

ANTALYA 09 -14 March
2025
Day 3

Green Loop



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What is Design-Based Learning (DBL)?

- Design-Based Learning (DBL) is an **inquiry-driven** pedagogical approach that **integrates design thinking and the design process into education**. It encourages students to solve **real-world problems** through **hands-on design activities**, fostering **creativity, problem-solving, and collaboration** across multiple disciplines.



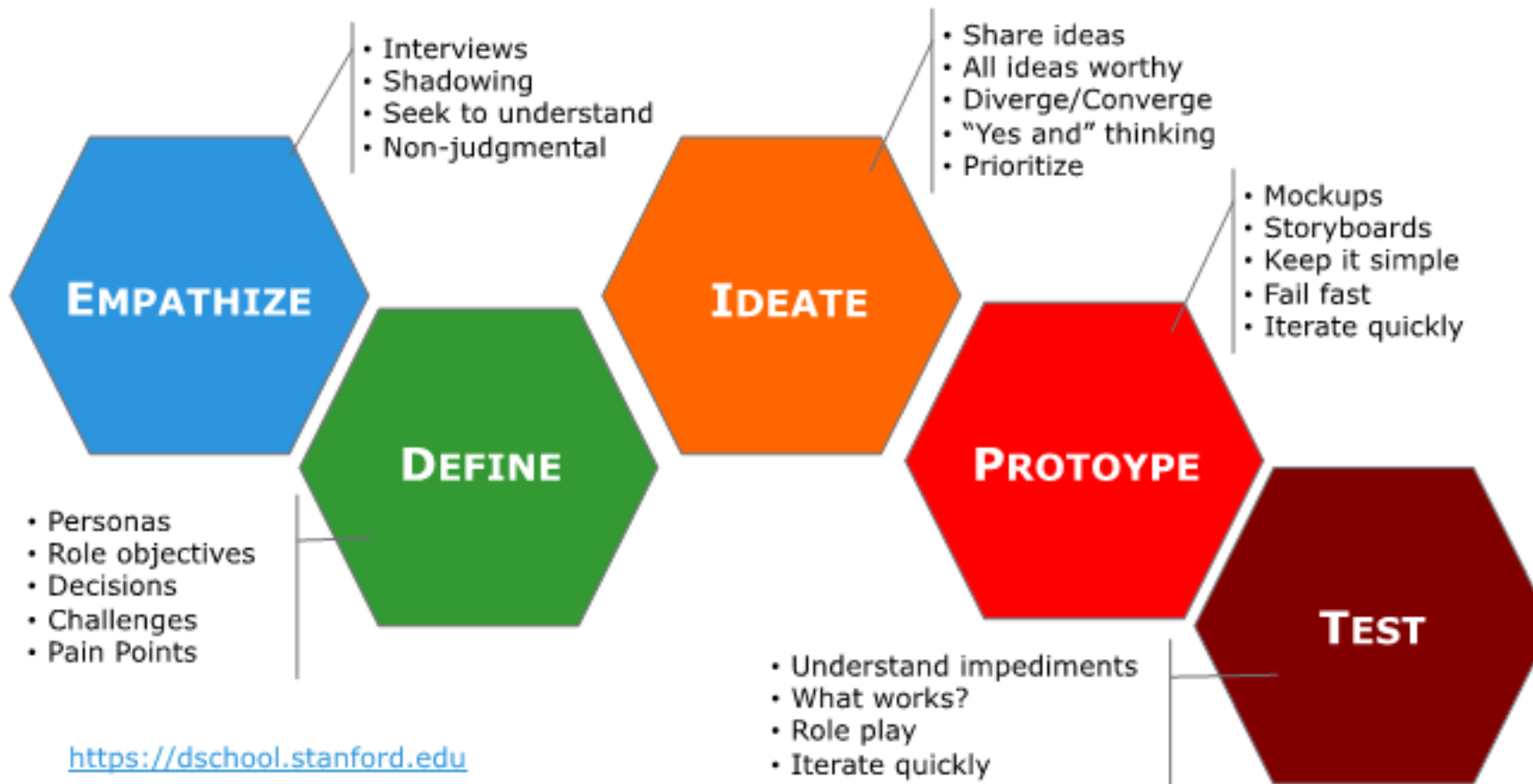
Why Use DBL?

