

How a Browser Renders

Computing

The pipeline from HTML to pixels, and which changes are cheap.

Every visual change re-enters this pipeline at some stage.

1

Parse

HTML becomes the DOM; CSS becomes the CSSOM.

2

Style

Match rules to nodes; compute the final value of every property.

3

Layout (reflow)

Calculate the size and position of every box. Expensive.

4

Paint

Fill in pixels: colours, borders, shadows, text.

5

Composite

Assemble the layers, on the GPU. Cheapest of all.

COST OF A CHANGE

width, top, font-size → layout, paint, composite

color, background → paint, composite

transform, opacity → composite only

Animate transform and opacity, never width, height or top. Those two skip layout and paint entirely.