



ArcGIS Maps SDK for JavaScript: Using Arcade with your Apps

Anne Fitz & Heather Gonzago

```
<arcgis-map zoom="4" center="-118,34">
  <arcgis-search position="top-right" />
</arcgis-map>
```

```
<arcgis-map zoom="4" center="-118,34" />
view.goTo({
  center: [-126, 49]
})
.catch(function(error) {
  if (error.name != "AbortError") {
    console.error(error);
  }
});
```

What is Arcade?

Create flexible content from existing data

- **Expression language** for...
 - calculating and formatting data values,
 - enforcing rules,
 - generating content elements, and
 - Creating any of the above conditionally.
- Works across ArcGIS applications
 - ArcGIS Pro
 - ArcGIS Online
 - ArcGIS Dashboards
 - Developer SDKs
 - ... and more!



What is Arcade?



Portable

- expressions work across ArcGIS



Lightweight

- scripts and expressions execute quickly



Geospatial

- treat geospatial data as first-class members



Secure

- expressions do not compromise security

When should I use Arcade?

- Arcade is especially useful when...
 - You don't own the data
 - The data updates frequently
 - You want to view your dynamic content in other applications (ArcGIS Pro, Native Apps, etc)
 - You want to easily work with feature data to create custom content in your apps
 - Leverage simplified language syntax or convenient built in Arcade functions



```
    queryParameters =  
        queryParameters().apply {  
            clause = "price > 200"  
        }  
    viewModelScope.launch {  
  
        // Single-line comment  
        /*  
         * -----  
         * Multi-line comment  
         * -----  
         */  
  
        // Single-line expression with an implicit return  
        // 'Hello world';  
  
        // Multiple statements in one line with an explicit return  
        // var x = 3; var y = 4;  
        // return x + y;  
  
        // Built-in functions  
        Console(Array(2, 'hello')) // Can be chained  
  
        // Multi-line expressions  
        function calculateRatio(values, index) {  
            var value = values[index];  
            return value / Sum(values);  
        }  
    }  
}
```

