# Frontend Development Ideation and Storyboarding

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## A1. Requirement Brief

Course Details: Grade Level: 9–12  
  
District: Computer Science Software Engineering  
  
College Articulation: Articulated College Credit to Mira Costa CC CS 111  
  
Content Area: Computer Science / Career and Technical Education (Information Technology Pathway)  
  
Course Standards: National: CTE (CSTA/IT Pathway)  
  
ISTE Standards for Students - International Society for Technology in Education (2016)

## A2. Learning Goal

Students will design and ideate a complete Frontend Development module that integrates visual design theory, HTML/CSS structure, and JavaScript interactivity. The focus is to teach how creativity and computation merge in web design — balancing usability, aesthetics, and functionality within modern web interfaces.

### A2a. Elaboration on Goals

In the Frontend Development Ideation module, students explore how design principles translate into functional, user-centered web pages. They begin by examining color theory, spacing, and typography in digital media, then transition these insights into responsive web layouts. Through structured storyboarding and mockups, they learn how web components—headers, navigation, grids, and footers—work together to build a cohesive and accessible user experience.

### A2b. Prerequisites

Students should already be familiar with the basics of HTML, CSS, and introductory JavaScript. Prior exposure to version control tools like GitHub and interface design tools such as Figma or Canva is recommended.

### A2c. Background

This module expands upon prior lessons in digital literacy and introductory coding. It guides students in merging visual design concepts with programming, helping them understand how front-end structure defines user engagement. The ideation process includes brainstorming, sketching, prototyping, and reviewing web usability guidelines.

### A2d. Learning Phases

The learning process is divided into four distinct ideation and design stages, each building upon the previous:  
  
1. Concept Visualization – Students brainstorm ideas and identify real-world websites that inspire their vision.  
2. Wireframe Drafting – Rough sketches and layout mapping using text boxes, ASCII art, or Figma.  
3. Storyboarding – Structured flow of user interaction and navigation.  
4. Design Reflection – Critical analysis of design choices and user experience.

## A3. Standards Alignment

CSTA 3A-AP-13: Decompose problems and subproblems into parts to facilitate design, implementation, and review of programs.  
CSTA 3A-AP-17: Systematically design and develop programs for broad audiences by incorporating feedback from users.  
CSTA 3A-AP-22: Design and develop computational artifacts working in team roles using collaborative tools.  
  
ISTE Standard – Innovative Designer: Students use design processes to generate ideas, test prototypes, and refine creative products.

## B. Storyboarding Ideation Process

### B1. Experience with the Ideation Process

Students engage in the design-thinking process through visual ideation and iterative mockups. They develop sketches of their web interfaces, exploring color palettes, typography, and layout structure. Brainstorming sessions are conducted to discuss how visual hierarchy and grid systems influence readability and navigation.

### B2. Storyboard and Layout Diagram

The storyboard visualizes how users navigate through the designed website. The ASCII diagram below represents a general page flow.  
  
-----------------------------------------------------  
| Header | Navigation Menu | Theme Toggle |  
-----------------------------------------------------  
| Hero Section: Title, Subtitle, and CTA Button |  
-----------------------------------------------------  
| Content Area: Grid of Cards or Text Panels |  
| [Card 1] [Card 2] [Card 3] |  
-----------------------------------------------------  
| Interactive Section: JS-driven animation or toggle|  
-----------------------------------------------------  
| Footer: Social Links | Copyright | Contact |  
-----------------------------------------------------

The storyboard helps learners think sequentially — understanding not just what appears visually, but how each element contributes to interaction flow, accessibility, and user retention.

### B3. Ideation Examples and Sketch References

Example 1 – Minimalist Portfolio Page:  
- Color palette: gold and black.  
- Key feature: theme switcher using JavaScript.  
- Layout: centered hero, grid gallery, responsive footer.  
  
Example 2 – Interactive Learning Module:  
- Navigation-driven structure.  
- Content dynamically updates using JS event listeners.  
- Wireframe emphasizes usability and flow between sections.

### B4. Instructional Strategy

Merrill’s First Principles of Instruction and Universal Design for Learning (UDL) guide the storyboard structure:  
  
Activation: Students recall prior knowledge of HTML and CSS syntax.  
Demonstration: Instructor shows examples of professional web wireframes.  
Application: Students create mockups and test layouts using code or diagrams.  
Integration: Learners present designs for peer feedback and reflection.

### B5. Storyboard Flowchart (Markdown/ASCII Style)

User Journey Flow:  
  
Start → Homepage → Hero Section → About Page → Projects → Contact Form → End  
  
 +-------------+  
 | Homepage |  
 +------+------+   
 |  
 v  
 +-------------+  
 | Projects |  
 +------+------+   
 |  
 v  
 +-------------+  
 | Contact |  
 +-------------+

## C. Module Outcomes

By the end of this Frontend Development Ideation and Storyboarding module, students will:  
  
- Produce a complete wireframe and storyboard visualizing user navigation.  
- Understand layout balance, alignment, and design accessibility.  
- Apply coding knowledge conceptually to design patterns.  
- Critically reflect on how structure affects usability and aesthetic coherence.

## D. References

[CSTA, 2017] Computer Science Teachers Association. (2017). CSTA K–12 Computer Science Standards.  
[ISTE, 2016] International Society for Technology in Education (ISTE). (2016). ISTE Standards for Students.  
[UDL, 2018] CAST. (2018). Universal Design for Learning Guidelines Version 2.2.