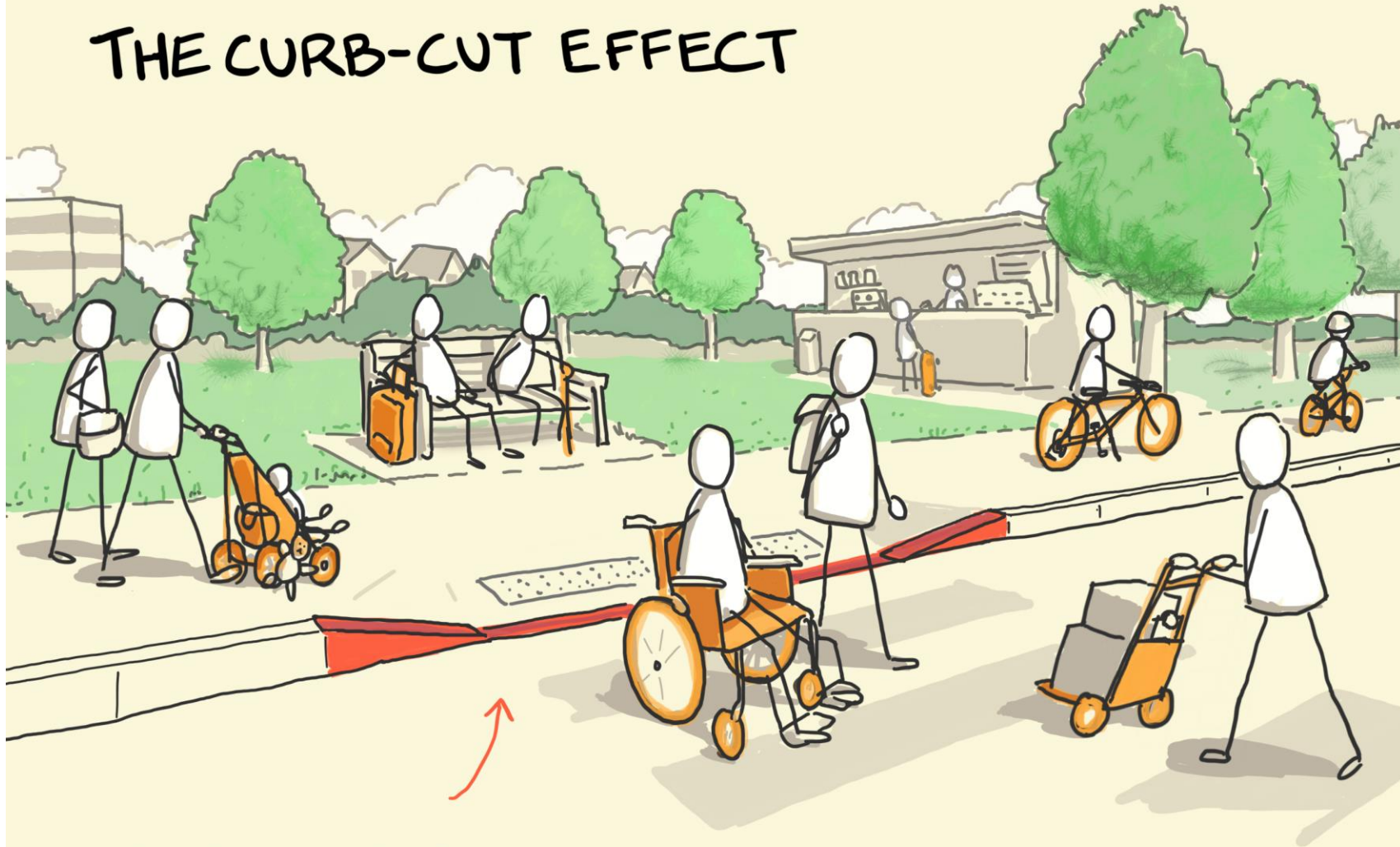
WHEN WE DESIGN FOR DISABILITIES

... WE MAKE THINGS BETTER FOR EVERYONE

sketchplanations

Universal Design in Learning (UDL)

UDL places **responsibility** for accessibility **on the course designer** rather than on the learner.