Demo of Arcade basics

Heather Gonzago

Arcade Profiles

Anne Fitz

```
view.goTo({  
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```
queryParameters =  
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```

What's a profile?

Arcade Profile = The context in which an Arcade expression is evaluated and interpreted

- Specifies:
 - The execution context
 - Profile variables
 - Function bundles
 - Valid data types that can be returned

<https://developers.arcgis.com/arcade/profiles/>

Function bundles

Describes a set of functions to include in a profile implementation

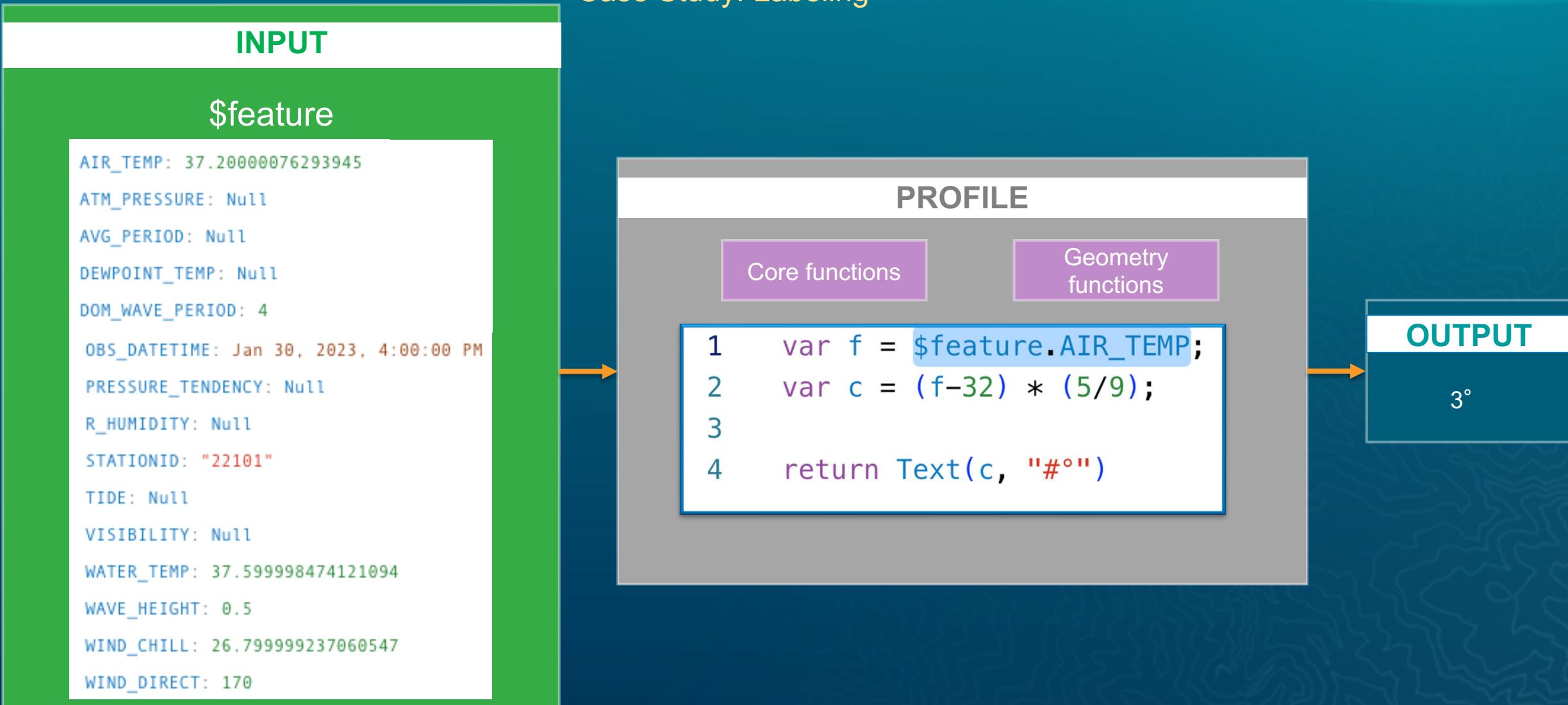
	Core bundle	Data access bundle	Database bundle	Geometry bundle	Portal access bundle	Track bundle
Constants	✓	✗	✗	✗	✗	✗
Array functions	✓	✗	✗	✗	✗	✗
Date functions	✓	✗	✗	✗	✗	✗
Debugging functions	✓	✗	✗	✗	✗	✗
Dictionary functions	✓	✗	✗	✗	✗	✗
Enterprise functions	✗	✗	✓	✗	✗	✗
Feature functions	✓	✗	✗	✗	✗	✗
FeatureSet functions	✗	✓	✗	✗	✗	✗
Geometry functions	✗	✗	✗	✓	✗	✗
Logical functions	✓	✗	✗	✗	✗	✗
