

The background is a solid teal color with various faint, white line drawings and sketches overlaid. These include architectural elements like a tall brick chimney, a spiral staircase, and a building facade. There are also scientific or technical sketches, such as a circular diagram with concentric rings, a DNA double helix, and a diagram of a bridge or structure. A small crescent moon is visible in the upper right corner.

Vue Fundamentals - KPN

Style Bindings & in depth components

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Using v-model

Two-way databinding with Vue

Using v-model to select changes

*"You can use the `v-model` directive to create **two-way data bindings** on form input, textarea, and select elements. It automatically picks the correct way to update the element based on the input type."*

Using v-model

Two-way data binding

Reflect changes in the UI back to the component
and the other way around


```
<input type="text" v-model="...">
```

Push items to (new) array

New Countries

Add Country

Canada
France



```
<input type="text" class="form-control-lg"  
      v-model="newCountry"  
      @keyup.enter="addCountry()"  
>  
<button @click="addCountry()" class="btn btn-info">  
  Add Country  
</button>
```

```
methods: {  
  selectCountry(index) {  
    this.selectedCountryIndex = index;  
  },  
  addCountry(){  
    this.newCountries.push(this.newCountry);  
    this.newCountry='';  
  },  
},  
computed: {
```

Using v-model on check boxes

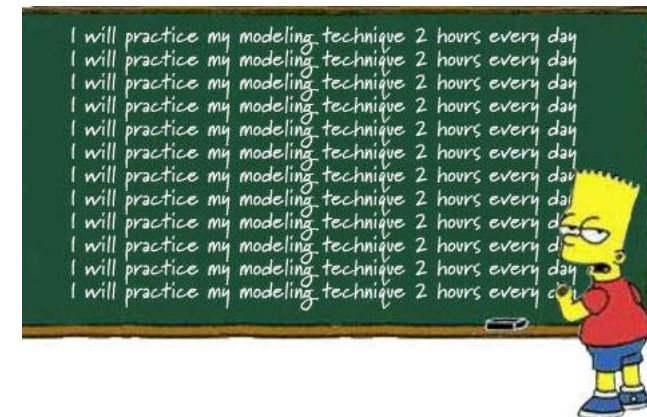
```
<input type="checkbox" v-model="...">
```

Using v-model on radio buttons

```
<input type="radio" v-model="...">
```


Workshop v-model

- Create a component with 2 input fields. The values you type in one field, are copied to the other field and vice versa
- Add checkboxes to your own data list. If a field is checked, it is added to an array and shown in the user interface
- **Optional:** create a textfield on one component.
 - Text that is typed in, is passed on as a `prop` to another component
 - See default `HelloWorld` component as an example for props
- Examples: `.../125-v-model`, `126-...`, `127-...`, `128-...`



Optional - modifiers for v-model

- Modifying the input, received from a `v-model` textbox
 - `.lazy`
 - `.number`
 - `.trim`
- <https://vuejs.org/v2/guide/forms.html#Modifiers>

Modifiers

`.lazy`

By default, `v-model` syncs the input with the data after each `input` event (with the exception of IME composition as [stated above](#)). You can add the `lazy` modifier to instead sync after `change` events:

```
HTML
<!-- synced after "change" instead of "input" -->
<input v-model.lazy="msg" >
```

`.number`

If you want user input to be automatically typecast as a number, you can add the `number`







