



Data Physicalization Lesson Plan and Learning Objectives

Lesson plan by Alexandra Wong and Priscilla Carmini

Date: January 25th, 2023, 12:00 – 1:30 pm

Session Length: 90 min

Brief description of:

1. library class's purpose
- OR
2. learning **outcomes** for library class
- OR
3. agenda

Event description for LibCal:

During this workshop we'll bring our data to life through crochet to reveal temperature changes. You will learn to crochet your own coaster or potholder to keep! This act of data physicalization aims to help people explore, understand, and communicate data using physical data representation. Come join us to see how data and crochet can integrate theory and creativity in this workshop.

All crochet experience levels from beginner to advanced are welcome to join this workshop. Materials will be provided.

Description of why it's needed:

- Data skills and data software can be intimidating. Melding the fields of data physicalization and critical making with traditional crafts like crochet can create a more welcoming way to understand and experience data fundamentals; it particularly reaches out to an audience who has been traditionally excluded from data and technology fields.
- As an exercise in critical making, data physicalization can increase discourse, reflection, and creativity, especially in STEM students ([Perin 2021](#))
- A data physicalization workshop follows many of the recommendations of the Digital Scholarship Steering Committee's Needs Assessment, including:
 - To continue ... examine research methods curriculum in York programs and note interdisciplinary techniques that aren't addressed by current IL instruction (e.g. ... visualization skills)
 - To expand ... Build communities of practice that are inclusive and encourage knowledge transfer and experimentation.



- To expand... generate awareness and advocate for digital scholarship approaches inclusive of feminist, “decolonial”, intersectional lenses, and acknowledging that one size doesn’t fit all
- This workshop could act as a pilot for the Markham campus’ Makerspace and potential opportunities to overlap with the field of critical making.

Workshop Learning Outcomes:

After attending this workshop, participants will be able to:

- Apply learned fundamental data skills including how to calculate the mean, mode, and median; analyze data patterns
- Describe different examples of data physicalization and learn how it may be applied with a variety of datasets.

Also:

- Feel confident to work with data within a supportive community environment
- Complete a small potholder using crochet techniques used in class.

Class sections	Timing	Main ideas covered
BRIEF Introduction & Agenda Activities? Please describe	15 min	1. Allow people to come in and get settled 2. Hand out crochet packages 3. Introduction to facilitators 4. Roundtable introduction of participants: names, pronouns, if they have crocheted before, and how they work with data (if at all)



BRIEF Teaching Concepts Activities? Please describe	40 min	Data Foundations • Concept of data physicalization, with examples • Basics of working with microdata and ways to summarize datasets • Introduction to finding data and quality of data providers (Government of Canada vs. random or aggregator websites) Provide students with examples of how temperature blanket might be created. For example, use week means from Toronto, Canadian temperature datasets. We will talk students through how we established temperature data points for our Toronto potholder. Note on creating data physicalizations: Creating data physicalizations is not always a straightforward process. You may find yourself compromising on the physicalization itself to include/omit certain data points. For example, Alex and I wanted to create a potholder with a year and a half worth of temperature data for this workshop. However, this would result in our potholder being 5 and a half inches, which would result in our potholder being smaller than the actual usable size. 1. How did we find these data sets? 2. How did we choose to establish the averages for our potholder?

		3. Show calculation of the monthly means with class (how to calculate means/medians/modes provided) 4. Explain how we encoded the data (i.e., 1 row = 1 month), and how this can change depending on their chosen encoding scheme. 5. Lead class through an in-class activity to establish temperature ranges based on mean data points, and which colours correspond with each temperature range.
	30 min	How to crochet, split into 2 smaller groups for teaching crochet concepts Crochet Concepts: - Knotting at the beginning - Holding the crochet hook - Chain stitch - Single crochet - Colour changes - Weaving in ends Time for participants to continue crocheting on their own. We will provide instructions for participants to create a potholder that is 6x6 inches. Chatting about applying Ideally, we hope participants will have finished at least 2 rows by the end of the workshop.
Summary Activities? Please describe	5 min	Summary of what we learned How to extend learning to making a 2nd potholder with remaining yarn We will also create monthly temperature examples from Iqualuit and Vancouver in Excel (link to Excel in handout, print out summary numbers in handout). This can be done as a take home activity

Important Content		
Databases demonstrated & search strategies used		
Links to videos & multimedia used		
Slides, activities & handouts	Slides: Y / N - link or attach Activities: ☒ / N - link or attach Handouts: ☒ / N link or attach	
Links to relevant course/subject guides		
BRIEF Other relevant notes for cluster members (i.e. academic integrity should	Would like to move away from teaching this workshop using technology and instead focus on the tactile/physical aspects of working with data. Workshop participants will each receive a kit, that comes with workshop materials for the crochet project, along with a printed handout used for teaching purposes.	



be covered, important to teach about primary/secondary sources, citation styles or citation exercises, anything unique)	To emphasize the feeling of community, technology will not be the focus and seating arrangement will be in a circle. We will be using the sound and moving image library for this workshop. Example pieces: - One completed potholder - One potholder with 1.5 rows completed - One potholder with 0.5 rows completed Books to borrow/bring - https://ocul-yor.primo.exlibrisgroup.com/permalink/01OCUL_YOR/1jocqcq/alma991028090799705164 - https://ocul-yor.primo.exlibrisgroup.com/permalink/01OCUL_YOR/1jocqcq/alma991009831889705164 - https://ocul-yor.primo.exlibrisgroup.com/permalink/01OCUL_YOR/26r5oc/alma991030790109705164 - https://ocul-yor.primo.exlibrisgroup.com/permalink/01OCUL_YOR/1jocqcq/alma991011581849705164
Notes	Notes: • We will pre-select all the colours for the students, along with a set of data points to work with temperature-wise. All materials will be provided in the workshop for students to use and take home after the workshop. • Total budget: \$100 – requested in December 2022 • Itemized budget (tax inclusive) ○ \$3.40/crochet hook = \$40 (Knitpicks, 10 hooks for students + 2 for instructors)



	○ \$55 for yarn bundle (Knitpicks, each ball of yarn to be divided into smaller balls to have a kit for each student) ○ \$5 for bags to contain individual kits of crochet hook + smaller balls of yarn (price estimated from Dollarama) ● Create an Excel spreadsheet that will mockup a potholder given temperature data ● https://sarahmaker.com/how-to-crochet/
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