SUBSYSTEMS TESTING, TECHNICAL WRITING, STAKEHOLDER FEEDBACK

DESIGN EPICS

LEARNING OBJECTIVES

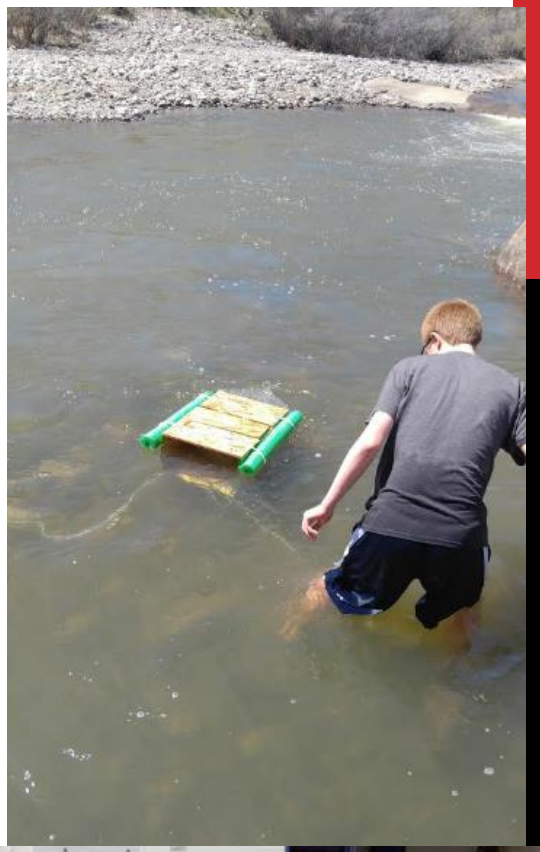
3. Design solutions through cycle of testing, refining, iterating, and feedback.

6. Present technical ideas and solutions graphically, orally, written, and through prototype demonstrations.

- 6.3 Compile user and stakeholder considerations, problem and technical requirements, research and testing results, to verbally and visually communicate design ideas and justifications through technical writing, applying proper tone, voice, grammar, structure, and formatting per given standards.

SUBSYSTEMS TESTING/RESEARCH

- **Follow your testing protocols** → *Have you gotten started?*
- **Document everything!** → *Photos, design log, etc*
- **Include results in subsystems report** → *this portion is lab report style*
- **USE resource librarians: guidance on research**



FIXING!

THE 5 COMMON TECHNICAL WRITING PITFALLS

Worksheet - work in teams

10 min

AWARENESS TRAINING

If you ever find yourself in the wrong story, leave.

-Mo Willems

Things do not change; we change.

-Henry David Thoreau

Some things have to be believed to be seen.

-Madeleine L'Engle

Are you so sure it's not the dancer who creates the music she moves to? Or the painter who manifests the mountains he captures? Or the tycoon who builds the empire before there's a dime?

Whatever you want, let it exist first in your mind, imagine every nuance and consideration, let the walls have substance, the halls have depth, and the money have weight in the palm of your hand, and then all that's necessary to bring it to pass will be drawn unto you.

-Mike Dooley

1. MAKE YOUR IDEAS ACCESSIBLE (AVOID DATA DUMPING)

Do not WRITE OUT everything in a table!!

And remember: a PICTURE tells a THOUSAND WORDS!

Revised:

Table 1 outlines properties of the grow system shelves, with pressure-treate
as the material.

Table 1. Plant Growing Shelf Properties

Property	Measurement	Unit
Length (L)	22	inches
Depth (D)	22	inches
Edge Width (W_{edge})	3	inches
Diameter of Center Perforation (D_{perf})	2.375	inches

2. PROVIDE FACTS (AVOID VAGUE, UNSUPPORTED FACTS)

Revised:

1.8 billion people don't have access to clean water. Water for People is a non-governmental organization that works in communities in nine countries to help improve water and sanitation for four million people [1].

3. (AVOID) WORDINESS AND EXPLETIVES*

Revised:

We recommend the purchase of a new computer.

Clean the lens frequently and regularly (see Procedure 1.32).

