1. **The Double Diamond Model**

A single product can’t solve every problem, and a single team can’t develop every possible solution to a given problem. Design methodologies help teams focus and commit.

**The *double diamond*** is a broadly applicable process model for a cross-functional, iterative design or innovation process. This methodology was [formalized by the British Design Council](https://www.designcouncil.org.uk/our-work/news-opinion/double-diamond-universally-accepted-depiction-design-process/) in 2005 through an in-depth study of 11 global brands, including LEGO, Microsoft, Sony, and Starbucks.

Take a look at the diagram to the right. The two-diamond structure of the diagram illustrates two modes of thinking that occur during the strategy and execution stages of the design process.

***Divergent thinking*** explores many possible solutions and generates novel ideas.

***Convergent thinking*** analyzes, filters, and focuses ideas and leads to decisions.

This model promotes creativity and innovation while making it clear when decisions should be made and when teams should commit to a direction. A well-executed double diamond process ensures that product requirements and subsequent design work are focused on user needs.

The four phases of the double diamond (**4Ds**) process are as follows:

1. **Discover** (divergent strategy): Explore the problem and landscape, and learn from users and the market through user interviews, surveys, and other research.
2. **Define** (convergent strategy): Sort and analyze the information gathered during the discovery stage and hone in on the problem we’re trying to solve.
3. **Develop** (divergent execution): Generate a range of ideas for possible solutions through brainstorms, workshops, low fidelity prototypes, and other ideation methods. Test different ideas with users or within the company to see what resonates.
4. **Deliver** (convergent execution): Hone in on, develop, and deliver the solution. Continue evaluating and testing the developed design to ensure it meets user needs.

**The Product Development Life Cycle**

Design doesn’t exist in a vacuum. Today’s UI and UX designers don’t just think about visual design: they are problem solvers involved in every stage of the product development process. The Product Development Life Cycle helps us understand how design fits into product development.

**The *Product Development Life Cycle* (PDLC)** is a cross-functional, iterative process, usually involving many stakeholders across an organization. The process starts from a problem or pain point to ensure that product development meets a real user need and that the whole team is aligned around the same goals.

Often, a product manager owns this process at a high level. UX designers and researchers can be involved at any stage of the cycle to ensure user needs are taken into account. UI designers are responsible for the visual layer of the product, one of the many outputs of the process.

UI and UX designers can use the stated goals and definitions from the Product Development Life Cycle to ensure their work meets the captured requirements and to facilitate smooth collaboration with other stakeholders.

The Product Development Life Cycle consists of **5 stages**:

1. **Brainstorm**: Starting from a defined problem or pain point, the team brainstorms all possible solutions. Market or user research can help inspire ideas.
2. **Define**: The team aligns on specifications for the product by defining the vision, goals, target users, features, benefits, and success metrics.
3. **Design**: The product is designed from low-fidelity to high-fidelity, starting with sketches and wireframes and moving to prototypes and a completed interface.
4. **Test**: The product or prototype is tested to ensure it works as intended. Testing can range from informal internal testing of low-fidelity prototypes to usability testing of a high-fidelity prototype or final product by external users.
5. **Launch**: The final design is released to the public, but the cycle doesn’t end here. Typically, testing continues even after the product has launched, and the cycle continues.

**Design Thinking**

The term *wicked problems* was coined by design theorist Horst Rittel to describe the types of extremely complex, multi-dimensional problems that designers are often tasked to solve. Design thinking isn’t limited to creating new products—it can affect change at a systemic level.

***Design thinking*** as a formal methodology has [developed across multiple disciplines since the 1960s](https://www.interaction-design.org/literature/article/design-thinking-get-a-quick-overview-of-the-history), and is commonly associated with the design and consulting firm [IDEO](https://designthinking.ideo.com/) and the Stanford School of Design (the [d.school](https://dschool.stanford.edu/)).

Design thinking puts people at the center of every process and encourages designers to set aside assumptions. For example, instead of designing a new children’s toothbrush, a design thinking approach would define “how to clean teeth” as the problem and explore a wide range of solutions.

Like the double diamond model, design thinking offers opportunities to focus on both divergent and convergent thinking across its steps to encourage both creativity and problem solving. Design thinking lives at the intersection of desirability (people), viability (business), and feasibility (technology).

Design thinking’s core activities are inspiration, ideation, and implementation, which occur across the **five stages of the process**:

1. **Empathize**: Understand the user and the landscape.
2. **Define**: Define the problem and align with business goals and user needs.
3. **Ideate**: Generate a range of ideas for possible solutions, emphasizing creativity.
4. **Prototype**: Explore potential solutions by creating prototypes of the product to gather feedback.
5. **Test**: Test the best solutions developed during prototyping. Prototyping or testing may lead to redefining the problem altogether. As with the other processes we’ve covered, this is an iterative cycle.

**User-Centered Design**

*User-centered design* (UCD) puts users at the center of product development and involves them in the design from the beginning. Here, design is seen as an iterative process that incorporates user feedback both during the development process and after launch. User-centered design responds to both contexts of use (such as the user’s environment, technology, and emotional state) and business goals.

If this is beginning to sound familiar, you’re right! UX and UI design as disciplines are user-centered, and associated methodologies generally fall under the umbrella of user-centered design. There are many parallels between the methodologies we’ve explored in this lesson, and any one of them will help us balance priorities and collaborate better as a designer.

While user-centered design processes may define the steps differently, they generally involve the following activities:

1. **Understand**: Empathize with the user.
2. **Specify**: Hone in on a specific problem to solve.
3. **Design**: Brainstorm and develop solutions.
4. **Evaluate**: Test the product or prototypes to assess success and incorporate feedback.