Math functions	✓	✗	✗	✗	✗	✗
Portal functions	✗	● ¹	✗	✗	✓	✗
Text functions	✓	✗	✗	✗	✗	✗
Track functions	✗	✗	✗	✗	✗	✓

1. Excludes FeatureSetByPortalItem

✓ Full support ● Partial support ✗ No support

Arcade Profiles: Self-contained environments for executing Arcade

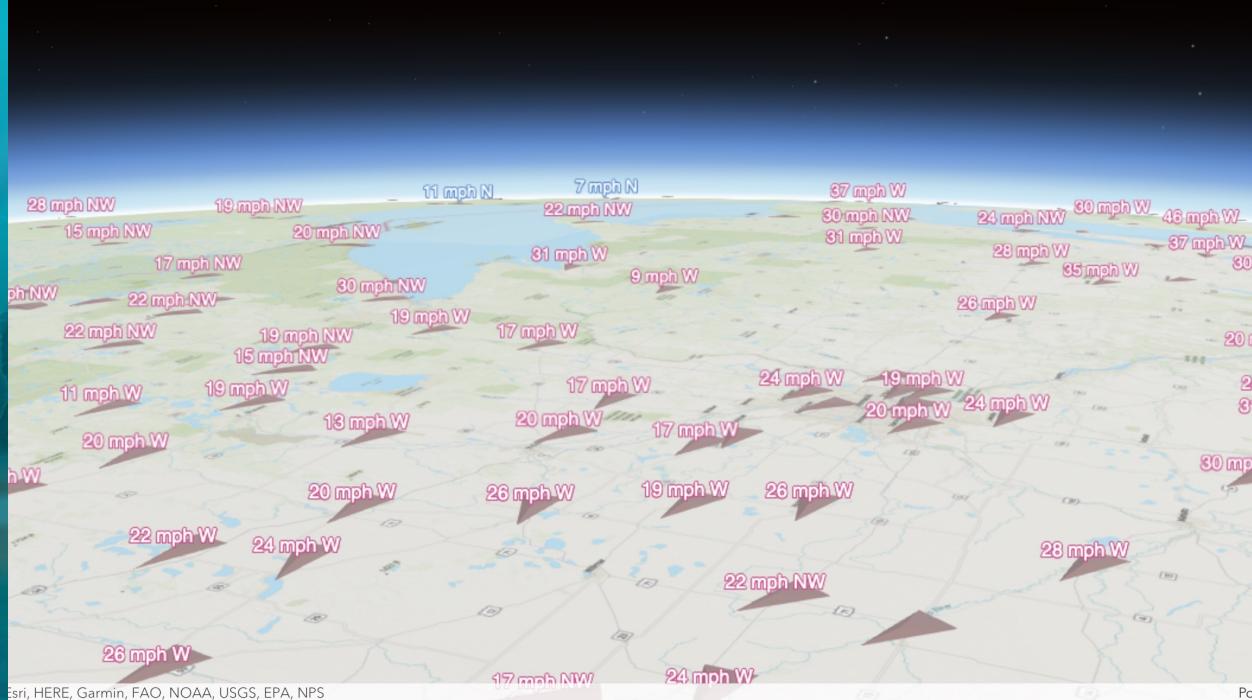
Case Study: Labeling



Profiles in the JavaScript SDK

	Visualization	Popup	Labeling	Feature Z	Form Constraint	Form Calculation
Context	ClassBreaksRenderer UniqueValueRenderer Visual Variables	Popup Template	LabelClass	ElevationInfo in 3D Scenes Feature ordering	FeatureForm widget FieldElement	FeatureForm widget FieldElement
Profile variables	\$feature \$view.scale	\$feature \$layer \$map \$datastore	\$feature	\$feature	\$feature	\$feature \$layer \$map \$datastore
Return Type	Text Number	Text Number	Text	Number	Boolean	Text Number Date
Function bundles	Core Geometry	Core, Geometry, Data Access, Portal Access	Core Geometry	Core Geometry	Core Geometry	Core, Geometry, Data Access, Portal Access

