

[Design Choices Behind the GEOMETRIX Website]:

When creating the GEOMETRIX educational platform, I made deliberate choices in typography, colours, structure, layout, and interactivity to ensure a clean, engaging, and user-friendly learning environment. Every design element—from the font family to the animations—serves both a functional and aesthetic purpose. Where possible, I evaluated alternatives and selected options that best met the needs of my target audience: learners seeking clarity, consistency, and focus.

[Font Selection and Origin] -

The main font family used across the site is 'Verdana', 'Arial', sans-serif, chosen for its clarity and wide compatibility across browsers and devices. Verdana's generous letter spacing improves on-screen readability, particularly important for educational content where students may spend extended periods reading. Alternatives like decorative or serif fonts (e.g., Times New Roman) were rejected because they can appear less modern and are harder to read at small sizes on digital displays. These fonts are web-safe, requiring no extra downloads, which improves accessibility and performance. I wrote and previewed the typography in Visual Studio Code, allowing real-time evaluation of hierarchy and balance.

[Colour Palette] -

The soft gradient background (linear-gradient (to right, #d7e1ec, #f2f6fc)) is paired with deep navy (#003566) and slate grey (#2c3e50) for body text. This combination was selected over brighter or higher-saturation palettes because research in colour psychology shows that cooler tones promote calm and concentration, reducing visual fatigue during long study sessions. Accent colours, such as light blue borders and hover highlights, gently guide attention without clutter. High-contrast combinations like black-and-yellow were avoided, as they may create visual strain in extended use.

[Structure and Layout] -

The site's flexbox-based two-column structure was chosen for its clarity and alignment with typical left-to-right reading patterns. A fixed sidebar houses branding and navigation, while the main content area presents lessons and resources. Alternative layouts like a single-column scroll or complex multi-panel grids were rejected because they risk burying navigation links and overwhelming first-time users. Using `display: flex` with `min-height: 100vh` ensures that the layout fills the screen evenly on all devices.

[Grids and Responsiveness] -

While flexbox is the main layout system, I implemented responsive breakpoints (`@media (max-width: 768px)`) to adapt the layout for tablets and mobile devices. The sidebar repositions above the main content, and navigation links rearrange into flexible blocks. This approach provides better small-screen usability than fixed-width layouts, which can force users to zoom or scroll horizontally—both poor mobile experiences.

[Text Sizes and Hierarchy] -

Relative units (`em`, `%`) were used for text, allowing natural scaling based on device settings. Headings such as `.fancy-heading` are bold, larger, and separated with subtle bottom borders to improve scannability. I tested alternative heading styles with shadows or uppercase lettering but found them distracting in an educational context. Supplementary `` text under navigation items offers helpful context while keeping the main content uncluttered.

[Images and Video] -

Educational diagrams (`Algebra.png`, `Algebra2.png`) are framed with light blue borders to visually separate them from surrounding text without drawing excessive focus. A YouTube `<iframe>` embeds video explanations, providing multimodal learning opportunities. Rounded corners (`border-radius: 5%`) soften the visual presentation compared to sharp-edged embeds, which can feel disconnected from the surrounding design.

[JavaScript and Transitions] -

The AOS (Animate On Scroll) library was integrated for smooth animations such as fade-up, fade-in, and zoom-in-up. These animations were chosen over more complex, looping effects because they are subtle, lightweight, and keep the learner's focus on the content. Custom interactivity in MathPolishment.js ensures form elements, hover states, and small UI responses feel responsive and context-aware.

[CSS Styling Decisions] -

The CSS prioritises:

- Consistency — Repeated use of spacing, borders, and colours creates a predictable visual identity.
- Scalability — Flexible units (vh, %, em) ensure adaptability across resolutions.
- Accessibility — Contrast ratios meet WCAG guidelines for readability, avoiding colour combinations that might disadvantage colour-blind users.
- Interactivity — Subtle hover states reinforce clickability without creating unnecessary motion.

[Personal Reflections and Design Rationale] -

Throughout development, I compared my chosen design elements to other possible options. For example:

- I avoided decorative fonts and complex scripts because, while they might create a unique brand identity, they would sacrifice readability—especially on small mobile screens.
- I chose cooler, low-saturation colours rather than bright, high-contrast ones because they better suit prolonged academic engagement and reduce eye strain.
- The two-column flexbox layout was prioritised over single-page scrolling because it provides clear, consistent navigation and keeps learning resources easily discoverable.
- Subtle AOS animations were used instead of flashy or constant animations, which could distract from mathematical explanations.

In every case, my choice was guided by usability, accessibility, and focus on learning outcomes rather than purely aesthetic preference. I believe these decisions make GEOMETRIX not just visually appealing, but functionally superior for its intended audience: learners who need clarity, not clutter.

[Conclusion]

The GEOMETRIX site's design integrates modern web standards, educational psychology, and responsive adaptability. By prioritising clarity over decoration, calm over visual noise, and structure over novelty, I created a platform that is accessible, engaging, and fit for purpose. Every design decision—down to the hover effect—serves the ultimate goal: making geometry intuitive, interactive, and visually harmonious.