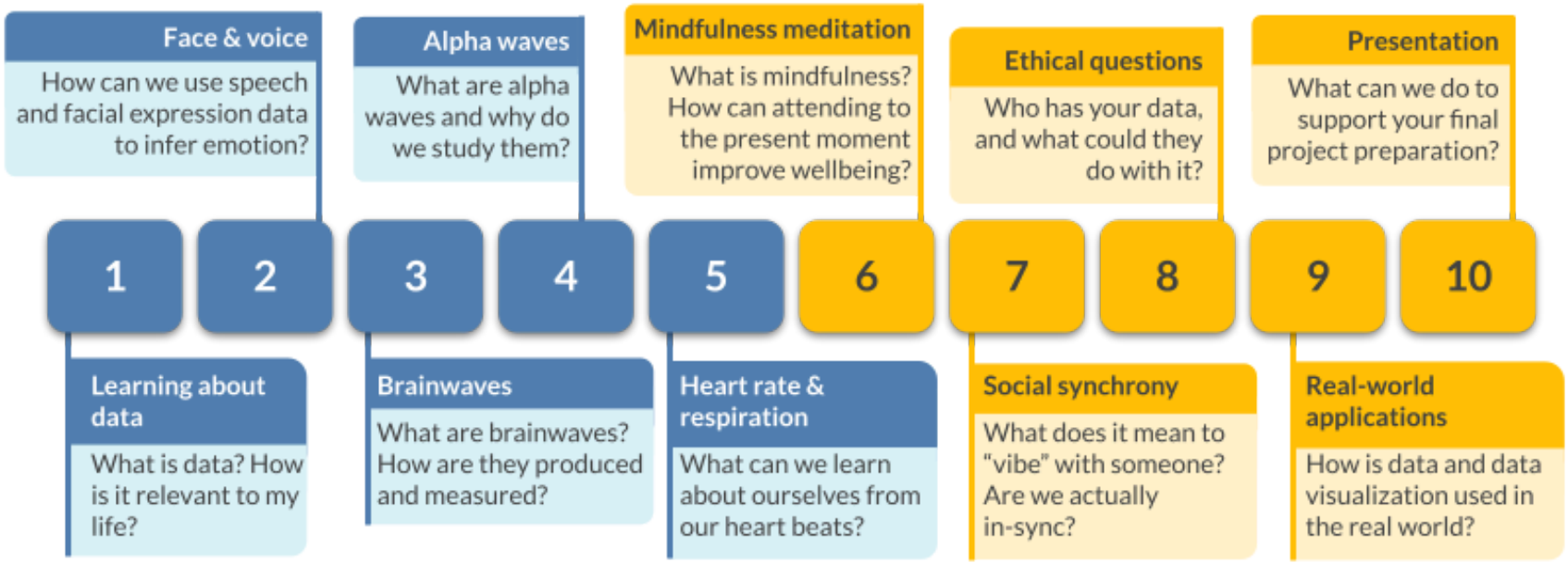
You Quantified Unit Plan

Piloted at Acera School, MA *(Spring 2024)*

mindHIVE

An overview of the You: Quantified course.

The **first half of the course (blue content)** is focused on student explorations of various data streams, while the **second half of the course (yellow content)** contextualizes this knowledge through real-world examples and the development of a final project.



A lesson-by-lesson course description.

The lessons consist of four segments: explore, learn, create, and apply.

See the next page for details.

#	Lesson	Guiding Question / Learning Outcomes	Explore / Engage	Learn	Create	Apply
1	Learning About Data Lesson Plan	What is data? How is it relevant to my life? Understand that data is everywhere and that it can be measured in many different ways. **Skill(s):** • Graphical representation **Technologies Engaged:** • Personal phones, computers, smart watches	**Activity 1A: Data Brainstorm** **Format: T-Chart** What kinds of data do you make? Brainstorm a list of the different types of data you are generating. Which of these types can you detect with your senses? For which of these types do you need additional instruments?	→ **Activity 1B: Lily's Life, In Data** **Format: worksheet** Introduce students to different data types: behavioral, body, brain **Group Discussion:** *What are some similarities you notice between these activities and their representations? What are some differences?*	→ **Activity 1C: Your Life, In Data** **Format: worksheet** Using the data type they were provided with for 1B, students will work in groups to create their own creative visualization for data points inspired by their own life.	**Speaker: N/A**
2	Face & Voice Lesson Plan	How can we use speech and facial expression data to infer emotion? **Skill(s):** • Facial recognition technology • Emotion detection • Data collection, visualization, & interpretation • Creative coding	**Activity 2A: Emotion Charades** **Format: hands-on** In teams, students will engage in 3 rounds of emotion charades. Round 1: Face only Round 2: Voice only Round 3: Face + voice **Group Discussion:** *In which round was it easier to guess the emotion conveyed by your teammate?*	**Activity 2B: When Data Becomes Information** **Format: film** After watching the animated short, "Bao," students will discuss at which point data becomes information. → **Activity 2C: You Quantified App Demonstration** **Visualization: Flower**	→ **Activity 2D: Visualization** **Exploration Question: What does a conversation look like?** Students will work in groups to "map a conversation" onto the Flower visualization. *Teachers are advised to prompt students into choosing conversation topics in which they can	**Speaker: Franc Camps-Febrer** Affiliation: hume.ai **Student Qs Doc:** Located here

