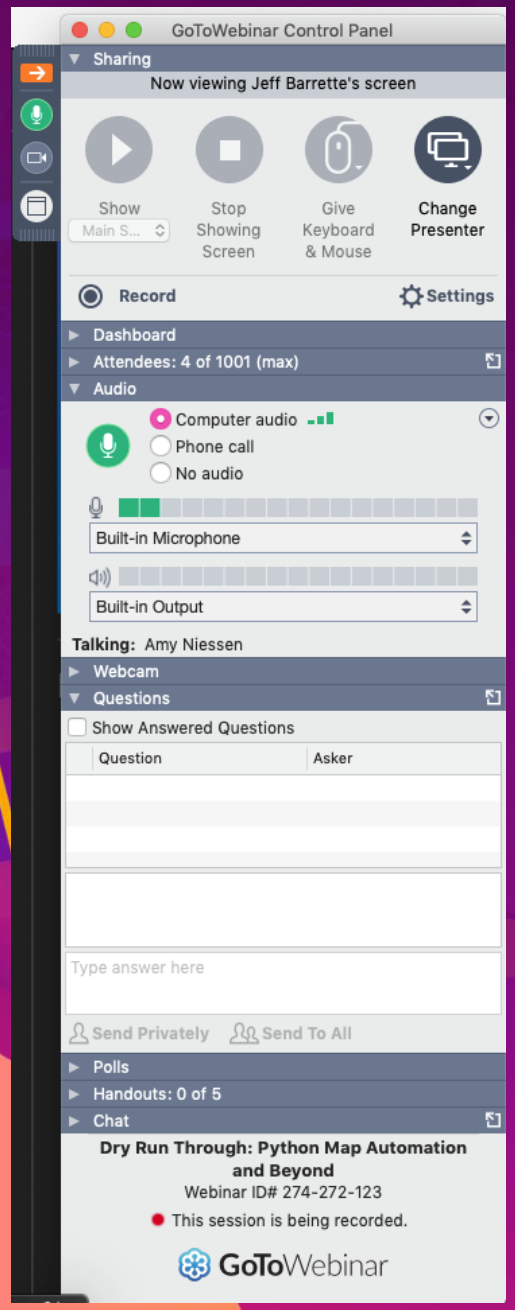
Working with custom JavaScript functions

