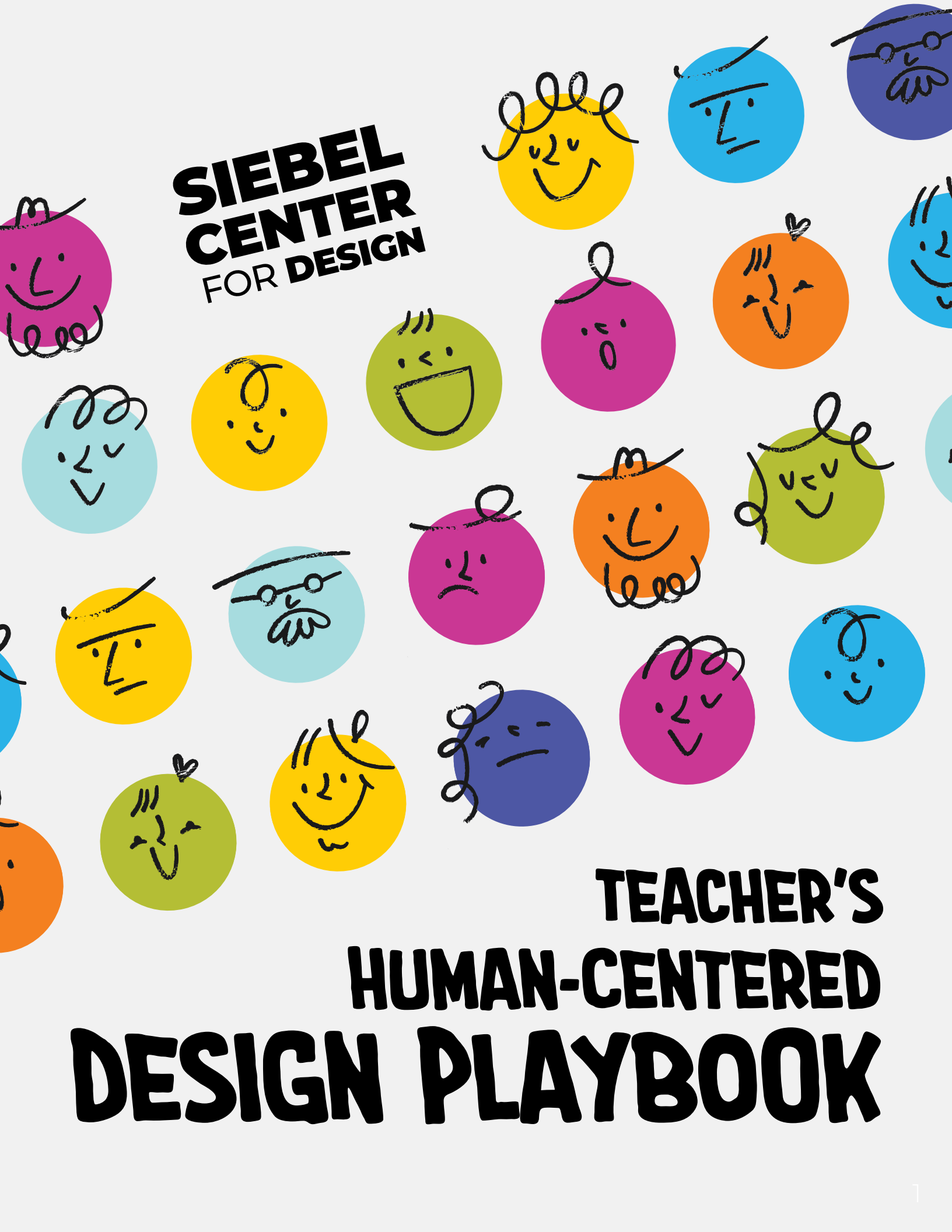




**SIEBEL
CENTER
FOR DESIGN**

**TEACHER'S
HUMAN-CENTERED
DESIGN PLAYBOOK**

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What is

Human-Centered

Design?

Human-Centered Design is a creative approach to problem-solving that starts and ends with people.

Instead of jumping straight to solutions, HCD asks designers to slow down first. To go learn from the people they're trying to help. To understand the real problem before attempting to solve it. To build rough, testable ideas and refine them based on what real users actually experience.

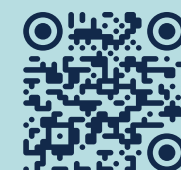
It's a process that takes empathy seriously as a design tool. Not empathy as a feeling but as a practice — a discipline of setting aside assumptions, asking better questions, and letting other people's experiences reshape your understanding of what's actually needed.

HCD has roots in design firms like IDEO and Stanford's d.school, but it belongs in classrooms. The skills it builds — curiosity, collaborative problem-solving, systems thinking, creative confidence — are exactly what students need to navigate a world full of complex, human problems. For a lot of students, HCD is the first time school has asked them to use their curiosity as the primary tool. That's not a small thing.

YOU DON'T HAVE TO BUILD THIS PRACTICE ALONE.

Bringing human-centered design into your classroom is easier with a community behind you. That's what the **Human-Centered Schools Network (HCSN)** is for.

Run by the Siebel Center for Design at the University of Illinois, the HCSN is a growing community of K–12 educators, school leaders, and administrators reimagining teaching and learning through human-centered design. Members share classroom-ready tools and resources, co-develop solutions to real challenges, connect with other practitioners, and gather at HCSN Summits.



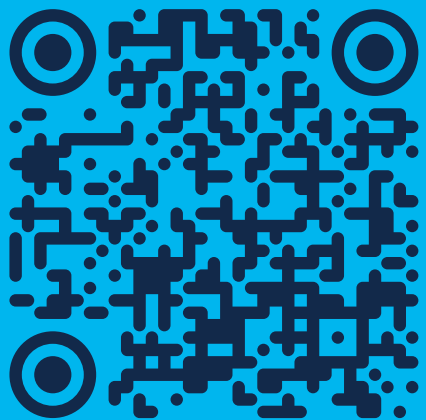
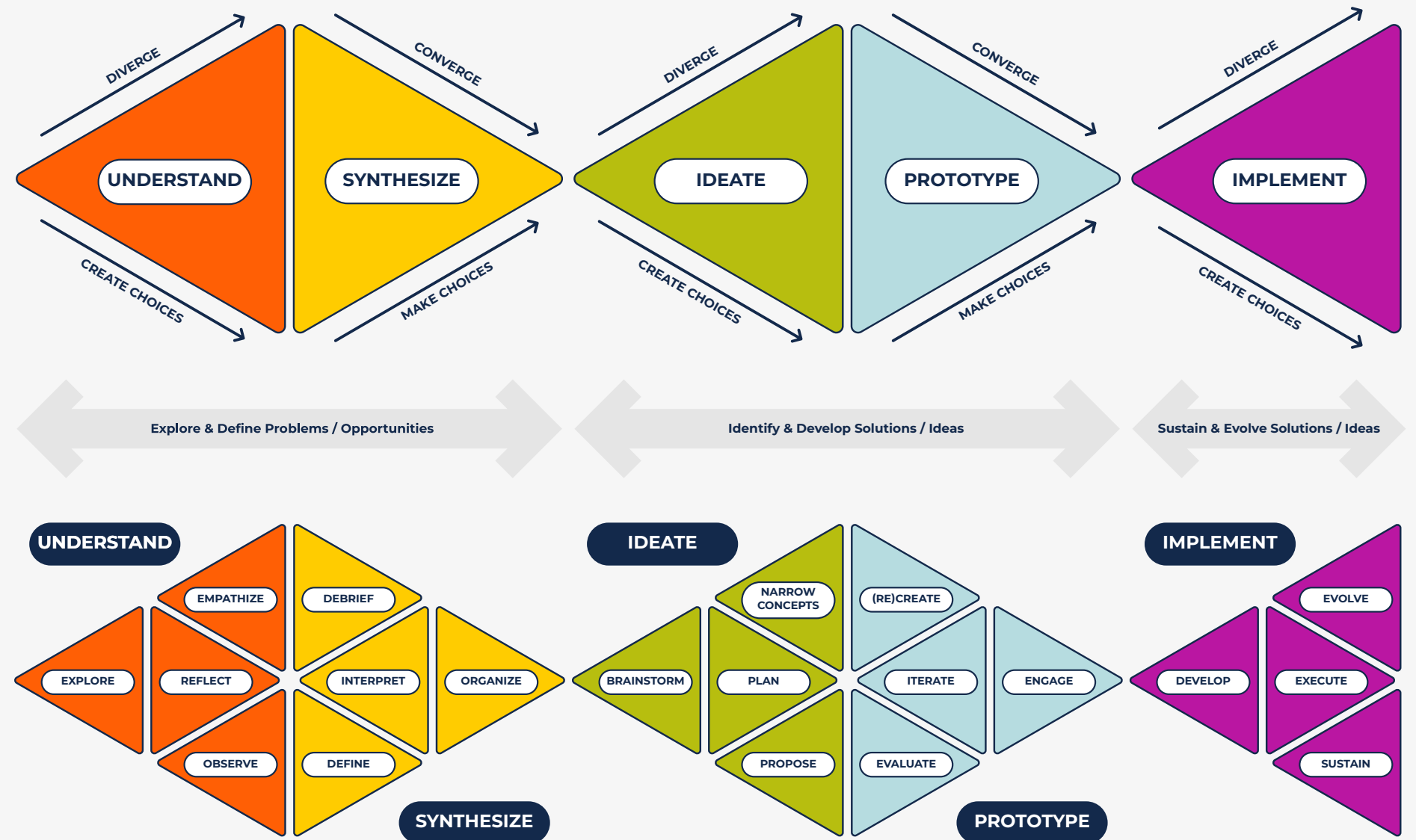
Explore resources, read stories from other classrooms, and find out how to get involved.