		Technologies Engaged: • You: Quantified app facial landmarks tool	*Why?* *In which round was it easier to express the emotion? Why?*	Students will work in groups to choose 5 salient facial features to map onto the visualization.	express emotion!	
3	Brainwaves Lesson Plan	What are brainwaves? How are they produced and measured? **Skill(s):** • Signal processing • Signal sonification • Signal decomposition • Creative coding **Technologies Engaged:** • EMOTIV EEG headset • You: Quantified app sonification tool	→ **Activity 3A: An EEG Exploration** **Format: EEG** Students will work in groups of 3 to explore EEG signals. **Group Discussion:** *What kinds of movements did you try experimenting with? What did you notice about the corresponding data? Was the data perfect?*	**Activity 3B: EEG Demonstration** **Visualization: Sound** Students will compare different brain imaging techniques, learn about EEG brain frequency basics, and the parts of a brainwave. Students will work in groups to guess the sound created with the sonification tool, and learn how to manipulate the visualization through code.	→ **Activity 3C: Visualization** **Exploration Question: Can you produce a unique sound using your own EEG signal?** Students will work in groups to produce their own, unique sound using the sonification tool. *Ideas for activities while conducting this exploration are: listening to different people talking, viewing different types of YouTube videos, comparing different forms of exercise, listening to different genres of music, and reading different genres of books.	**Speaker: Jason Snell** Affiliation: NYU + Independent **Student Qs Doc:** Located here
4	Alpha Waves Lesson Plan	What are alpha waves and why do we study them? **Skill(s):** • Signal processing	→ **Activity 4A: EEG Exploration** **Format: EEG** Students will work in groups of 3 to explore EEG	**Activity 4B: EEG Demonstration** **Visualization: Sun** Students will review the different frequencies, and	→ **Activity 4C: Visualization** **Exploration Question: Create your own!** Students will work in	**Speaker: Roshini Randeniya** Affiliation: EMOTIV **Student Qs Doc:** Located here

		• Signal decomposition • Data collection, visualization, & interpretation • Creative coding **Technologies Engaged:** • EMOTIV EEG headset • You: Quantified app	signals.	when they're usually observed. Students will work in groups to explore the sun visualization, and how it changes in response to different tasks / activities (e.g., meditation, solving a Rubik's cube or puzzle).	groups to create their own exploration question and choose a visualization to answer this question.	
5	Heart Rate & Respiration Lesson Plan	What can we learn about ourselves from our heart beats? **Skill(s):** • Signal processing • Signal decoding • (Informal) Data parsing / extraction / selection • Data collection, visualization, & interpretation **Technologies Engaged:** • EmotiBit	→ **Activity 5A: Heart Rate Exploration** **Format: hands-on** In pairs, students will experiment with modulating their heart rate in different conditions: *How can we make these conditions relevant to daily life experiences?* • Sit, breathe normally • Sit, breathe rapidly • Inhale deeply, exhale deeply • 3 things you're thinking of • Watch video: heights clip • Watch video: scary clip As part of this activity, students will begin thinking	**Activity 5B: A Look at Your Life** **Format: worksheet** Individually, students will be given time to reflect on how they experience stress in their own life, how they usually react to this stress, and how they find themselves adapting (or come back to baseline) after some time. **Guiding Question:** *Why is it important for your body to be able to adapt to the environment?* **Activity 5C: What Would You Do?** **Format: thought experiment** Students will be prompted	→ **Activity 5D: Visualization** **Exploration Question: Create your own!** Students will work in groups to create their own exploration question and choose a visualization to answer this question. *Ideas for activities while conducting this exploration are: listening to hard rock music, reading a favorite book, having a stimulating conversation, competing in a game, watching comedy clips *Visualization this week is hand-drawn.	**Speaker: Kaia Sargent, Kurtis Bertauche** Affiliation: UCLA / NYU, EmotiBit **Student Qs Document:** Kaia Sargent doc located here Kurtis Bertauche doc located here