** An expletive is an unnecessary word…. Yes, including cuss words ☺*

4. PRESENT MATERIAL LOGICALLY (AVOID TOO MUCH "HOW I DID THIS")

Revised:

We used bread, chunky peanut butter, and strawberry jelly to make peanut butter and jelly sandwich.

5. USE ACTIVE VOICE (FOR EPICS REPORTS)

Revised:

The team's system empowers individuals and families to grow vegetables year-round to supplement their diet. An affordable, feasible, and functional system provides a balance of food choices in these areas.

REFLECTION QUESTIONS – IN YOUR DESIGN LOG

- **What pitfalls are you guilty of?**
- **What can you do differently?**

Additional resource: Ch 3 of A Guide to Writing as an Engineer, posted on BB: "Guidelines to Writing Noise-free Engineering Documents"

3 min

ASSIGNMENT FOR NEXT WEEK (STUDIO DAY 1): INTERVIEW OF TECHNICAL PROFESSIONAL *(1 PT, INDIVIDUAL)*

- **Read chapter 1 – GWE (Guide to Writing as an Engineer - *Posted on BlackBoard*)**
- **Complete Question #1: Interview a working engineer OR scientist**
- **Print out your interview summary and bring to class *next week*.**
- **Peer review for pitfalls in class *next week*.**
- **Make revisions and submit by end of the week.**

INCORPORATING STAKEHOLDER FEEDBACK

EPICS

LEARNING OBJECTIVES

2. Research the context and background of problems and solutions, including user needs and technical requirements, through scholarly and authoritative sources, and stakeholder input.

- 2.5 Analyze the problem from a user's and stakeholders' perspective.

3. Design solutions through cycle of testing, refining, iterating, and feedback.

- 3.1 Refine design/solution ideas through qualitative and quantitative justification with respect to requirements, constraints, novelty, and user/stakeholder needs.
- 3.4 Analyze and create iterations of the design through testing and refining prototypes.

WHAT HAPPENS WITHOUT STAKEHOLDER INPUT IN THE PROBLEM-SOLVING PROCESS?

Hint:

Hint, hint:

→ Unusable, suboptimal, or hard-to-implement solutions

PROGRESS ON YOUR "COMMUNICATION PLAN" FROM TESTING PROTOCOLS?

From Testing Protocols guidelines:

Table 2: Communication Plan for Stakeholder Feedback

Stakeholder/Type	Name, Contact Info	Due Date	Person Responsible

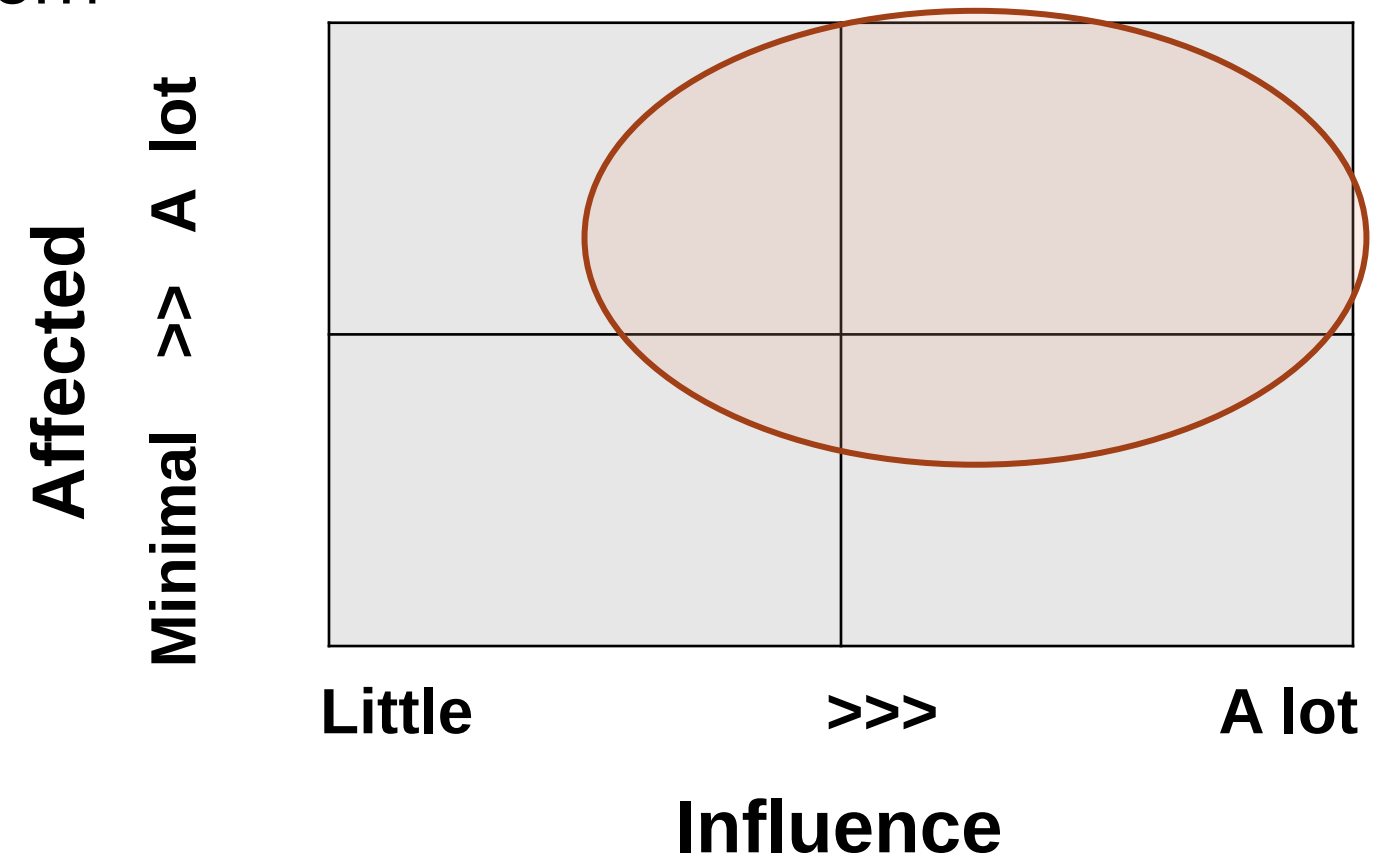
Class discussion: what's going well, not so well?

2-3 min

REMEMBER? MAPPING STAKEHOLDERS

- How **affected** are they by the problem?
- How much **influence** do they have over the situation/problem/solution?

→Who are your key stakeholders?



WHAT KEEPS US FROM ENGAGING WITH STAKEHOLDERS?

Individually:

Think of all the reasons that keep you from asking end-users, and other key stakeholders, their opinions on your process.

4-5 min

WHAT KEEPS US FROM ENGAGING WITH STAKEHOLDERS?

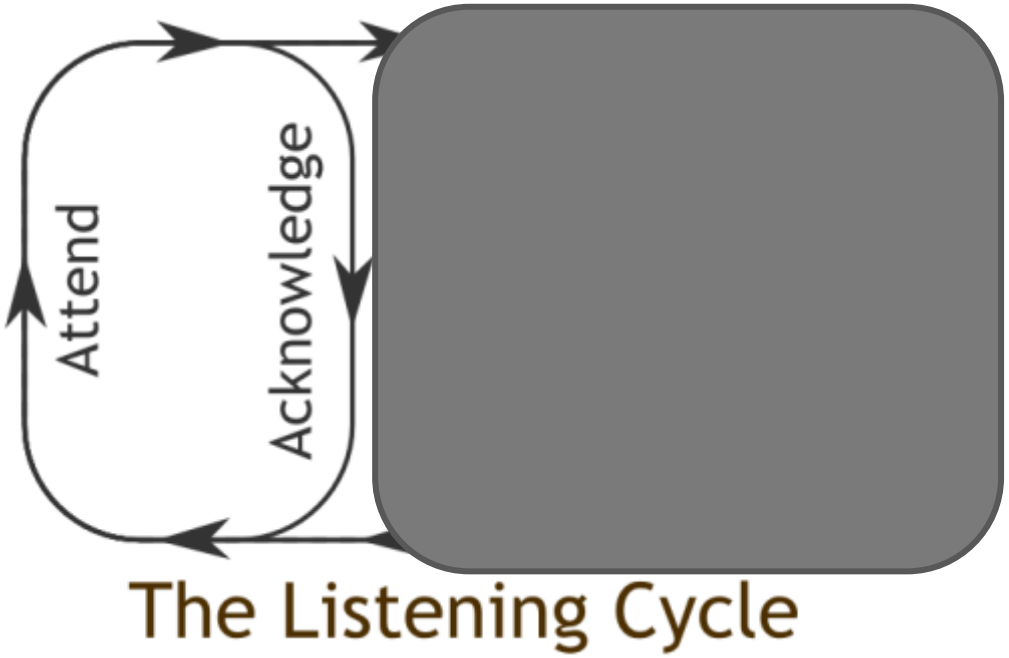
In your teams:

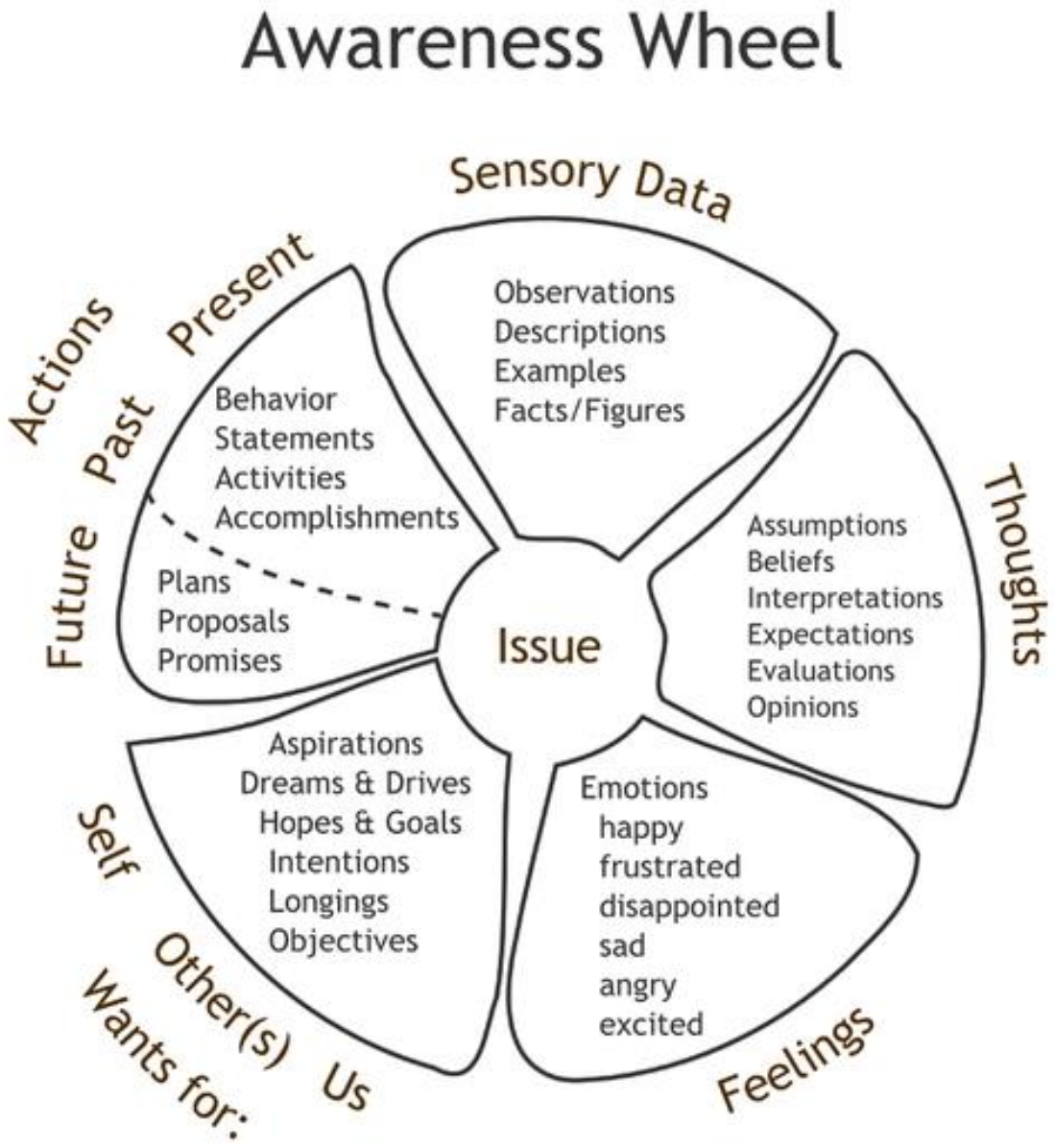
Think of all the reasons that keep you from asking end-users, and other key stakeholders, their opinions on your process.

