Class 6: Event Handling

- Review: Last Class
- Handling Events
- JavaScript Functions
- Arrow Functions
- Inline Event Handlers
- Summary

Review: Rendering with a Conditional Statement

```
export default function DarkModeSwitch({ isDarkMode }) {
  if (!!isDarkMode) {
    return <button>
             <img src="light-mode.svg" />
           </button>
  } else {
    return <button>
             <img src="dark-mode.svg" />
           </button>
  }
}
```

Review: Rendering with the Ternary Operator

```
export default function DarkModeSwitch({ isDarkMode }) {
  return <button>{!!isDarkMode ? (
    <img src="light-mode.svg" />
  ) : (
    <img src="dark-mode.svg" />
  )}</button>
}
```

```
export default function DarkModeSwitch({ isDarkMode }) {
  return <button>
    <img src={!!isDarkMode ? "light-mode.svg" : "dark-mode.svg"} />
  </button>
}
```

Review: Rendering with the Logical AND Operator

```
export default function DarkModeSwitch({ isDarkMode }) {
  return (
    <button>
      {!!isDarkMode && <img src="light-mode.svg" />}
      {!isDarkMode && <img src="dark-mode.svg" />}
    </button>
  )
}
```

Review: Truth and Falsy

Falsy

- `null`
- `undefined`
- `false`
- `NaN`
- `0`
- `-0`
- `0n`
- `""` or `''`
- `document.all`

Truthy

Anything that is **not** falsy.

Examples:

- `true`
- `[]`
- `{}`
- `42`
- `"hello"`
- `function() {}`
- `new Date()`

Events

Events

Responding to an action, like a mouse click or finger tap.

Idea: Execute some code when *something* happens.

Demo: Flip Card Event

```
function flipCard() {
  alert("TODO: flip card");
}
```

```
<button onClick={flipCard}>
```