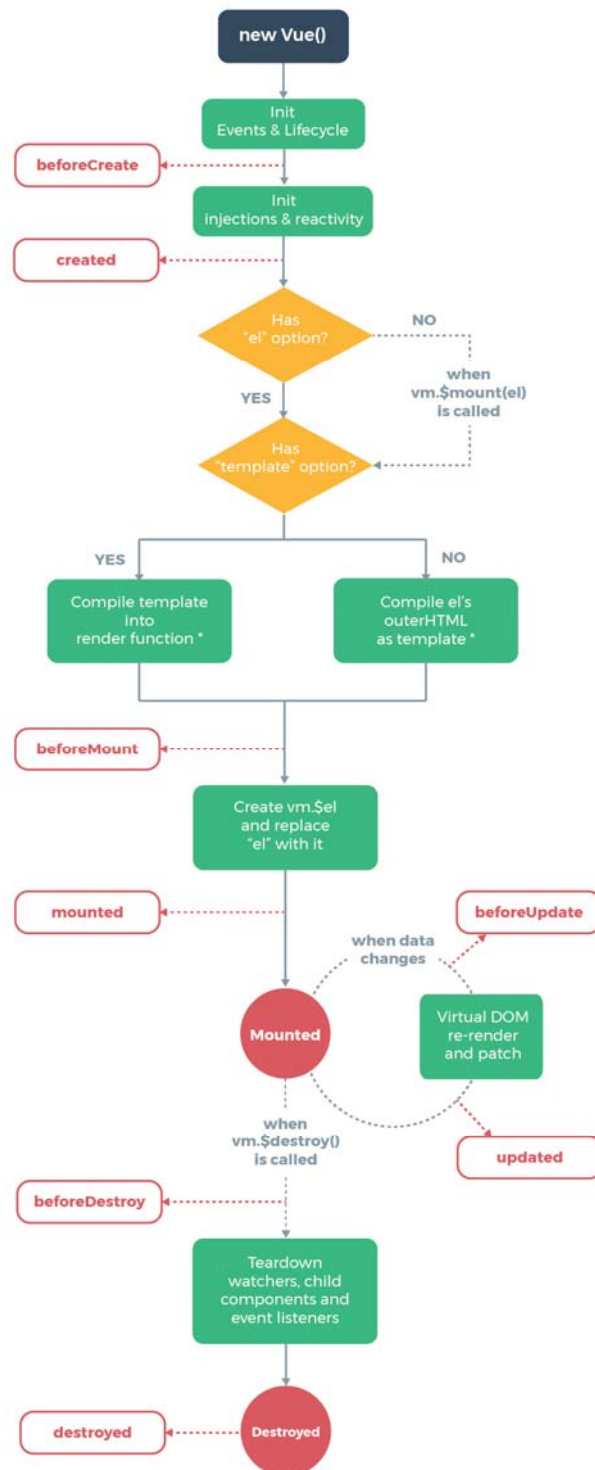
Component lifecycle hooks

Tapping into the lifecycle of created components

Lifecycle hooks

- Perform an action automatically when a specific lifecycle event occurs

“Each component instance goes through a series of initialization steps when it’s created - for example, it needs to set up data observation, compile the template, mount the instance to the DOM, and update the DOM when data changes.”



Official lifecycle diagram

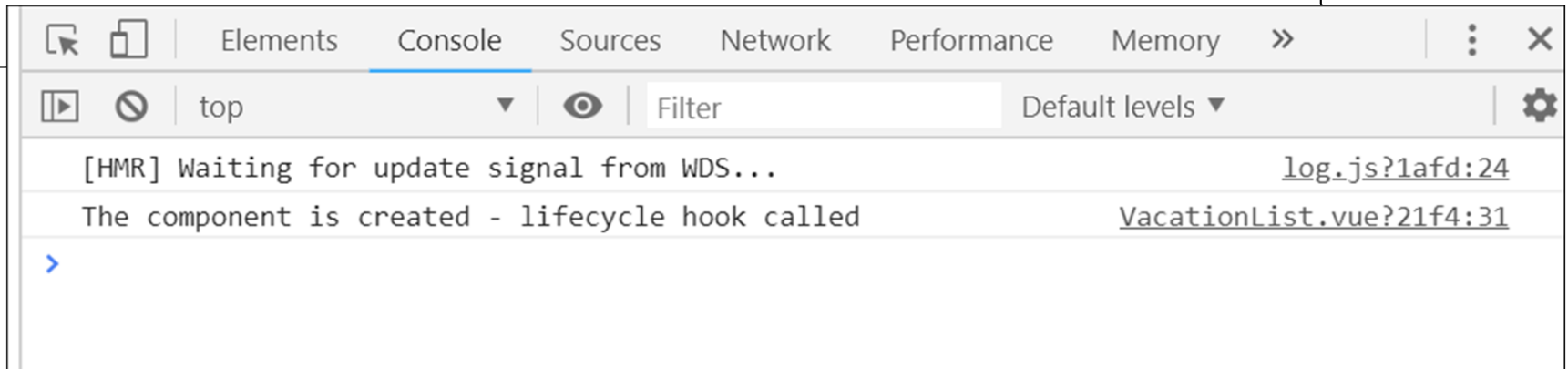
The Red squares are the lifecycle hook methods.