in ArcGIS Survey123 Forms

We will start shortly…

Ismael Chivite

Travis Butcher



Before we start…

Working with custom JavaScript functions

in ArcGIS Survey123 Forms

Ismael Chivite

Travis Butcher

Agenda

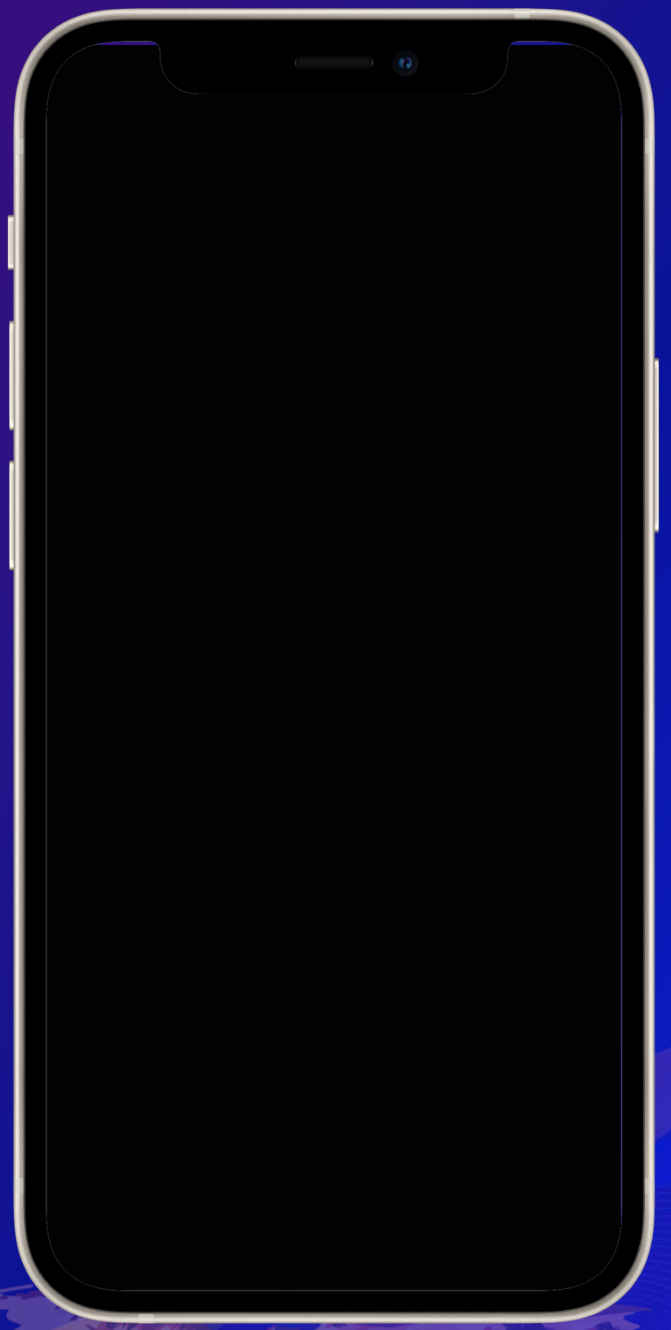
- **The Basics, by Ismael Chivite (20 minutes)**
  - Why should you care about custom JS functions in Survey123?
  - How to work with custom JS functions
  - Demonstration
  - Limitations
- **Advanced topics, by Travis Butcher (20 minutes)**
  - Getting serious with webpack
  - Demonstration
- **Where to learn more**
- **Live Q&A**

Why JavaScript functions in ArcGIS Survey123?

- **Complement XLSForm expression syntax**
- **Use in calculation, constraint and relevant expressions**
  - Working with data in feature services
  - Spatial analysis
  - Work with values across repeats
  - Access third-party APIs
  - Build complex calculations
  - Parse complex data structures
  - Data validation rules and constraints
- **Supported in the Survey123 field app and web app**