Scan Qr or follow link to Learn More: <https://go.illinois.edu/HCSN>

HUMAN-CENTERED DESIGN TAXONOMY

Our Human-Centered Design Taxonomy provides a flexible, accessible, and approachable structure that can guide the processes of solving wicked problems and generate creative and meaningful solutions. HCD should not be viewed as a predefined sequential series of processes that one initiates to solve a problem; rather, it is best described as “a system of spaces”.

Each space consists of processes such as empathize, organize, brainstorm, create, and develop which can be executed by learning and implementing practices such as interviewing people, identifying themes, communicating ideas, creating prototypes and developing plans to bring final designs to the market. The Taxonomy presents the Human-Centered design spaces and processes based on the definitions and the practices defined in our research.



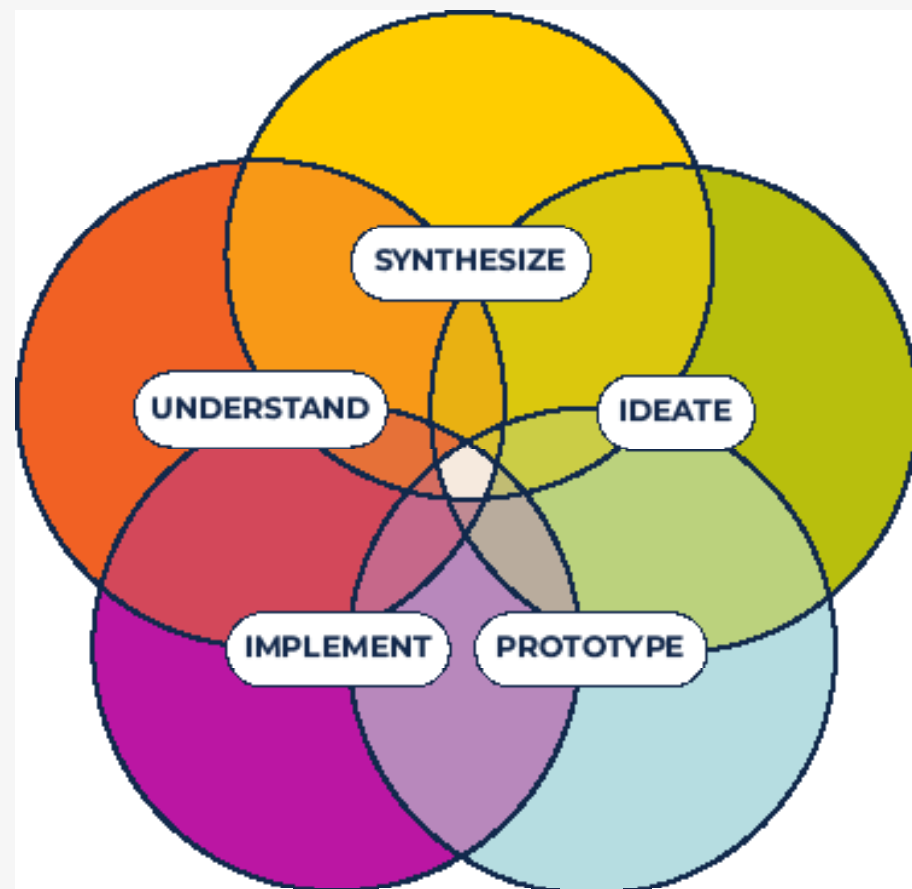
Scan the QR Code to learn more details about our Human-Centered Design Taxonomy & Explore SCD's Research work!

THE FIVE SPACES

HCD CORE IS ORGANIZED AROUND FIVE SPACES

UNDERSTAND
SYNTHESIZE
IDEATE
PROTOTYPE
IMPLEMENT

We call them spaces, not steps. Steps imply a straight line. Design doesn't work that way. Students move forward, loop back, skip ahead, and sometimes discover they need to return to the beginning with fresh eyes. That's not a problem, that's the process working.



THINK OF EACH SPACE AS A DIFFERENT MODE OF THINKING

01 | Understand

Who are we designing for, and what do they actually need? This space is about deep listening, suspending assumptions, and learning from real people before making any decisions.

02 | Synthesize

What does all of this research mean? This space is about turning raw observations into insights — finding the patterns, naming the themes, and framing the real design challenge.

03 | Ideate

What are all the ways we might solve this? This space is about generative, divergent thinking, quantity over quality, wild ideas welcome, building on each other's thinking.

04 | Prototype

What does our best idea look like when it's real enough to test? This space is about building rough, fast, and cheap concepts to learn, not to launch.

05 | Implement

How do we make this work in the real world, and keep it working? This space is about execution, sustainability, and the ongoing cycle of improvement that follows a launch.

HOW TO USE THIS WORKBOOK

THIS IS A FIELD GUIDE, NOT A SCRIPT.

Each section covers one HCD space. You'll find the core concepts, practical activities, facilitation guidance, honest advice for when things get hard, and space to capture your own observations. You don't have to use all of it, or use it in order. Two class periods might be enough for a first pass through Understand. A full semester might not be enough to go deep on all five spaces. Let your students, your context, and your curriculum lead.



EACH SECTION INCLUDES

- The big idea — plain language, no jargon
- Key concepts students need to know
- Learning outcomes to hold in mind
- Practical logistics and activities
- Facilitation tips that actually help
- Real talk for when things go sideways
- Your notes — space to reflect and iterate



A FEW THINGS WORTH KNOWING

- You don't have to do all of it
- You don't have to do it in order
- Activities can be homework or woven into existing projects
- The Teacher Notes pages are for you so, use them
- Adapting freely is the right call, not a compromise
- Your students' experience is the best feedback you'll get

A NOTE ON YOUR ROLE AS FACILITATOR

Facilitating HCD is different from most teaching and that difference is worth naming upfront.

In most classroom contexts, you're the expert. You know the answer. Your job is to help students get there. In HCD, the people you're designing for are the experts. Students' job is to go learn from them and your job is to create the conditions for that learning to happen.

That means sitting with ambiguity longer than feels comfortable. Resisting the urge to resolve tension too quickly. Letting students struggle productively instead of smoothing the path. Celebrating the question more than the answer.

It also means modeling the mindset you are asking students to adopt. When you say "I don't know, let's find out", genuinely, not as a teaching technique, you give students permission to not know either. That permission is the foundation everything else is built on.

THE MOST IMPORTANT THING YOU CAN DO

Trust the process.

HCD feels messy in the middle.

That's not a sign something has gone wrong.

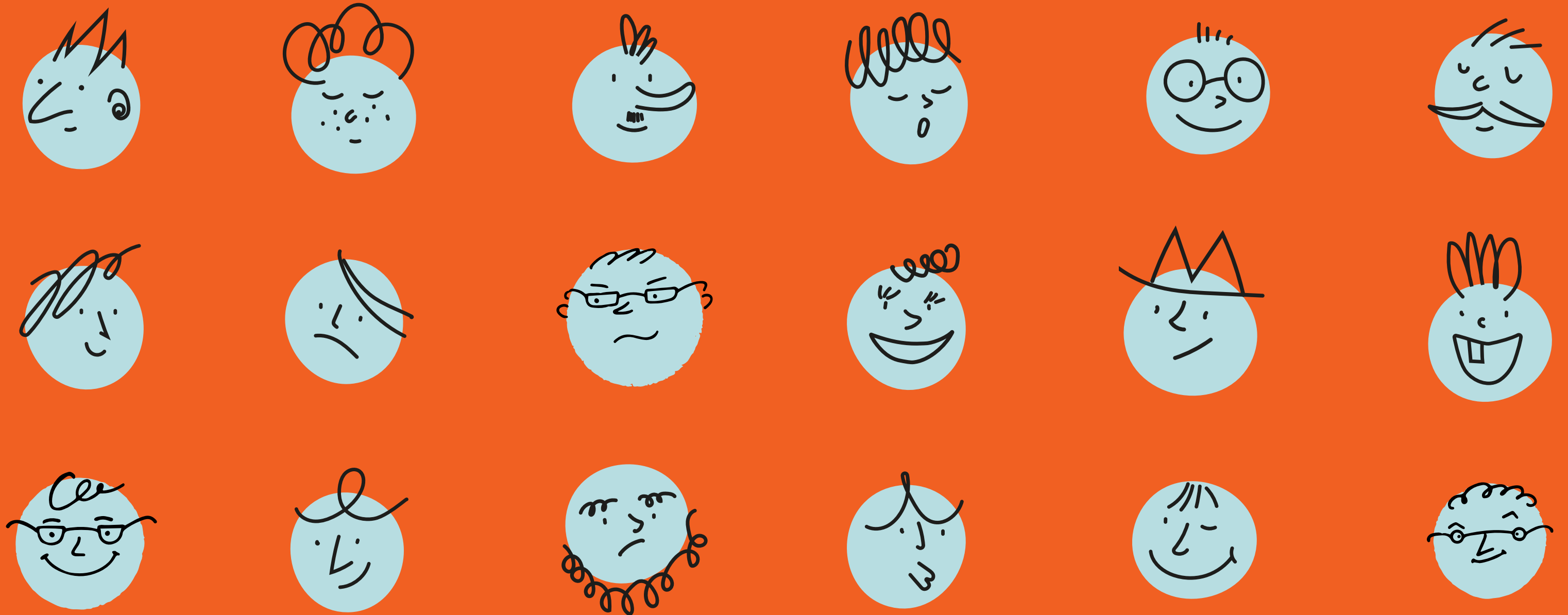
The mess is where the thinking happens.

