

Solve for Tomorrow

Design Thinking Toolkit

FACILITATOR'S GUIDE





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Welcome to
Samsung Solve For Tomorrow
A Design Thinking
Toolkit!



About Samsung Solve for Tomorrow

Launched in 2010, Samsung Solve for Tomorrow program is a unique competition that encourages innovative thinking, creative problem-solving, and teamwork to nurture social innovation ideas that address the community's most pressing problems.

Samsung Solve for Tomorrow was designed to increase interest and proficiency in Science, Technology, Engineering, and Math (STEM) education. Samsung Solve for Tomorrow encourages young people to apply STEM to find creative solutions, to solve challenges, and to address risks faced in their local communities. As of 2020, the Samsung Solve for Tomorrow program reached over 1.5 million contestants in more than 20 countries around the world.

Young minds have the power to create positive change in society, and Samsung Solve for Tomorrow helps participants develop skills that go far beyond the technical. In addition to developing a deep understanding of their local context, Samsung Solve for Tomorrow participants develop critical thinking, creative thinking, communication, and collaboration: skills that will define the future of our workforces, our industries, and our societies.

The Samsung Solve for Tomorrow contest emphasizes three levels of problem-solving: reframe, ideate, and realize. The design thinking process helps us address each of these levels in a structured, thoughtful, and engaging way.

Teams have the opportunity to receive mentorship from Samsung employees who act as volunteer advisors. Contestants who make it to the finals get an opportunity to pitch their ideas to Samsung panelists with the potential to win Samsung technology for their schools.

About this design thinking toolkit

This toolkit is designed to help leaders of all kinds—teachers, students, team leaders, facilitators in the Solve for Tomorrow program, and more—learn the design thinking process from start to finish. With this guide we hope to build your confidence identifying real user needs, solving local problems, and executing a tangible design project with any group, team, or class.

Think of this resource as an overview of basic methods, tools, and activities that can serve as a launch pad for further project-based, human-centered learning. Feel free to use this guide in whatever ways meet your needs, your environment, your group, and your goals.

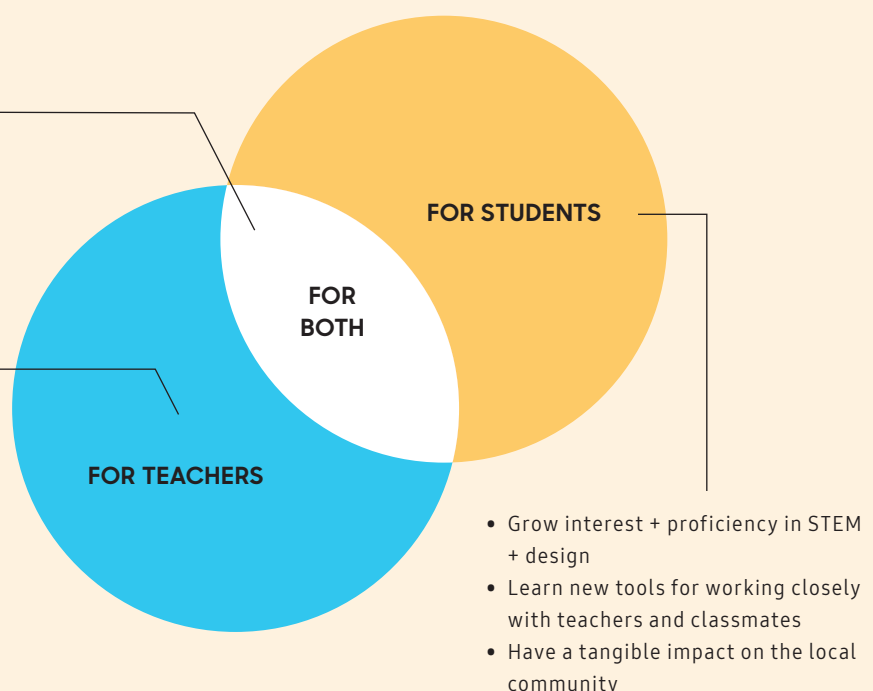
Learning how to facilitate and run the design thinking process will be invaluable. When leading a team, especially a team of students, through a project that addresses a real-life challenge, setting a plan, process, and pace for the work can feel daunting. Design thinking is a process that has been used thousands of times over by students, teachers, companies, and governments around the world, and the structure that you'll find in this facilitator's guide can help you lead team-based design projects with confidence. The design thinking process helps teams get from the messy, abstract phase of selecting a challenge all the way to the focused work of developing a final prototype to share with stakeholders. Follow the steps of this journey as you would a map. Trust that the process will lead you to real, tangible results at the end of your project.

The value of design thinking¹

Design thinking is a practice that helps facilitators and students learn and lead in new ways. The design thinking process goes hand in hand with the engineering process and STEM education. Leveraging design thinking allows us to come together to generate creative, energizing, and tangible solutions to complex problems.

- Nurture problem-solving + creative thinking skills
- Increase collaboration + communication inside and outside the classroom

- Develop skills to manage team-based learning
- Learn to apply STEM + design techniques to solve real-world problems
- Build creative confidence as an educator



To complement this facilitator's guide, we have developed a workbook with activities that correspond to sections in this guide. The workbook makes each step of the project concrete and actionable. Distribute those workbooks to students or participants at the start of your project, or pick and adapt activities yourself to meet the needs of your team.

This work references a few existing resources:

Daylight Design's *Legal Empowerment: Innovation Workshop Booklet*

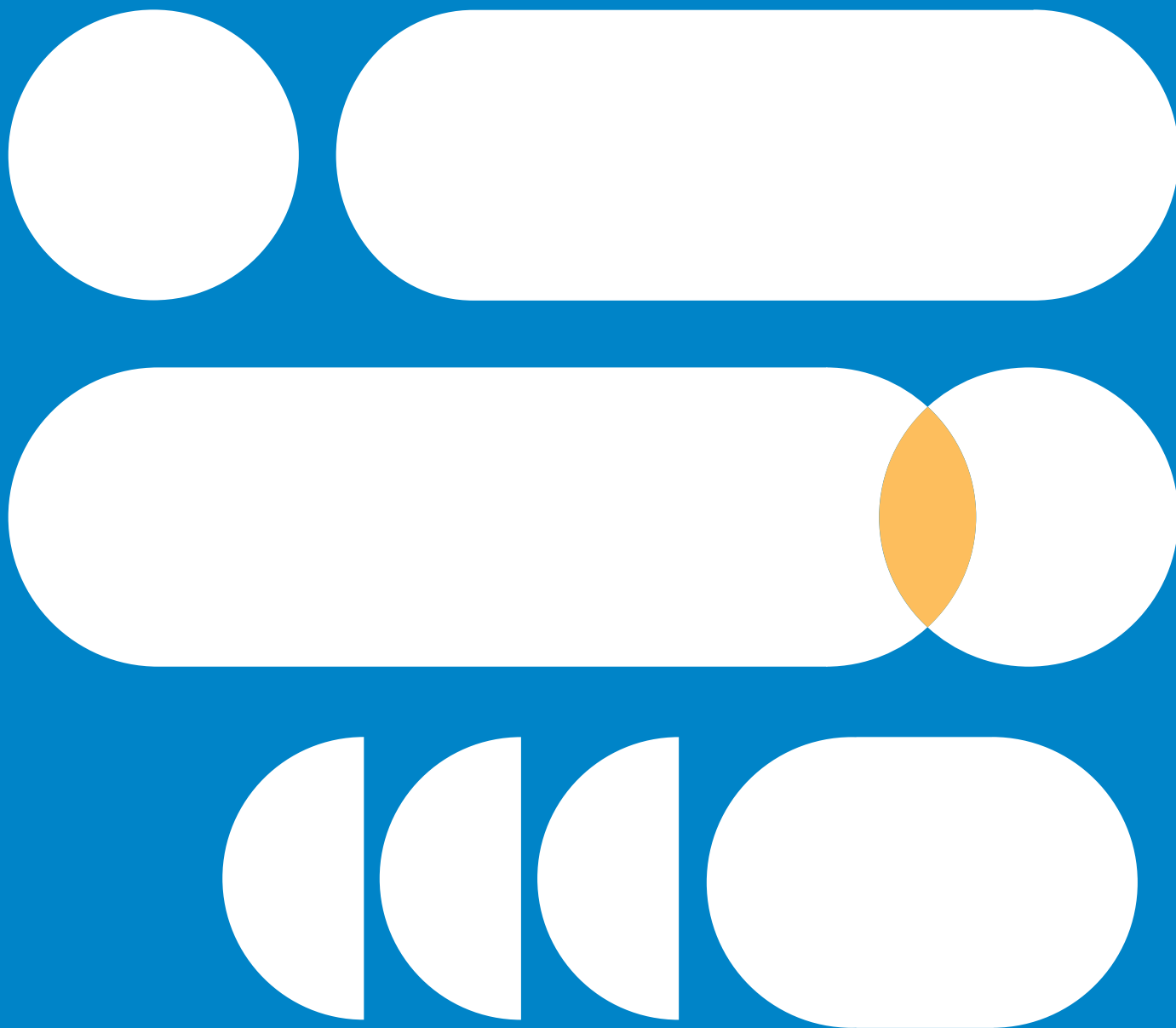
Stanford University d.School's *Design Thinking Bootleg*

Stanford University K12 Lab Network's *d.tech Playbook*

IDEO's *Design Thinking for Educators*

A full reference list will also appear at the end of this guide.

Have fun and enjoy the design thinking journey!



Design
thinking is a
process and
a mindset

Design thinking is a process and a mindset

Design thinking, also known as **human-centered design**, is a powerful practice for solving problems. It's an approach to innovation that uses processes and tools from the design world to make creative leaps in the real world.

The work of a designer is to observe and identify human needs and to find creative solutions that meet those needs. Design thinking is the process that carries us from observations to solutions.

Design thinking is for everyone. Adopting the design thinking process and mindsets can help us find creative solutions to problems we face at any scale. Maybe we need help figuring out what we want our future to look like or how to make a positive change in our community. Design thinking is the set of tools that can help us find answers to those problems, no matter our background, experience, or interests.

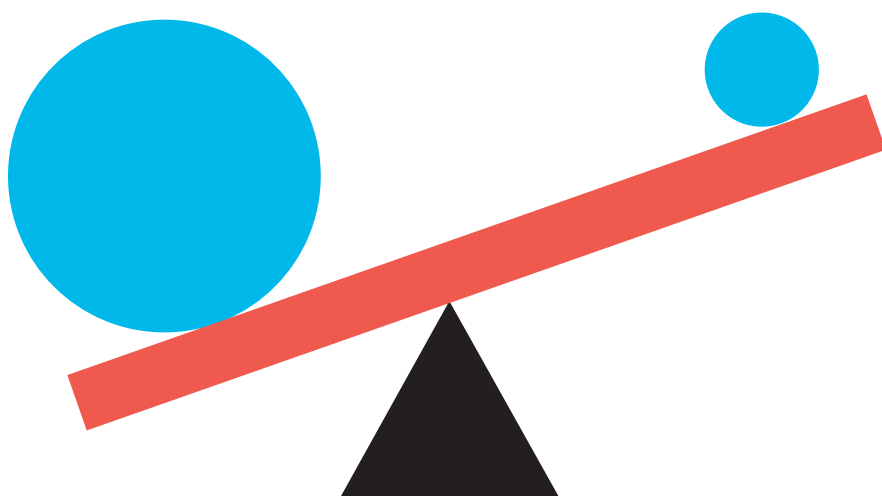
Before we introduce the steps of the design thinking process, we should first learn and embrace the designer's mindsets. Understanding how designers **think** and **talk** will inform our understanding of how designers **work**.

THINK like a designer.

As we go through the design thinking process, we should uphold the following principles:

- **Focus on human values:** Identify real user pain-points and ground solutions in their needs.
- **Radical collaboration:** Breakthrough insights come from diverse backgrounds and viewpoints.
- **Be visual:** Diagram, sketch—always aim to visualize ideas and concepts to create clarity.
- **Bias towards action:** Come up with solutions, not problems. Prototype to learn vs. pontificating.
- **Defer judgment:** Trust is the fertile soil for creativity; imagine first, evaluate after.
- **Embrace experimentation:** Ambiguity is inherent in the creative process; run experiments to learn.²

Even if we are familiar with a topic, it's important to approach every design challenge as if we are seeing it for the first time. Designers often refer to this as a **beginner's mindset**. When working to understand our problem and the people affected by it, our primary mindset should be one of openness and learning. We want to avoid coloring our interactions with users with our own biases and personal beliefs, because holding onto stereotypes can inhibit us from opening up to empathy.