Most used:

- created
- updated
- destroyed

Using the created hook

```
export default {
  name: "VacationList",
  data() {
    return {
      header: 'List of destinations',
    }
  },
  // Using the 'created' lifecycle hook.
  created(){
    console.log('The component is created - lifecycle hook called');
    // update the header
    this.header = 'The component is created';
  },
  ...
}
```

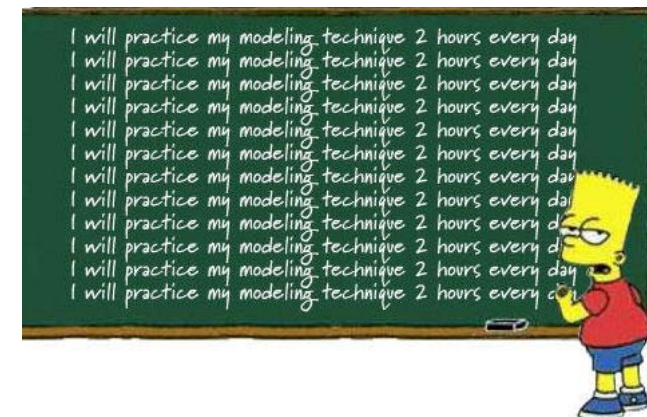


Usage of lifecycle hooks

- Typical usage
 - `created` – initialisation of variables, call API's for fetching data etc.
 - `mounted` – if you want to access or modify the DOM.
 - `updated` – when the component receives new data from the outside (props)
 - `destroyed` – to destroy or garbage collect stuff that is not removed automatically
 - Vue 3: `unmounted()` (instead of `destroyed()`)

Workshop

- Create a new component.
- Give it some data that you bind in the UI.
- Use a lifecycle hook `created` to log to the console that the component is created.
- Edit the data in the `created` lifecycle hook. Verify that it is shown correctly in the UI.
- Read the documentation on some other lifecycle hooks, for instance <https://www.digitalocean.com/community/tutorials/vuejs-component-lifecycle>
- Example: [.../150-lifecycle-hooks](#)