It states that the most inclusive approach to education is to **design** instruction **with diverse learners in mind** from the beginning.

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

Accessibility

Every little bit counts

It can be overwhelming, so …

- Don't try to do everything at once.
- Do the easy things first.
- Introduce one thing at a time.
- Don't be hard on yourself (take the growth mindset approach).

The Carpentries Accessibility Checklist

If you're worried, you'll forget about something.
Check out the checklist in the Carpentries Handbook.

In time grow your own checklist, based on experience.

Systemic exclusion

As with other demotivation pitfalls, we can also think carefully about the language that we use and how we interact with our learners to avoid reinforcing systemic bias.

Stereotypes

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

When Instructors have stereotypes about learners

- call attention to differences unnecessarily
- give more or less attention to certain learners
- respond to questions differently for certain learners

When learners experience stereotypes about themselves

- develop a fixed mindset about aspects of their own capability

- experience increased cognitive load when reminded about a stereotype, interfering with the learning process. This is known as **stereotype threat**.

What can we do about our own stereotypes

- Get to know people from many different groups!

- Observe your own behaviour and build awareness of situations in which your perceptions and behaviours are influenced by stereotypes.

- Avoid calling attention to common stereotypes, even in a way that seems positive.

Inclusive Practices in a Carpentries Workshop

- Setting Expectations with the Code of Conduct

- Listening with Assessment and Feedback

- Examining your Actions
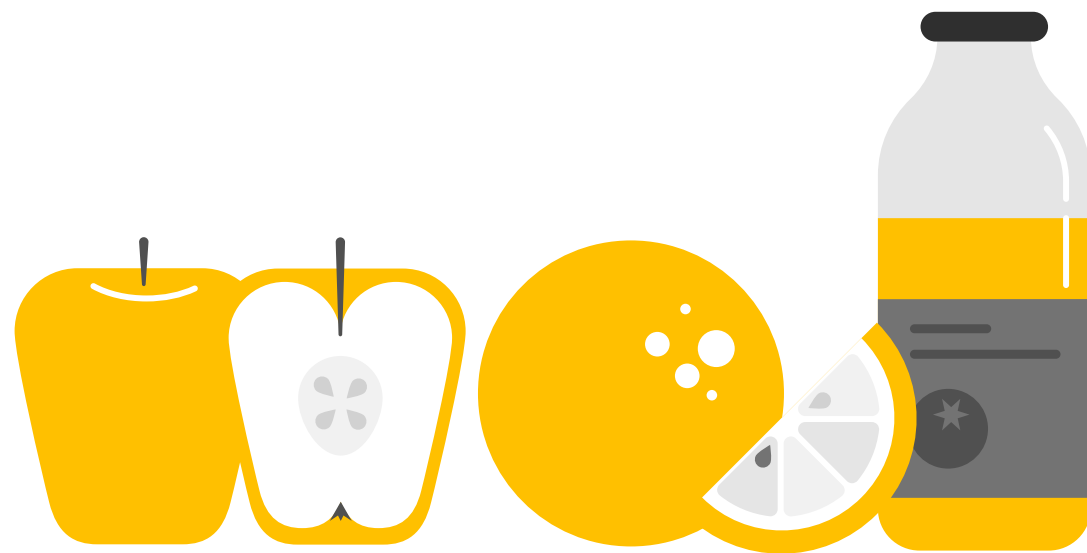
Teaching is a skill

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.