2. *d.tech Playbook* by Norman Tran and K12 Lab Network at Stanford dschool is licensed under CC BY-NC-SA 4.0

TALK like a designer.

Feedback is critical to the design thinking process. As we come up with ideas, we need to work together to refine them into novel, actionable, and viable concepts. It's never fun to raise an idea only to have it shot down by teammates, so designers use the **"I like, I wish, I wonder..." framework** when offering feedback.

"I like..." When offering feedback, start by giving a compliment. Let's tell our teammate something we like about their idea—something we think could really work.

Ex. "I like how you've used a larger font to highlight the titles of each section in this toolkit. That will likely make it easier for readers to navigate the content."

"I wish..." Once we've offered a compliment, we can offer a desire that we would like the designer to consider. Our wishes may be based on our experience interacting with the design, feedback we've heard from others, or former experiences we've had with a relevant topic.

Ex. "That said, I wish the headlines didn't take up so much of the page. They seem to overpower the text below."

"I wonder..." This is where we can insert constructive feedback about how teammates can make their ideas even better. We can suggest a provocation that steers our teammate in a direction we believe in.

Ex. "I wonder if we can decrease the size of the headlines, move them off center, and increase the body text size slightly. This may allow us to have a more balanced page that's easier to read."



A stylized graphic consisting of the words "I WOND" and "I WOULD" stacked vertically. The top word "I WOND" is in blue, and the bottom word "I WOULD" is in orange. The letters are bold and sans-serif. The "I" in both words is a simple vertical bar. The "W" in "WOND" is blue, and the "W" in "WOULD" is orange. The "O" in "WOND" is orange, and the "O" in "WOULD" is blue. The "D" in "WOND" is blue, and the "D" in "WOULD" is orange. The "R" in "WOULD" is orange. The words are slightly offset to the right.

WORK like a designer.

Now that we understand the designer's mindsets, we can dig deeper into the design thinking process.

Design thinking is a five-step creative process. This guide will explain each of the five steps: **empathize, define, ideate, prototype, and test**. While each step is useful on its own, combining all five steps helps us deliver the most impactful solutions.

No problem is too big for design thinking. We can use this process to tackle problems at home, at school, in our community, and more. The design thinking process also builds personal skills like **creativity, collaboration, communication, and critical thinking**, which will serve us long after our project is over.

Let's get started!

FIVE-STEP CREATIVE PROCESS

1. Empathize

2. Define

3. Ideate

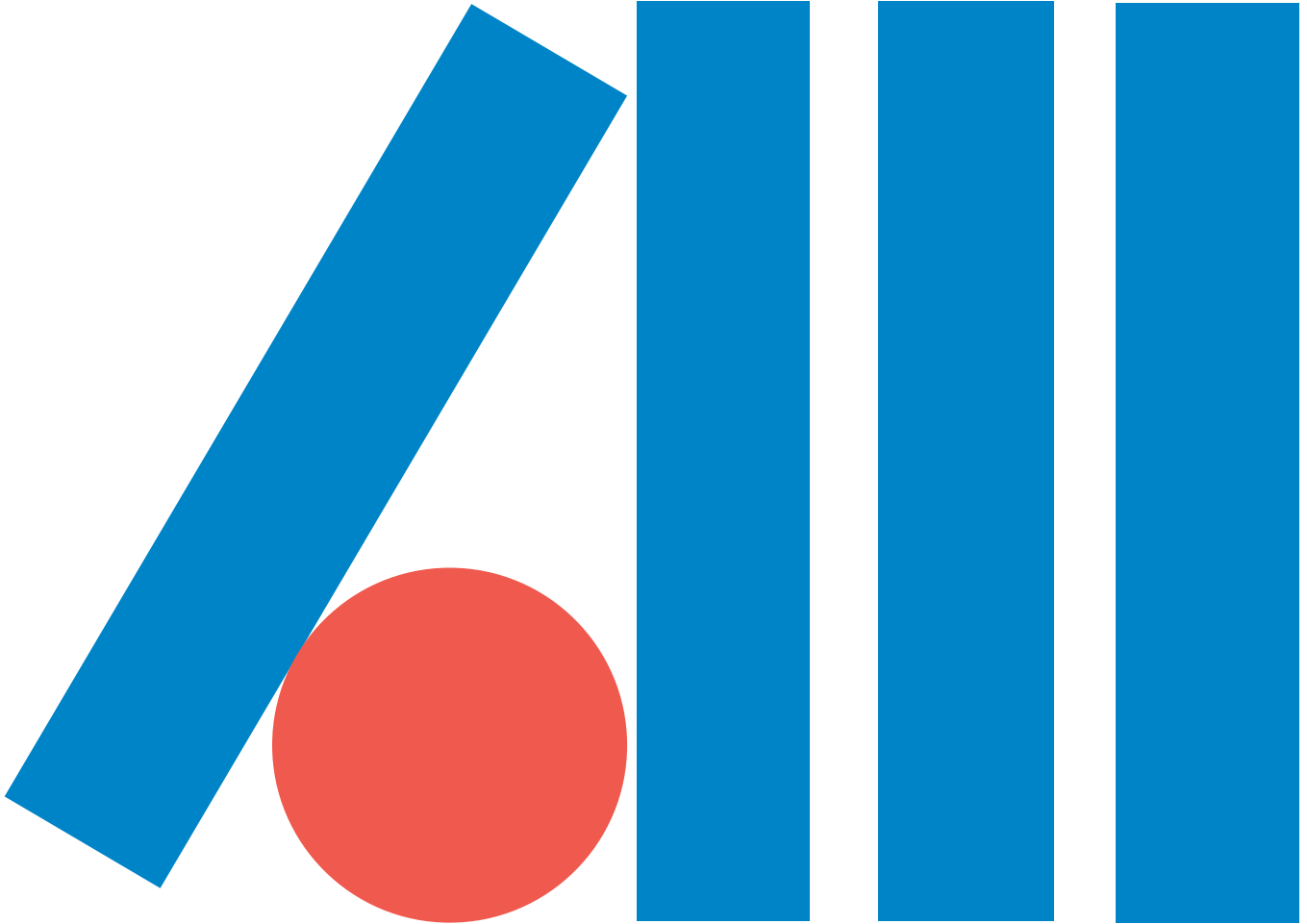
4. Prototype

5. Test



Let's use design thinking to make
our communities better!

The design thinking process



Prepare

Get ready for design thinking.

Prepare

Like any curriculum or project, the design thinking process requires effort, intentionality, and planning. Whether we're using this toolkit to support a Samsung Solve for Tomorrow project, to learn more about design thinking, or to find ways to integrate design thinking into our curriculum, there are standard practices we can leverage to make the process a smooth one.

Build a team

When working on a complex, creative project, a team is stronger than any individual. When we help students, friends, classmates, or colleagues work together as a team, we bring together diverse perspectives and skills for a more efficient and enriching experience. Together, teams can create the most considered, creative solutions.

We don't want a project team that's too large or too small. Too many voices in the room will stifle efficiency and creativity. Too few may make the tasks at hand feel overwhelming and decrease engagement. Later in the toolkit we'll encounter steps of the process where we can invite more people in, but our core project team should have **3-5 people**.

Diversity in the team is a good thing; it allows for multiple perspectives to coalesce around a single problem and inform our final design. Embrace variety in teams and assign specific roles that each team member will uphold throughout the project. Below are some suggestions. We can also get creative and assign roles that make the most sense for our project:

- **The coordinator:** The coordinator keeps the team's materials and processes organized so that no ideas or prototypes get lost along the way.
- **The enthusiast:** The enthusiast inspires the team with big ideas, morale boosts, and positivity.
- **The nagger:** The nagger makes sure the team is on task and meeting deadlines, constantly moving the project forward.
- **The leader:** The leader keeps track of project progress, always focused on the big picture and working towards the larger goal.³

Once the team leader is assigned, they start to plan our team's project.

Note: teachers who are leading a team of students will likely take on a more overarching role that oversees budgets and timelines, breaks up tasks, and drives the team towards deadlines and goals.

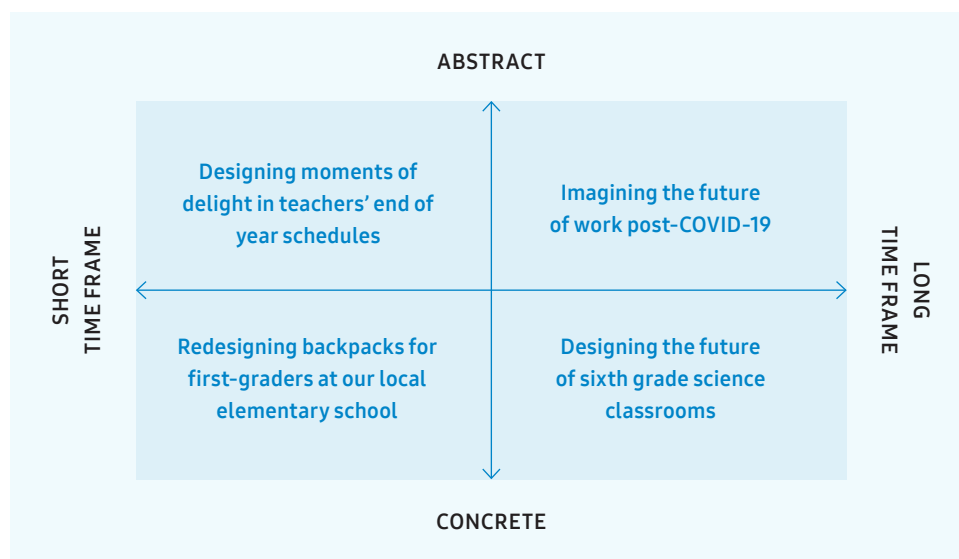
Select a challenge

Design challenges can vary greatly, but the goal of identifying and solving for an unmet need remains constant. Finding a problem to solve can be as simple as observing the world around us; maybe our friend is really struggling with something or our community is facing a challenge. As a team, it's important to come together to identify project topics that feel relevant and important to everyone.

As a team, create a long list of potential project ideas. The following questions can help us get our idea list flowing: Is there a problem we've noticed at our school or in our community? Is there an event or moment we witnessed that has always stuck with us? Is there a certain population we really want to help? Is there an inspiring individual we really want to work with? Is there a problem that has been holding us back? Do we have a pet peeve that we really want to address?

Once we've generated a substantial list, we can discuss the ideas that feel exciting and rich and vote on the one we want to pursue. The most successful projects are the ones that all team members are excited about, so make sure that each participant's voice is heard.

Note that for younger or less experienced design thinkers, it might make sense to pick a more concrete project topic. With more advanced teams, we can take on more abstract projects. We should also consider the amount of time we have when selecting our project topic. Here are four examples of potential design challenges mapped along the axes of concreteness and time:



Once we've defined our challenge, we can create a project plan to help us meet our goals.

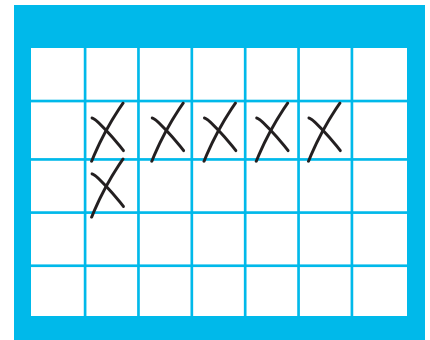
Create a project plan

Some of us may be working on a project for Samsung Solve for Tomorrow Program, which provides us with deadlines and a set timeline. Others of us may be running a design thinking process for a class, for our students, or for fun. No matter the context, each project requires planning and structure to get from start to finish.

Creating a project plan helps us consider the needs of our team, the realities of our environment, the flexibility of our schedules, and more. Our first project plan is never our last; project plans can change over time as project needs inevitably change.

It's a good idea to start with the constraint of a timeline. How much time do we want this project to take? One month? One semester? One year? Set an official, final deadline in accordance with this timeline.

Once we have a timeline, we can break up the 5 steps of the design thinking process across it. If we need to move quickly, we may want to



give one week to each step of the design process. If we have more time, we may want to give 2-3 weeks for each step of the process.

Consider where and how our team will work. Is there a weekly period where we will meet as a team? Will we meet every day after class? Will we meet for a full day every Saturday? Choose a meeting cadence that is frequent enough to keep momentum and reasonable enough to not feel overbearing. If our schedule doesn't work for everyone on our team, our project will be significantly harder to execute.

