

Project: Measure & Animate — A Tiny JS App

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Overview

Build a one-page mini app that performs the following tasks:

1. Calculates speed from distance and time.
2. Converts between Celsius and Fahrenheit.
3. Shows a simple CSS keyframe animation of a moving dot.

Learning Goals

- Declare variables of different data types.
- Write functions and arrow functions.
- Perform basic calculations.
- Read and write to the DOM.
- Style with CSS and create a CSS animation (no JS animation).

Functional Requirements

- Inputs for distance (m) and time (s); a button outputs 'Speed: X m/s'.
- Inputs or buttons to convert temperatures ($^{\circ}\text{C} \rightarrow ^{\circ}\text{F}$ and $^{\circ}\text{F} \rightarrow ^{\circ}\text{C}$).
- A visible dot that moves left→right continuously using CSS keyframes (3s per loop), also changing color while moving.
- Show examples of number, string, boolean, and array variables in code and print them (and their typeof) to the console.

Technical Constraints

- Do not use requestAnimationFrame or delta time.
- Keep logic simple; minimal to no validation.
- Single HTML file with embedded style and script is OK.

Deliverables

- A single index.html file that runs in any modern browser.
- Short comment block at the bottom of the HTML answering:
 1. What is a variable?
 2. What is a function vs an arrow function?
 3. How do CSS keyframes create motion?

Step-by-Step Checklist

1. Declare variables of number, string, boolean, and array types; log their typeof.
2. Write functions for conversions and calculations.
3. Create HTML inputs for distance and time; calculate and display speed.
4. Add Celsius↔Fahrenheit converters using arrow functions.
5. Style the page using CSS (fonts, padding, button styles).
6. Add CSS keyframe animation to move a dot left→right in 3s, looping infinitely and changing color.
7. Write short reflection answers as comments.

Grading Rubric (out of 100)

- Variables & data types printed with typeof: 15 marks
- Functions + arrow functions implemented and used: 20 marks
- Calculations (speed & temperature conversions): 20 marks
- DOM interaction (inputs → output text): 15 marks
- CSS styling (layout, button, readable typography): 10 marks
- CSS animation (motion + color, 3s infinite): 10 marks
- Reflection answers (clarity and completeness): 10 marks

Bonus (+10): Add a second CSS animation (e.g., scale or rotate) combined with the slide for a more dynamic effect.