→ What are ways to deal with these hold-ups?

INTERVIEWING SKILLS

- **Be prepared**
- **Uninterrupted Attendance**
- **Awareness**





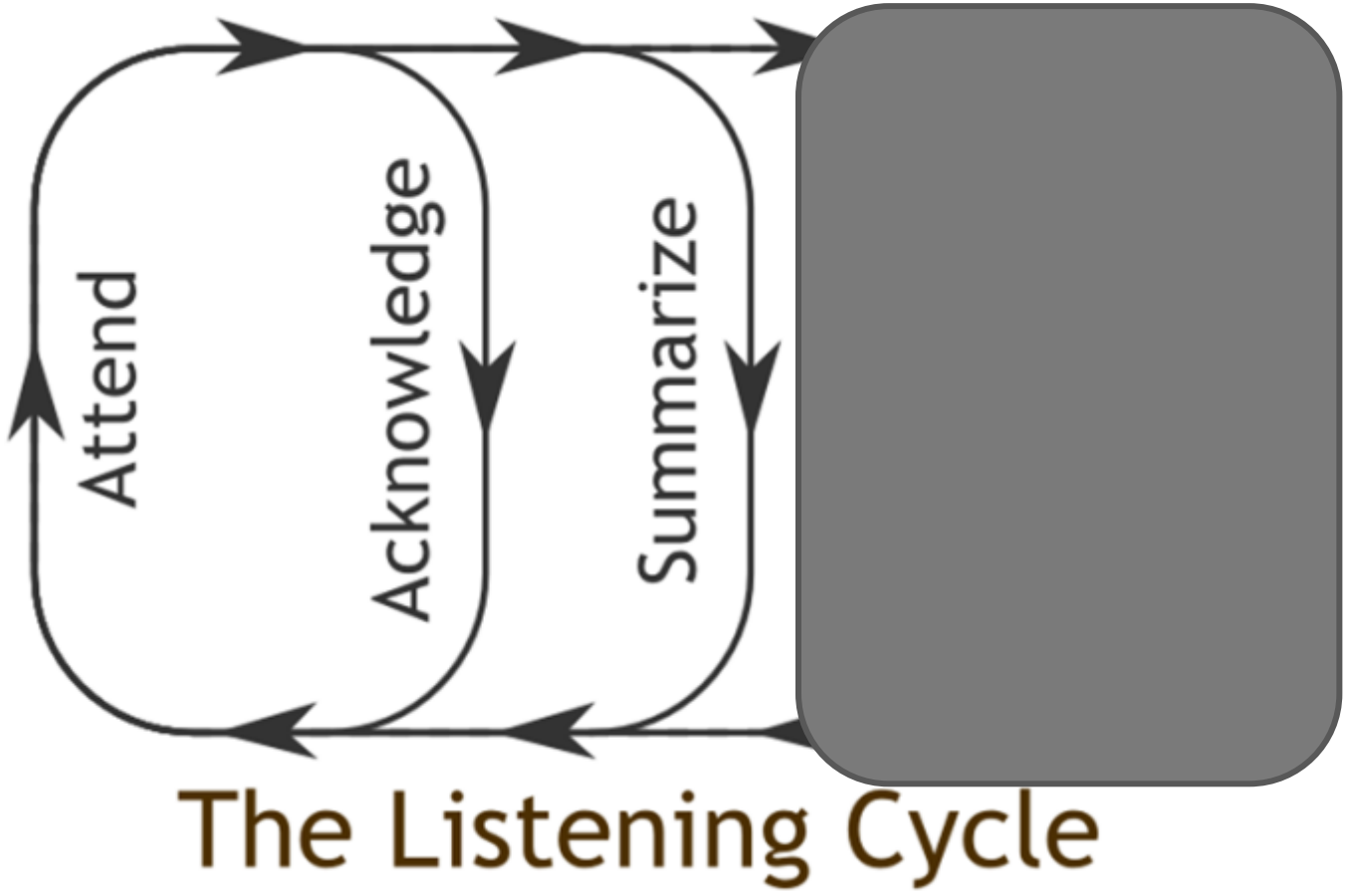
PREPARING TO INTERVIEW

- Respect their time!
  - Do your research
  - Plan your interview
  - Prepare good questions
- Awareness of the ‘baggage’ you each bring in with you
  - They will be forming perceptions of you
  - They are the expert!
- Bring a notebook and take good notes, or a recording device (with permission)