Think of the project plan as our internal accountability tool and include deliverable dates that match the needs of our team and our project.

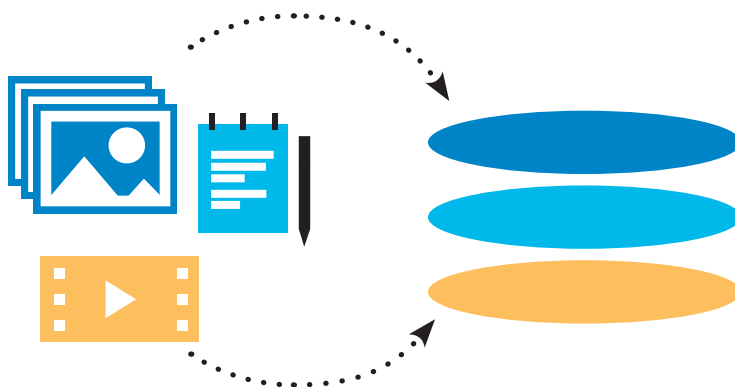
Once we have enough structure and clarity in our project plan that it feels actionable, we can make our plan concrete. Write delivery dates on a calendar, whiteboard, or wall. Create a shared digital calendar that all teammates can see. Make the project plan visible and prominent so that the demands of the project process never get lost!

TIP: Create a project documentation plan

In addition to a project plan, make a project documentation plan. As we go through the design thinking process, we should document EVERYTHING! Take pictures, recordings, videos, notes, and more to keep a detailed record of each step of our process. As a team, decide: Who will take pictures and when? Where will we store images, videos, and recordings? Who will be our notetaker? Where will we house our notes? We will thank ourselves later if we keep an organized trail of our project process from start to finish!

Find space

Having a dedicated space for our project can help house ideas and progress, maintain consistency, and legitimize our team’s process. Any space will do as long as it allows for our team to gather, sit, talk, and work together comfortably. A classroom, table, meeting room, corner of the library, dorm room—the list goes on—will do! Note that a dedicated space, even if it’s just a wall, gives our team a physical reminder of our work. It allows us to put up inspiring imagery or notes from research and to be continuously immersed in learnings. Shared visual reminders help us track the progress of the project and stay focused on the challenge. To spark new ideas and to get unstuck when the work gets more challenging, consider changing the space from time to time. ⁴



Depending on the nature and the complexity of our project, it may make sense to create a digital space, as well. In whatever existing platform we use to store digital documents, create a project folder with a set of subfolders that correspond to each phase of the project. Establishing organized digital habits at the outset will save our team time and headaches later in the process.

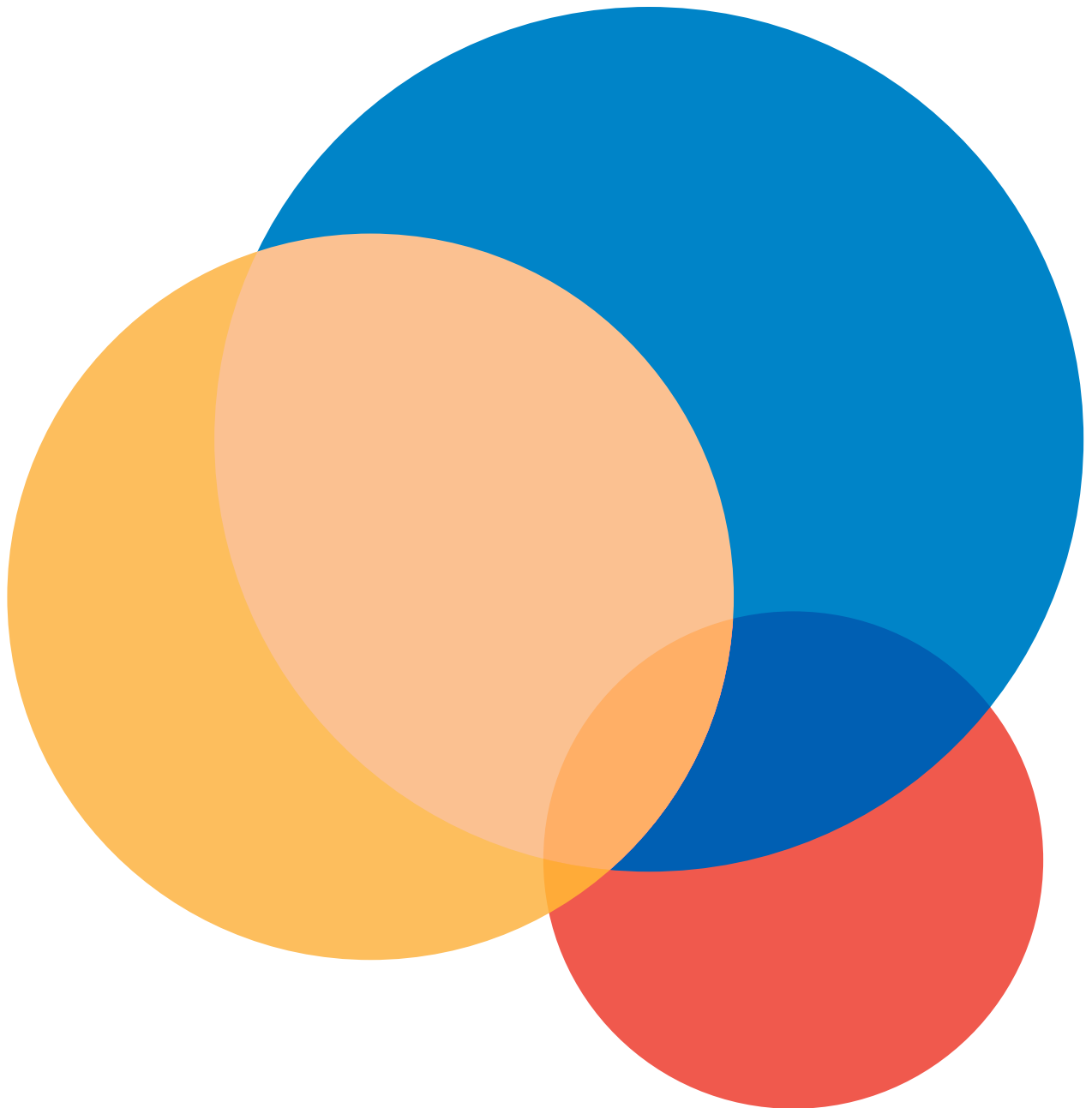
Gather materials

The design thinking process is active, collaborative, and generative, which means that we need both the appropriate space and the necessary materials to have a successful experience. At the end of the day, whatever resources we have access to WILL be enough; there's no requirement that we buy new materials to be effective design thinkers. As long as we have materials that allow teammates to draw a quick sketch, jot down some notes, create a quick prototype, or visualize an idea, we'll be able to engage with the design thinking process in the hands-on way it requires. If, however, we have budget and means to gather supplies, here are some recommendations:

- Post-it notes (3x3 and 3x5)
- Pencils and erasers
- Sharpies or other markers that make a line thick enough to view from a distance
- Construction paper/cardboard/foam core
- Adhesives (tape, glue, hot glue)
- Scissors/X-acto knives
- Cameras (digital/video)



With our team, plan, space, and materials in place, we're ready to start our project!



Step 1

Empathize

Learn from people.

Empathize

Empathy is the basis of design thinking. As human beings, we connect deeply with the needs of others and the challenges our communities face. As designers, we have the ability to make real and lasting change.

When we choose a design project, the problem we want to solve may be familiar to us but may not be our own lived experience. We must therefore start our process by learning about the problem and the people it impacts. We call these people our **users**. Users inspire our design.

We can build empathy for our users by learning their values and needs, rituals and behaviors, likes and dislikes, hopes and fears, and more. It's important to gather as many perspectives on the problem as we can so that we create the most informed design possible.

To empathize with users, design thinkers:

- **Research:** Look for existing solutions and inspiring ideas out in the world. Remain truly curious about both familiar and unfamiliar circumstances.
- **Interview:** Interact with users through short and long-form encounters. Ask questions to learn about and absorb the user's perspective.
- **Observe:** View users and their behaviors in the context of their lives, without judgment.
- **Immerse:** Wear our users' shoes. Experience what they experience for a mile or two.

Not every project requires all of these techniques. As a team we can decide which empathy techniques feel most useful and relevant to our project. That said, the two skills that designers typically prioritize for any project are **research** and **interviews**.

If we have time to supplement our interviews, we may add in a few **observation** sessions. If we are redesigning a complicated experience, conducting an **immersion** is probably a good idea.

In this section, we will take a closer look at these four methods for empathizing.

How to empathize

Research

Conducting background research at the start of a project helps us better understand our challenge and the context that surrounds it. Spending time browsing the internet, reading books and articles, talking to family and friends, watching videos, and more are all great methods for deepening our understanding of a problem.

Later in the empathy process, we will interview and observe people directly. First, we must take the time to educate ourselves on our topic so that we can have a shared vocabulary and understanding. It's impossible to become an expert in a week, but it's possible to do enough focused research that we learn how to have a professional conversation with others about the topic.

As we research our problem, we should take note of existing, related solutions. If we're designing a robot that picks up trash on the beach, for example, we can research existing cleaning robots, beach clean-up programs, successful recycling initiatives, and more.

Designers often talk about looking for **analogies** or **analogous experiences** in our research. This means looking at other industries, products, or examples that share elements of our project. For example, if we are trying to figure out how to redesign the waiting room experience at a health clinic, we could visit a fast food restaurant to see how they move customers through the line or go to a theme park to see how they keep people entertained while they wait. The more creative we get with our research, the more perspectives we will have on our problem!

Tips for research

- Keep an organized list of every resource we visit. Create a document where we can paste links to online articles and websites and write down book titles.
- Look for analogies and related industries and products we can turn to for inspiration.
- Think about a research strategy. Are there specific questions we really want answered? Certain areas we really want to explore? Align on these questions as a team and consistently revisit them.

Interview

Interviews are about speaking with a few people that we believe will help us better understand the problem we want to solve. The people we interview are called **participants**. Participants can represent our user population or offer an expert perspective on our project topic. Whenever possible, interviewing participants “in context” (ie. in their own homes, at their places of work, etc.) helps us gather the most information about who this person is and how they operate.

Choosing the right participants will determine the success of our interviews. We try to select a few people (3-5) who we think represent our user type and a couple of experts in the field. The number of participants we choose to interview depends on how much time we have for our project, so we can adapt our numbers based on what feels appropriate for our scope. It’s important to select participants who exhibit a range of behaviors. We want to interview people in the mainstream, but we also want to interview people at the extremes. People at the extremes are great at giving a voice to problems that those in the middle might feel but have a harder time putting their finger on. Check out this example:

A team of Samsung Solve for Tomorrow participants in the United States wanted to prevent accidents from happening as students got on and off the school bus. From interviews with students and bus drivers, the team learned that a lot of cars illegally pass stopped school buses, which puts students in danger. One of their classmates was almost hit by a car at the bus stop. The team met their school’s transportation directors and their mayor to discuss the prevalence of accidents near the school bus area. From these interviews, the team could start thinking about solutions to the problem.⁵

When interviewing participants, our aim is to understand their needs, rituals, opinions, and more. By adopting a **beginner’s mindset**, we can enter the conversation open and ready to learn. Whether we have 30 minutes or 3 hours to conduct an interview, we spend the vast majority of the time listening instead of talking. We refrain from ever trying to educate or speak for the participant during an interview and prioritize listening instead. Flexibility is one of the most important traits of an interviewer. While we try our best to stick with our list of questions, we can also let ourselves follow our participant’s trains of thought.

5. “2018-2019 Samsung Solve for Tomorrow Student Video: Holly Grove Middle School, North Carolina,” YouTube video, 2:59, posted by Samsung U.S. Newsroom, 2019, <https://youtu.be/sOHxZvsAg9s>.

When we conduct an interview, it's just as important to hear what the participant says as to hear what they don't say. What does the participant's body language look like? What questions really bring out their emotions or stories? Take mental and physical notes throughout the process.

Below, find concrete tips for conducting interviews.

Tips for interviews

Whether we're interviewing users or experts, here are some tips for interviewing participants.

Plan

- Compile a list of all the people our team might want to learn from.
- Identify what types of participants each person on our list represents (ie. User? Expert? Extreme user?)
- Think through how accessible these potential participants are and how we will get in touch with them.