```
    queryParameters =  
        queryParameters().apply {  
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    viewModelScope.launch {
```



Profile Demos

Anne Fitz and Heather Gonzago

Arcade APIs

Anne Fitz

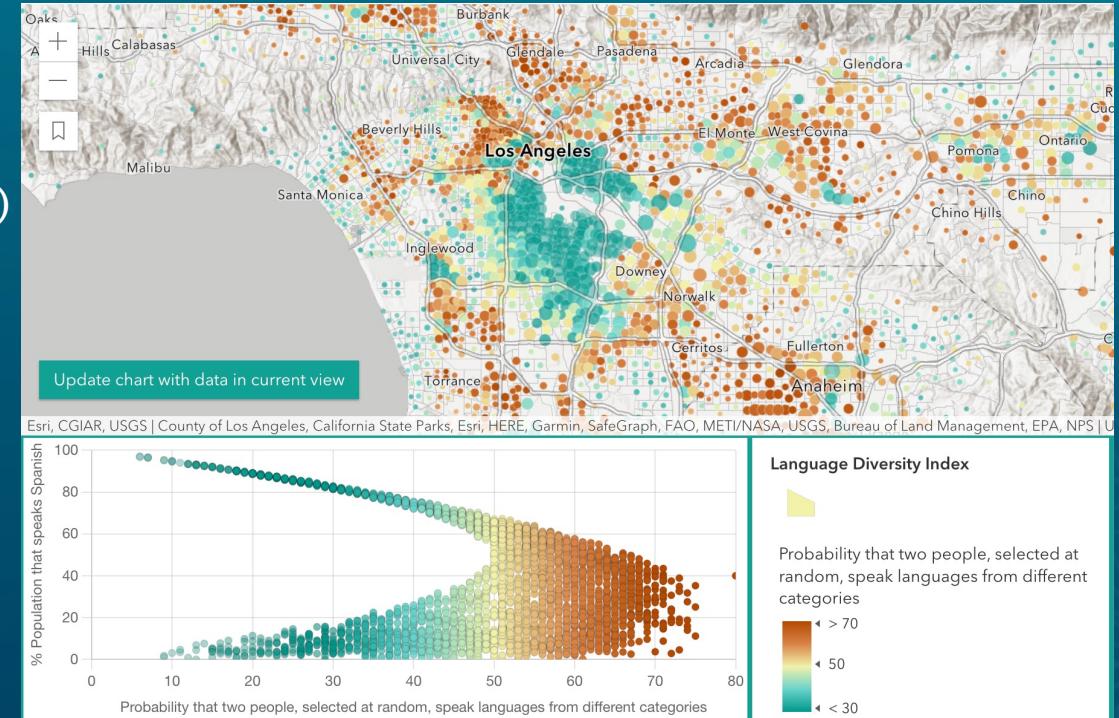
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Execute expressions on your own terms

esri/arcade-module for evaluating Arcade

1. `createArcadeProfile`
2. `createArcadeExecutor(script, profile)`