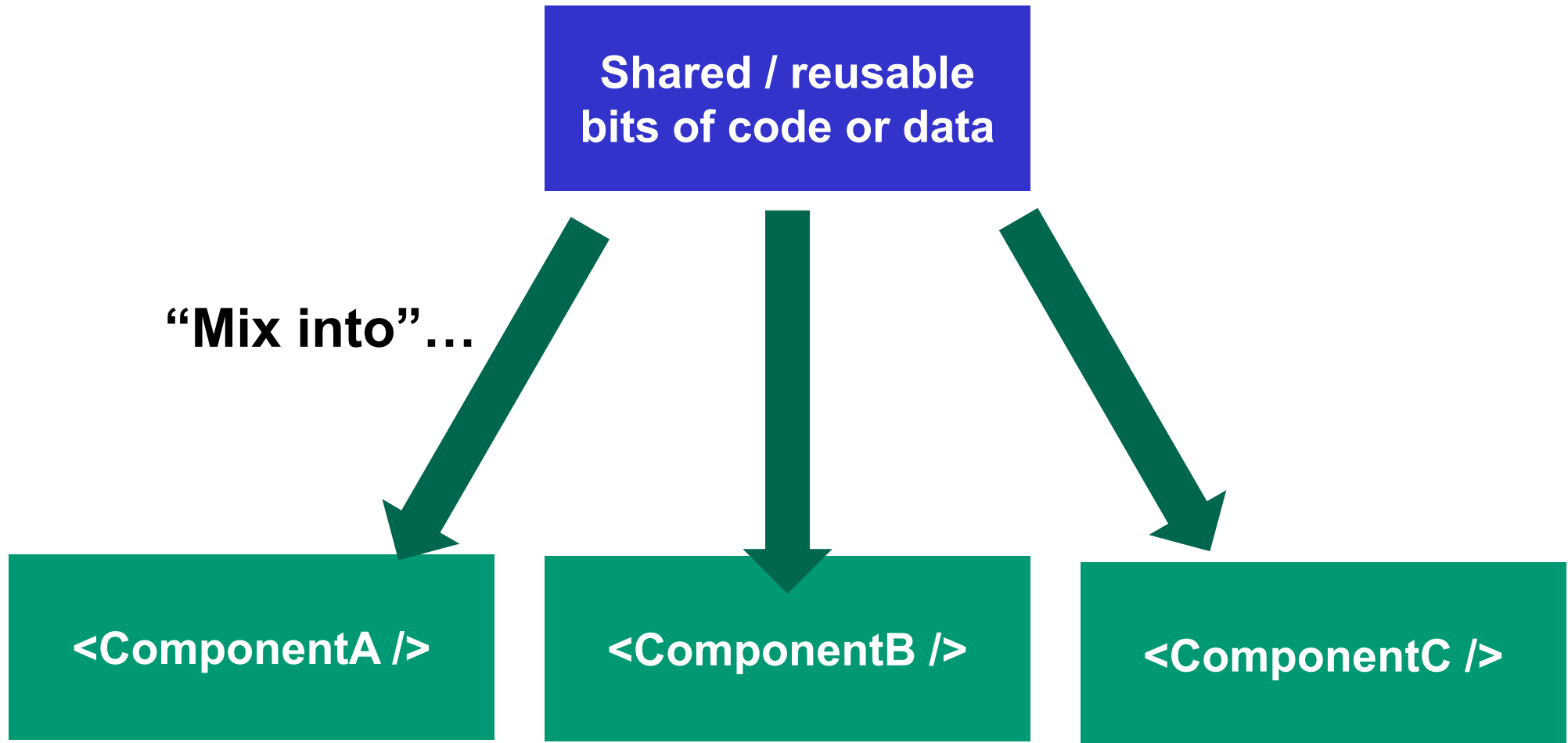




Using mixins

Reuse functionality across components

Mixin architecture



“Mixins are a flexible way to distribute reusable functionalities for Vue components. A mixin object can contain any component options. When a component uses a mixin, all options in the mixin will be “mixed” into the component’s own options.”

Mixins

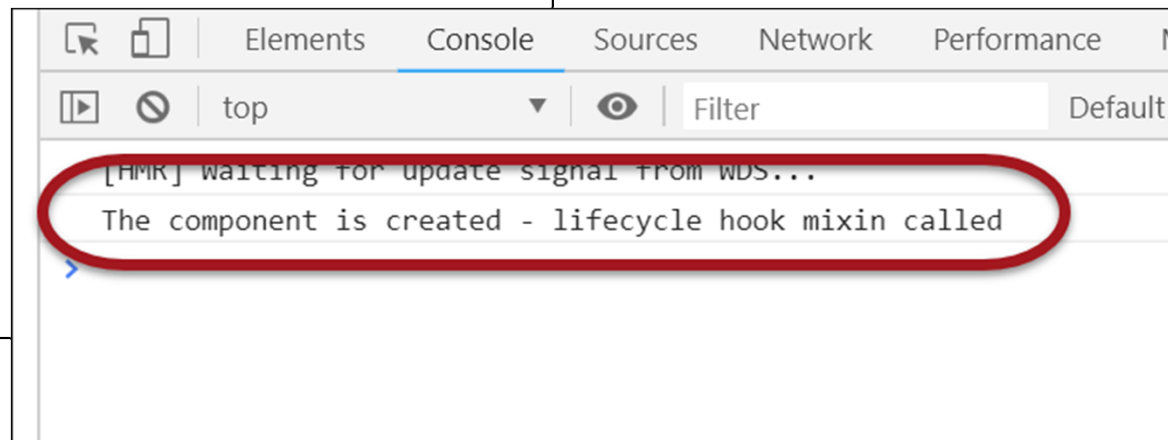
- Mixins are a way to share functionality across components
- Useful if you find yourself duplicating code in multiple components
- Usually stored in a separate file

```
// mixins.js - export default mixins in this application.  
// They can be loaded into every component that needs them.  
export default {  
  // Using the 'created' lifecycle hook in a mixin  
  created(){  
    console.log('Component created - lifecycle hook mixin called');  
  },  
}
```

Using a mixin

- Import the `mixin.js` file in the component
- Add it to the `mixins` property of the component.
- It is used as before
- NOT just lifecycle hooks! All kinds of functionality & data you want to share


```
<script>  
  ...  
  // import the mixin  
  import createdHookMixin from '../mixins/mixins.js'  
  
  export default {  
    name: "VacationList",  
    ...,  
    mixins:[createdHookMixin]  
  }  
</script>
```