Recruit

- Reach out and schedule interviews with our final list of participants.
- Update the list of who we will talk to based on participants' availability and needs.
- Create an interview schedule so that we don't forget about any interviews.

Prepare

- **Discussion guides** are documents where we write down all of the questions we want to ask in the order we want to ask them.
- Every discussion guide looks different. We should write down the amount of questions that will help us feel comfortable facilitating a conversation.
- Think of the discussion guide as a reminder of all the topics we want to cover with sample questions, not as a script that we have to read line by line.

Set up

- If possible, arrange to meet in the participant's context (ie. their home, their place of work, an environment that relates to your project, etc.).
- Try not to crowd the participant, especially if we are meeting in their space. No more than 2 collaborators (one note-taker, one filmer/photographer) should come along with the designated interviewer. If working with students, bring 1 teacher and 2-3 students.

- If the participant agrees, record the interview and take notes of what is said, how something is said, and what is not said. Take photos of all key moments and relevant details in the environment, but only if it's ok with the user.

Start

- To start, we thank the participant for their time and introduce ourselves by name.
- Give the participant the opportunity to ask questions at the beginning of the interview. They may be curious to learn more about our research or each teammate.
- Explain to the participant that there are no right or wrong answers to any of the questions and that we just want to learn about their experience.
- Clarify any formalities at the outset (ie. "Is it ok for my teammate to take pictures and to record this interview to share with the rest of our team?")

Conduct

- Talk as little as possible. Listen a lot.
- Remember we are there to learn, not to teach. Stay open, don't judge, don't 'fix' the participant's language or explain something for them.
- Go with the flow. When the participant speaks, let them speak, even if it's not directly aligned with our discussion guide.
- Ask open questions. Open questions are questions that the participant can't answer with a simple 'yes' or 'no.' "Tell me about your family" is an open question. "Do you live with your family?" is a closed question.
- Start with broad questions that are less personal. As the conversation goes on it's okay to get more specific.
- Allow for breaks in the conversation, and don't be afraid of silence. Give participants time to think before they answer.

Gather information

- Ask participants for concrete anecdotes that highlight their feelings and opinions.
- Ask participants to show any interesting processes, objects, or tools that they refer to, if they have them on hand.
- Observe facial expressions, posture, and gestures.
- Take a look around, if the participant permits it. What does the environment tell us? What do we notice? Do we see anything unexpected?
- Try to get at why someone feels the way they do. We can always ask "why?" multiple times to dig deeper into a participant's response.
- Capture the participant's responses exactly as they say them. We don't want to change, edit, or simplify their words, because that's how our own beliefs and biases can creep in.

Debrief

- Take time to debrief with our team as soon as possible after the interview.
- Discuss as a group what we each found interesting, what surprised us, and what really stuck with us after the conversation.
- Write down all of these topics, comments, and quotes on post-it notes (a notebook or loose paper also work).

REFER TO "STEP 1: EMPATHIZE" IN THE WORKBOOK P. 13 ~ 17 FOR RELATED ACTIVITIES!

Observe

Observation is an empathy-building technique where we watch participants go about their daily routines in their own environments. We become like a fly on the wall, intently listening to every exchange, watching every gesture, and noting every detail about the environment. This practice of silent observation can pair nicely with conducting interviews with the same participants. Oftentimes the most meaningful realizations occur when we can observe someone and then ask them about their behaviors and motivations in a follow-up interview.

Observations are great tools for understanding how our participant interacts with a complicated process (ie a surgeon doing surgery), a unique environment (ie. a teacher in a kindergarten classroom), or a lived reality (ie. a homeless person living in a shelter).

As we observe, we first watch what happens in the context without influencing it. We take notes of things we notice and moments that confuse or surprise us. Only after we've observed for a substantial amount of time should we interact with the participant to ask follow-up questions.

Tips for observations



Plan ahead

- Compile a list of potential observation opportunities.
- Think of point people we could contact to help us coordinate these observations.

- Contact those point people and explain that we're working on a project that would benefit from having a deeper understanding of a certain activity/context. Coordinate a time when we can observe.
- Clarify how many observers our participant can accommodate. Ask in advance where we should situate ourselves so that we stay out of the participant's way.
- Ask the participant ahead of time if they will allow us to photograph or video moments of the session.

Come prepared

- Bring a notebook and two pens (always good to have an extra!).
- If the participant said they were comfortable with pictures, bring a camera or smartphone with plenty of available storage.
- Bring a water bottle and a snack if we know we'll be on our feet for a long time.

Follow up

- Send a thank you note over email or by hand to thank the participant for their time.
- Arrange a follow-up conversation if we have any further questions.
- Capture, compile, and share our notes and reflections with our team.

Immerse

Unlike observations where we **watch** participants complete certain tasks, immersion is when we **do** those same tasks ourselves. With immersion, we slip into the role of the user to understand the pros and cons of an experience first-hand.

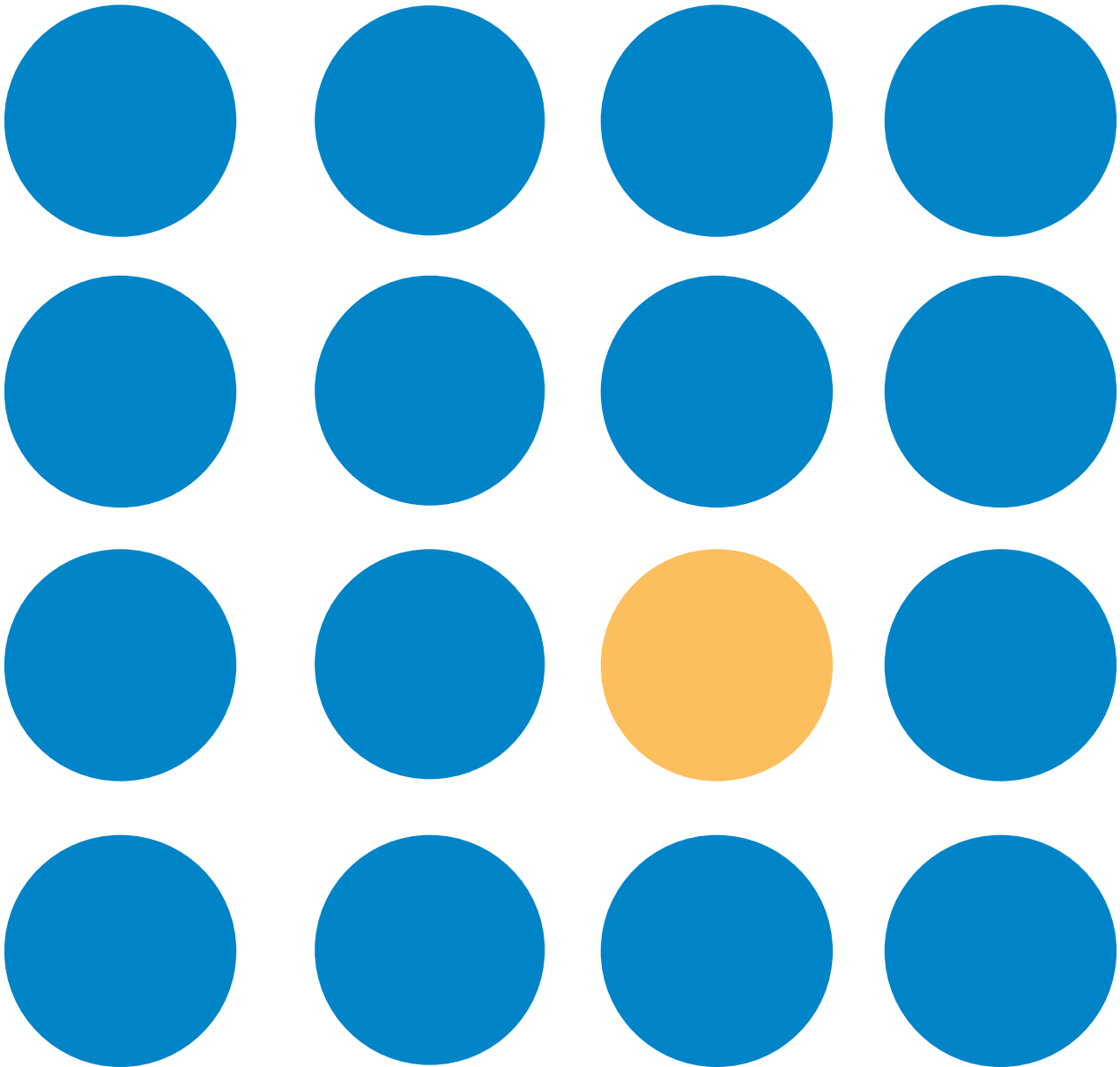
Immersion is helpful if we are trying to rethink a product (ie. we need to design a new backpack so we use an existing backpack for a week to see how it works), restructure an experience (ie. we need to help nurses optimize their workflow to fit in a 4-hour shift, so we shadow different nurses for multiple 4-hour shifts), or rework a process (ie. we need to rethink the drop-off and pick-up process at our school, so we drive through the line multiple times as if we are a parent to experience patterns or inconsistencies).

Tips for immersions

- Try to get as close to the user's role as possible, but remember there are certain things that we can never fully understand and simulate. (ie. If we are able-bodied, we will never fully understand what it's like to live in a wheelchair, even if we sit in a wheelchair for a day.)
- Identify a specific task we want to execute and work on it in as realistic an environment as possible.
- Create relevant boundary conditions artificially, if necessary (ie. time pressure, language barriers, etc.).
- Take note of all hurdles that complicate the experience and all aids that support it.
- If a team member accompanies us, ask them to document the process with photos and notes.
- Reflect on what we saw, heard, and felt along the way. Consider having a teammate interview us about our experience.



Samsung Solve for Tomorrow participants learn from a Samsung mentor about the first step of the design thinking process: Empathize.



Step 2

Define

Look for insights. Find patterns.

Define

Now that we've connected with users, heard from experts, and developed a detailed understanding of our problem, it's time to transition from "looking backward" to "looking forward." In the **define** phase, we move from observing the real world to describing future possibilities.

Our inputs from the empathy phase are often abundant and messy, so this is the part of the process where we make sense of what we learned. Since we can't solve for everything that we hear and learn, it's important for us to pull out and focus on the learnings that feel most important. Once we hone in on the exact aspects of our problem that we want to tackle, we can generate our point of view on how to move forward.

To define problems, design thinkers:

- **Craft insights:** Cluster learnings from research, identify patterns, and highlight important findings.
- **Identify a point of view (POV):** Specify where we want to have impact and the scope of our design.
- **Write "How might we...?" (HMW) questions:** Prepare prompts for generating ideas that align with our POV.

In this section, we will take a closer look at these three methods for defining.

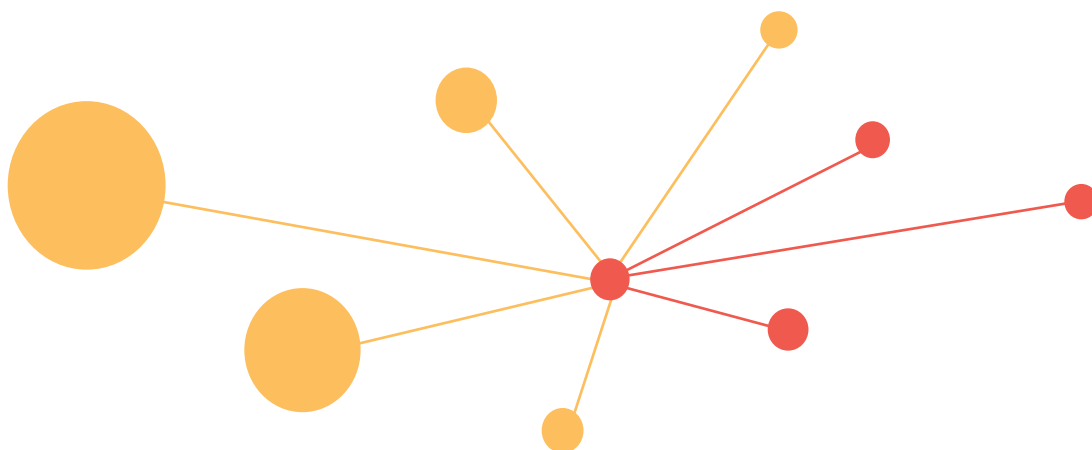
How to define

Craft insights

Insights are statements that explain the “aha” moments we felt during the empathy phase. **“Aha” moments** are sudden discoveries or realizations that we have as a result of researching, interviewing, or observing. One important quote, conversation, or experience can shape our whole outlook on the problem we want to address, and we want to bring those moments to the forefront as we define our challenge.

