



# ArcGIS API for JavaScript: Customizing Widgets

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GIS  
INSPIRING  
WHAT'S  
NEXT

# Agenda

- What can be customized
- Customization approaches with demos
- Q & A

# What we mean by customizing

- Theming
  - Changing styles: colors, sizing, font, etc.
- Altering presentation of a widget
  - Custom UI
- Adding additional functionality

# Customization Approaches

- Authoring a theme
- Recreating a view
- Extending a view



A pixel art illustration of three characters holding a large black sign with an orange border. The sign contains the text 'CONTINUE?' and 'Y/N'. The background is a dark blue gradient with a faint, stylized cityscape at the bottom.

CONTINUE?  
Y/N

# Level 1 I



Theming

# Level I: Theming

## Why Theme?

- Match branding.
- Match the map.
- Contrast with the map.
- Based on the environment.
- User-specific (e.g. bigger buttons)



# Theming Technology

The background features a dark blue gradient that transitions into a lighter teal at the bottom. The bottom portion is filled with an abstract, layered composition of geometric shapes, including rectangles and lines, in various shades of blue, teal, and light green. Some elements have a slight glow or transparency, creating a sense of depth and movement.

We use

*Sass*

to create our CSS.



[nodejs.org](http://nodejs.org) | [gruntjs.com](http://gruntjs.com)



# Sass

is a powerful scripting language for compiling CSS.

- It's modular.
- It's DRY.
- It makes theming easy.

PREVIOUSLY ON THEMING  
LIFE WAS HARD.

Before, you needed to

1. Pull down the API (arcgis-js-api).
2. Create a theme directory in the right place.
3. Create a Sass file.
4. Import the core file.
5. Run the compiler.
6. Wonder if there were an easier way.

# There is an easier way!

1. Get our theme utility.
2. Use the utility.
3. Customize your theme.
4. Then magic.



# There is an easier way!

1. Clone the utility `jsapi-styles.git`
2. Run `npm install`
3. Edit `sass/my-theme/main.scss`.
4. See `dist/my-theme/main.css`.



You won't need the base stylesheet.

# Step 1

Clone the repo.

<https://github.com/jcfranco/jsapi-styles>

```
git clone https://github.com/jcfranco/interactive-design.git
```



# Step 2

```
npm install
```

- Installs the necessary bits.
- Creates a sample theme directory.
- Compiles the CSS from the SCSS.
- Spins up a preview in your default browser.

# Step 3

Edit your theme.

```
sass/my-theme/main.scss
```

Optionally, edit your app.

```
preview/index.html
```

# Step 4

Host your stylesheet and any relevant assets.

Link your stylesheet in your app.

```
<!-- In your app: -->  
<link href="path/to/your/theme/main.css" rel="stylesheet">
```

Let's have a look!

# Theme Smart

Avoid adding additional CSS selectors.

Instead, use Sass to your advantage.

Let's look at how the core theme is structured.

# Theme Structure

- Color : `colorVariables.scss`
- Size : `sizes.scss`
- Type : `type.scss`

# Theme Structure

## Default

```
// Inside base/_colorVariables.scss  
$background_color : #fff !default ;
```

Any value assignment overrides the **!default** value.

```
// Inside sass/my-theme/main.scss  
$background_color : #cc4b09;
```

The background features a complex, abstract composition of overlapping, semi-transparent geometric shapes and patterns. On the left side, there are various map-like elements, including a grid pattern, a topographic contour map, and a network of lines. These are layered with numerous rectangular and polygonal shapes in a rich color palette of blues, greens, oranges, reds, and purples. The overall effect is a sense of depth and dynamic movement, with the elements appearing to recede into the distance. The right side of the image transitions into a solid, dark teal gradient.

So let's make a theme!



# Level I: Theming Recap

- Use the utility for easy theming.
- Theme structure
  - Color
  - Size
  - Typography
- Use the core and override values.

# LEVEL UP!



Ready?

# LEVEL II



Views

# Level II: Widget Composition

Widgets are composed of Views & ViewModels

- Benefits of View/ViewModel
  - Reusable
  - UI replacement
  - Framework integration

# Level II: Views

- Presentation of the Widget
- Uses ViewModel APIs to render the UI
- View-specific logic resides here

# Level II: Working with Views

## API Exploration

- Locate Doc
- Locate Sample

# Level II: LocateViewModel

## Overview of LocateViewModel

```
interface LocateViewModel {  
  readonly state: string;  
  locate(): IPromise<Object>;  
  graphic?: Graphic;  
  scale?: number;  
  view?: MapView | SceneView;  
}
```

# Demo: Customize widget View

Lets create a custom widget view.

- Demo Complete
- Demo Steps
- Demo Start





# Level II: Views Recap

What have we learned about Widget Views?

- Face of the widget
- Present ViewModel logic
- ViewModel separation allows framework integration or custom views
- Views downloadable on API doc pages

# LEVEL UP!



Ready?

# LEVEL III



Extending a View

# Level III: Extending a View

- Why?
  - Reusable
  - Same ecosystem
- How?
  - JS API v4.8
  - `esri/widgets/Widget`
  - TypeScript

`esri/widgets/Widget`

- Provides lifecycle
- API consistency

# Lifecycle

- constructor
- postInitialize
- render
- destroy

# render

- Defines UI
- Reacts to state
- Uses JSX
- VDOM

# TypeScript

- Typed JavaScript
- JS of the future, now
- IDE support
  - Visual Studio
  - WebStorm
  - Sublime
  - and more!



# Demo: Extending a View

Demo | Steps



# Level III: Extending a View Recap

- Reusable
  - View/ViewModel
- Same ecosystem
  - No extra libraries
- Extended existing widget
  - Lifecycle
  - TypeScript

# LEVEL UP!



Ready?