			about heart rate variability (HRV) and how this can be decoded from a PPG signal.	to think about how they might react to a stressful / stress relieving situation, and will be guided to discuss how this relates to the body's autonomic NS. ***This activity is optional.**		
6	Mindfulness Meditation Lesson Plan	What is mindfulness? How can attending to the present moment improve wellbeing? **Skill(s):** • Introductory research methods • Data collection, visualization, & interpretation • Creative coding **Technologies Engaged:** • EMOTIV EEG headset • EmotiBit • You: Quantified app	**Activity 6A: Mindfulness Exploration** **Format: MH website** Individually, students will take 10-15 minutes to complete the MindHive mindfulness study, linked here. Once students have participated, and have had a chance to read a description of the study, they'll answer the following questions: *What was the exploration question asked in the study you participated in?* *How did the scientist aim to answer this exploration question?* *Aside from focus, what other cognitive or brain functions could we look at in association with mindfulness?* ***Optional: Group**	**Activity 6B: Mindfulness? Bingo!** **Format: hands-on** In small groups, students will discuss and reflect on personal experiences with mindfulness, guided by the bingo cards. *What were some of your small group's takeaways?* **Activity 6C: A Guided Meditation** **Format: hands-on** The teacher leads the class in a 1-min guided meditation (script in slides). *What did you experience?* Students will be given time to write down any reflections they had.	→ **Activity 6D: Visualization** **Exploration Question: How do your brainwaves change as you engage in meditative practice?** In small groups, students will choose a meditative practice, conduct a short Google search about this practice, predict how their brain waves might change while engaging in this practice, and conduct the exploration. *Activities related to HR/HRV will be added to this curriculum.	**Speaker: Noah Gould** Affiliation: Muse **Student Qs Doc:** Located here *Sarah Lynn's presentation on her work in meditation was included in the curriculum, however, she is not currently a guest speaker for this course.

			discussion about the tasks used in this study.			
7	Social Synchrony Lesson Plan	What does it mean to "vibe" with someone? Are we actually in-sync? **Skill(s):** • Signal processing • Data parsing / extraction / selection **Technologies Engaged:** • You: Quantified app face synchronicity tool	**Activity 7A: A Social Synchrony Exploration** **Format: worksheet** In pairs, students will complete the worksheet activity – they'll be prompted to play an adapted version of the 36 questions game, and reflect on their social closeness with their partner. Adaptation: Students anonymously answer the adapted questions for themselves, and as a group, must guess whose answers belong to which student. **Group Discussion:** *How did your social closeness rating change by the end of the activity?* *Which answers surprised you most?* *What do you have in common with your own friend group?*	No activities here.	→ **Activity 7B: Visualization** **Exploration Question: Create your own!** Students will work in groups to create their own exploration question and choose a visualization to answer this question. *Ideas include: testing out an activity with those who you aren't the best of friends with, competing to obtain the highest synchronicity score, combining results from different visualizations, creating a facial expression sequence, testing out activities you do / don't enjoy	**Speaker: Dr. Suzanne Dikker** Affiliation: NYU **Student Qs Document:** Located here
8	Ethical Questions	Who has your data, and what could they do with it?	**Activity 8A: Where Do You Stand?** **Format: hands-on**	→ **Activity 8B: Case Studies** **Format: worksheet**	→ **Final Project Intro** Final Project Guide here [Final Project] Data Viz	**Speaker: Gaelen Hadlett, Mimi Onuoha** Affiliation: Independent,

	Lesson Plan	***Soft* Skill(s):** • Critical reflection & dialogue **Technologies Engaged:** • Personal phones, computers, smart watches • EMOTIV EEG headset • EmotiBit	Students should physically stand on the spectrum of a line indicating the position that aligns with their beliefs on data usage from "Anyone should be able to know anything about me" to "I should be able to control everything that the world knows about me".	In small groups, students will pick one of the case studies listed on the slide and answer the corresponding questions in the provided worksheet. **→ Activity 8C: NeuroFutures Card Game** **Format: hands-on** As a whole group, students will reflect on pros / cons of possible NeuroFutures technologies, and consider various POVs in discussing their value and application.	Guide here	Independent **Student Qs Documents:** Mimi Onuoha doc located here Gaelen Hadlett doc located here
9	Real-World Applications Lesson Plan	How is data and data visualization used in the real world? ***Soft* Skill(s):** • https://docs.google.com/document/d/1FD8ubh3fE6makTJJe5VUwmFGwl8jxiGriae8IFP3Lgw/edit **Technologies Engaged:** • Personal phones, computers, smart watches • EMOTIV EEG headset	Watch the EEG video. **Discussion Questions:** *What if your teachers could watch your brain activity in real-time?* *Who should have access to this information?* *Do we have the right to privacy of our own thoughts?* *How can wearing this type of technology modify your behavior?* ***This video is optional for this lesson.**	No activities here.	No activities here. The You: Quantified final project is introduced. Final Project Guide here [Final Project] Data Viz Guide here	**Speakers: Stefanie Posavec, Sari Carel, Henry Valk** Affiliation: Dear Data, Independent, Pison **Activity: Speaker Scavenger Hunt** **Format: worksheet** Students will take time to explore the work of today's speakers, reflect, and discuss. **Student Qs Documents:** Stefanie Posavec doc located here

		• EmotiBit				Sari Carel doc located here Henry Valk doc located here
10	Project Preparation Lesson Plan	What can we do to support your final project preparation?	No activities here.	No activities here.	No activities here.	No guest speakers.