returns ArcadeExecutor
3. `ArcadeExecutor.execute()` or
`executeAsync()`
 - pass in an object defining profile variables & optional spatial reference
 - Returns value of evaluated expression

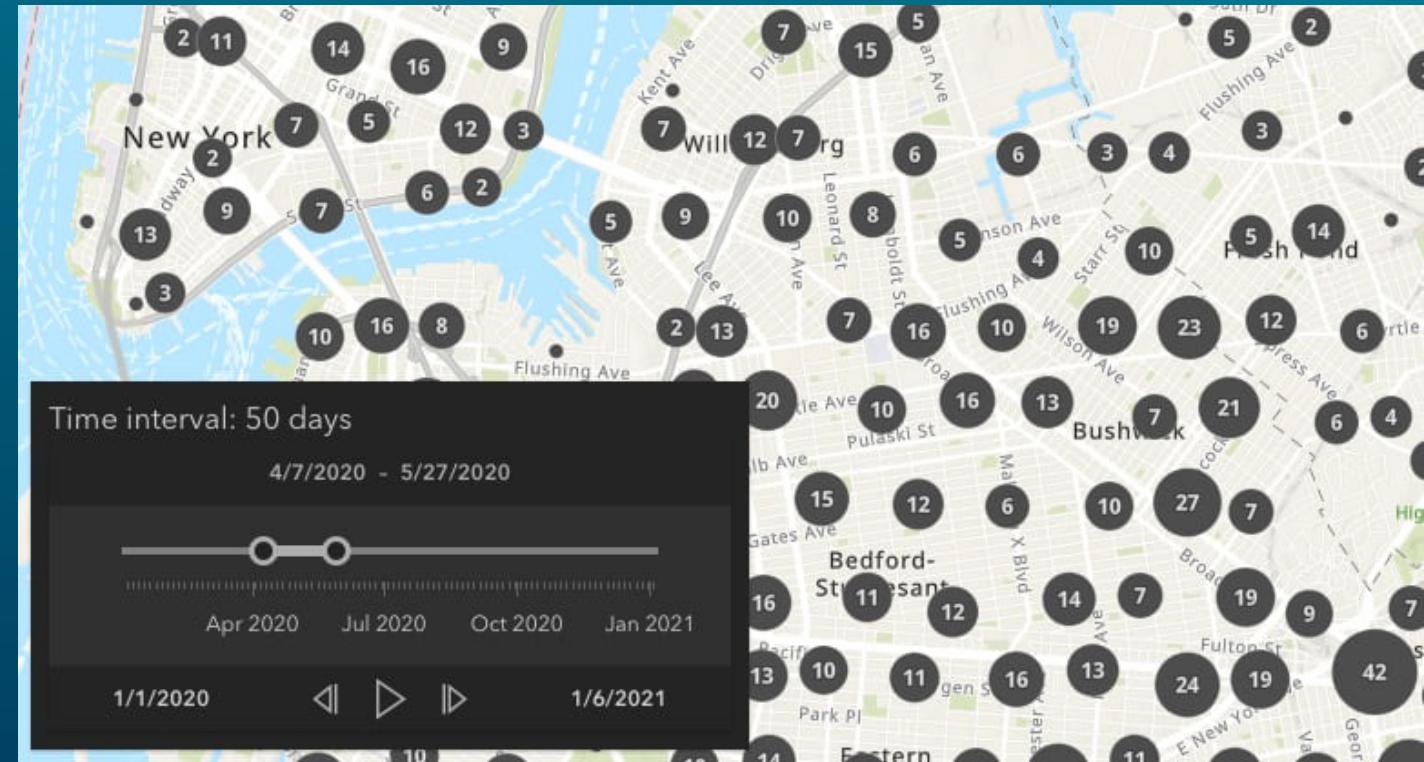


[Blog post: Execute expressions on your own terms](#)

Create a custom profile

- STEPS:

1. Define the profile variables
2. Write the Arcade expression
3. Create an Arcade executor
4. Execute the script
5. Display the output