Setting a 'namespace'

Tip: if you have to reuse data, it is an option to put in a nested object, so the mixin data can be distinguished from the component data:

You have now created some kind of custom 'namespace'



The screenshot shows a code editor with three tabs: `mixins.js`, `VacationPicker.vue`, and `VacationList.vue`. The `VacationList.vue` tab is active, displaying the following code:

```
10  },|
11  mounted(){
12    console.log('The DOM is now attached..');
13  },
14  data(){
15    return{
16      mixinData:{
17        msg: 'Hello Stellendam'
18      }
19    }
20  }
21 }
22
```

A red arrow points to the `mixinData` object in the `data()` function, highlighting the custom namespace used to distinguish the mixin data from the component data.

Global mixins

- You can create a mixin for the complete `Vue` instance
- Use the `Vue.mixin()` option in `main.js`
- Candidates for global mixin data:
 - Global URL endpoints
 - Error messages
 - Translations
 - General data

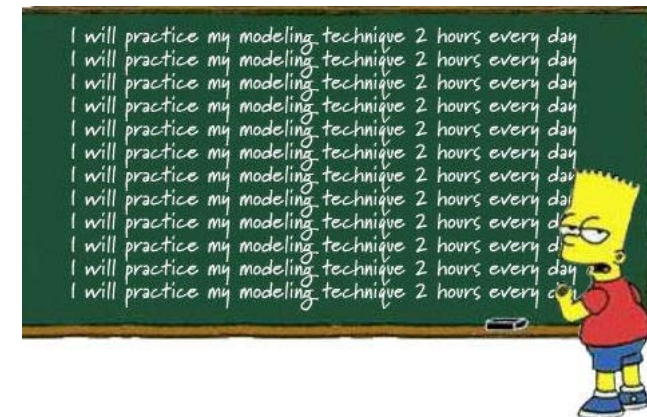
```
5
6 // Global mixins - available in ALL components
7 import mixins from "../mixins/mixins"
8 Vue.mixin(mixins);
9
10 import ...
12
```

Rules

- Component methods **override** mixin methods
- Component computed properties **override** mixin computed properties
 - “last one wins”
- Component lifecycle hooks are **added** to mixin lifecycle hooks
- Component data is **added** to mixin data
 - UNLESS you have a naming conflict