1Utama – Camp5 Climbing Gym
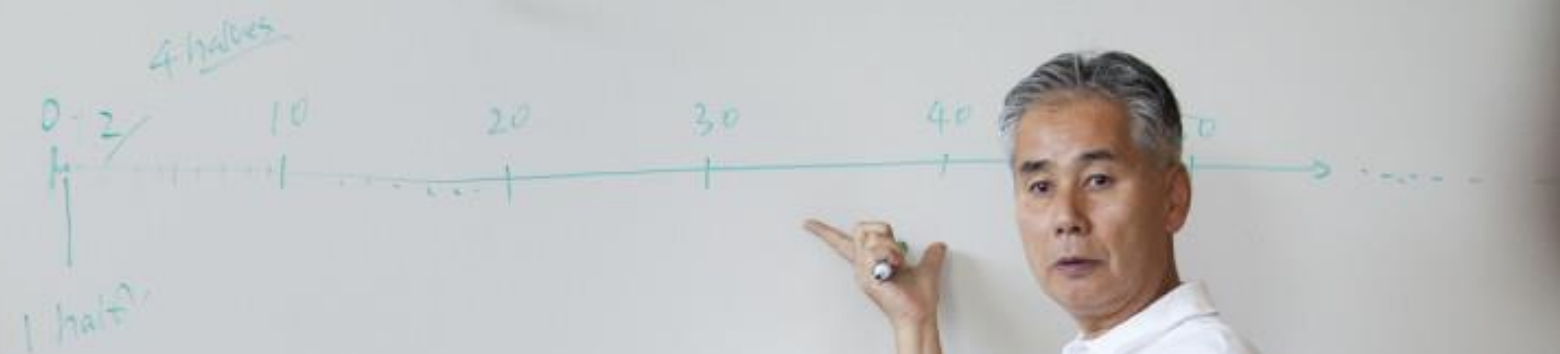
Lesson Study
jugyokenkyu

Feedback is hard

www.DEATHBULGE.COM

Initiate feedback

What kind of feedback are you looking for? Ask Questions.
"What is one thing I could have done as an instructor to make this lesson more effective?"
"If you could pick one thing from the lesson to go over again, what would it be?"

Balance

What to improve / What went well
Tip / Top

Communicate expectations

How learners / other instructors can best communicate their feedback to you?

Use feedback translator

Someone (co-instructor) who can communicate collected feedback.

Tips for giving feedback

✓ Be positive.

✓ Be specific

✓ Provide next steps (actionable)