Your job isn't to clean it up.

It's to help students stay in it long enough for something real to emerge.

QUESTIONS? REACH THE SCD TEAM AT DESIGNCENTER@ILLINOIS.EDU

UNDERSTAND



**Before you can design anything meaningful,
you have to understand the people you're designing for.**

**The goal isn't to confirm what we think we know.
*It's to discover what we never knew we didn't know.***

WHAT IS THIS, REALLY?

The Understand space is the foundation of everything that follows. Students step outside their own assumptions and go learn from real people through interviews, observation, and genuine curiosity.

This is not a research report phase. It's a listening phase. Students are learning to ask better questions, sit with uncertainty, and let other people's stories surprise them.

The biggest shift you'll need to make as a facilitator: slow everything down.
The temptation is to jump to solutions. The whole point of Understand is to resist that.

The four modes of Understand

Students move between these — they're not steps to check off in order.

Explore

Survey the landscape before diving in. What do you already know? What are you assuming? Document it — those assumptions are your first research targets.

Reflect

Come back to what you're learning. What gaps opened up? What do you still need to know? Adjust and go again. This is the most skipped step — don't skip it.

Observe

Watch what people actually do — not just what they say they do. Be in the environment. Notice what's invisible to the people already living it.

Empathize

Go talk to people. Really talk to them. Seek out the unexpected voice — the person whose experience you wouldn't have thought to include.

Key concepts & terminology

MAKE SURE STUDENTS ARE FLUENT IN THESE BEFORE THEY START. THEY'RE NOT JARGON — THEY'RE THE ACTUAL TOOLS OF THIS SPACE.

EMPATHY

Seeing the world through someone else's eyes, not just feeling sorry for them, but genuinely trying to understand their experience from the inside.

Systematic investigation into the behaviors, needs, and motivations of the people you're designing for. Not a survey. A real attempt to understand.

USER RESEARCH

STAKEHOLDER

Anyone affected by or with influence over the problem, not just the obvious end user. Who else is in the room, even if they're not visible yet?

The preconceived notions that cloud our understanding of others. The first step to overcoming bias is catching it in yourself.

BIAS

What students will be able to do

HOLD THESE IN MIND AS YOU FACILITATE. THEY'RE YOUR COMPASS, NOT A CHECKLIST.

Set exploration goals based on current assumptions and knowledge gaps

Conduct interviews that build genuine empathy — not just gather data points

Observe environments and behaviors through a designer's lens

Identify both explicit (stated) and implicit (unstated) needs

Demonstrate real perspective-taking — seeing a situation from someone else's position

Spot own biases and assumptions — and question them

How do I run it?

The Basics

TIME

2–4 class periods minimum. Can also run as ongoing homework or woven through other projects.

GROUPS

Pairs for interviews. Groups of 3–4 for observation. Individual for reflection.

SPACE

Flexible seating. Wall space for posting findings.

MATERIALS

Sticky notes. Large paper. Markers. Notebooks. That’s it.

Three activities worth your time

INTERVIEW ROLEPLAY

Before students talk to real people, they practice with each other. Run one round, then debrief together: Which questions got real answers? Which ones fell flat? This is where they discover their questions are actually statements in disguise.

STORY CIRCLES

After research, students share the most human moment they encountered — not the most data-rich finding. The one that made them stop. This builds empathy across the whole class, not just within individual teams.

EMPATHY GALLERY WALK

Teams post their research findings visually around the room. Everyone rotates and leaves reactions on sticky notes. What resonates? What surprises? What opens up a new question?

Discussion starters

For small groups

“Share one thing you learned that completely changed your perspective on this problem.”

For individuals

“Write a letter to yourself from the perspective of the person you interviewed.”

Reflection prompts for students

- What surprised you most about what you learned from your interview or observation?
- How did your initial assumptions about this person or problem change through your research?
- What emotions did you notice in yourself and in others during this process?
- How might this person’s experience be different from your own — and why does that matter?

How to know it’s working

WHILE IT’S HAPPENING

Watch their questions. Are they genuinely open-ended? Is the student listening — or just waiting for their turn to talk? Quality of curiosity matters more than quantity of output.

ASK STUDENTS TO ASSESS THEMSELVES

Not just what they learned — how did they change? Did their assumptions shift? Can they name a moment they were wrong? That’s the real growth indicator.

AT THE END

Interview summaries, empathy maps, and peer presentations all show what students heard. But also look for what they don’t know yet — that’s just as important.

Before you facilitate

Model active listening out loud. Narrate your thinking so students can see what it looks like to actually listen instead of waiting to respond.

Set interview etiquette before anyone talks to anyone. What does a good question sound like? What does a bad one feel like to receive?

Can’t access community participants? School staff and family networks are valid starting points. So is each other — peer interviews on low-stakes topics build muscle before the real thing.

When it goes sideways
EVERY TIME. THESE ARE THE MOMENTS.
HERE'S WHAT ACTUALLY HELPS.

Students make assumptions instead of asking questions

Give them question stems and practice “I wonder...” statements before the interview. The shift from “I think” to “I wonder” is a real one — it puts them in a different mental posture. Also: reward curiosity explicitly. Celebrate the student who came back with more questions than answers.

Their questions are actually leading questions in disguise

This is the most common trap. “Don’t you think the cafeteria food is bad?” is not a question — it’s an opinion with a question mark. Teach neutral framing. Practice converting loaded questions to open ones as a class, out loud, before anyone goes to interview a real person.

They can’t find willing participants

Start closer to home. School staff, family members, and community partners are all valid. So is the question: what can you offer the person being interviewed? Reciprocity matters.

Interviews stay surface-level

Teach the follow-up as a skill, not an instinct. “Can you tell me more about that?” and “What did that feel like?” are not natural for most students. They need to practice them until they feel normal. Model it yourself — interview a student in front of the class and narrate your follow-up choices.

Students rush through interviews to get it done

Set a minimum time and build in silence practice. Teach them that a pause after an answer is an invitation, not an awkward failure. The best stuff often comes out after the student thinks the interview is over.

Students are uncomfortable and want to bail

Lower the stakes first. Peer interviews on easy, low-stakes topics build the muscle before the real thing. Provide scripts. Let them practice in settings where being imperfect is fine.

Your Notes

Use this space after you run the Understand space.
These observations are the raw material for your next iteration.

WHAT WORKED BETTER THAN EXPECTED?

WHAT FELL FLAT OR FELT FORCED?

A STUDENT MOMENT WORTH REMEMBERING

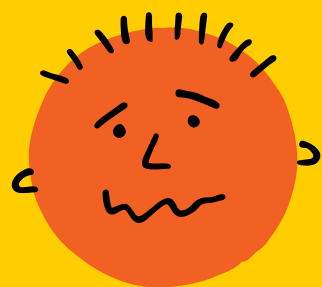
WHAT WOULD YOU CHANGE BEFORE RUNNING THIS AGAIN?

ONE THING YOU WANT TO TRY NEXT TIME

A few resources worth your time

Empathy: Why It Matters, and How to Get It — Roman Krznaric
The Art of Gathering — Priya Parker (read this for thinking about interview environments)
Thanks for the Feedback — Stone & Heen (counterintuitively useful for listening skills)

SYNTHESIS



**This is where you turn a pile of raw research
into something that actually means something.**

The goal isn't to organize data.
It's to find the human truth buried inside it.

WHAT IS THIS, REALLY?

The Synthesize space is where sense-making happens. Students come back from their research with quotes, observations, and stories and now they have to figure out what it all means.

This is harder than it sounds. The temptation is to skim the surface: find a few patterns, label them, move on. The real work is staying with the messiness long enough for genuine insights to emerge.

The biggest shift here: moving students from “what we heard” to “what it means.” Those are two very different things, and most students need help making that jump.

The four modes of Synthesize

These are not linear — expect students to loop back, especially between Organize and Define.

Debrief

Get everything out. What did you hear? What stood out? What surprised you? Don't filter yet — just surface.

Organize

Start clustering. Group related observations. What's pulling toward each other? What's in tension?

Define

Name the patterns. Develop insights. Write How Might We statements that open up the problem space.

Interpret

What do you still not know? What questions does this research open up that you need to answer before moving forward?

Key concepts & terminology

THESE ARE THE TOOLS STUDENTS USE TO MAKE MEANING FROM RESEARCH. WORTH SPENDING TIME ON BEFORE THEY DIVE IN.

AFFINITY MAPPING

Grouping related data to reveal larger themes. The physical act of moving sticky notes matters — don't skip it for a digital shortcut.

A deep understanding that reveals underlying motivations or needs. Not an observation — an interpretation. “People are busy” is an observation. “People feel guilty about not doing more” is an insight.

INSIGHT

THEME

A central idea that emerges across multiple data points. Good themes are specific enough to be useful and broad enough to be meaningful.

How Might We — a question that reframes a challenge as a design opportunity. “How might we help students feel less anxious about interviews?” Not “How might we fix anxiety.”

HMW STATEMENT

PATTERN RECOGNITION

Identifying recurring themes, behaviors, or needs across different data sources. The skill of seeing what's consistent underneath the variation.

What students will be able to do

HOLD THESE IN MIND AS YOU FACILITATE. THEY'RE YOUR COMPASS, NOT A CHECKLIST.

Organize and categorize qualitative data using affinity mapping and other methods

Identify patterns and themes across multiple sources — not just within one interview

Distinguish between observations (what happened) and insights (what it means)

Write How Might We statements that genuinely open up the problem space

Communicate complex findings clearly — in both visual and narrative formats

How do I run it?