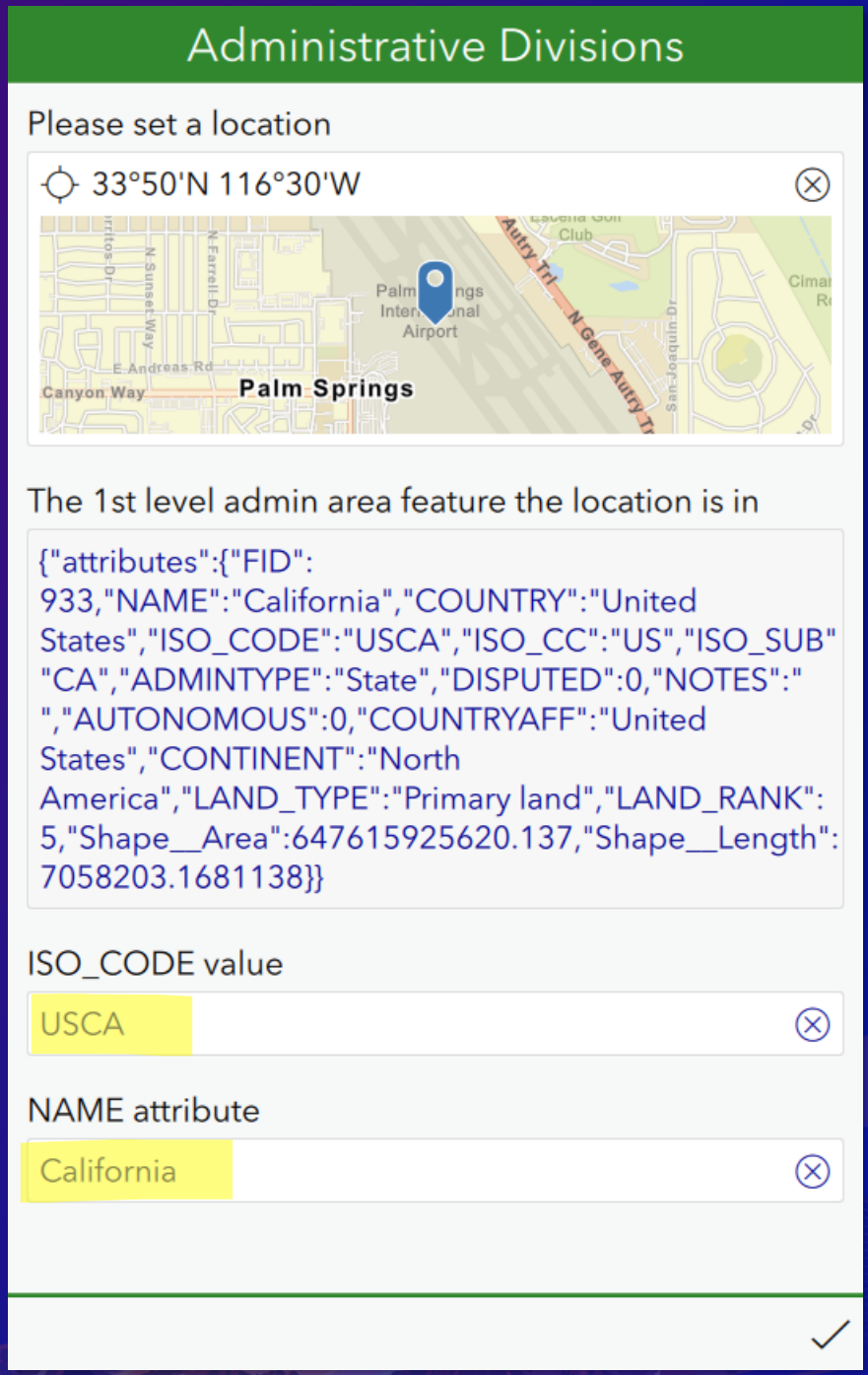
Work with third-party APIs

```
// Query the Open Weather API: https://openweathermap.org/api
function runWeatherCalcs(lat, lon, key){
    // Check to make sure we have latitude, longitude and an API key
    if (lat == null || lon == null || key == null) {
        return "";
    }

    // Create the request object
    var xmlhttp = new XMLHttpRequest();
    // Format the URL with the input parameters
    let lat_param = `lat=${lat}`;
    let lon_param = `lon=${lon}`;
    let key_param = `APPID=${key}`;
    let format_param = 'format=json';
    let units_param = `units=imperial`
    let parameters = [lat_param,lon_param,key_param,format_param,units_param].join("&")
    var url = `https://api.openweathermap.org/data/2.5/weather?${parameters}`;

    // Make the request
    xmlhttp.open("GET",url,false);
    xmlhttp.send();

    // Check the response. 200 indicates success from the API
    if (xmlhttp.status!=200){
        return null;
    } else {
        // Check the information in the response for an error
        var responseJSON=JSON.parse(xmlhttp.responseText)
        if (responseJSON.error){
            return responseJSON.error;
        } else {
            if (responseJSON){
                return JSON.stringify(responseJSON);
            }
            else {
```