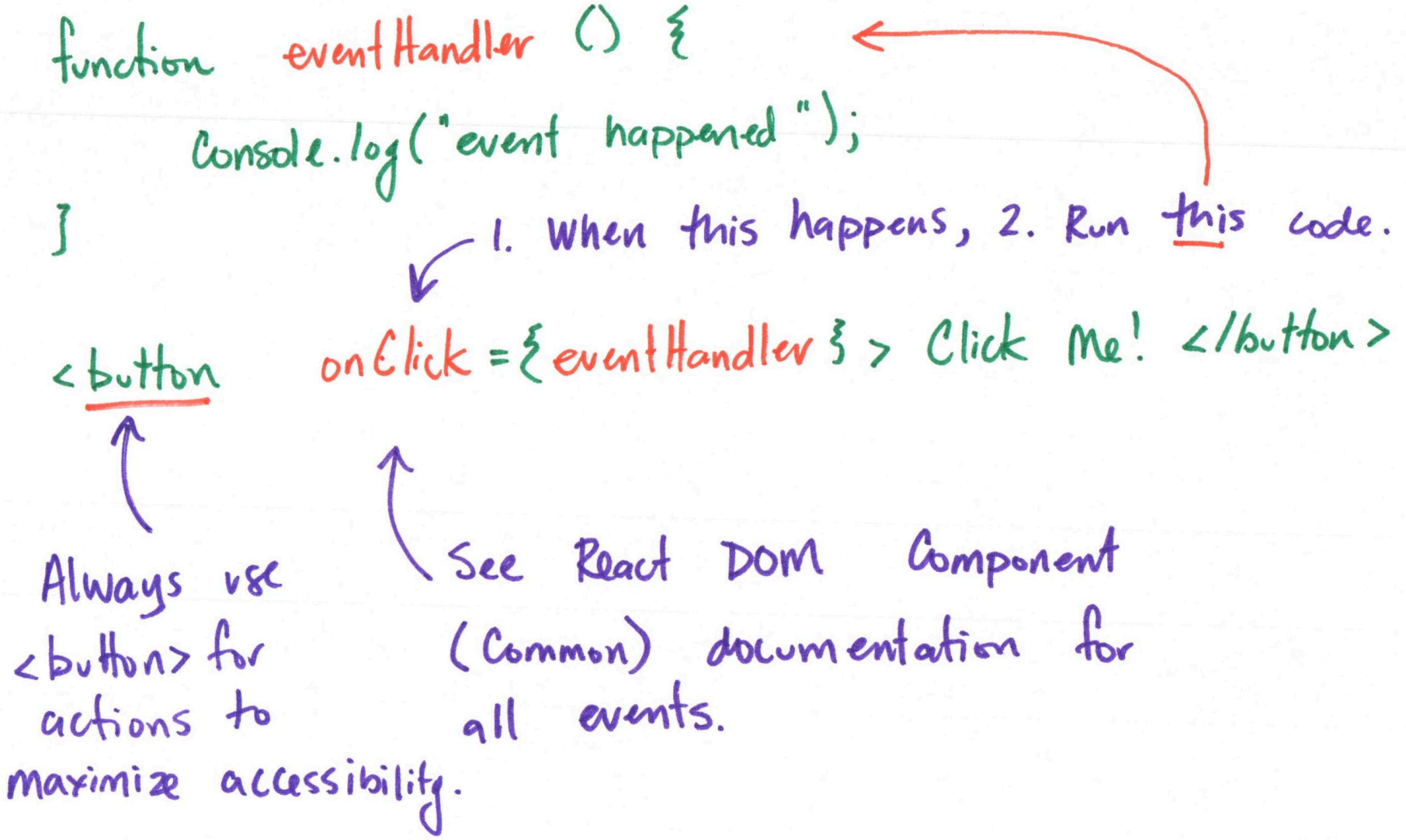
Handling Events

1. **Event handler:** A function that is called when the event occurs.

```
function eventHandler() {
  alert("Event occurred!");
}
```

2. An **event listener** that listens for a specific event and calls the event handler when the event occurs.

```
<button onClick={eventHandler}>
  Click me!
</button>
```


function eventHandler () {
console.log("event happened");
}
1. When this happens, 2. Run this code.
<button onClick={eventHandler}> Click Me! </button>
Always use <button> for actions to maximize accessibility.
See React DOM Component (Common) documentation for all events.

JavaScript Functions

Functions

Declaration

```
function greet(name) {
  return `Hello, ${name}!`;
}
```

Function Call

```
greet("Alice"); // "Hello, Alice!"
```

Gotcha: Function Call vs. Function Reference

`functionName()` is a **function call** that executes the function and returns its result. `functionName` is a **function reference** that refers to the function itself without executing it.

```
function greet(name) {
  return `Hello, ${name}!`;
}

greet("Alice"); // "Hello, Alice!" (function call)

greet; // function reference (the function itself, not called)
```

Function Callback (Handler)

```
function greet(name, callback) {
  console.log("Hello " + name);
  callback(); // the passed function is called
}

function sayGoodbye() {
  console.log("Goodbye!");
}

greet("Alice", sayGoodbye); // passing sayGoodbye as a callback
```

Demo: Bake Cake

```
function turnOnOven(thenDo) {
  console.log("oven on")
  if (thenDo) {
    thenDo()
  }
}

function bakeCake() {
  console.log('baking cake')
}

turnOnOven(bakeCake);
```

Arrow Functions

Arrow Functions

An **arrow function** is a concise way to write a function expression in JavaScript.

```
(name) => `Hello, ${name}!`
```

When called, it **returns** the result of the expression on the right-hand side of the arrow (`=>`). (e.g. “Hello, Alice!”)

Arrow Functions with Multiple Statements

An arrow function can also contain multiple statements, but in that case, you must use curly braces (`{}`) and explicitly return a value.