Remember that giving and receiving feedback is a skill

You need feedback on feedback

You need to practice
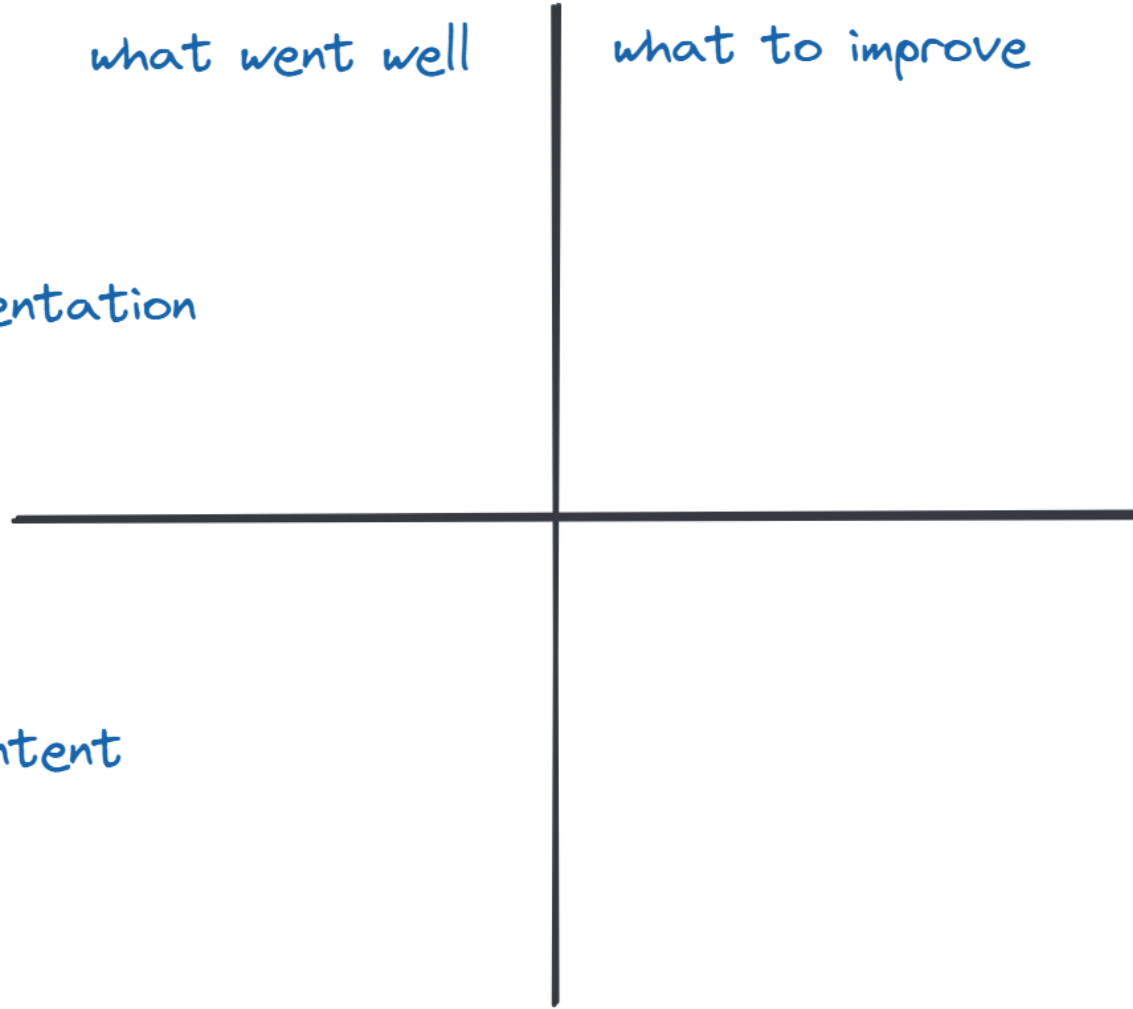
Exercise (10 min)

We will start by observing some examples of teaching and providing some feedback.

Watch example teaching video and then give feedback on it.

Put your feedback in the Collaborative Document.

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).

Exercise: Sharing Feedback (breakouts ~25 min)

You will be split into breakout rooms with 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.

Get together with your group and have each person teach their segment to the group while one person records this (video and audio) using a cell phone or some other handheld device. Keep a strict time limit of 90 seconds per person (one person should be responsible for the timekeeping).

After the first person finishes, rotate roles (they become the videographer, the audience becomes the instructor, and the person who was recording becomes the audience) and then rotate roles again.

After everyone in the group of three has finished teaching, watch the videos as a group. Everyone gives feedback on all three videos, i.e., people give feedback on themselves as well as on others. Keep an eye on the time during feedback, especially if your group has more than 3 people, to be sure to leave time for everyone.

After everyone has given feedback on all of the videos, return to the main group and put everyone's feedback about you into the collaborative document.

Exercise: Using Feedback (5 min)

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?

Based on this feedback, identify at least one specific change you will make to your teaching. Describe your change in the Collaborative Document.

Key Points

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.

Homework

Homework

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.

Prepare for the live coding exercises.

Instructor Training Day 2

Welcome back

Warmup: What you learned yesterday?

One (favourite) thing (concept, idea, theory) you remember from yesterday.

Goals for this workshop:

Get familiar with and understand how to apply research-based teaching principles, especially as they apply to The Carpentries audience.

Understand the importance of a respectful and inclusive classroom environment; commit to creating such an environment; and be able to identify and implement The Carpentries policies and general practices to accomplish this.

Practice and develop skills in the teaching methods used in Carpentries workshops

Learn enough about The Carpentries organization to know where to go for help, how to start organizing a workshop, and how to get involved with community activities.