To craft insights we have to **review our findings**. This means processing, organizing, and making sense of the information we gathered in the empathy phase. After all of our research, interviews, observations, and immersions, we hopefully took time as a team to debrief and write down moments, quotes, or experiences that stood out to us. If we didn’t do that yet, we can do that now. We should also go through our notes, transcripts, videos, recordings, images, etc. and pull out any other information that feels important and meaningful. Write down all of these quotes and moments on post-it notes and stick them up in our dedicated project space. It helps when we can see all of our most important inputs on one wall or surface.

Once we have our important inputs from research collected in one space, we can sort, cluster, and organize. **Looking for patterns** is one way we can bring order and structure to the chaos of our inputs. We can start by physically grabbing post-it notes and moving them closer to post-it notes that feel related. As we go, we talk through the rationale for moving each post-it towards another. Maybe there’s one sentiment that we heard multiple times over from different participants. Maybe there are quotes that conflict and we want to explore that tension. Maybe there are statements that reinforce or add specificity to others. As we go through this clustering process, specific categories or topic areas will start to emerge.



Looking for patterns is a creative and iterative process with no 'right' or 'wrong' way to do it. Follow the inputs and patterns that generate the most energy in the group. Some post-its may get left behind as we cluster, and that's ok! The point of this exercise is to make meaning out of what we've seen and heard.

As clusters and patterns develop, we should write simple headlines that address the inputs in each cluster. No need to make our headlines perfect. "Doing dishes = most frustrating but most gratifying part of the day" could be one or "Backpacks: too big on most days, too small on some" could be another.

Now that we've clustered our inputs, we can start adapting our headlines into **insights**. Insights are succinct statements (1-2 sentences) that convey our understanding of our inputs and nudge us towards a successful future concept. Check out this example:

A team of Samsung Solve for Tomorrow participants in Seoul, South Korea wanted to reduce food waste at their school. After conducting interviews and observations at lunch time, the team came together, wrote down quotes and observations on post-it notes, and laid the notes out to make sense of what they saw. One note said, "Whenever Seo-yeon asks for a 'little bit' of food at lunch, the server still gives her too much." Another note said, "When Joon asked for 'some more,' the server gave him a heaping scoop of food." Bringing these observations together helped the team identify a pattern. From that pattern, they came up with the following insight; **it's hard for students to tell servers how much food they want when there are no units to refer to. One person's "little bit" may be different from another's, and this confusion leads to students getting served more than they can eat.** From this insight, the team could start to think about solutions to address that insight.⁶

Crafting effective insights can be tricky. It may take multiple attempts to get them right. We should therefore feel free to adapt the insight-crafting process to meet the age and experience level of our group. Young children will likely just identify the moments from research that felt most exciting and identify patterns. More advanced design thinkers can dig deeper into the nuances of our inputs and craft specific insights. The ultimate purpose of crafting insights is to help us move towards our project goal.

On the following page, find concrete tips for crafting insights.

6. "MUJIGAE the Food-Tray," Vimeo video, 4:21, posted by Ahyetn Kim, 2016, <https://vimeo.com/159308929>.

Tips for crafting insights

Review findings

- If possible, review findings immediately after each session.
- On individual post-it notes write down any quotes, memories, moments, questions, or surprises that came up during the interview/observation/immersion.
- Once we're back in our project space, put all post-it notes up on a wall or surface to make sure they are visible to the whole team.
- Re-read all interview notes to see if there are any relevant or important points we want to add to the collection of post-its we already have.
- Print and add any important pictures to our post-it wall.

Look for patterns

- Start identifying and clustering the post-it notes that seem most interesting. Make sure that everyone gets a chance to speak up.
- Feel free to change, move, combine, or discard clusters as we go.
- Ask ourselves which clusters feel related, inconsistent, surprising, important, least interesting, etc.
- Add simple headlines to each cluster as we go. This will prevent our team from forgetting why we clustered certain inputs.

Craft insights

- As a team, start writing insights based on the clusters we've identified.
- Strive to create insights that go beyond mere observations and that are well-informed, memorable, and actionable.
- Remember that insights should point us to future actions and inspire our design.
- Once we've generated insights, we can start to discuss what opportunities these insights might point to.

Identify a point of view (POV)

Once we've created a set of insights that feel comprehensive, important, and actionable, we can develop our overarching **point of view (POV)**. Also called a **problem statement**, a point of view is a sentence (or two) that makes our design challenge actionable. The POV reframes our problem in the context of our insights and helps us generate ideas that meet our goals.



A POV statement should always include the user, their needs, and an insight.

Here are couple examples of POV statements:

- Parents in rural America [user] need access to more fresh foods [user need] because they are worried about the health and development of their children [insight].
- 2nd graders at Elmhurst Elementary [user] need backpacks with more distinct sections and pockets [user need] because they have trouble organizing their belongings effectively [insight].

Tips for identifying a point of view (POV)

- Try using the formula: user + need + insight to develop a POV statement.
- It's possible that our project will have a couple POVs. Give every teammate a chance to create a POV statement. Vote on the statements that feel most compelling.

REFER TO "STEP 2: DEFINE" IN THE WORKBOOK P. 24 FOR RELATED ACTIVITIES!

Write “How might we...?” (HMW) questions

Identifying our **point of view** starts to prepare us for the next phase: **ideation**. We can break our POV statement down into more specific questions called “**How might we...?” (HMW) questions**. Written in the form of “How might we...[achieve/do/allow/help] X, Y, or Z?” these questions help us brainstorm concrete ideas that meet our design goals.

HMW questions that work particularly well for brainstorming are, “broad enough to include a wide range of solutions but narrow enough to impose helpful boundaries. Between the too narrow ‘HMW create an ice cream cone that doesn’t drip?’ and the too broad, ‘HMW redesign dessert?’ is the properly scoped, ‘HMW redesign ice cream to be more portable?’”⁷

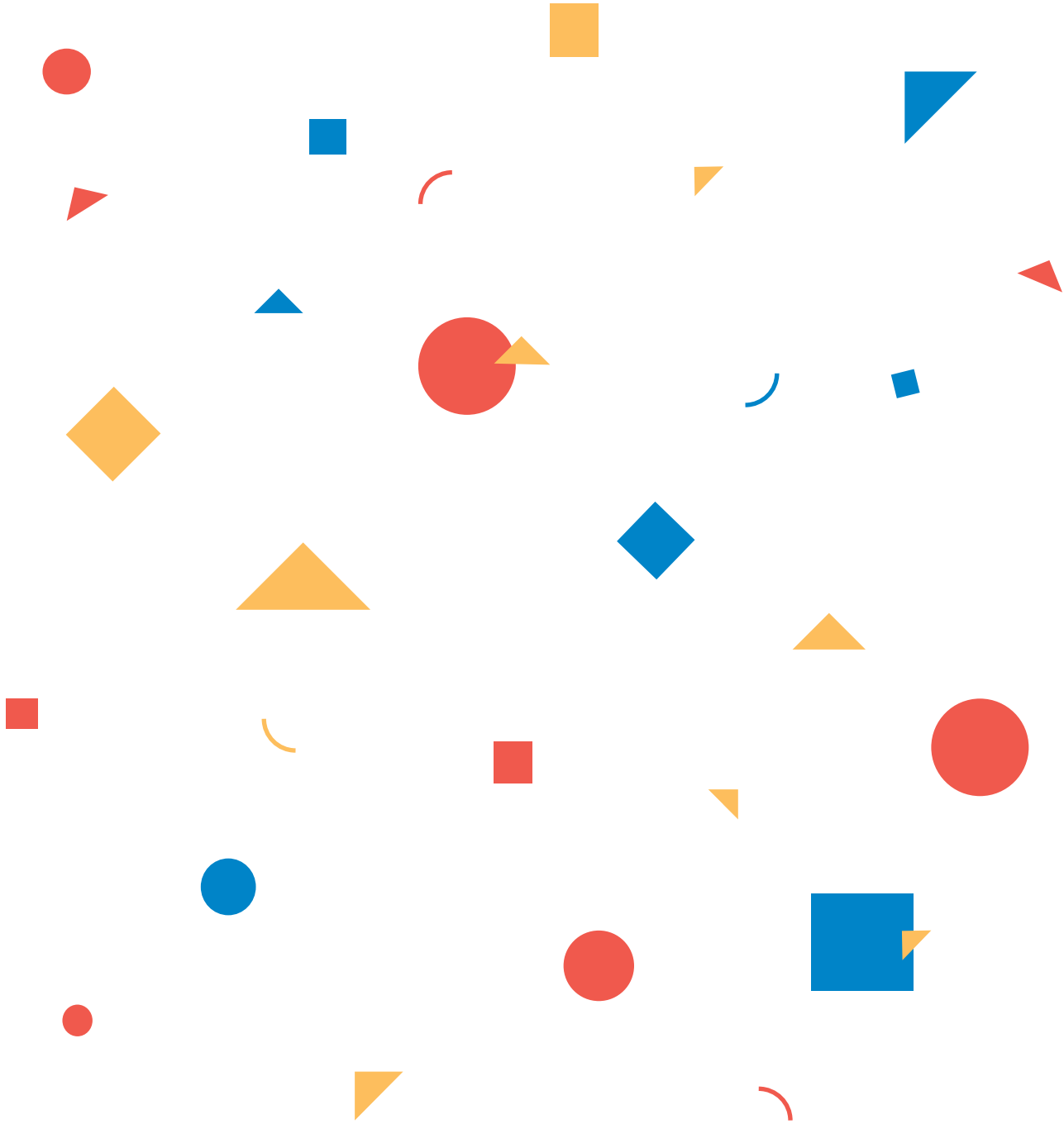
Tips for writing “How might we...?” (HMW) questions

- Start with your design challenge and point of view statement. Then break down the larger challenge into smaller actionable bits and generate questions that can point us towards potential ideas.
- Check out the following example of a challenge with a POV and corresponding HMWs. The HMW prompts below can help us craft effective HMW questions for any project:
 1. **Challenge:** Redesign the airport waiting space.
 2. **Point of view:** Parents need to entertain their young, playful children without irritating already-frustrated fellow passengers.
 3. **How might we...**
 - **Alleviate tension:** Separate kids from fellow passengers?
 - **Explore the opposite:** Make the wait time the most exciting part of the trip?
 - **Question an assumption:** Remove wait time altogether?
 - **Create an analogy from need to context:** Make the airport like a spa? Like a playground?
 - **Change a status quo:** Make playful, loud kids less annoying?⁸

REFER TO “STEP 2: DEFINE” IN THE WORKBOOK P.25 FOR RELATED ACTIVITIES!

7. *Design Thinking Bootleg* by Scott Doorley, Sarah Holcomb, Perry Klebahn, Kathryn Segovia, and Jeremy Utley at Stanford dschool is licensed under CC BY-NC-SA 4.0

8. Ibid.



Step 3

Ideate

Generate creative solutions.

Ideate

Our earlier phases of work resulted in understanding our users, generating insights and points of view, and identifying areas of opportunity. The ideation phase marks the point in the project where we return from abstraction to envision concrete solutions.

To ideate, design thinkers use two modes of thinking:

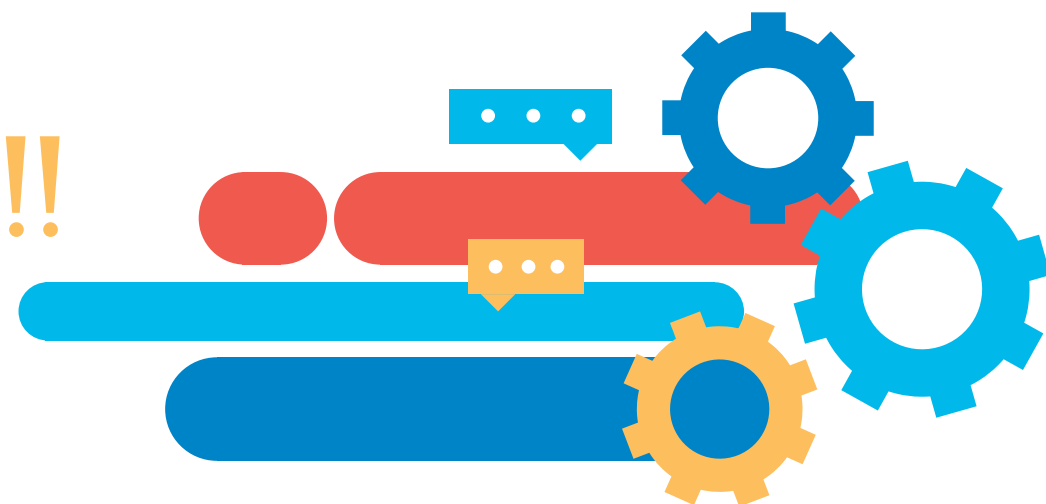
- **The creative mode**, which is when we let our minds wander freely and we generate as many ideas as possible. **Brainstorming** is a creative mode process.
- **The analytical mode**, which is when we focus our thinking and select the best ideas. This is often referred to as **evaluating**.