The Basics

TIME

1–2 class periods for basic pattern ID. Add more for deeper analysis — this space rewards extra time.

GROUPS

Small groups of 3–4 for synthesis work. Pairs for detailed analysis tasks.

SPACE

Large wall space for affinity mapping. Tables for small group work.

MATERIALS

Sticky notes in multiple colors. Chart paper. Markers. Tape. Printed quotes from research.

Three activities worth your time

AFFINITY MAPPING

Put every observation, quote, and data point on its own sticky note. Then cluster. No labels at first — just let the groupings emerge. Only after you have clusters do you name them. The naming is the insight.

THEME GALLERY WALK

Teams post their themes and insights on the wall. Everyone rotates and leaves reactions. Which themes resonate? Which feel too vague? This builds collective understanding fast.

HOW MIGHT WE WORKSHOP

Take your top three insights and write HMW statements for each. Aim for five per insight. Too narrow? Too broad? The rewriting is the thinking.

Discussion starters

For small groups

“Which insights challenge your original assumptions about this problem?”

For individuals

“Write about a moment when you suddenly understood something new about your users.”

Reflection prompts for students

- What patterns surprised you most when you stepped back and looked at all the data together?
- How did working with your team change your understanding of what the research revealed?
- What insights emerged that you never would have seen from individual interviews alone?
- How do your insights connect back to the real people you interviewed?

How to know it’s working

WHILE IT’S HAPPENING

Listen to how students talk about their data. Are they saying “this person said” or “our users feel”? The shift from individual to pattern is the sign synthesis is happening.

AT THE END

Final synthesis presentations, insight documentation, and HMW statements. Look for specificity, things like vague themes and generic HMWs mean the surface hasn’t been broken yet.

ASK STUDENTS TO ASSESS THEMSELVES

Can they explain the difference between an observation and an insight? Can they point to the data behind each theme? That’s the real test.

Before you facilitate

Encourage productive disagreement. When students argue about where a sticky note goes, that’s the synthesis working. Don’t resolve it too quickly.

Watch for the two failure modes: themes that are too broad (“people want things to be easier”) and teams that confirm their original assumptions instead of following the data.

Model thinking aloud. Pick up two notes, talk through why they might go together — or why they don’t. Show students what it sounds like to genuinely wrestle with data.

When it goes sideways
EVERY TIME. THESE ARE THE MOMENTS.
HERE'S WHAT ACTUALLY HELPS.

Themes are too broad or generic

Require supporting quotes for every theme.
“People are stressed” isn’t a theme — it’s a starting point.
Push: stressed about what, specifically, and when?

Students can’t tell observations from interpretations

Use a two-column template: “what we saw/heard” on the left,
“what we think it means” on the right. Keep them physically separate
until students can make the distinction naturally.

Analysis paralysis — can’t move forward

Set time limits for each phase. Good enough synthesis beats perfect
synthesis that never finishes. Teach the “five sticky notes minimum”
rule for a theme to count.

Outlier data gets ignored

Explicitly ask teams to find the most surprising finding. Create a “this doesn’t
fit” category on the wall and make it required. Outliers often become the
most interesting insights.

Strongest personality dominates the synthesis

Use silent synthesis periods — everyone moves their own notes
in silence first. Then discuss. This ensures all voices shape
the clustering before the talkers take over.

Students revert to their original assumptions

Require evidence-based themes. For every theme, ask:
which specific data points support this?
If they can’t point to the data, the theme is an assumption wearing a costume.

Your Notes
Use this space after you run the Synthesize space.
These observations are the raw material for your next iteration.

WHAT WORKED BETTER THAN EXPECTED?

WHAT FELL FLAT OR FELT FORCED?

A STUDENT MOMENT WORTH REMEMBERING

WHAT WOULD YOU CHANGE BEFORE RUNNING THIS AGAIN?

ONE THING YOU WANT TO TRY NEXT TIME

A few resources worth your time

Made to Stick — Chip Heath & Dan Heath (for communicating insights effectively)
The Lean Startup — Eric Ries (useful framing for insight-to-action thinking)

I D E A T E



This is where students stop analyzing and start imagining.

The goal isn't to find the right answer.

It's to generate enough ideas that the right answer has somewhere to come from.

WHAT IS THIS, REALLY?

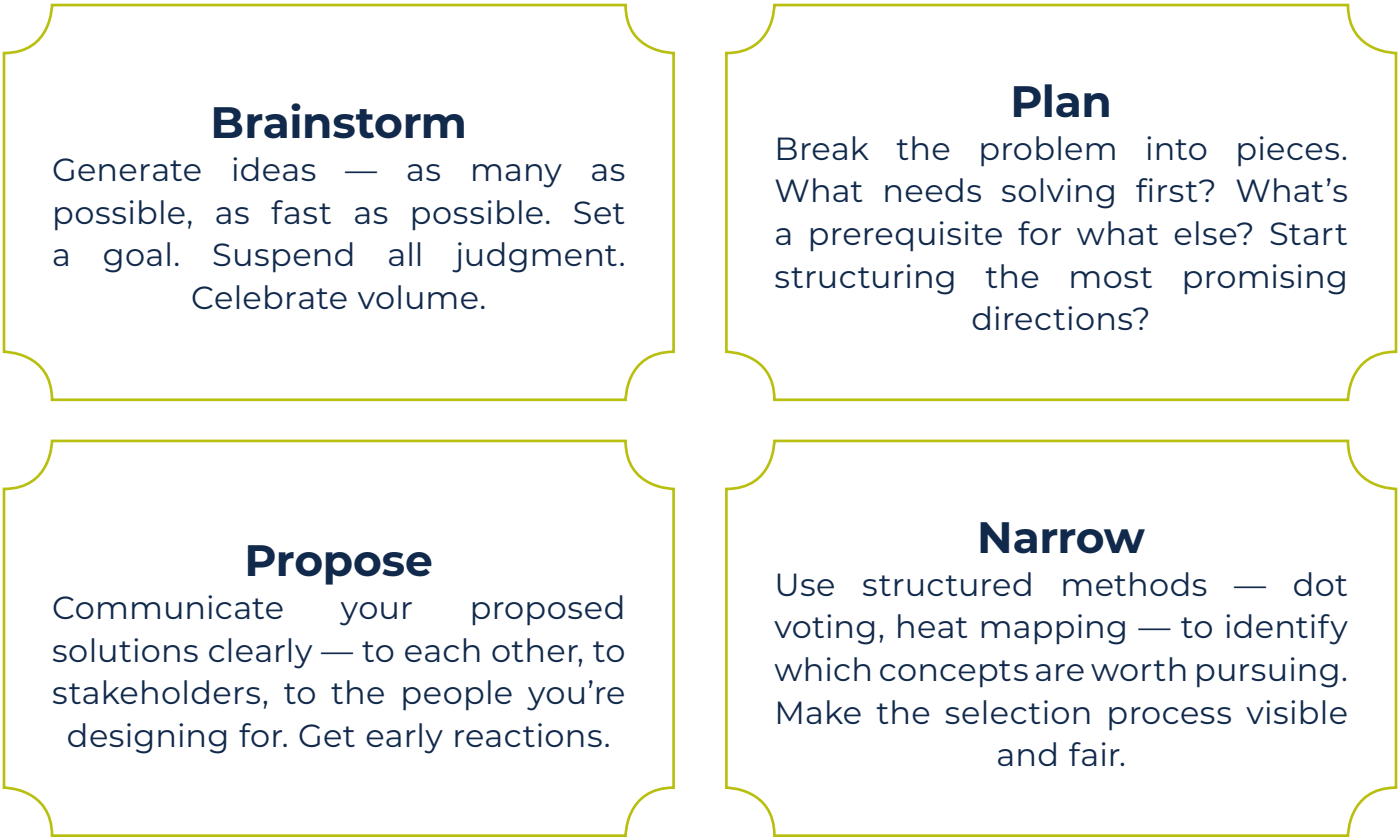
The Ideate space is the creative engine of HCD. Students take everything they learned in Understand and Synthesize and use it as fuel for generating solutions — lots of them, fast, without judgment.

This is divergent thinking territory. Quantity over quality. Wild ideas welcome. Building on each other's thinking instead of competing with it. The evaluation comes later, here, the only job is to generate.

The biggest shift you'll need to make: protect the generative space. Students are trained to evaluate immediately. Your job is to keep holding that door open longer than feels comfortable.

The four modes of Ideate

Ideation isn't one thing — it moves through generating, planning, proposing, and narrowing.



Key concepts & terminology

THESE CONCEPTS HELP STUDENTS UNDERSTAND WHAT IDEATION ACTUALLY IS — AND WHY THE RULES AREN'T ARBITRARY.

BRAINSTORMING	A structured technique for generating many ideas in a short time. The structure matters — pure free association usually produces less than a facilitated session with clear rules.
Exploring multiple possible solutions rather than converging on one. The opposite of what most schoolwork trains students to do.	DIVERGENT THINKING
IDEATION	The full creative process of generating, developing, and communicating new ideas. Not just brainstorming — the whole arc from “what if” to “here’s what I’m proposing.”
The belief that you have good ideas worth sharing — and the willingness to share them before they’re polished. Coined by IDEO. Built through practice, not talent.	CREATIVE CONFIDENCE

What students will be able to do

HOLD THESE IN MIND AS YOU FACILITATE. THEY'RE YOUR COMPASS, NOT A CHECKLIST.

