



## What is Design Thinking?

Design Thinking is an iterative process in which to identify alternative strategies and solutions for reaching a deep level of understanding of a challenge, issue or project. The process helps in questioning a problem, assumptions, and overall implications by re-framing the issue in fresh new ways. Design Thinking also involves ongoing experimentation: prototyping, testing, and trying out concepts and ideas.

### Steps of the Design Process

Design Thinking is generally broken down into five phases:

1. **Empathize** with your users or those who will benefit most from your solution
2. **Define** the problem, your users' needs, and your insights
3. **Ideate** by challenging assumptions and creating ideas for innovative solutions. This could involve research and brainstorming, ultimately leading toward a solution to develop.
4. **Prototype** to start creating a solution or solutions.
5. **Test** and evaluate solutions, redesigning and refining if necessary.

These five phases or stages do not have to follow any specific order and can often occur in parallel and repeat iteratively. Unlike a solely scientific approach, where the majority of known aspects of a problem are tested, the Design Thinking process includes ambiguous elements of the problem to uncover alternative strategies. In terms of K-12, Design Thinking merges . . .

### 21st century Skills

Initiative and Self-direction  
Productivity and Accountability  
Concentration and Perseverance  
Flexibility and Adaptability  
Reflection and Self-assessment  
Viewing Failure as an Opportunity to Learn  
Science & Technology/Engineering

### Critical Thinking

Geometry: Angles, Point, Line, Plane  
Scale, Ratio & Proportion  
Solving Real-world Problems  
2d to 3d Conversions; Developing Spatial Sense  
Number Sense; Fractions  
Measurement & Estimation; Area, Perimeter, Slope

### Inquiry & Problem-solving

Scientific Inquiry  
Engineering Design  
Materials & Tools  
Technological Systems  
Energy and Power Technologies  
Physical Sciences

Matter; Motion & Stability

Forces & Interactions; Structures

Ecosystems, Energy & Dynamics

Earth and Space Sciences

Earth Systems & Human Activity

Sustainable Design

## **Creativity: Imagination and Innovation**

Sketching & Schematic Drawing

Drafting, Revising & Exhibiting

3D Model-building

Elements & Principles of Design

Observation, Invention & Critical Response

The Role of Artists and Designers in Communities

Inventions, Technologies and the Arts

The Interdisciplinary Nature of Design

Community Planning & Design

## **Communication & Collaboration**

English Language Arts

Reading Literature and Informational Text

Writing: production and distribution

Presentation of Knowledge and Ideas

Comprehension and Collaboration

Research

Responding and Reflection

Vocabulary Acquisition and Use

## **Teaching the Design Process**

While many students may never have heard of the design process, most of them should know of the scientific method. Educators can note the similarities that Design Thinking and the Scientific Method share.

One hand-on way of getting students onboard is through a rapid prototyping session. In this way, students can focus on the process without getting too preoccupied with specifics.

Keep the session short and focused. Provide student groups with an overview of the process then assign a design problem for them to solve. LEGOs, for instance, are a simple material for children to utilize any number of ways. As students work on their designs, teachers can circulate about the room and help each group to identify where they are in the design process.

Allow time at the end of the session for each student group to share their designs with the rest of the class, explain how they came up with the idea, what challenge it solves, how it works, etc. This is also a great opportunity for students to beef up their presentation skills while reflecting on what they learned through the Design Thinking process.

Design Thinking allows students and educators to generate new ideas to solve the problem, prototype, test, and iterate for maximum student benefit. With Design Thinking, educators can make sure that next gen learning is truly student-centered.