Work with a feature service

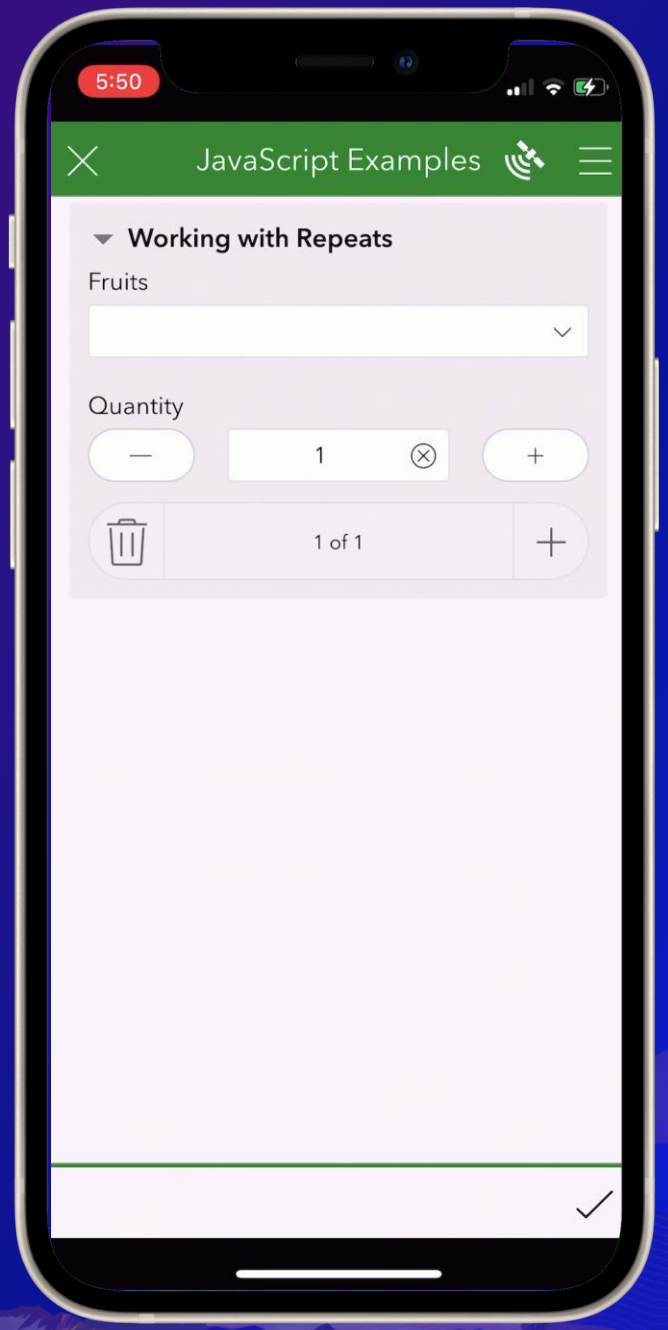
```
// Query a feature layer and returns the feature that intersects the location
function featureByLocation(layerURL, location, token) {
    // Output value.  Initially set to an empty string (XLSForm null)
    let outValue = "";

    // Check to make sure both layerURL and location are provided
    if (layerURL == null || layerURL === "" || location == null || location === "") {
        // The function can't go forward; exit with the empty value
        return location;
    }

    // The coordinates will come in as `<lat> <lon> <alt> <acc>`.
    // We need <lon>,<lat> for the query
    // Note that I'm using the relatively new ` ` string that lets me place variables ${var}
    let coordsArray = location.split(" ");
    let coords = `${coordsArray[1]},${coordsArray[0]}`;


    // Set up query parameters
    let f = "f=json";
    let geometry = `geometry=${coords}`;
    let geometryType = "geometryType=esriGeometryPoint";
    let inSR = "inSR=4326";
    let spatialRel = "spatialRel=esriSpatialRelIntersects";
    let outFields = "outFields=*";
    let returnGeometry = "returnGeometry=false";
    let returnCount = "returnCount=1";
    let parameters = [f,geometry,geometryType,inSR,spatialRel,outFields,returnGeometry,returnC
    if (token) {
        parameters = parameters + `&token=${token}`;
    }
    let url = `${layerURL}/query?${parameters}`;

    // Create the request object
    let xhr = new XMLHttpRequest();
```



Work with repeats

```
function HasDups (myArray) {
   return new Set(myArray).size !== myArray.length;
}
```

type	name	label	relevant
begin repeat	fruits	Working with Repeats	
select_one fruits	fruit	Fruits	
decimal	qty	Quantity	
end repeat			
note		Fruits repeated	pulldata("@javascript", "JS.js", "HasDups", ${fruit})



JavaScript functions in ArcGIS Survey123

- Use the pulldata("@javascript") function to execute JavaScript
- Often used in conjunction with pulldata("@json")
- Scripts tab in Connect for managing JS files
- JavaScript files live in the scripts survey folder

