Many Ways to Do Form Validation with JS

- I won't teach just 1 "best" way
- You often have to implement according to design
    - Designers will have different ideas and goals
- I will show how to do different options
    - And offer pros/cons
- A set of options for you + designer to pick from

Working with Forms with JS

- JS offers a lot of options base HTML/CSS does not
- Let's create an example form

```
<form class="register" action="/register" method="POST">
  <label class="register__label">
    <span class="register__name-label">Name</span>
    <input name="name" class="register__name">
  </label>
  <label class="register__label">
    <span class="register__email-label">Email</span>
    <input name="email" type="email" class="register__email">
  </label>
  <label class="register__label">
    <span class="register__confirm-label">Confirm Email</span>
    <input name="confirm" type="email" class="register__confirm">
  </label>
  <button type="submit" class="register__submit">Register</button>
</form>
```

Events

- Validating Forms with JS
- Have code that reacts to **events**

```
const nameEl = document.querySelector('.register__name');

nameEl.addEventListener('input', () => { //fat arrow function
 console.log("typing happened");
});
```

Value

- Event object is passed to callback
- Event object `.target` is DOM Node of field
- `.value` property is current value of the field

```
const nameEl = document.querySelector('.register__name');

nameEl.addEventListener('input', (event) => {
 // Can decide if value is okay as they type
 console.log(event.target.value);
});
```

Form Events

- There are MANY events
- Here are some common ones for forms
    - `input`
    - `submit`
    - `focus`
    - `blur`
    - `change`
    - `keydown`

`input` event

- Typing on a text/textarea
- Changed selection on `<select>`
- Inconsistent on checkbox/radio
    - Use change event instead

```
const nameEl = document.querySelector('.register__name');

nameEl.addEventListener('input', (event) => {
 // Can decide if value is okay as they type
 console.log(event.target.value);
});
```

`submit` event

- Fires on `<form>` when submitted
    - On `<form>` element, not on button!
    - Even though submit likely from a button
- `event.preventDefault()` stops submit

```
const formEl = document.querySelector('.register');
formEl.addEventListener('submit', (event) => {
  // event.target is the form, not the fields
  const isFormInvalid = true; // Put code to decide here
  if( isFormInvalid ) {
    // Put code to tell user what to fix here
    event.preventDefault();
  }
});
```

`invalid` event

- Like `submit`, triggers on submit
  - When HTML validation not passed
- No `submit` in such case

`focus` and `blur` events

- Fires when element gains/loses focus
- Does NOT propagate/"bubble"
    - This can complicate things later! (only a little)
- Used to validate a field after user LEAVES the field
    - Good UX because only complains after done
    - Poor UX because fixes require they go back
- Can get `blur` AND `submit` if they click submit

change event

- Fires when a value changes
  - like `blur` on text
  - on selection for select/radio/checkbox

keydown event

- Fires on keypress
- BEFORE key is added to field
- Fires even if key is modifier (Shift, Ctrl, etc)
- `event.preventDefault()` - key is not added to field
- Event object has info about the key pressed
    - `.key` - which key is pressed
    - `.shiftKey`, `.altKey`, `.ctrlKey`, `.metaKey`
    - `.isComposing` - translation inputs (Ex: Pinyin)
    - Event object, not `event.target`

keydown example

```
// prevent "-" from being entered

inputEl.addEventListener('keydown', (event) => {
  if( event.key === "-" ) {
    event.preventDefault();
  }
});
```

- Cut and Paste/autofill can bypass
- Do not assume too much
    - Users enter data in many ways

How to inform user of problems?

- Prevent submission
- Indicators
- Messages

Preventing Submission

- Telling user and stopping submissions
    - Two different requirements
- Stop submission on `submit` event
    - Disabling button may not stop submission!
    - Enter on form field can submit!

Visual Indicators Cannot be JUST color

- Ex: Put red border around invalid fields
    - Requires they see and distinguish red
    - Not good for color-blind or vision-impaired
- Indicators + Messaging better
- For indicator styling
    - Place class on field(s) and/or on form
    - Have CSS that selects for field

```
.invalid {  /* class on field */
  border: 1px solid red;
}
```

Messaging

- Text informing user of problem
- Can be at top of form
- Can change text of/change submit button
- Can be on each field
- UX is finding the way best for user
    - Not the easy way for developer

Changing Text using JS (innerText)

- Pros:
  - Text updates dynamically
- Cons:
  - Error text lives in JS
  - Only plain text can change (not HTML)

Using `innerText` dynamically

```
<div class="demo"></div>
<button class="button__add">Add</button>
```

```
let count = 0;

const buttonEl = document.querySelector('.button__add');
const demoEl = document.querySelector('.demo');
buttonEl.addEventListener('click', () => {
  count += 1;
  demoEl.innerText = count;
});
```

`.innerText`

- Change the text content of a DOM Node

```
<div class="demo"></div>
```

```
const demoEl = document.querySelector('.demo');

demoEl.innerText = "Hello World";
```

- Set to empty string to remove

```
demoEl.innerText = "";
```

Styling elements that use innerText

- Often you want errors to have styling
    - borders, padding, etc
- Don't want this visible when text is empty

```
.demo {
  padding: 1rem;
  background-color: #FF000033; /* red w/transparency */
}

.demo:empty {  /* Only applies when element is empty */
  display: none;
}
```

`.innerHTML` allows more than text

```
const demoEl = document.querySelector('.demo');

demoEl.innerHTML = `<p>This is <b>Awesome!</b></p>`;
```

- As with `innerText`, set to "" to remove
- An element with child elements is not `:empty`
    - Even if those elements have no text

Changing HTML using JS (innerHTML)

- Pros:
    - Allows more complex messaging
- Cons:
    - Puts HTML in JS
        - Harder to edit/maintain
    - Security issues if data isn't sanitized

Summary - Forms with JS

- Events allow you to react at different times
- Can examine content of fields
- Can prevent submission
- Can change CSS to change styling
- Can display messages to the user

Powerful, but requires effort

- Detailed work
- Needed skills to distinguish yourself!

Summary - Common Form Events

- `input` - Check as typed
- `keydown` - Edit WHILE typing
- `focus`/`blur` - Check after leaving
- `change` - Check after change complete
- `submit` - form event, check before submit
    - Should always be checked on submit

Summary - Showing User Results

- Add/Remove text using `.innerText`
    - Pro: Secure
    - Con: Text in JS
- Add/Remove HTML using `.innerHTML`
    - Pro: Most Control
    - Cons: HTML in JS, security risk if user data
        - Never use user supplied data!