- Use structured brainstorming techniques to generate a high volume of diverse ideas
- Move fluidly between divergent (generating) and convergent (narrowing) thinking
- Suspend judgment during idea generation — and recognize when they're not doing it
 - Build on each other's ideas rather than replacing them
 - Connect proposed solutions back to specific user needs and insights

How do I run it?

The Basics

TIME

1–2 class periods for brainstorming and a filtering activity. Constraint challenges can extend this productively.

GROUPS

Small groups of 3–4 for brainstorming and prioritizing. Individual for personal sketching and reflection.

SPACE

Open areas for movement. Wall space for posting ideas. Flexible seating.

MATERIALS

Sticky notes. Large paper. Markers. Index cards. Timers. Art supplies for sketching.

Three activities worth your time

CRAZY 8S

Each student folds a paper into eight panels and has 8 minutes to sketch eight distinct ideas — one per panel. Speed forces quantity over polish. Debrief: which sketches surprised you?

IDEA SPEED DATING

Students rotate quickly through partners, sharing one idea each time and picking up reactions. Ideas evolve and improve through the rotations. Good for breaking logjams.

REVERSE BRAINSTORMING

Instead of “how might we solve this,” ask “how might we make this problem worse?” Then reverse the answers. Often surfaces solutions that direct brainstorming misses entirely.

Discussion starters

For small groups

“What patterns do you notice in the types of solutions across all teams?”

For individuals

“Sketch one idea that felt risky to share and explain why it might actually work.”

Reflection prompts for students

- What idea surprised you most today — yours or someone else’s?
- How did building on someone else’s idea change or improve your original thinking?
- What made it easier or harder to share new ideas with your group?
- Which ideas feel most connected to the real needs of the people you interviewed?

How to know it’s working

WHILE IT’S HAPPENING

Watch for “yes, and” behavior — students building on each other’s ideas rather than redirecting to their own. That’s the sign ideation is working as a collaborative act.

AT THE END

Look at the diversity of ideas, not just the volume. Did they push past the obvious solutions? Are the ideas actually connected to user insights or floating free?

ASK STUDENTS TO ASSESS THEMSELVES

Did they share something that felt risky? Did they build on an idea they didn’t start? Those behaviors are the growth edges in this space.

Before you facilitate

Enforce the no-judgment rule explicitly and repeatedly. When you hear “that won’t work,” stop the room. The rule isn’t politeness — it’s the whole mechanism.

Use silent brainstorming first, especially with groups where one or two voices tend to dominate. Everyone generates on their own before sharing.

Set numerical goals: “we need 40 ideas before we can evaluate any of them.” Quantity targets break the perfectionism loop.

When it goes sideways
EVERY TIME. THESE ARE THE MOMENTS.
HERE'S WHAT ACTUALLY HELPS.

Students immediately judge or dismiss ideas

Stop the room when it happens. Make it a teachable moment, not a shame moment. Restate the rule and continue. The no-judgment norm has to be actively maintained — it won't hold itself.

One person dominates the brainstorm

Use silent brainstorming first. Rotate who speaks. Try brain writing — everyone writes ideas on paper and passes them around — instead of verbal brainstorming.

Students get stuck on one type of solution

Introduce a constraint: “now solve it with no technology” or “now solve it for someone 80 years old.” Constraints force new directions faster than any prompt.

Fear of sharing wild ideas

Celebrate the most unusual idea in the room explicitly. Share examples of solutions that seemed ridiculous and worked. Model vulnerability by sharing a wild idea yourself.

Groups run dry too quickly

“What else?” is the most powerful facilitation question in this space. Ask it every time they think they're done. The ideas after the first wave are usually the most interesting ones.

Ideas stay disconnected from user insights

Post actual user quotes on the wall before brainstorming begins. Require students to point to a quote before proposing a solution. The connection has to be visible.

Your Notes

Use this space after you run the Ideate space.
These observations are the raw material for your next iteration.

WHAT WORKED BETTER THAN EXPECTED?

WHAT FELL FLAT OR FELT FORCED?

A STUDENT MOMENT WORTH REMEMBERING

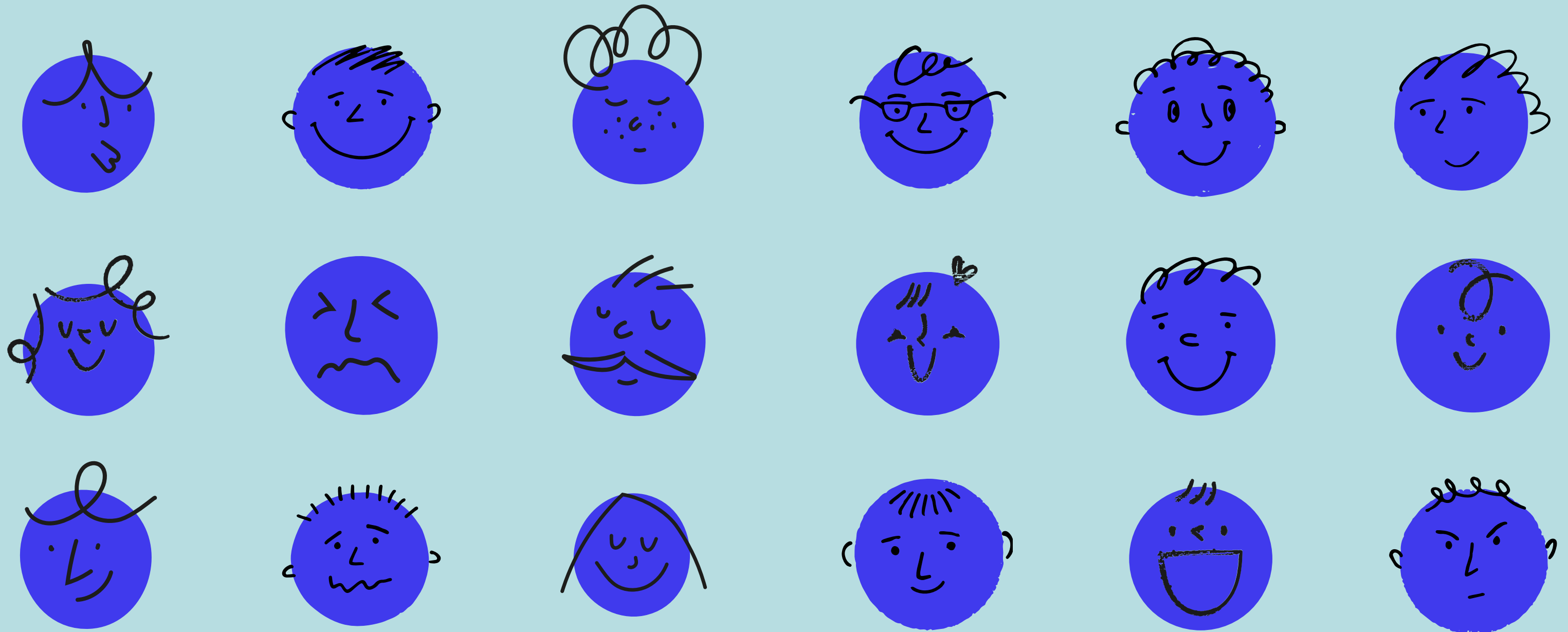
WHAT WOULD YOU CHANGE BEFORE RUNNING THIS AGAIN?

ONE THING YOU WANT TO TRY NEXT TIME

A few resources worth your time

The Innovator's Mindset — George Couros (building creative confidence in education)
Gamestorming — Dave Gray (practical group ideation methods)
A Whack on the Side of the Head — Roger von Oech (classic creative thinking techniques)

PROTOTYPE



**Ideas don't become real by thinking about them harder.
They become real by building them.**

The goal isn't to make something perfect.
It's to make something testable.

WHAT IS THIS, REALLY?