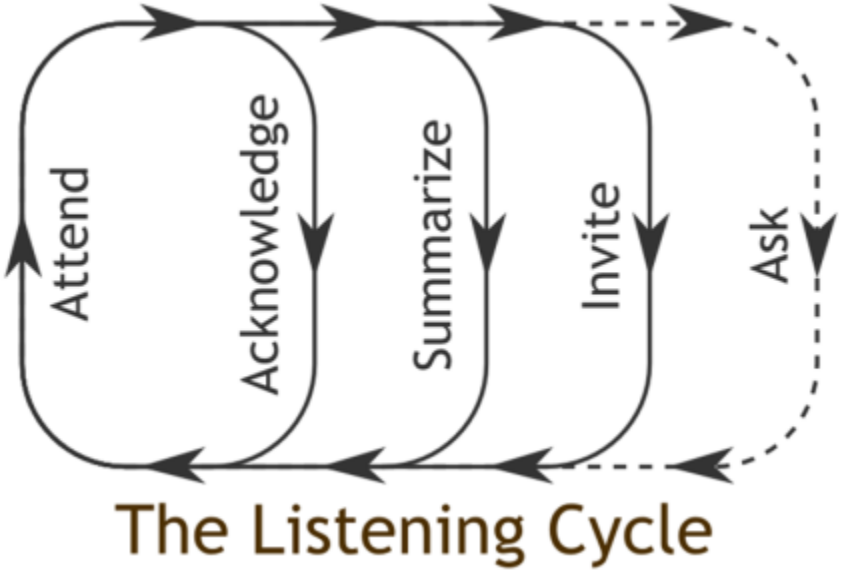
- Be prepared to LISTEN INTENTLY…

TAKING THE NEXT STEPS IN THE LISTENING CYCLE

Summarize what you heard.



BE AN EXPERT INTERVIEWER
FINAL STEPS IN THE LISTENING CYCLE



Hone your observation (awareness) skills

- Many times people say one thing, but do another
- Awareness of all forms of communication
  - Body language, tone, pace, volume

Invite them to share

- Ask them to Show you or DRAW for your, or
- Bring props (rough and refined prototypes, sketches, etc.)
- Ask them for examples or stories

When enough time has passed for a follow-up,

- Ask open-ended questions, not many that have yes/no answers
  - **“Tell me more about…”**
  - **“Can you clarify….”**

DOCUMENT (in your design log)

PEER REVIEW "PROXY" STAKEHOLDER FEEDBACK

Pair up with another team to serve as "proxy" stakeholders:

1. explain the role you want them to serve (ie single parent, resident of assisted living facility, etc)
2. present your solution concept. Use graphics and/or prototypes
3. DOCUMENT the feedback and responses.

10-12 min

NEXT STEPS

Revise and/or act on your Testing Protocols Communication Plan

From Testing Protocols guidelines:

Table 2: Communication Plan for Stakeholder Feedback

Stakeholder/Type	Name, Contact Info	Due Date	Person Responsible

COMING THIS WEEK

- **Studio Day 2:**
  - No Mentor Presentation
  - Subsystems Testing Continued

COMING UP NEXT WEEK

- **Studio Day 1:**
  - DUE: Technical professional Interview (bring print out to class)
  - **Homework:** read Ch 1 GWE (posted on BB)
  - Subsystems Testing Continued
- **Studio Day 2:**
  - DUE: Subsystems reports

TEAM TIME

Follow testing protocols

- Prototype construction
- Component and subsystem validation – testing and/or research
- Communication plan revision / next steps

Work on Subsystems report

Remainder of class