When we begin the ideation phase, we want to start in the creative mode and generate as many ideas as possible. We deliberately refrain from evaluating or questioning ideas. Bringing in the analytical mode too early can squash the creativity and openness of our team.

Later in this phase, evaluation becomes more important. Once we've generated a multitude of ideas, we can think critically about the best ideas and screen out solutions that feel inadequate, uninteresting, or inappropriate for our project scope.

Ideation is one of the most fun and creative parts of the design thinking process. Teams of any age can join together in a group and come up with ideas.

In this section, we will take a closer look at the two stages of ideation: **generate** and **evaluate**.



How to ideate

Generate

Brainstorms are team sessions where we turn the creative mode on, generate as many ideas as possible, and encourage wild thinking. The best way to have a good idea is to have lots of ideas, and brainstorms are one type of creative activity that can help generate many ideas. Brainstorms allow us to think freely about solutions without the fear of external judgment or self-censorship.

Before starting a brainstorm, it's important to make sure that our team is energized and ready to think outside the box. Once we bring everyone together in our project space, we should spend some time loosening up. Stand up and do some jumping jacks or funny dance moves. Play a quick game or sing a song. The goal here is to make our environment feel open and fun.

Now that we are ready to brainstorm, sit together in a group—ideally around a table—with an empty project surface like a board or wall nearby. Make sure that everyone has access to a stack of scratch paper, index cards, or post-its where we can sketch lots of ideas. Give everyone a sharpie or thick black marker to write with. As we jot down ideas, we'll put them up on the board for everyone to see. Avoid using pencil or pen as the lines will be too thin to be visible and they may encourage people to write too much. When we capture ideas, we want to be as visual as possible, so quick sketches (no matter our drawing ability!) or a tagline are better than detailed paragraphs.

Though it's somewhat counterintuitive, the best brainstorms happen when we follow a strict set of rules. These rules are listed on the following page. Make sure everyone on our team understands them before we begin.

To run a brainstorm, we take one HMW question at a time and come up with as many ideas as possible that address that question. For each HMW, try setting a timer for 10 minutes. Setting a time limit stimulates our brains and encourages us to get ideas "out there" instead of thinking too long and hard about each one. If people's energy is still flowing around one HMW, add another 10 minutes to the timer. If people are slowing down, jump to the next HMW or take a two minute break from brainstorming.

Everyone on the team should actively come up with ideas. As we come up with an idea, we write it down on our post-it or scratch paper and share it aloud with the group. One person's idea may stimulate another's, so it's important that we share our ideas aloud as they emerge.

Capture EVERY idea that comes to mind, even ones we don't love, and put them up on the wall. We can get rid of less interesting ideas later.

Tips for generating ideas

Prepare for the brainstorm

- Select 5-6 HMW questions that we want to address.
- Limit each brainstorm to an hour. Depending on the age and attention span of our group, adjust the time limit accordingly.
- Clean up and create space in our project area.
- Set out a thick, black marker like a Sharpie and a stack of post-its, index cards, or scratch paper for every person joining the brainstorm.
- Bring a stopwatch, timer, or phone with a timer/alarm.
- Conduct a quick loosening-up exercise as a team.
- Review "Brainstorm rules," written below.

Brainstorm rules

- Don't judge.
- Go for quantity.
- Encourage wild ideas.
- Build on the ideas of others.
- Stay focused and on topic.
- One conversation at a time.
- Draw, sketch, and scribble ideas. Be visual.

Conduct the brainstorm

- Spend 10-20 minutes addressing one HMW question at a time. Set a timer in increments of 10 minutes for each question.
- Come up with as many ideas as possible. Write every idea down.
- Share every idea openly and put every idea up on the wall immediately after it's shared.

REFER TO "STEP 3: IDEATE" IN THE WORKBOOK P. 27 FOR RELATED ACTIVITIES!

Evaluate

During the evaluation phase, we select the few ideas that promise the greatest development potential.

For now, the intuition of the team—sharpened by the perspective of the user—is the best way to pick ideas to push forward. We don't need to get too deep into what's feasible or plausible given budget, timeline, skill, team, or other constraints. More structured evaluation can happen in later stages when we develop our ideas a bit more.

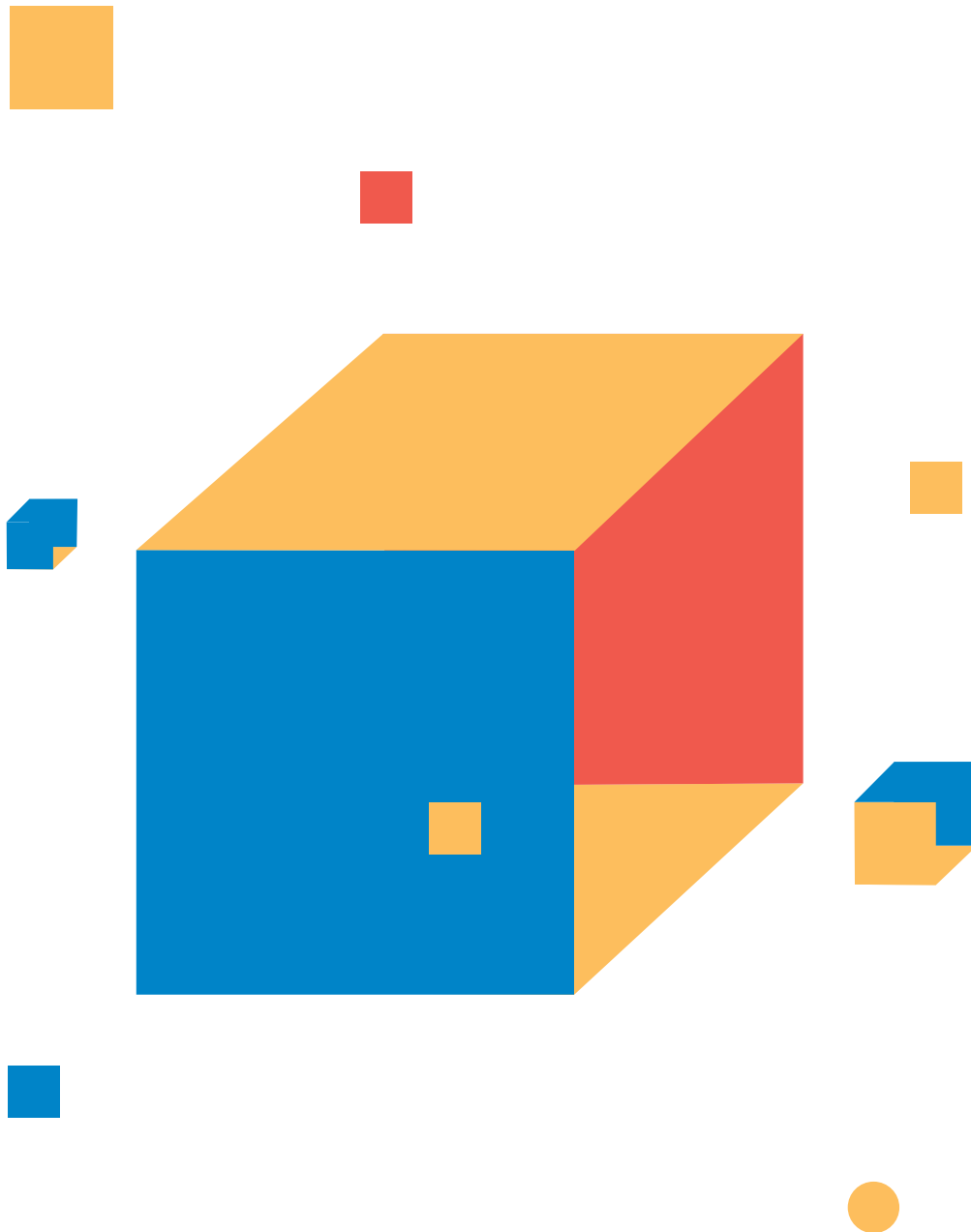
To select the most interesting ideas at this phase, we each get a set of 5 voting "dots," stickers, or a uniquely colored marker. Take a few minutes to have everyone go up to the board and read through the ideas. As we come across a favorite, we place our sticker or draw a colored dot on the idea. Once everyone has used all 5 votes (it's okay to vote for our own ideas), sit down as a team and talk through the results.

Tips for evaluating ideas

- Give each team member a set of voting "dots," stickers, or a uniquely colored marker.
- Limit the number of votes that each team member gets. Try starting with 5 votes per person. Maybe even assign each person one "super vote" for an absolute favorite idea and 4 regular votes.
- The first round of voting should be quiet and individual. Encourage everyone to vote for their true favorites rather than follow the crowd.
- As we vote, try to select a range of ideas. We want to preserve the breadth of solutions generated by the group.
- For more structure, try giving voting criteria like: the rational choice, the most likely to delight, the darling, and the long-shot.⁹

REFER TO "STEP 3: IDEATE" IN THE WORKBOOK P. 28 FOR RELATED ACTIVITIES!

⁹ Design Thinking Bootleg by Scott Doorley, Sarah Holcomb, Perry Klebahn, Kathryn Segovia, and Jeremy Utley at Stanford dschool is licensed under CC BY-NC-SA 4.0



Step 4

Prototype

Make ideas tangible.

Prototype

The aim of the **prototype** phase is to make our ideas tangible and real so that we can learn about their successes and shortcomings. These learnings happen when we build the idea as a team and when we share the idea with others. The goal of sharing a prototype with others is to see how well our idea responds to the problem we're trying to solve.

When we hear the term 'prototype,' we might think of a complicated hardware model or digital experience. But prototyping does **not** require producing sophisticated or expensive models. A prototype should be just detailed enough to test and answer core questions and assumptions that are fundamental to our concept. The two outcomes of a prototype are iteration or rejection, so the less time we invest in building a 'perfect' prototype, the sooner we can learn.

In fact, prototypes that are too sophisticated are often counterproductive. Overly-complicated prototypes can lead to feedback from users that is too detailed for this phase of the project. Investing undue effort in a prototype can also cause us to become unnecessarily attached to an idea not because it's great but because we spent so much time and effort building it.

There are multiple prototyping methods. We should choose the appropriate method and level of detail that will allow us to test the success of our concept. No matter what, we should always start with the question, 'What do we want to learn?'

To prototype, design thinkers:

- **Tell stories:** Tell a plausible story about how the concept will come to life in a real use case.
- **Paper prototype:** Sketch initial concepts on paper to make an idea visible.
- **Digital prototype:** Design **wireframes** or simple screen layouts that give a sense of how the screens of an app or site could flow.
- **Physical prototype:** Make a physical model to test how a mechanism might work, to feel our product in our hands, or to give the model to a user for testing.

In this section, we will take a closer look at these four methods for prototyping.

How to prototype

Tell stories

The simplest prototyping method is storytelling. Telling a story from the user's perspective about how or when our concept can be used builds credibility and brings our idea to life.

Rather than highlight our concept's features or technology, our story should focus on the overall benefits and the key moments of the user's experience with the concept. Our story can address both emotional and rational aspects of the idea.

Stories can take many forms. We can draw pictures, write a few paragraphs, create a fake ad, write a mock Youtube review, make a comic strip, and more.

Tips for telling stories

- Explain how the user's experience with the concept unfolds over time. Try to paint a "journey" of how a user would come in contact with, interact with, and leave an encounter with our concept.
- Highlight the key moments in the experience rather than every detail. Designers call these **magic moments**. Illustrating a few magic moments can help convey the essence of an idea without getting bogged down in unnecessary details.
- Keep it simple! Stick figures or simple sentences are more than sufficient. We want to avoid getting lost in details.

REFER TO "STEP 4: PROTOTYPE" IN THE WORKBOOK P. 30 FOR RELATED ACTIVITIES!