Morning

Getting Started on Instructor Certification

The Carpentries: How We Operate

10:45 ☕🥧 morning break

Live coding is a skill

Preparing to teach

12:45 🍱 lunch break

Afternoon

More practice live coding

Working with your team

15:30 ☕ afternoon break

Launches and Landings (how to start he workshop)

Putting it all together

Wrap-up

17:00 End & Drinks 🍻🍷🥤

Exercise: What questions do you have? (5 min)

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 Collaborative Document.

We will answer these questions in the Collaborative Document during your work time and will return to this list later today.

Getting Started on Instructor Certification

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

1. Attend a **Welcome Session**.

2. Complete a **Teaching Demonstration**.

3. **Get Involved!** Choose one more step to further your engagement with The Carpentries.

All trainees have **3 months (90 days)** from the end date of their training to complete checkout.

Exercise: Be The Expert, Checkout Q & A (10 min)

In groups, read and discuss one of the three checkout procedures described on this page:
https://carpentries.github.io/instructor-training/checkout.html

Make notes in the Collaborative Document:
- 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.

Exercise: Schedule a checkout step (10 min)

Take a moment to review your calendar and sign up for one or more sessions to get your checkout process rolling!

Visit the Welcome Session Etherpad: https://pad.carpentries.org/welcome-sessions-2023

Visit the Teaching Demonstrations Etherpad: https://pad.carpentries.org/teaching-demos

If you would like to attend another community session for your 'Get Involved' step, visit the Community Sessions Etherpad: https://pad.carpentries.org/community-sessions-2023

What does the badge mean?

1. **You can teach** Carpentries workshops.

2. **You get to vote** for Carpentries Executive Council

3. **You can register** for Carpentries **Bonus Modules**.

4. **You can share** it your CV
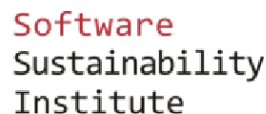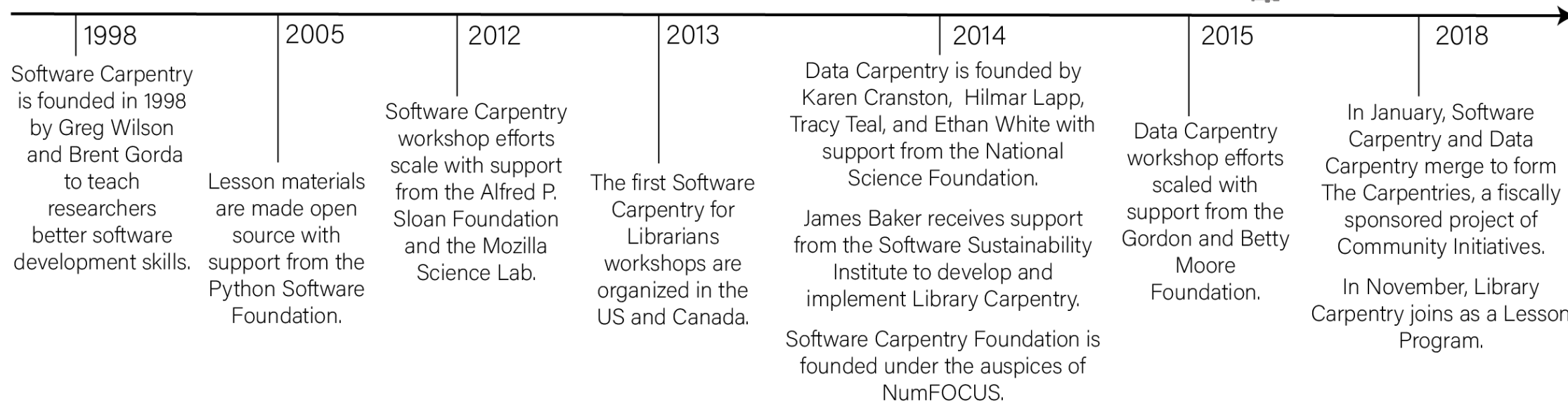
The Carpentries: How We Operate

Questions
- How is The Carpentries organised and run?
- What is the difference between SWC, DC, and LC workshops?
- How do you run a Carpentries workshop?