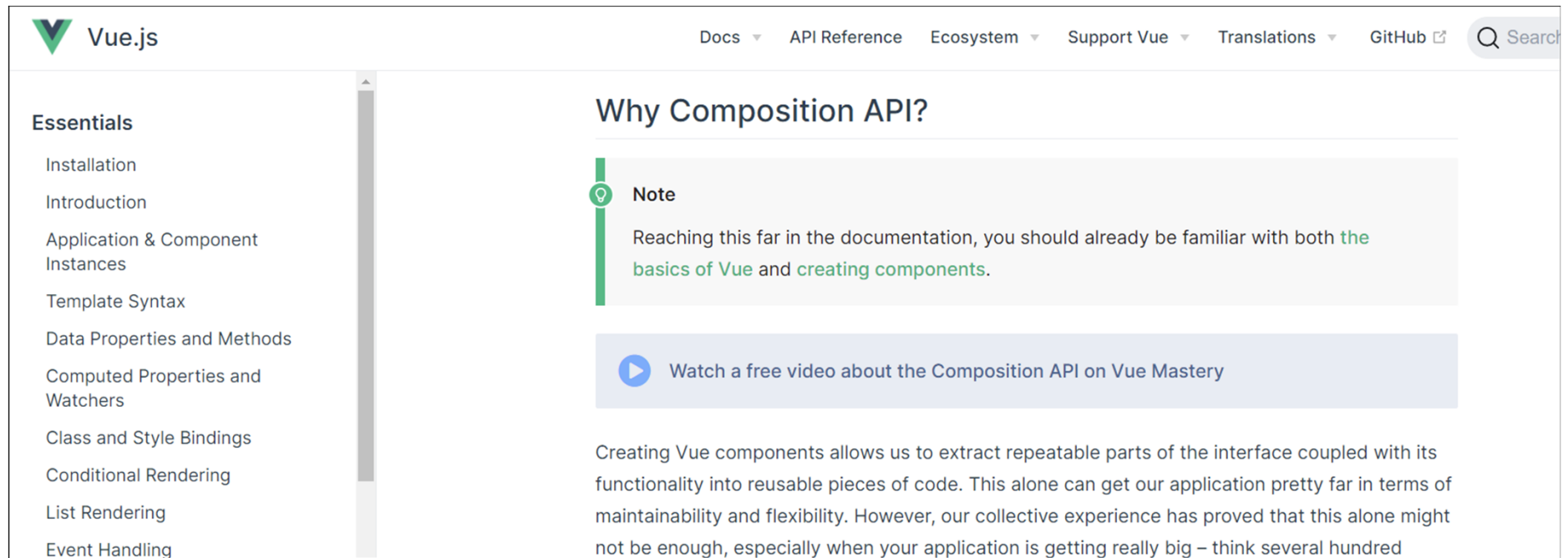
Workshop - mixins

- Create a mixin for the `data.js` – file
- Use it in the component.
 - See if the component can still access the data
 - This way you can share data over multiple components
- Optional: create a global mixin and see if you can access it from all components
- General example: `../160-mixins`



Vue 3 – mixins less important

- New concept – **Composition API**
- Setup() – for composing components
- <https://v3.vuejs.org/guide/composition-api-introduction.html#why-composition-api>



The screenshot shows the Vue.js documentation website. The header includes the Vue.js logo, navigation links (Docs, API Reference, Ecosystem, Support Vue, Translations, GitHub), and a search bar. The left sidebar lists 'Essentials' topics: Installation, Introduction, Application & Component Instances, Template Syntax, Data Properties and Methods, Computed Properties and Watchers, Class and Style Bindings, Conditional Rendering, List Rendering, and Event Handling. The main content area is titled 'Why Composition API?'. It features a 'Note' box with a lightbulb icon stating: 'Reaching this far in the documentation, you should already be familiar with both the basics of Vue and creating components.' Below this is a video player placeholder with a play button icon and the text 'Watch a free video about the Composition API on Vue Mastery'. At the bottom, a paragraph begins: 'Creating Vue components allows us to extract repeatable parts of the interface coupled with its functionality into reusable pieces of code. This alone can get our application pretty far in terms of maintainability and flexibility. However, our collective experience has proved that this alone might not be enough, especially when your application is getting really big – think several hundred'.



Style Bindings

On using global styles and scoped styles

Global styles and scoped styles

With default styles, CSS is globally available.

For instance, see `App.vue`:

```
<style>
  #app {
    font-family: 'Avenir', Helvetica, Arial, sans-serif;
    color: #2c3e50;
  }
</style>
```

This is also true for components!

Using scoped styles

- To avoid naming collisions, it is best to add the `scoped` attribute to a style block inside a component
- Different components now can reuse the same classname without clashes.

```
<template>
  <div>
    <h2 class="heading">Component 1</h2>
    ...
  </div>
</template>

<script>
  export default {
    name: "ComponentOne",
  }
</script>

<style scoped>
  .heading {
    font-size: 36px;
    color: cornflowerblue;
  }
</style>
```

```
<h2 class="heading">Component 2</h2>
<style scoped>
  .heading {
    font-size: 36px;
    color: crimson;
  }
</style>
```

```
<h2 class="heading">Component 3</h2>
<style scoped>
  .heading {
    font-size: 48px;
    color: rebeccapurple;
  }
</style>
```


Three components. Same class name, different styling.

Component 1

Lorem ipsum dolor sit amet, consectetur adipisicing elit. At illum molestiae quae tempore ut. Expedita nostrum omnis perspiciatis porro praesentium repellat similique voluptate voluptatum. Dolorum eaque ex praesentium quibusdam voluptates?