Paper prototype

We may feel the need to make our prototype more visual than a written story allows. Paper prototyping is a fast and inexpensive way to create visual aids that show the key elements of our concept.

When we paper prototype, we sketch out versions of our concept on paper. We can sketch out scenes, trace the outlines of devices like phones and draw what we think key screens will look like, illustrate flowcharts to show how a user would interact with our concept, and more.

Paper prototyping can be highly collaborative. It's easy for multiple teammates to contribute to a sketch or to draw more than one version of the same idea.

Tips for paper prototyping

- Avoid excess detail. Use lines, shapes, and headlines to illustrate the concept.
- Don't be afraid to throw out ideas and start over. Explore variations of the same idea and allow other teammates in on our process.



REFER TO “STEP 4: PROTOTYPE” IN THE WORKBOOK P. 31 ~ 32 FOR RELATED ACTIVITIES!

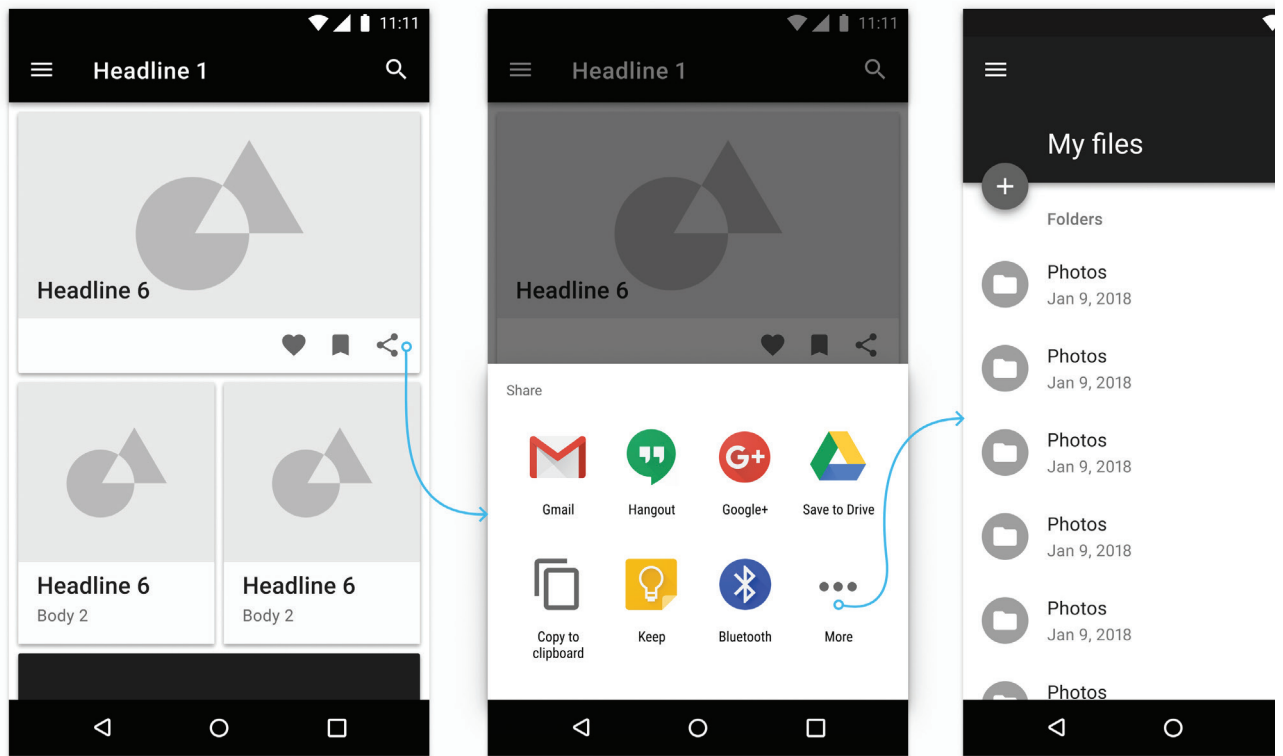
Digital Prototype

Digital prototyping is best when we are looking to create a digital product like an app or a website. Creating an early prototype of what key screens could look like helps us simulate the experience a user would have with our product. When creating a digital prototype, we don't only consider the look and feel of digital screens. We also want to account for the order and flow of the experience, because we will ultimately design how someone moves through our digital product.

To create a digital prototype, we can use simple layout tools like Powerpoint or more interactive prototyping softwares like Figma, InVision, Marvel, Atomic, Adobe XD, Flinto, etc. Either approach is effective, so we should only use tools that feel appropriate for the skill and age level of our group. Again, we prototype to learn; we don't need to design the final product now.

Tips for digital prototyping

- Decide in advance what we want to test. Creating apps and websites requires designing lots of screens, but for now we should pick a few key screens to prototype. Which screens will help our users best see how the overall experience will look and feel? Which moments and interactions do we have the most questions about?
- Keep screen designs simple. Gray boxes as placeholders for images and black and white text is fine. Don't worry about expressing too many visual details, colors, fonts, etc.
- Break down complex interactions into small steps. Make it clear to the user how they get from point A to point B in your digital experience.



Example of an app prototype created in Figma, an interactive prototyping software

Physical Prototype

Physical prototypes are hands-on, tangible manifestations of our concept. They may not include all the details and functionality that our final design will, but they are representative models of what's to come.

Physical prototyping methods vary greatly. We can design a model out of paper, cardboard, foamcore, clay, wood, metal, etc. A cardboard model can be just as effective as a 3D print, we just need to decide which format will help us best learn and test.

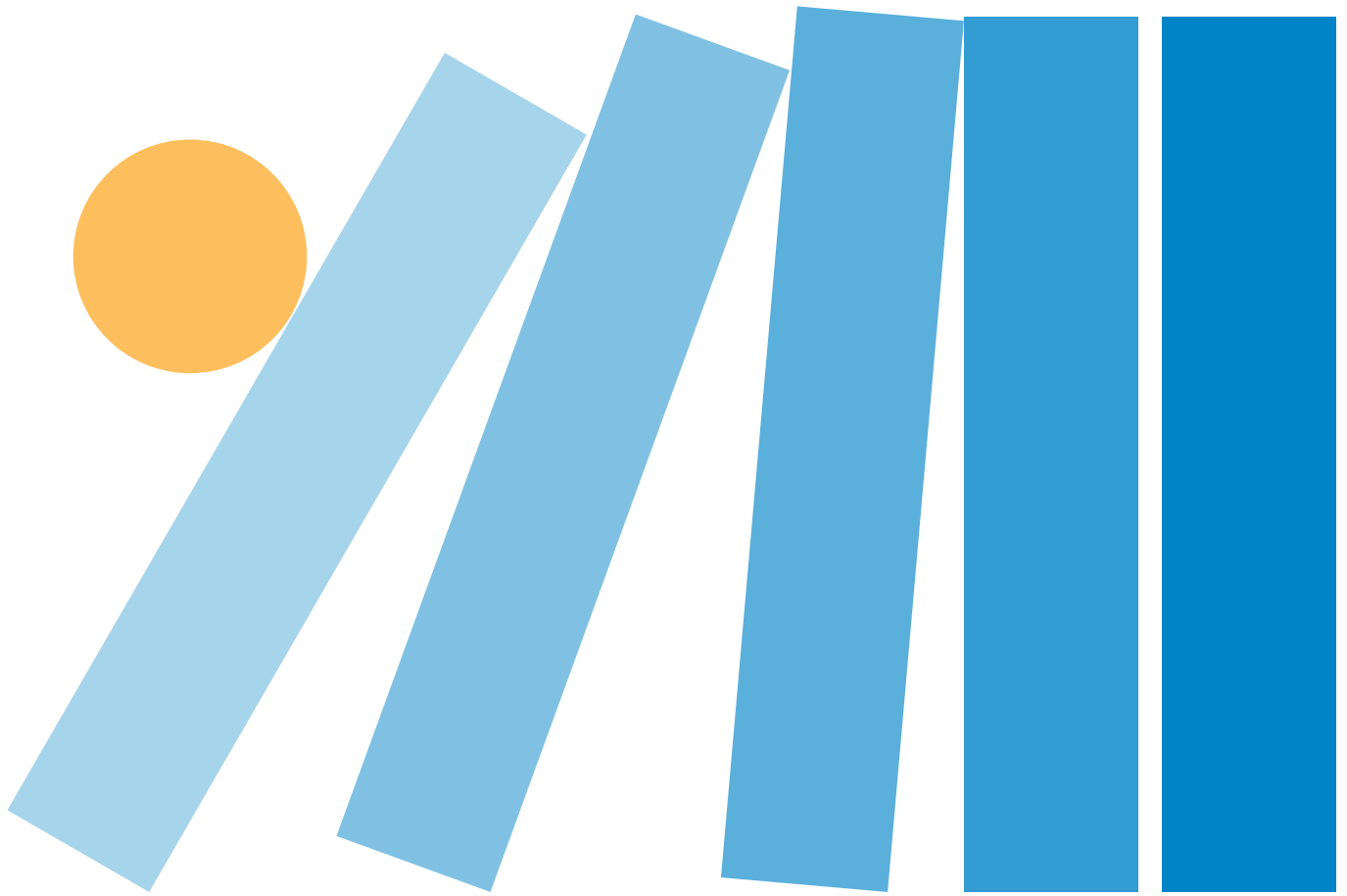
There's no limit to what we can pull together when creating a physical representation of an idea. We should get creative and let our ideas fly. Use whatever resources we have on hand to create a model.

Tips for physical prototyping

- Decide as a team the exact interactions, features, or functions we want our prototype to include. Leave unnecessary features behind.
- Avoid creating a prototype that looks more finished than the concept behind it. Since physical prototypes are the most "real" kind of prototype (we are creating a physical model for a user to interact with), it's critical that we keep them simple.
- Formulate questions in advance that we will want to test with users.
- Keep physical functions clear and separate so that we can test them one at a time.



A Samsung Solve for Tomorrow participant presents his team's physical prototype at a final presentation



Step 5

Test

Put ideas into the world.

Test

Although testing is technically the last step of the design thinking process, it's actually part of a three-part cycle. Once we create a prototype (part one), we need to validate it with users to see if it adequately meets our users' needs (part two). Based on user feedback, we improve our prototype to make it more effective at meeting users' needs (part three). Prototypes only represent our best thinking to date, so putting them to the test with users and experts allows us to see any holes, challenges, or false assumptions that we didn't see before. Testing also allows us to celebrate successes and watch our concept come to life!

Testing prototypes requires us to reach back out to users and to speak with them honestly about the success of our design. It's important that we gather a diverse range of honest feedback and that we present our concept neutrally when talking to users. We don't want to sway users' feedback based on our opinions.

As users test our prototypes and give us feedback, the same principles as in Step 1: Empathize apply. We need to stay open to users' perspectives. Remember that the design thinking process only works when we accept and implement feedback, so we shouldn't be afraid to hear constructive criticism. Prototypes are meant to change over time, and it's better to respond to honest feedback now than to wait until our concept is out in the world and falls short of our intended goal.

The improvements we make to our prototypes after testing with users are called **iterations**. Iterations help us get closer and closer to creating a concept that effectively meets our users' needs.

To test concepts, design thinkers:

Share with users: Ask for honest feedback from those who are directly affected by our design.

Iterate: Improve upon initial prototypes and concepts to more accurately meet user needs.

In this section, we will take a closer look at these two phases of testing.

How to test

Share with users

Sharing and testing prototypes with users can feel similar to conducting empathy interviews. The need to build rapport and to let users lead remains the same, but testing prototypes with users is more focused than our initial interviews. We should have a clearly defined set of questions that we want to test with users. Some examples of questions we can test at this phase are:

- Is the value proposition for our product solid?
- Do users understand when and how to interact with our prototype?
- Is the level of complexity of our concept appropriate?
- Have we made the right assumptions about how the user journey unfolds?

Based on what we learn from testing these questions with users, we can then improve upon or **iterate** on our prototype later in this phase.

Start by contacting a few potential users to request a 30-minute feedback session. It's best to find new users who aren't people we interviewed at the beginning of our project. We want someone with fresh eyes to validate whether we accurately identified a real need and whether our concept responds to that need effectively. Bring our discussion guide along to the meeting and sit down with the participant. Start the session by briefly explaining what the context and intended goal of our concept is. Once the participant has enough context to understand the prototype, present the prototype as neutrally as possible and let the participant engage with it.