# LEVEL IV



Put it all together.

# Conclusion

- Authored a theme
- Recreated a view
- Extended a view

# Additional Resources

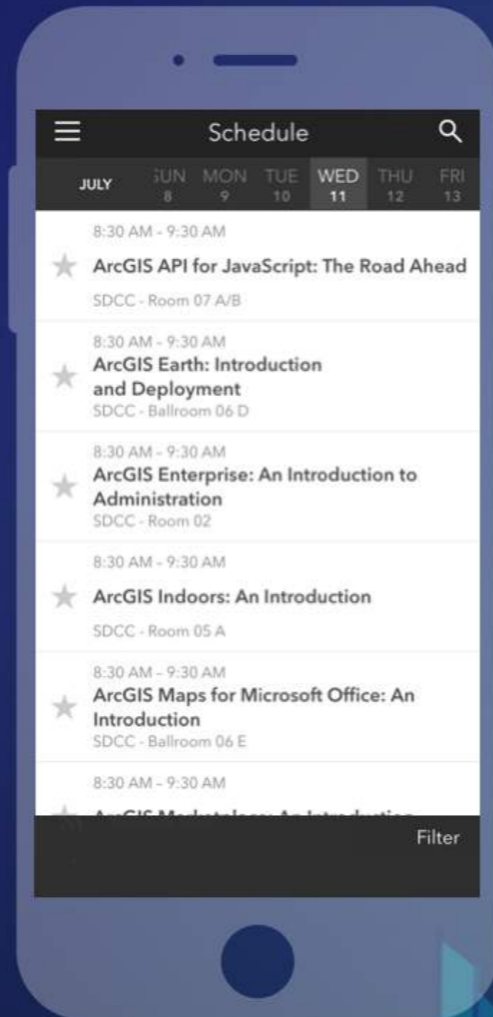
- Implementing Accessor
- Setting up TypeScript
- Widget Development
- JS API SDK

# Please Take Our Survey on the App

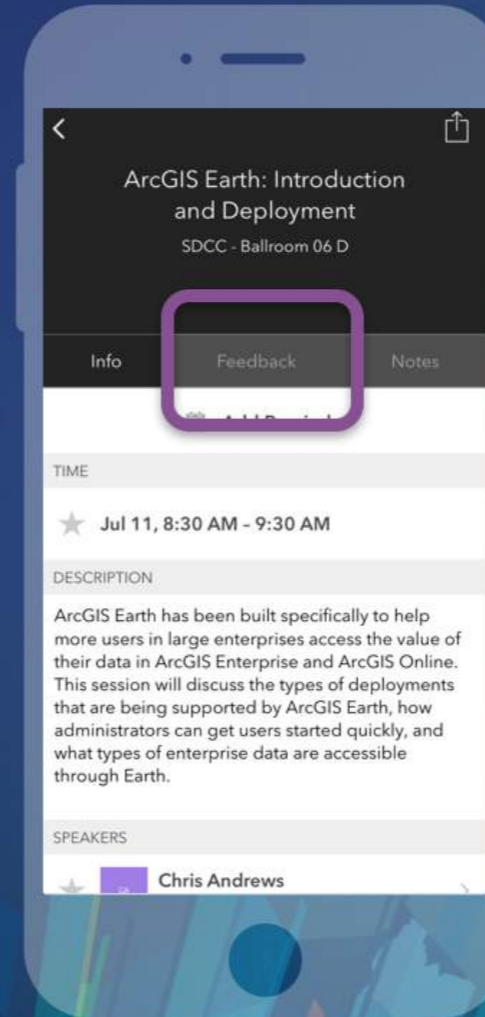
Download the Esri Events app and find your event



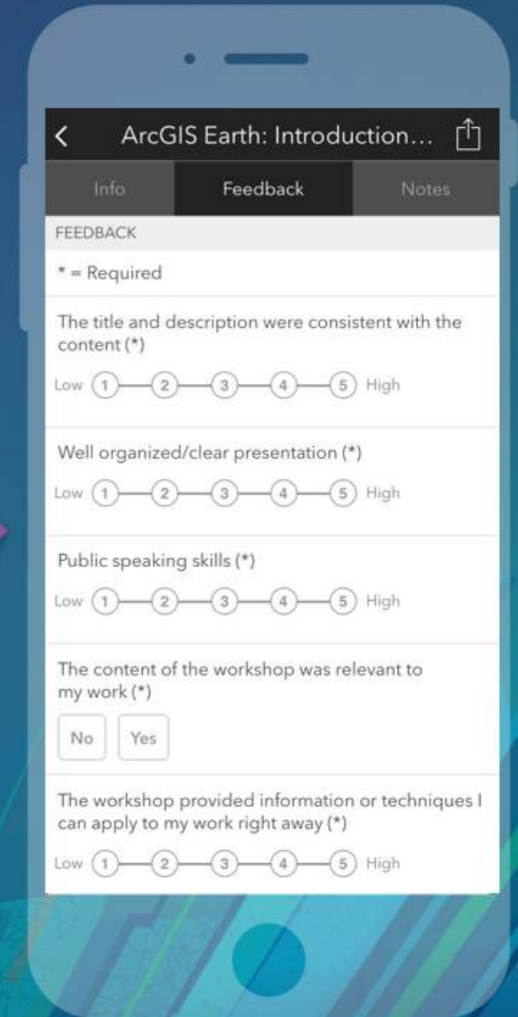
Select the session you attended



Scroll down to find the feedback section



Complete answers and select "Submit"



# Questions?

For example

🤔 *Where can I find the slides/source?*

👉 [esriurl.com/customwidgetsuc2018](https://esriurl.com/customwidgetsuc2018) 👈





esri

THE  
SCIENCE  
OF  
WHERE