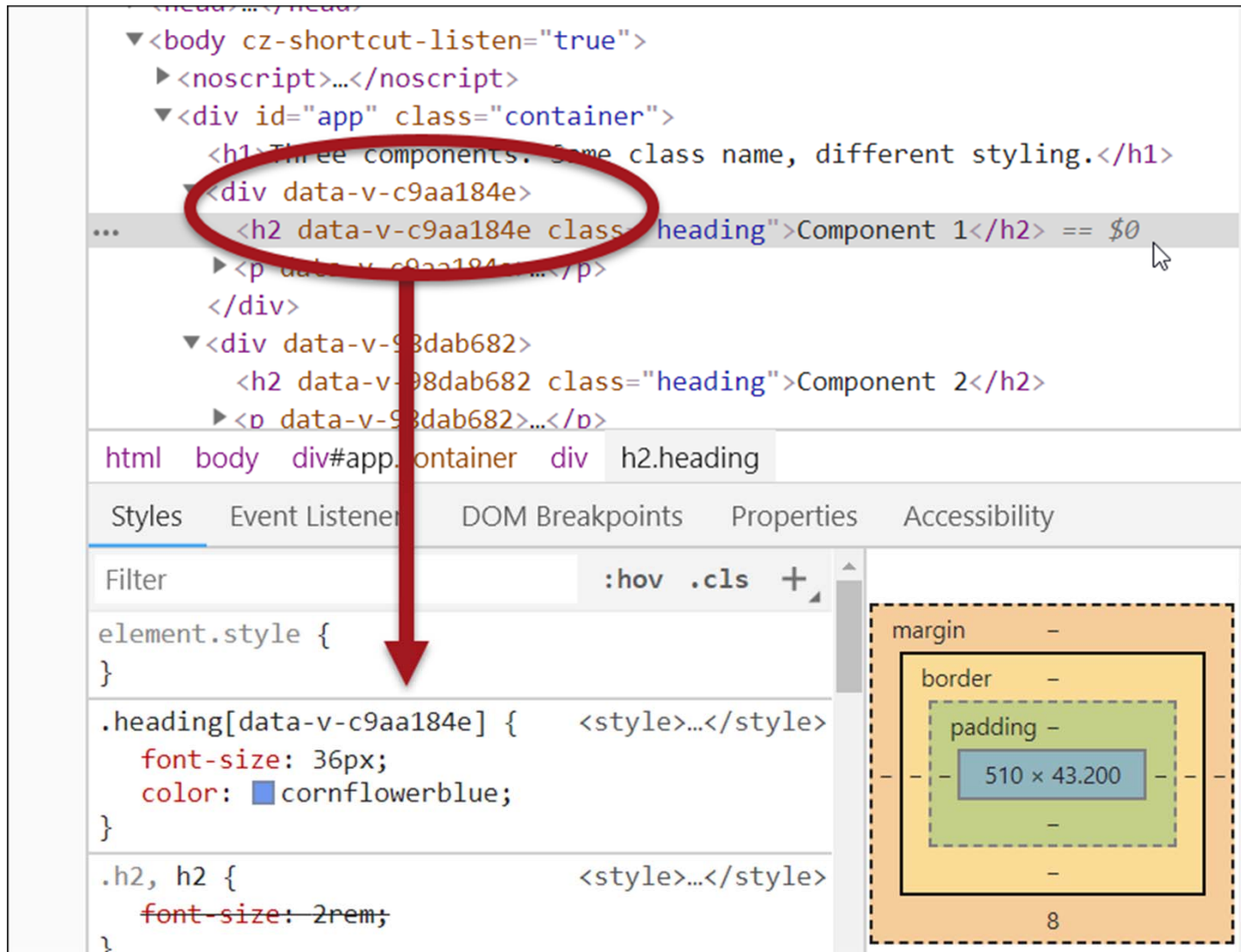
Component 2

Lorem ipsum dolor sit amet, consectetur adipisicing elit. At illum molestiae quae tempore ut. Expedita nostrum omnis perspiciatis porro praesentium repellat similique voluptate voluptatum. Dolorum eaque ex praesentium quibusdam voluptates?

Component 3

Lorem ipsum dolor sit amet, consectetur adipisicing elit. At illum molestiae quae tempore ut. Expedita nostrum omnis perspiciatis porro praesentium repellat similique voluptate voluptatum. Dolorum eaque ex praesentium quibusdam voluptates?

Vue adds (semi random) hashes to elements



General rules on styling

- Do not create global styles in components
- Only the top level component (`App.vue`) should have global styles
- You *can* use a generic CSS-framework like Bootstrap, Foundation, Vuetify, etc.