- **Encourages deeper learning** – Students must understand and apply knowledge to create meaningful **artifacts or prototypes**.
- **Promotes iteration & problem-solving** – Students assess, test, and refine their work.
- **Fosters collaboration & expertise** – Teamwork allows students to specialize in different areas.
- **Develops 21st-century skills** – Communication, critical thinking, and innovation.



The Design Process in DBL

Stanford d.school Design Thinking Process





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DBL in Circular Economy Education

Example DBL Project: "Reimagine Waste Management in Schools" Problem:

How can we design a school with zero waste?

DBL Process:

1. Students research waste generation in schools.
2. They brainstorm innovative solutions (composting systems, reusable materials).
3. Design prototypes (digital models, physical displays).
4. Test and refine through school-wide implementation.
5. Present solutions to peers or school wide



◆ Example DBL Application:

If a teacher wanted to run a **biodegradable packaging DBL project**, they would:

- 1.Analyze** students' knowledge of materials and waste.
- 2.Design** a hands-on activity where students explore material properties.
- 3.Develop** a lesson where students prototype compostable containers.
- 4.Implement** the project and test materials in real conditions.
- 5.Evaluate** how well students understood Circular Economy concepts.



The Doreen Nelson Method & Backwards Thinking™

Doreen Nelson, founder of DBL, introduced **6 ½ Steps of Backwards Thinking™**, emphasizing **spatial and hands-on learning**.

How It Works:

- Students **physically create mini-models** (e.g., shelters, cities, systems) to **solve real-world content-related problems**.
- Encourages **decision-making, adaptability, and creative reuse of concepts**.
- **Inclusive methodology** – Effective for diverse learners (gifted, at-risk, ADD/ADHD, English Language Learners).



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The Doreen Nelson Method of Design-Based Learning Backwards Thinking Process

Backwards Thinking™



THE 6½ STEPS OF BACKWARDS THINKING

- **STEP 1: WHAT DO I NEED TO TEACH? THEMES, CONCEPTS, STANDARDS**
- Each Design Challenge is derived from an Essential Question organized around a topic or a theme that comes from the required Standards

MIGRATION



**The Doreen Nelson Method of Design-Based Learning
Backwards Thinking Process**

Backwards Thinking™



- **STEP 2: IDENTIFY A “PROBLEM” FROM THE CURRICULUM**
- Examples: Why do people migrate? How do natural resources define cultures? Why did cities come into being?



**The Doreen Nelson Method of Design-Based Learning
Backwards Thinking Process**

Backwards Thinking™



- **STEP 2 ½: STATE A “NEVER-BEFORE-SEEN” DESIGN CHALLENGE**
- **STEP 3: SET CRITERIA FOR ASSESSMENT**
- List “DON’T WANTS” and “NEEDS” based on curriculum, standards, and content.
- Plan evaluation



**The Doreen Nelson Method of Design-Based Learning
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Backwards Thinking™



STEP 4: LET STUDENTS “GIVE IT A TRY” (DURATION: 45 MINUTES TO 2 HOURS)

Students:

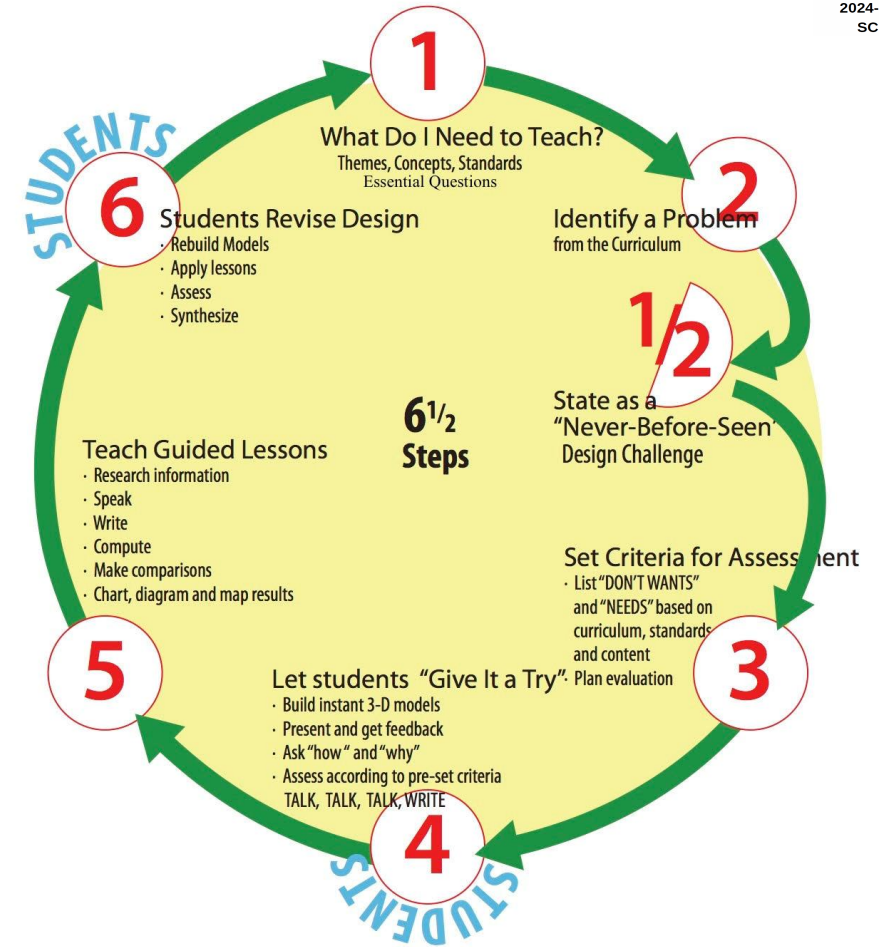
- Build instant 3-D models
- Present and get feedback
- Learn to ask “how” and “why”
- Learn to self-assess according to pre-set criteria
- TALK, TALK, TALK, WRITE: Students learn to describe their designs
- through presentation and discussion as preparation for writing.



The Doreen Nelson Method of Design-Based Learning
Backwards Thinking Process
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- **STEP 5: TEACH GUIDED LESSONS (DURATION: ONE WEEK TO A MONTH)**
- Teach Guided Lessons in any subject using students' personal connection to their Never-Before-Seen artifacts as a tool for learning.
- Examples: the mathematics of the artifact's size, shape, and volume; its scientific feasibility, the language and art skills of reading, speaking, writing, and drawing.
- Students:
- Research information
- Speak
- Write
- Compute
- Make comparisons
- Chart, diagram, and map results



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STEP 6: STUDENTS REVISE DESIGN

Students:

- Rebuild Models
- Apply lessons
- Assess
- Synthesize



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The 6 ½ Steps of Backwards Thinking™ (Doreen Nelson, DBL Founder)

- This DBL model emphasizes **spatial problem-solving and hands-on learning**.
- **Steps in Backwards Thinking™:**
 - 1.Start with a creative constraint** – Give students a **content-related challenge**.
 - 2.Identify a scenario** – Have them build **physical representations** (miniature models, **prototypes, cities, avatars, etc.**).
 - 3.Problem-Solve Spatially** – Make them **physically design solutions** rather than just write ideas.



- 1. Create a Backwards Plan** – Ask, “What do we need to make this work?”
- 2. Prototype & Evaluate** – Constant **iteration and feedback loops**.
- 3. Apply Across Disciplines** – Connect design challenges to **math, science, history, and more**.
- 6 ½. Rethink the Original Idea** – Step back, **reassess, and improve**.



ADDIE Model (Instructional Design Model for DBL Implementation)

- The **ADDIE Model** is an instructional framework often applied in DBL-based learning environments. It structures lesson planning with **design principles in mind..**



Stages of ADDIE:

- 1. Analysis** – Identify learning objectives and student needs.
- 2. Design** – Plan the DBL experience, resources, and materials.
- 3. Development** – Create or prototype learning activities.
- 4. Implementation** – Conduct and facilitate the DBL lesson.
- 5. Evaluation** – Assess student learning and improve the process.

Waste is a design flaw – if we design systems correctly, waste should not exist."