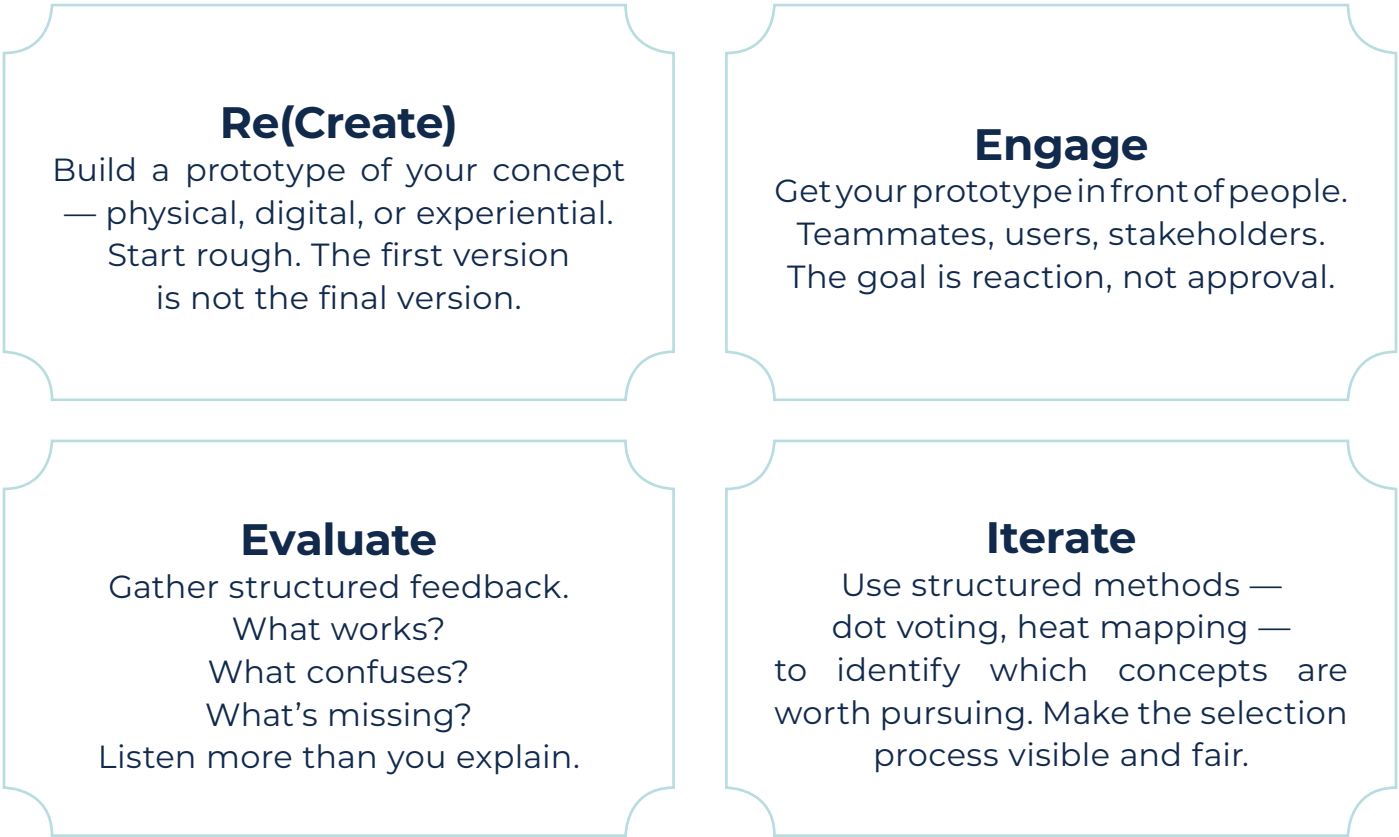
The Prototype space is where students get their hands on the problem. They take their best ideas and build quick, rough, testable versions — not to show off, but to learn.

Prototypes can be a sketch on paper, a cardboard model, a role-played scenario, a digital mockup, or a storyboard. The fidelity doesn't matter. What matters is that it's concrete enough for someone to react to.

The biggest shift here: reframing failure. A prototype that doesn't work isn't a failure, it's a finding. The sooner students internalize that, the faster they'll actually build something worth building.

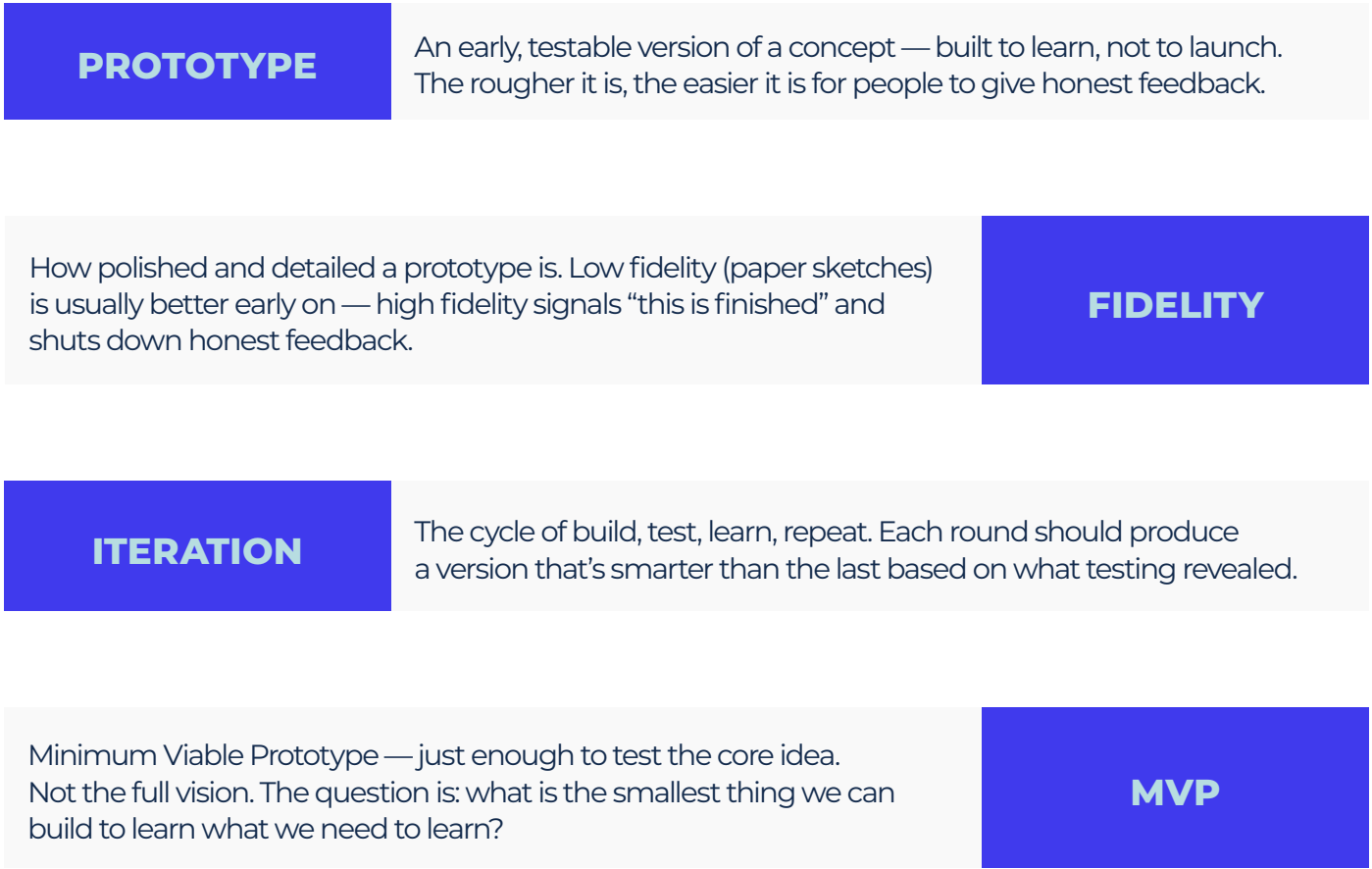
The four modes of Prototype

Prototyping is iterative by nature — expect students to cycle through these more than once.



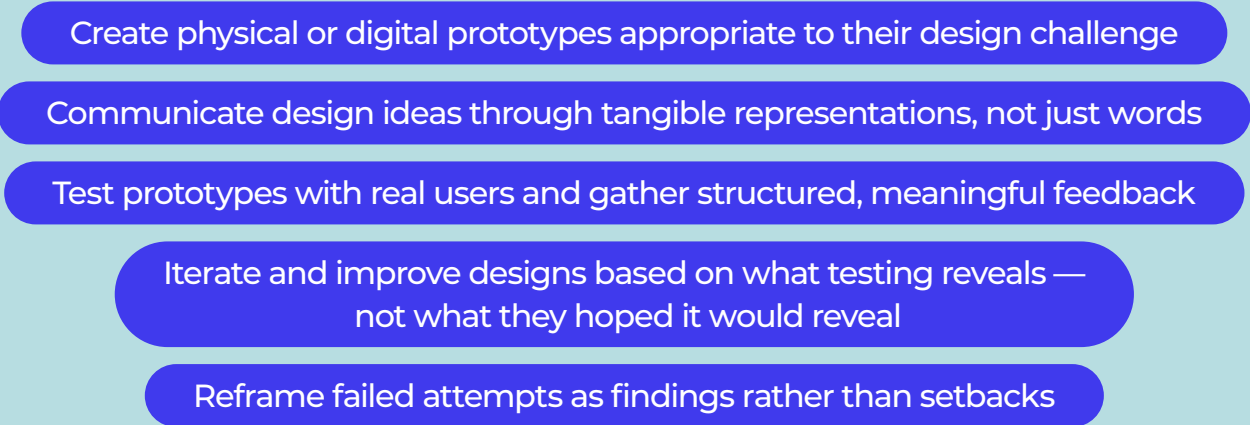
Key concepts & terminology

THESE CONCEPTS HELP STUDENTS UNDERSTAND WHY THEY'RE BUILDING ROUGH THINGS ON PURPOSE.



What students will be able to do

HOLD THESE IN MIND AS YOU FACILITATE. THEY'RE YOUR COMPASS, NOT A CHECKLIST.



How do I run it?

The Basics

TIME

1–2 class periods for simple paper or digital prototypes with basic testing. More for higher fidelity or multiple iterations.

GROUPS

Small teams of 2–4 for building. Pairs for testing. Individual for reflection.

SPACE

Tables for building. A separate testing area if possible. Storage for works-in-progress.

MATERIALS

Cardboard, tape, scissors, craft supplies, recycled materials. Paper and markers for low-fi. Canva or Figma for digital. Whatever’s available.

Three activities worth your time

PAPER PROTOTYPING

Students build a version of their concept using only paper, sticky notes, and markers. Forces focus on the idea, not the execution. Surprisingly effective at surfacing real feedback.

PROTOTYPE GALLERY WALK

Works-in-progress are shared around the room. Other students give structured feedback: one thing that’s working, one question, one suggestion. Quick, specific, actionable.

THINK ALOUD PROTOCOL

A user interacts with the prototype while narrating their thought process out loud. Students observe and take notes — they don’t explain or defend. What they hear will change the next version.

Before you facilitate

Set strict time limits for building. “Good enough to test” is the goal. Perfectionism is the enemy of learning in this space.