Conditionally applying styles

- Bind to the style attribut like so:
 - `v-bind:style="{ ...some-style...}"` or just
 - `:style="{...some-style...}"`
 - For instance `:style="{ border: '2px solid black'}"`
 - These are actually just CSS styles and notation!
- If your CSS-style has a hyphen in them, a special notation is needed:
 - `:style="{['background-color']: 'lightBlue'}"`
 - or use camelCase notation:
 - `:style="{backgroundColor: 'lightBlue'}"`

Making the style conditional

- For instance: we only want the style to be applied if the cost of a trip is less than 1000
- We can just bind to the HTML `:style` property
- For the value: use a computed property, or method.
- Let the computed property or method return a valid CSS style object

`:style="{backgroundColor: 'lightBlue'}"`



This works, but it is not conditional

This example: using a method

```
<li class="list-group-item"
    :style="highlightBackground(index)"
    v-for="(country, index) in data.countries" :key="country.id">
    {{ country.id }} - {{country.name}}
</li>
```

```
methods:{
  highlightBackground(index){
    return {
      backgroundColor:
        this.data.countries[index].cost < 1000 ?
          'lightBlue' :
          'transparent'
    }
  }
}
```

Conditionally applying styles

List of destinations

1 - USA

2 - Netherlands

3 - Belgium

4 - Japan

5 - Brazil

6 - Australia

Using v-model on a selection list

```
<h2>Destinations cheaper than:  
  <select class="form-control-lg" v-model="selectedCost">  
    <option value="1000">1000</option>  
    <option value="2000">2000</option>  
    <option value="3000">3000</option>  
    <option value="4000">4000</option>  
    <option value="5000">5000</option>  
    <option value="6000">6000</option>  
  </select>  
</h2>
```

```
data() {  
  return {  
    ...  
    selectedCost: 1000  
  }  
},  
methods: {  
  highlightBackground(index) {  
    return {  
      backgroundColor:  
        this.data.countries[index].cost < this.selectedCost ?  
          'lightBlue' :  
          'transparent'  
    }  
  }  
}
```


Conditionally applying styles

List of destinations

1 - USA
2 - Netherlands
3 - Belgium
4 - Japan
5 - Brazil
6 - Australia

Destinations cheaper than:

2000 ▾

1000

2000

3000

4000

5000

6000

Conditionally applying classes

- Most of the times it is better to use CSS classes instead of inline styles
- Class binding is an object where the **keys** are the name of the CSS-class you want to toggle.
- You set the **value** to a boolean expression that should evaluate to `true` or `false`
 - If `true`, the class is applied
 - If `false`, the class is removed from the element
 - Of course this is all dynamic

Same functionality – with class binding

Create a CSS class:

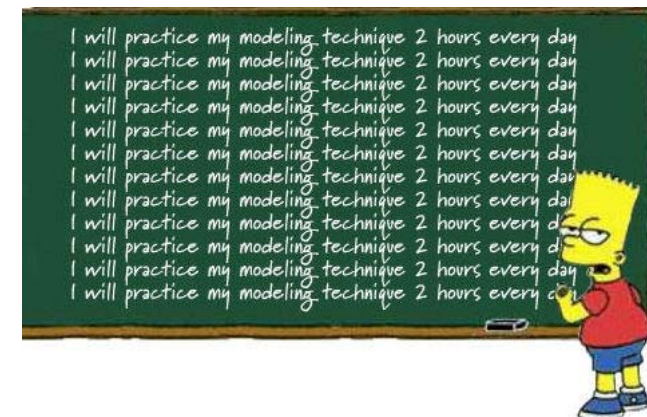
```
<style scoped>
  .lightblueBackground {
    background-color: lightblue;
  }
</style>
```

Apply the class conditionally in HTML:

```
:class="{ 'lightblueBackground': country.cost < selectedCost }"
```

Workshop

- Create a component with a `<button>` and a `<div>`
- if the button is clicked, the class of the div is toggled
 - First – use conditional styles
 - Second – use conditional classes
- Add a `<div>`. If you hover the mouse over the div, toggle a class to highlight it
- Ready made example: [140.../.../ConditionalClass.vue](#)
 - (But first try it yourself!)



Checkpoint

- You can use **v-model** in various situations
- You know about **lifecycle hooks**
- You can write and (re)use **mixins**
- You know the difference between **global styles** and **scoped styles**
- You know how to apply styles and classes **conditionally**