Carefully watch and listen to how the participant interacts with the prototype. If there are specific tasks that we want participants to do, we can ask open-ended questions like "How do you think you would complete X task?" or "Where would you expect to find Y feature?" or "What do you expect Z part to do?" Don't defend our idea or try to change a user's mind. We should only jump in to clarify if we think the participant has thoroughly misunderstood our prototype.

As a general rule, users are not very good at describing their ideal future, but they can be surprisingly accurate and insightful when it comes to choosing between two possible futures. As a result, it can be quite helpful to show users more than one potential solution as prototypes. In our feedback sessions, we can ask participants to talk us through the perceived differences between the two concepts and the pros and cons of each solution.

Pay close attention to which aspects of the prototypes are most important to users. Are these aspects the ones we meant to highlight? If not, we may need to adjust our prototype.

Record participant feedback in the same way we recorded empathy interviews. Take lots of notes and take photos, videos, or other recordings with the participant's permission.

Tips for sharing with users

Plan

- Compile a list of a few participants and experts that our team wants to get feedback from.
- Reach out and schedule 30-minute sessions with participants.

Prepare

- Create a list of questions that we want answered in our testing sessions.
- Plan out a schedule that allows us to get the most out of each testing session.
- Before testing with users, prototype our testing plan by running a mock testing session with one of our teammates.

Conduct

- Give the participant some context on our project and explain why we are approaching them at this stage of the process.
- Remind the participant that all feedback they provide is valuable, whether positive or negative.
- Clarify any formalities at the outset (ie. "Is it ok for my teammate to take pictures or videos of this interview?"). Take notes and pictures as appropriate.
- Present the concept neutrally. Don't try and sell it!
- Listen and watch carefully as the participant reacts to our concept. Discover what the user finds successful about our prototype. Don't try and change the participant's opinion or clarify something they are confused about. Observe where and why the participant is getting confused.
- Ask "Why?" when the participant gets stuck or communicates a positive or negative reaction.
- As needed, after the participant has provided their impressions, explain the need we are solving for. Ask if the participant identifies with the need and whether they feel our prototype responds to that need.

Debrief

- After the session, analyze which of our previous assumptions were confirmed and which were disproven.
- As a team, discuss the ways that we can iterate on our design to respond to feedback. If we heard the same sentiment multiple times from different users, that's likely a good place to start with improvements.

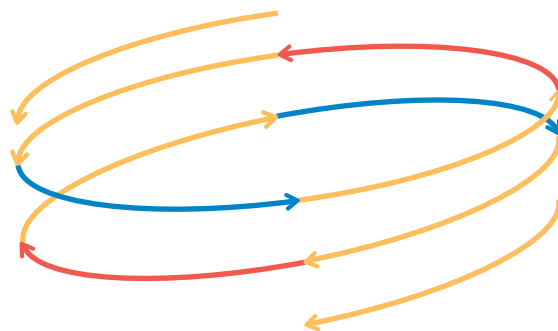
REFER TO "STEP 5: TEST" IN THE WORKBOOK P. 37 ~ 38 FOR RELATED ACTIVITIES!

Iterate

When we **iterate** on our concept, we create a new version that addresses the feedback we heard during user testing. While iteration is not one of the five formal steps of the design thinking process, it's the glue that connects Step 4: Prototype and Step 5: Test in a continuous feedback loop.

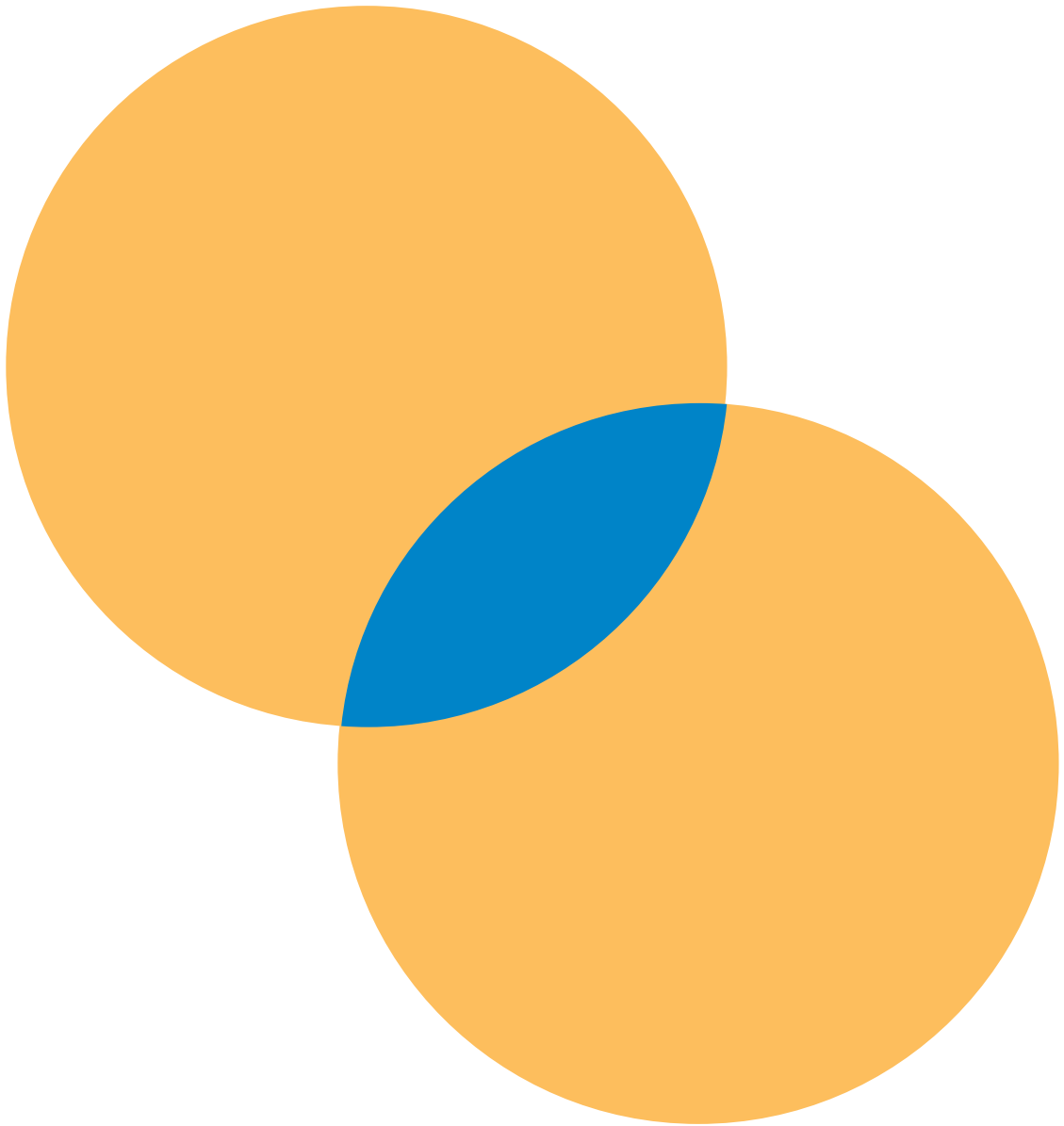
Iterations can be infinite. It's hard to know when a project is truly "done," which is why setting timeline or budgetary constraints at the outset of the project can be helpful. Certain projects may have a longer timeline that can accommodate multiple rounds of testing and iteration, while other projects may only allow us to do that process once. Feedback is central to the process, so we should always try to iterate at least once on our concept before getting to the finish line.

Iterations can be small – like adjusting a specific button, lever, or screen – or large – like shifting our underlying approach to the problem. We might even find that our concept successfully responds to a totally different need than we intended. We should prioritize iterations that will have the greatest impact on the efficacy of our final product. If we respond to the feedback we heard most consistently, we are most likely to mitigate a challenge for future users.



Tips for iterating

- Revisit our notes from sharing with users. Are there any comments, suggestions, or problems that came up multiple times? These would be good places to start.
- Iterate according to the scope we have. If we only have a week to iterate, we probably can't reinvent our concept from the ground up, but we can improve upon a few elements of the experience.
- Think ahead about where we want our iteration to lead. If our former assumptions were slightly off, what are our new assumptions? If a feature needs to be updated, how do we want to update it? Discuss these plans as a team.



Share

Bring our work to life.

Share

The finish line can look very different from one project to another. Maybe we want to present to our teachers and classmates, to initiate a conversation with our local government, or to get funding from investors.

No matter our goal, telling an effective story about our project and process is critical to getting buy-in from others. Knowing how to effectively and professionally share our work is just as important as doing the work itself!

There are multiple ways to share our work with others. We can make a video, write an article or an essay, present our work in person, and more. Each format has its own considerations, but the core storyline always remains the same: **Our user is the hero of our story.**

Starting our story with a clear explanation of the problem and who it impacts will help bring the empathy and importance of our work to life. Once we help our audience understand our user, we can adjust the flow and structure of the rest of our story to meet the goals of our delivery. For example, if we want our government to be more aware of the needs of our community, we should likely spend more time on empathetic storytelling. If we want to win a contest, we should likely put special emphasis on the originality and functionality of our concept.

When crafting our story, we should consider each step of the design thinking process and address some or all of the prompts below. In any project share, we should present our work with confidence. Our hard work and teamwork got us to this point, and if we exude confidence when we share, we will elicit confidence in our idea from our audience.

Tips for sharing our work with others

No matter what storytelling format we choose, the following points outline the traditional narrative arc of a design thinking project share-back. Try to have our story answer the following questions as **clearly, concisely, and confidently** as possible.

| INTRODUCTION | Who are we?

- Quickly introduce everyone on our team and our roles on the project.

| EMPATHIZE | Who are our users and what are we solving for?

- Who are our users? Tell an illustrative story about our users and their pressing needs.
- What problem is our user population facing? State the exact problem we worked to address.

| DEFINE | Why is it important that we address these users and our stated problem?

- Why are our users' needs currently unmet? List or explain the barriers to success. Mention other interventions people have tried in the past that have been unsuccessful or incomplete.
- What is our POV on the problem? Explain how our solution improves upon or defies what's already out there.

| IDEATE | What is our solution?

- How does our solution work? Give the audience a glimpse of our concept. Talk through how our solution works at a high level (no need to get too detailed) and state how it meets our users' needs.

| PROTOTYPE | How did we get here?

- Give our audience a quick overview of our process from start to finish.
- Who did we interview?
- How did we synthesize our learnings and develop our POV?
- How did we come up with ideas and what led us to pick this one?
- What aspects of our idea did we highlight with our prototype?

| TEST | How did we address feedback and refine our solution accordingly?

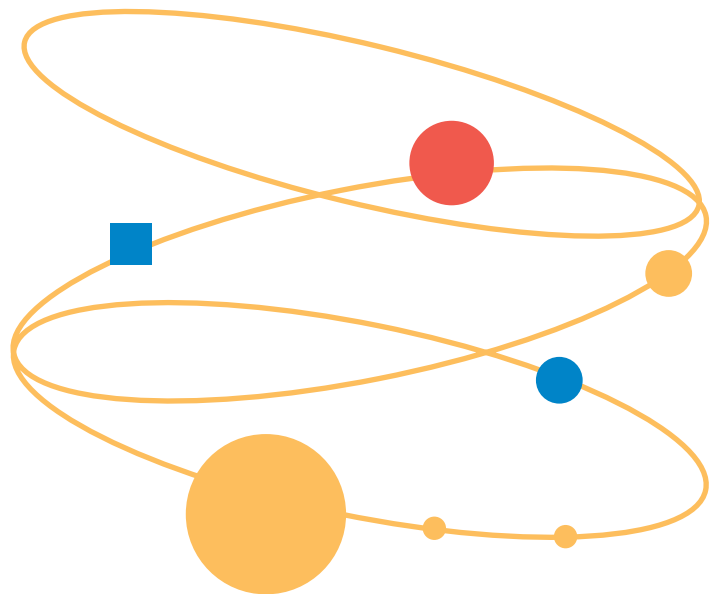
- Who did we test our concept with?
- What was the most common or impactful feedback we received?
- How did we respond to that feedback?

| OUTCOMES | What is our impact?

- What is our demonstrated impact? Provide quotes or data that show how users react to our idea.
- What did we learn? List and mention a few high-level learnings that our project team took away from this project.
- Where do we want to improve or grow? If we had more time and more resources, what would we want to do differently? What do we want to do with this concept in the future?

| CLOSING | What does our audience think?

- If we're presenting in person, leave time at the end of every presentation for a few questions and comments from the audience.
- If we don't know the answer to a question, that's ok! Just answer to the best of our ability.



Acknowledgements

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