Teach students to separate their identity from their prototype. When feedback comes in, the job is to listen and document — not to explain why the prototype is actually fine.

If they want to start over instead of iterating, make them articulate what specifically didn’t work and what specifically they’d change. Starting over is sometimes right — but it should be a decision, not a default.

Discussion starters

For small groups

“Share one specific piece of user feedback that surprised you — and how you plan to respond.”

For individuals

“Document the evolution of your prototype through photos or sketches with explanations.”

Reflection prompts for students

- What did you learn about your idea by trying to build it that you couldn’t have learned just by thinking about it?
- How did feedback change your understanding of what was actually important about your design?
- What failures or mistakes taught you the most during this process?
- How does your current prototype connect back to the needs of the people you interviewed?

How to know it’s working

WHILE IT’S HAPPENING

Watch the building process, not just the output. Are students making decisions? Testing assumptions? Or are they decorating something they’ve already decided is done?

AT THE END

Look for evidence of iteration — not just a final prototype, but documentation of how it changed and why. The reasoning behind the changes is the learning.

ASK STUDENTS TO ASSESS THEMSELVES

Can they describe what a specific failure taught them? Can they trace a design decision back to a piece of user feedback? That’s the reflective loop working.

When it goes sideways
EVERY TIME. THESE ARE THE MOMENTS.
HERE'S WHAT ACTUALLY HELPS.

Perfectionism prevents rapid prototyping

Set a timer. Seriously. “You have 20 minutes to build something testable.” Constraints are more effective than encouragement here. Celebrate rough prototypes explicitly.

Limited materials or budget

Paper prototyping is underrated. Some of the most effective user testing happens with sketches on index cards. Constraints also force creative problem-solving — which is the point.

Students afraid to test with real users

Start with peer testing. It's lower stakes and faster to arrange. Provide a simple script. Model what it looks like to share an unfinished thing and ask for honest feedback.

Feedback is too vague to act on

Teach specific feedback formats before testing begins. “I like / I wish / what if” is simple and effective. Structured feedback beats unstructured every time.

Students want to start over instead of iterating

Ask: what specifically didn't work, and what would you change? If they can answer those questions precisely, iteration is possible. If they can't, that's a signal they need to do more testing first.

Prototype has drifted from original user insights

Post user quotes and HMW statements near the building area. Require students to explain the connection between a design decision and a piece of their research. If they can't, it's a design decision worth questioning.

Your Notes

Use this space after you run the Prototype space. These observations are the raw material for your next iteration.

WHAT WORKED BETTER THAN EXPECTED?

WHAT FELL FLAT OR FELT FORCED?

A STUDENT MOMENT WORTH REMEMBERING

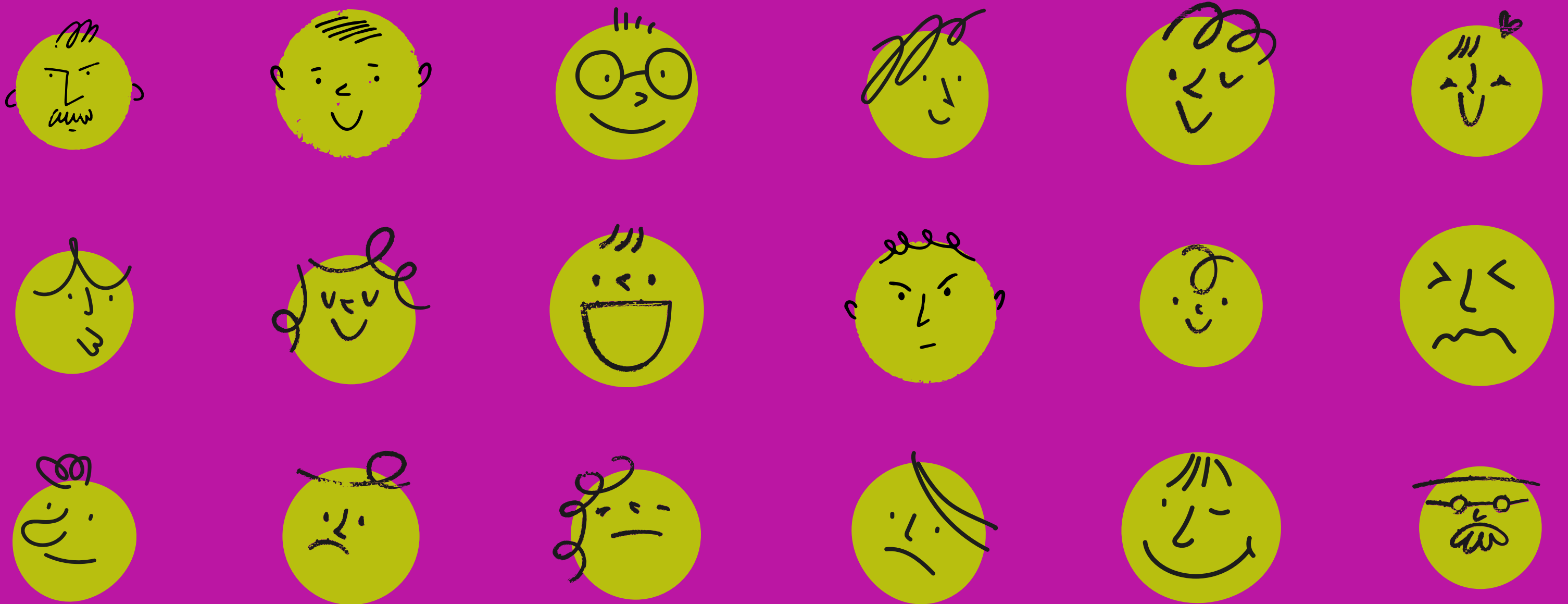
WHAT WOULD YOU CHANGE BEFORE RUNNING THIS AGAIN?

ONE THING YOU WANT TO TRY NEXT TIME

A few resources worth your time

Sprint — Jake Knapp (rapid prototyping and testing methods, highly practical)
Worlds of Making — Laura Fleming (maker education in schools)
The Lean Startup — Eric Ries (the build-measure-learn loop applied)

IMPLEMENT



**Designing something is one thing. Making it real —
and keeping it real — is something else entirely.**

The goal isn't to launch and move on.
It's to build something that keeps working after you leave the room.

WHAT IS THIS, REALLY?

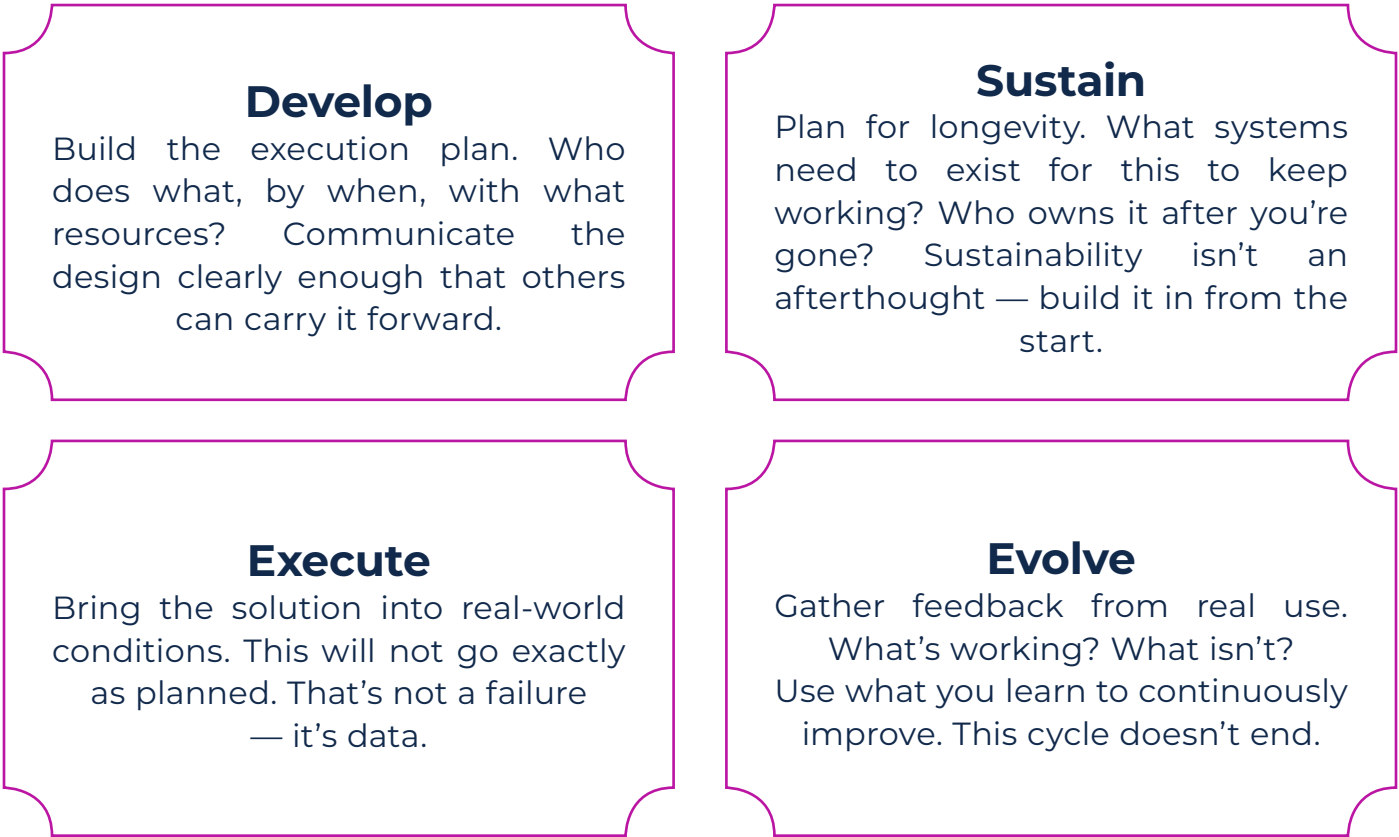
The Implement space is where students encounter the full weight of real-world constraints. Budget. Buy-in. Logistics. The gap between a great prototype and a working solution is often wider than they expect.