Objectives
- Get connected with The Carpentries community.
- Describe where you can go to get information on running a workshop.

A VERY BRIEF HISTORY OF THE CARPENTRIES

software carpentry

DATA CARPENTRY D

Library Carpentry

1998
Software Carpentry is founded in 1998 by Greg Wilson and Brent Gorda to teach researchers better software development skills.

2005
Lesson materials are made open source with support from the Python Software Foundation.

2012
Software Carpentry workshop efforts scale with support from the Alfred P. Sloan Foundation and the Mozilla Science Lab.

2013
The first Software Carpentry for Librarians workshops are organized in the US and Canada.

2014
Data Carpentry is founded by Karen Cranston, Hilmar Lapp, Tracy Teal, and Ethan White with support from the National Science Foundation.

James Baker receives support from the Software Sustainability Institute to develop and implement Library Carpentry.

Software Carpentry Foundation is founded under the auspices of NumFOCUS.

2015
Data Carpentry workshop efforts scaled with support from the Gordon and Betty Moore Foundation.

2018
In January, Software Carpentry and Data Carpentry merge to form The Carpentries, a fiscally sponsored project of Community Initiatives.

In November, Library Carpentry joins as a Lesson Program.

Software Carpentry

Audience: researchers who need to program more effectively

Domain independent

Modular curriculum: three distinct sections, one optional

Data Carpentry

Audience: researchers who are dealing with significant data

Domain specific (ecology, genomics, GIS, others…)

Full, two day curriculum centered around a single dataset

Research-focused computational skills

Novice-level training

Two day workshops*

Volunteer instructors applying Carpentries teaching practices

Address gaps in computational skills

Modular curriculum

Domain targeted

Library Carpentry

Audience: people in library and information related roles

Domain focus: collections & information support (e.g.: museums & archives), LIS
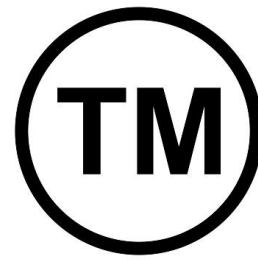
Modular curriculum centered around core objectives and lessons

*flexible scheduling

Rules

Using the Names and Logos

- The names "Data Carpentry", "Library Carpentry", and "Software Carpentry" and their respective logos are all trademarked.
- You may only call a workshop a Data Carpentry, Library Carpentry, or Software Carpentry workshop if it meets the requirements.
- Please report 'Mix and Match' Workshop (there is a form for it)

Materials

All Carpentries lesson materials are freely available under a permissive open license.

Exercise: Carpentries Jargon (classroom)

How many of the following terms you can define?

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

Organising a workshop

Two types of workshops:

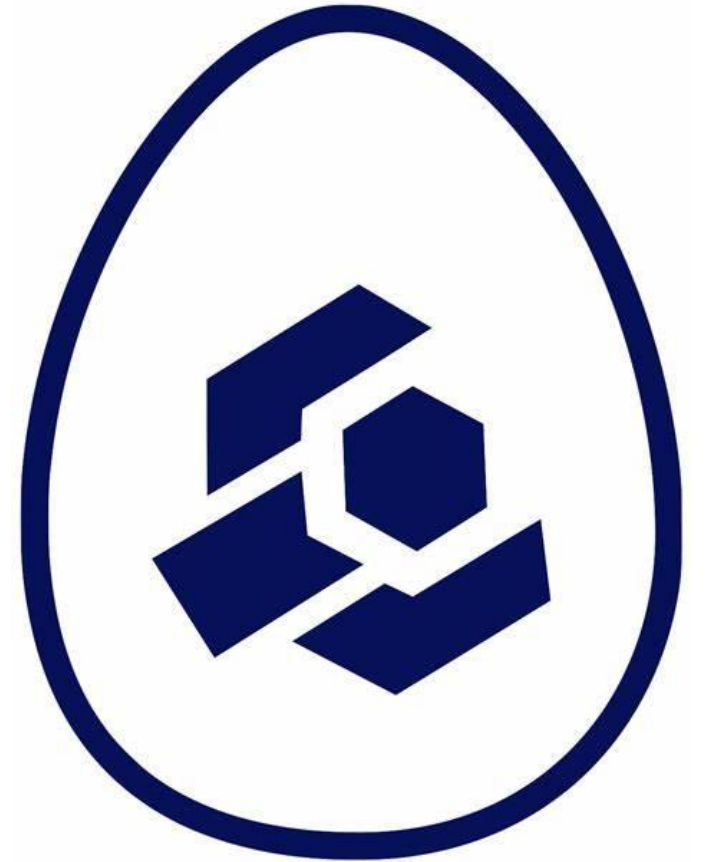### Centrally organised

- From institutional membership

- Ad-hoc paid

Self-organised

- Consult The Carpentries Handbook

  docs.carpentries.org

Setting Out On Your Own... Together: Lesson Incubation

- Use Carpentries Lesson Template

- Put it in the incubator

- Use Curriculum Development Handbook

Keep in touch

Want to listen?

- Sign up for our newsletter
- Follow us on Twitter, Facebook, or LinkedIn

Want to interact (or listen with options to engage)?

- Join our Slack organisation
- Join our Email lists (start with "Discuss"!)

Want to join meetings (to meet new people or listen in)?

- Sign up for Community Discussions (or just drop in if there is space!) or other events when announced
- Explore taking on one of the Roles identified above

Key points

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 is provided in The Carpentries Handbook.

Life coding is a skill

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.

(Participatory) Live Coding

Instructors **do not use slides** to teach coding, but work through the lesson material, **typing in the code** or instructions, with the workshop **participants following along**.

Exercise Anticipate the Impact (5 min)

Think of advantages and challenges of participatory live coding from both a learner's and an instructor's point of view in the Collaborative Document.

Exercise: Compare & Contrast

Watch two participatory live coding demo videos as a group. Write down feedback. 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 and `unicorn.dat` files.

Top Ten Tips for Participatory Live Coding in a Workshop

1. Stand up and move around the room if possible.
2. Go slowly.
3. Mirror your learners' environment.
4. Use your screen wisely.
5. Use illustrations.

Top Ten Tips for Participatory Live Coding in a Workshop

6. Turn off notifications
7. Stick to the lesson material.
8. Leave no learner behind.
9. Embrace mistakes.
10. Have fun!

Exercise (25 min): Practice teaching

1. Split into groups of three.
2. Assign roles, which will rotate: presenter, timekeeper, note-taker.
3. 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.
4. 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 Collaborative Document.
5. Trade off roles.

Preparing to Teach

Questions

- How should I prepare to teach?

Objectives

- Create a profile for a learner in your workshop.
- Critically analyze a learning objective for your workshop.
- Identify checkpoints in a lesson for formative assessment.

Exercise (3 min): Imagine a Learner

Take a moment to silently imagine a learner who might attend your workshop.

- What is their background?
- What problem do they face?
- What will they gain from attending your workshop?

Your learners

You will never know the full spectrum of neurodiversity represented in your workshop.

Thinking deeply about learners as people can help you prepare to bring your best self and provide an inclusive environment for everyone.