Statements

```
(name) => {
  const greeting = `Hello, ${name}!`;
  return greeting;
}
```

Expression

```
(name) => `Hello, ${name}!`
```

Gotcha: Parentheses in Arrow Functions

When an arrow function has a single parameter, you can omit the parentheses around the parameter. However, if there are zero or more than one parameters, you must include the parentheses.

```
() => "Hello!" // valid (no parameters)

// Single parameter (parentheses optional)
name => `Hello, ${name}!` // valid

(name) => `Hello, ${name}!` // also valid
```

Demo: Bake Cake

```
function turnOnOven(thenDo) {
  console.log("oven on")
  if (thenDo) {
    thenDo()
  }
}

turnOnOven(() => console.log('baking cake'));
```

Calling an Arrow Function

```
(name) => `Hello, ${name}!`("Alice"); // "Hello, Alice!"
```

`(name) => `Hello, ${name}!`` is an arrow function that takes a parameter `name` and returns a greeting string.

Call this function by appending `()` with the argument `"Alice"` to the arrow function.

Function Expressions

Declaring a function and assigning it to a variable.

```
const greet = function(name) {
  return `Hello, ${name}!`;
};
```

```
const greet = (name) => `Hello, ${name}!`;
```

Calling the function:

```
greet("Alice"); // "Hello, Alice!"
```

Activity: Frog's Functions

Frog can `eat()`, `drink()`, `chat()`, `hop()`, and `sleep()`, but they must **think** (`frogThinkThenDo()`) before they take each of take these actions.

Working with your peers (2-4), complete the hand out.

Function Call

```
functionName()
```

Function Handler

```
functionName
```

Activity: Frog's Functions - Part II

1. Open a **terminal** in your activity codespace.
2. Run `frog-functions.js` outside the browser using Node.js:

```
node frog-functions.js
```

Tip: Use up arrow key to access previous commands in the terminal.

Inline Event Handlers

Inline Event Handlers

Use an arrow function or anonymous function directly in the event listener.

```
<button onClick={() => alert("Event occurred!")}>
  Click me!
</button>
```

```
<button onClick={function() { alert("Event occurred!"); }}>
  Click me!
</button>
```

Demo: Flip Card Event

```
<button onClick={() => alert("TODO: flip card")}>
```

Inline or Declared Event Handlers?

Do you need to call the same event handler from multiple places? If so, declare it as a function and reference it in the event listener.

Declared Event Handler

```
function eventHandler() {
  alert("Event occurred!");
}
```

```
<button onClick={eventHandler}>Button 1</button>

<button onClick={eventHandler}>Button 2</button>
```

Inline Event Handler

```
<button onClick={
  () => alert("Event occurred!")}>
  Click me!
</button>
```

Activity: Event Handler Practice

1. Create a new `Alert` component with an `<h3>` and a `<button>`.

```
<div className="alert" role="alert">
  <h3>{message}</h3>
  <button type="button" ariaLabel="dismiss alert">
    ╳
  </button>
</div>
```

2. When the button is clicked, display an alert with the message "TODO: dismiss alert".

Event Accessibility

Always use a `<button>` element for clickable actions, and provide an `aria-label` for screen readers if the button's content is not text.

```
<button type="button" ariaLabel="dismiss alert">
```

Never use a non-interactive element (like `<div>` or `<span>`) with an `onClick` handler, as this is not accessible to keyboard users and screen readers.

```
<div onClick={() => alert("Event occurred!")}>
```

Summary

- Event handlers are functions that are called when an event occurs.
- Event listeners listen for specific events and call the event handler when the event occurs.
- Functions can be declared using function declarations, function expressions, or arrow functions.
- You can use inline event handlers or declare them as functions and reference them in the event listener.
- Always use semantic HTML elements (like `<button>`) for interactive content and provide appropriate accessibility attributes.

What's Next

Due Today: Project 1, Milestone 2

Due Tuesday: Class 7 Preparation