[Blog post: How to create a custom Arcade profile](#)

Arcade Editor Component

Anne Fitz

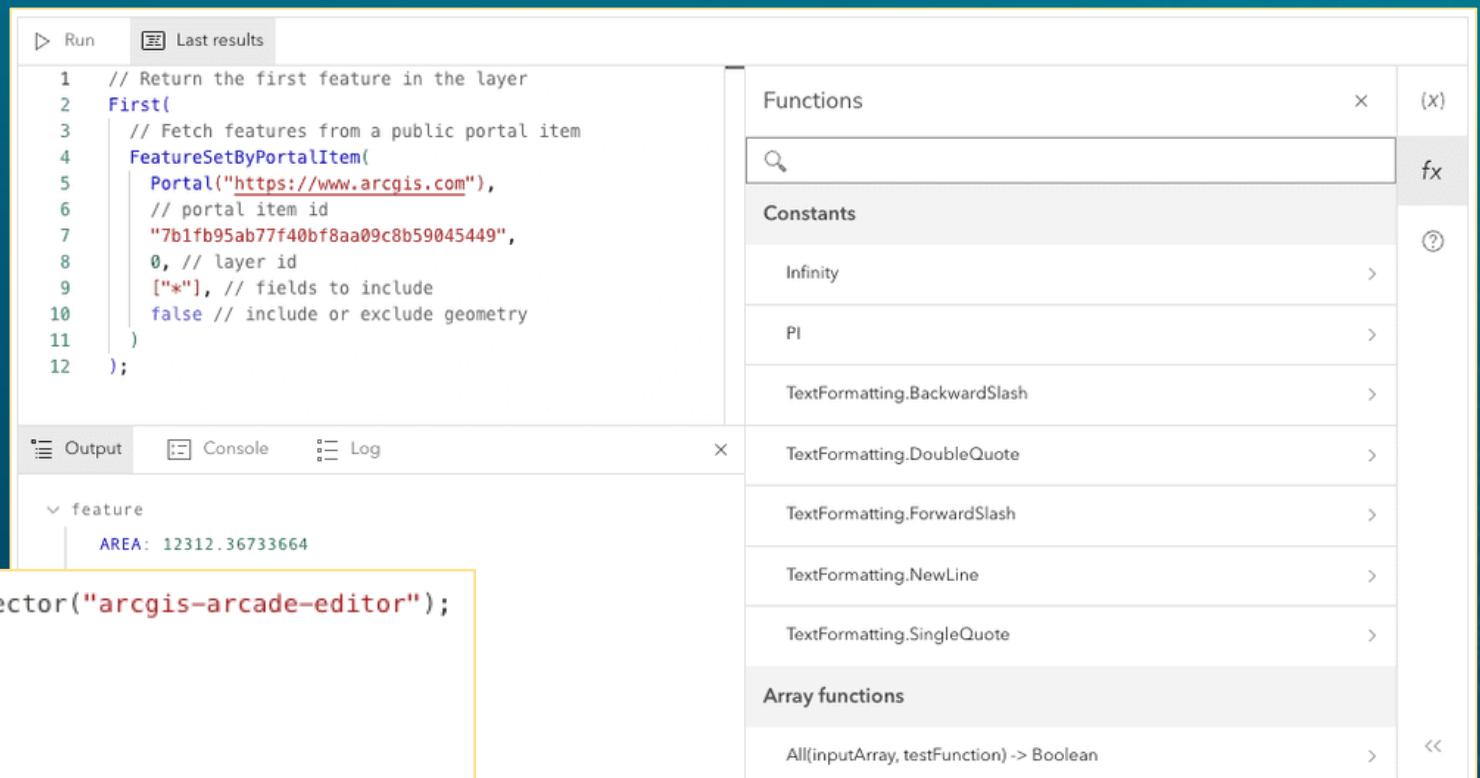
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Arcade Editor Web Component (beta)

Available in the [@arcgis/coding-components](#) package

- Use with existing profile OR create custom Arcade profile



The screenshot shows the ArcGIS Arcade Editor Web Component interface. On the left, there is a code editor window containing the following JavaScript code:

```
const arcadeEditorElement = document.querySelector("arcgis-arcade-editor");

arcadeEditorElement.profile = {
  id: "visualization",
  definitions: {
    $feature: aFeatureLayerInstance
  }
};
```

On the right, there is a sidebar with the following sections:

- Functions
- Constants
 - Infinity
 - PI
 - TextFormatting.BackwardSlash
 - TextFormatting.DoubleQuote
 - TextFormatting.ForwardSlash
 - TextFormatting.NewLine
 - TextFormatting.SingleQuote
- Array functions
 - All(inputArray, testFunction) -> Boolean

Resources

- Arcade documentation: <https://developers.arcgis.com/arcade>
- Using Arcade with the JavaScript SDK:
<https://developers.arcgis.com/javascript/latest/guide/arcade/>
- Arcade doc's resources page for quick links to blogs, samples, training, and videos:
<https://developers.arcgis.com/arcade/guide/resources>

This screenshot shows the 'Arcade' documentation page. It includes a sidebar with navigation links like 'Introduction', 'Where to use Arcade', and 'Why Arcade is useful'. The main content area has sections for 'Arcade' and 'How to write Arcade expressions', with a code editor at the bottom containing the following JavaScript:

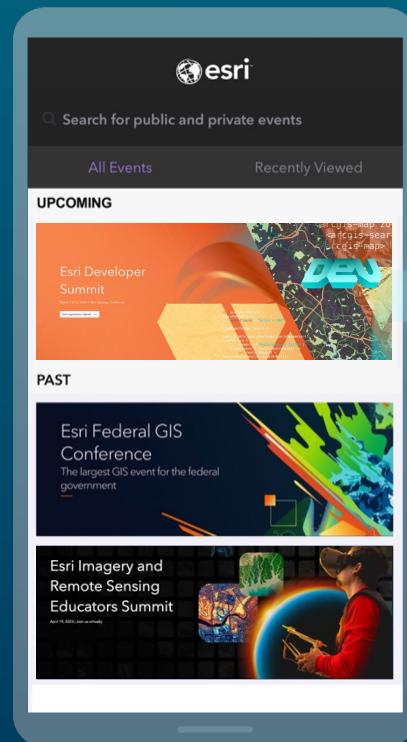
```
// returns the % of the population that is age 18 and older
render.valueExpression = "Round((feature.AGE_18P / feature.TOTAL_POP) * 100)";
```

This screenshot shows the 'Arcade' documentation page within the ArcGIS Maps SDK for JavaScript. It features a sidebar with links such as 'Overview', 'Get started', 'Labeling', and 'FAQ'. The main content includes sections for 'What is Arcade?' and 'How to write Arcade expressions', along with a code editor showing the same ArcGIS Arcade expression as the previous screenshot.

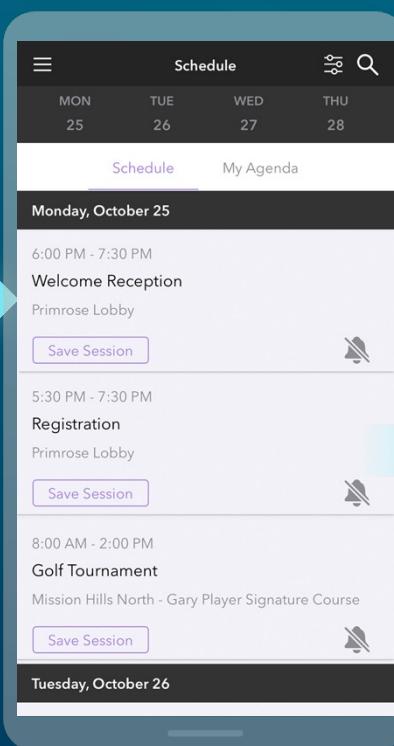
This screenshot shows the 'Resources' page for Arcade. It lists various links under categories like 'ArcGIS Online', 'ArcGIS Maps SDK for JavaScript', and 'Arcade Templates'. It also includes sections for 'Examples' (with a link to 'Arcade blog articles') and 'Blogs' (with a link to 'Arcade blog posts'). A sidebar on the right provides links to 'Arcade editor', 'Training', and 'Arcade Academy'.

Please Share Your Feedback in the App

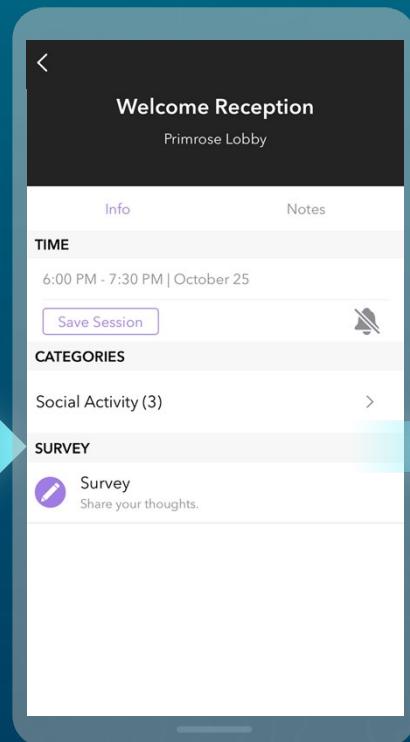
Download the Esri Events app and find your event



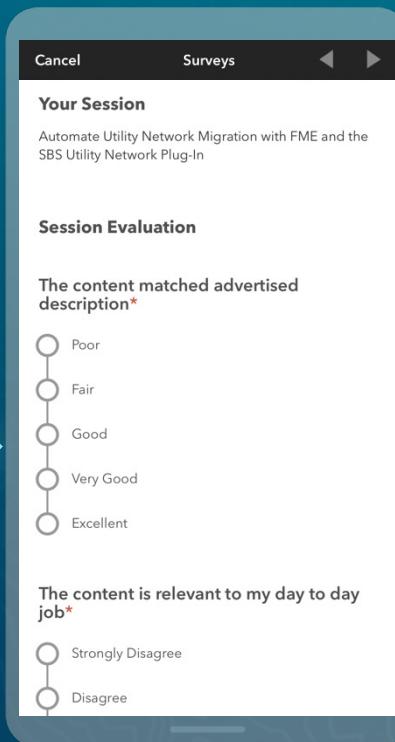
Select the session you attended



Scroll down to "Survey"



Log in to access the survey



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  }  
});
```

```
// show the compass and pass the  
mapRotation state data  
Compass(rotation = mapRotation)  
    // reset the ComposableMapView's viewpoint  
rotation to point north using the  
mapViewModel  
    mapViewModel.setViewpointRotation(0.0)  
}
```



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```
const layerList = new LayerList({  
    view: view  
});  
  
// Add widget to the top right corner  
// of the view  
view.ui.add(layerList, "top-right")  
  
<arcgis-map zoom="4" center="-118,34"
```