Remember Your Pre-Workshop Surveys

Examine Learning Objectives

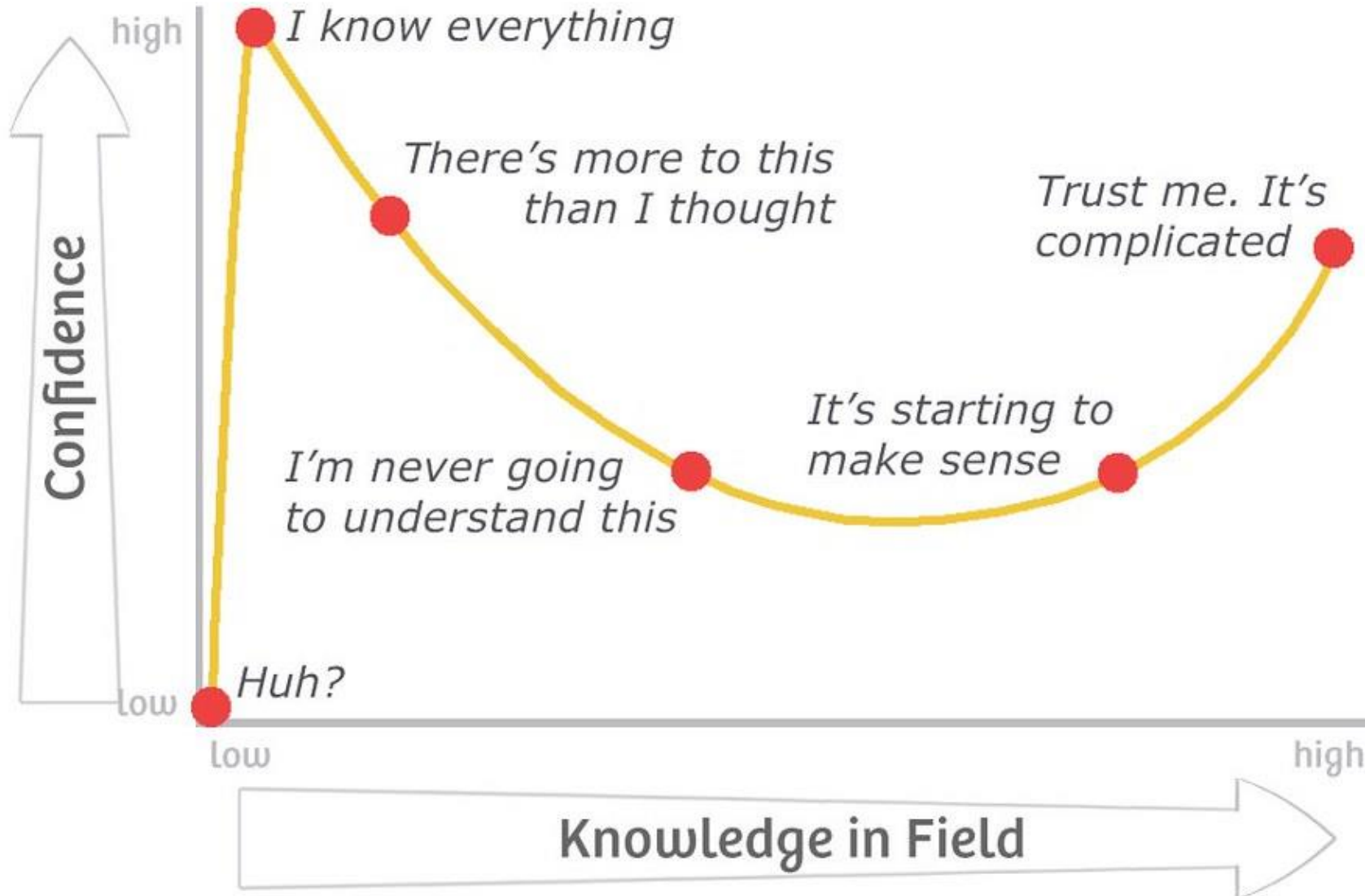**Beware the Urge to Complicate**

Prepare to Use Formative Assessments

How frequent?

- Every 5 – 10 minutes.
- Depends on the "density" of the content.
- Used to break-up instructional time and refocus attention.

"Do You Understand?" is Ineffective as a Formative Assessment

Dunning-Kruger effect

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