This is strategic territory. Students learn to think about scalability — can this grow? Sustainability — can this keep going without them? And impact measurement — how do we know it's actually working?

The biggest shift here: implementation is not the end of the design process. It's the beginning of a new cycle of learning. The solution that launches is never the solution that stays.

The four modes of Implement

These modes often run in parallel — sustaining, executing, and evolving happen simultaneously in real implementations.



Key concepts & terminology

THESE CONCEPTS HELP STUDENTS THINK BEYOND THE LAUNCH — TOWARD SOLUTIONS THAT ACTUALLY LAST.



What students will be able to do

HOLD THESE IN MIND AS YOU FACILITATE. THEY'RE YOUR COMPASS, NOT A CHECKLIST.

- Execute functional versions of their solutions in authentic settings — not just classroom simulations
- Develop clear communication strategies and execution plans others can actually follow
- Create systems for monitoring whether the solution is working over time
- Adapt when reality diverges from the plan and recognize that as expected, not exceptional
- Articulate the difference between outputs (what you did) and outcomes (what changed)

How do I run it?

The Basics

TIME

1–2 class periods for implementation planning. Real execution extends beyond the classroom — plan for that.

GROUPS

Small teams of 3–4 for planning and executing. Whole class for stakeholder presentations.

SPACE

Execution areas vary by solution. Presentation space for communication plans. Room to debrief.

MATERIALS

Varies by solution. Always: documentation materials, evaluation instruments, and a simple way to capture what's being learned.

Three activities worth your time

IMPLEMENTATION PITCH

Teams present their implementation plan to a panel — ideally including real stakeholders, not just classmates. The questions a stakeholder asks will reshape the plan in ways peer feedback can't.

IMPACT STORYTELLING

Students document and share stories of how their solutions affect real users. Numbers matter, but a specific human story of change is what makes impact legible to others.

RETROSPECTIVE

At regular intervals during execution, teams ask: what did we plan to happen? What actually happened? What do we do differently next? Short, structured, honest.

Discussion starters

For small groups

“Share one unexpected obstacle you encountered and how you adapted your approach.”

For individuals

“Write a letter to next year’s students about what you wish you had known about implementation.”

Reflection prompts for students

- How has your understanding of the original problem evolved through the implementation process?
- What surprised you most about the difference between designing a solution and implementing it in the real world?
- How did working with real stakeholders and constraints change your approach to problem-solving?
- What impact are you most proud of — and how do you know your solution is actually making a difference?

How to know it's working

WHILE IT'S HAPPENING

Watch how students respond when things don't go as planned. Do they adapt or freeze? The quality of their adaptation is the measure of the learning, not the smoothness of the execution.

AT THE END

Look for evidence of real-world impact — not just a completed plan, but documentation of how the solution performed in practice and what students did with what they learned.

ASK STUDENTS TO ASSESS THEMSELVES

Can they point to a specific moment where reality changed their plan — and explain what they did about it? That's implementation learning. Not just “we launched.”

Before you facilitate

Emphasize the cyclical nature of implementation from the start. Students often treat launch as the finish line — reframe it as the beginning of a new feedback loop.

Help students identify early adopters: the stakeholders most likely to try the solution and give useful feedback. Starting with willing participants builds momentum and evidence.

Celebrate adaptive learning. When the plan doesn't survive contact with reality, that's not a problem to manage — it's the most important learning opportunity in this whole process.

When it goes sideways
EVERY TIME. THESE ARE THE MOMENTS.
HERE'S WHAT ACTUALLY HELPS.

Students treat implementation as a one-time event Build regular review and improvement cycles into the project timeline from the start. A retrospective every two weeks makes iteration a habit, not an exception.
Stakeholder resistance or lack of buy-in Start with the willing. One enthusiastic early adopter is worth more than ten reluctant participants. Find the person who wants this to work and build from there.
Solutions that work initially but fail over time Ask the sustainability questions early: who owns this when the team moves on? What does it need to keep running? A solution that depends on one person's ongoing heroic effort isn't sustainable.
Communication plans that don't reach intended audiences Test communication materials with the actual target audience before full rollout. A poster that makes sense to the design team may make no sense to the people it's meant to reach.
Difficulty measuring impact Start with the simplest possible metric. Before and after. A story of change from one specific person. You don't need a research study — you need honest, observable evidence that something shifted.
Evolution that loses connection to original user needs Return to the original research regularly. Post user personas and HMW statements in the workspace. Require that every significant change to the solution be traceable back to something a real user told you.

Your Notes
Use this space after you run the Implement space.
These observations are the raw material for your next iteration.

WHAT WORKED BETTER THAN EXPECTED?

WHAT FELL FLAT OR FELT FORCED?

A STUDENT MOMENT WORTH REMEMBERING

WHAT WOULD YOU CHANGE BEFORE RUNNING THIS AGAIN?

ONE THING YOU WANT TO TRY NEXT TIME

A few resources worth your time

Getting to Maybe — Frances Westley (social innovation and sustainable implementation)

Switch — Chip Heath & Dan Heath (how to drive change when change is hard)

Your Notes

Use this space for any general notes you might have.

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SIEBEL CENTER FOR DESIGN



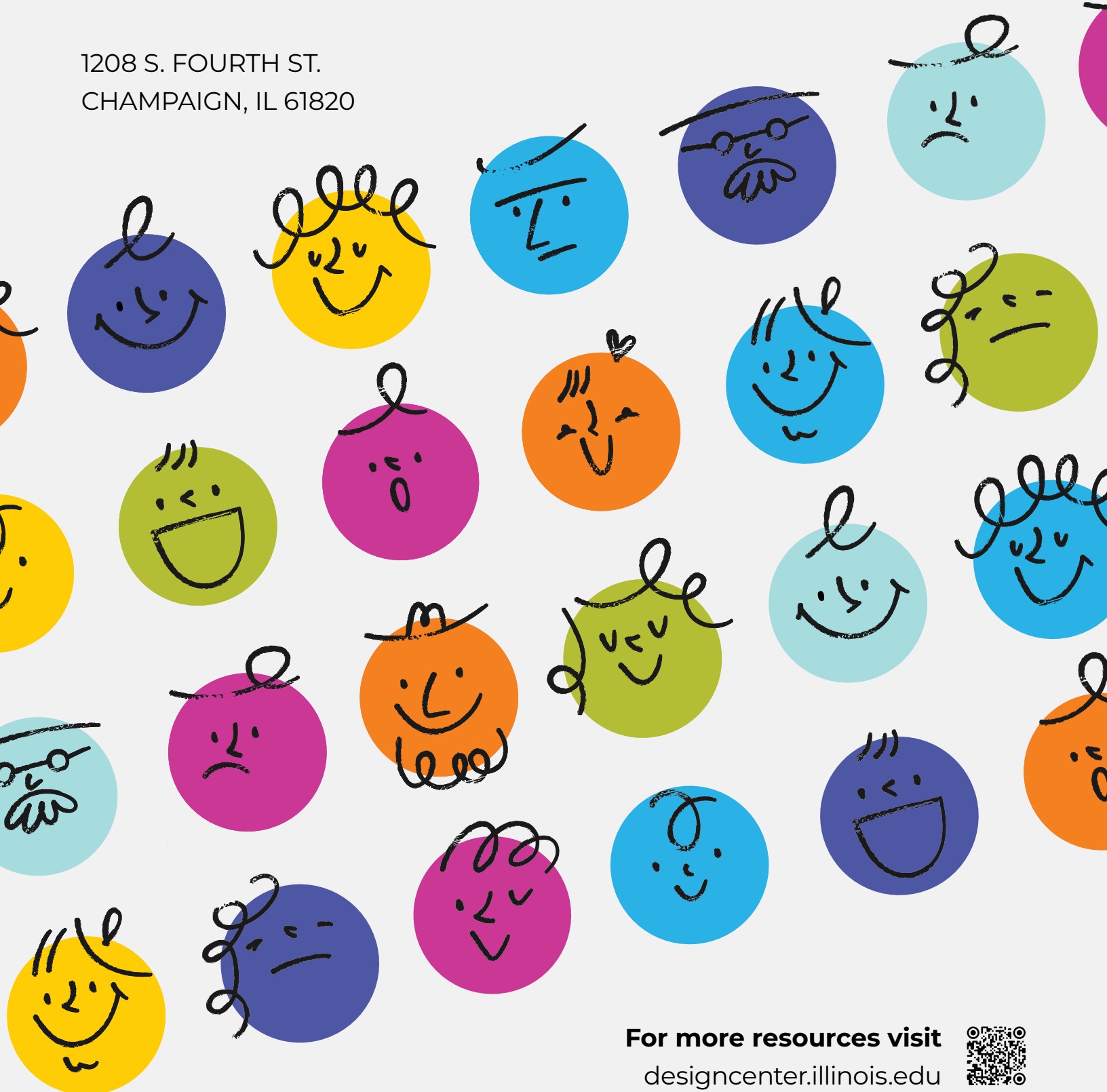
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