JavaScript pulldata() function in XLSForm

Execute a JavaScript function

Function name

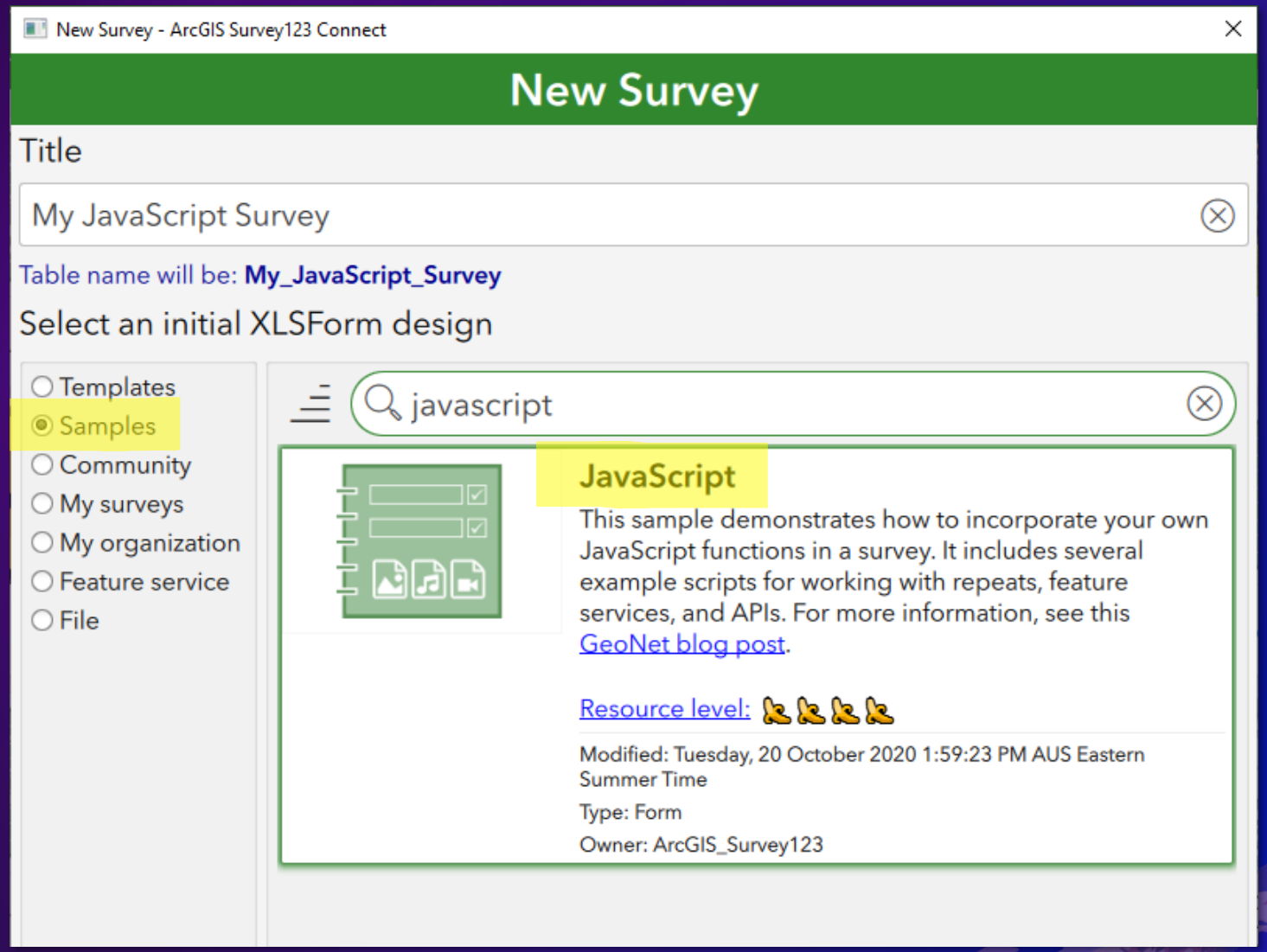
Function parameter

```
pulldata("@javascript","yourJSFile.js","yourFunction",${parameter1},"parameter2")
```

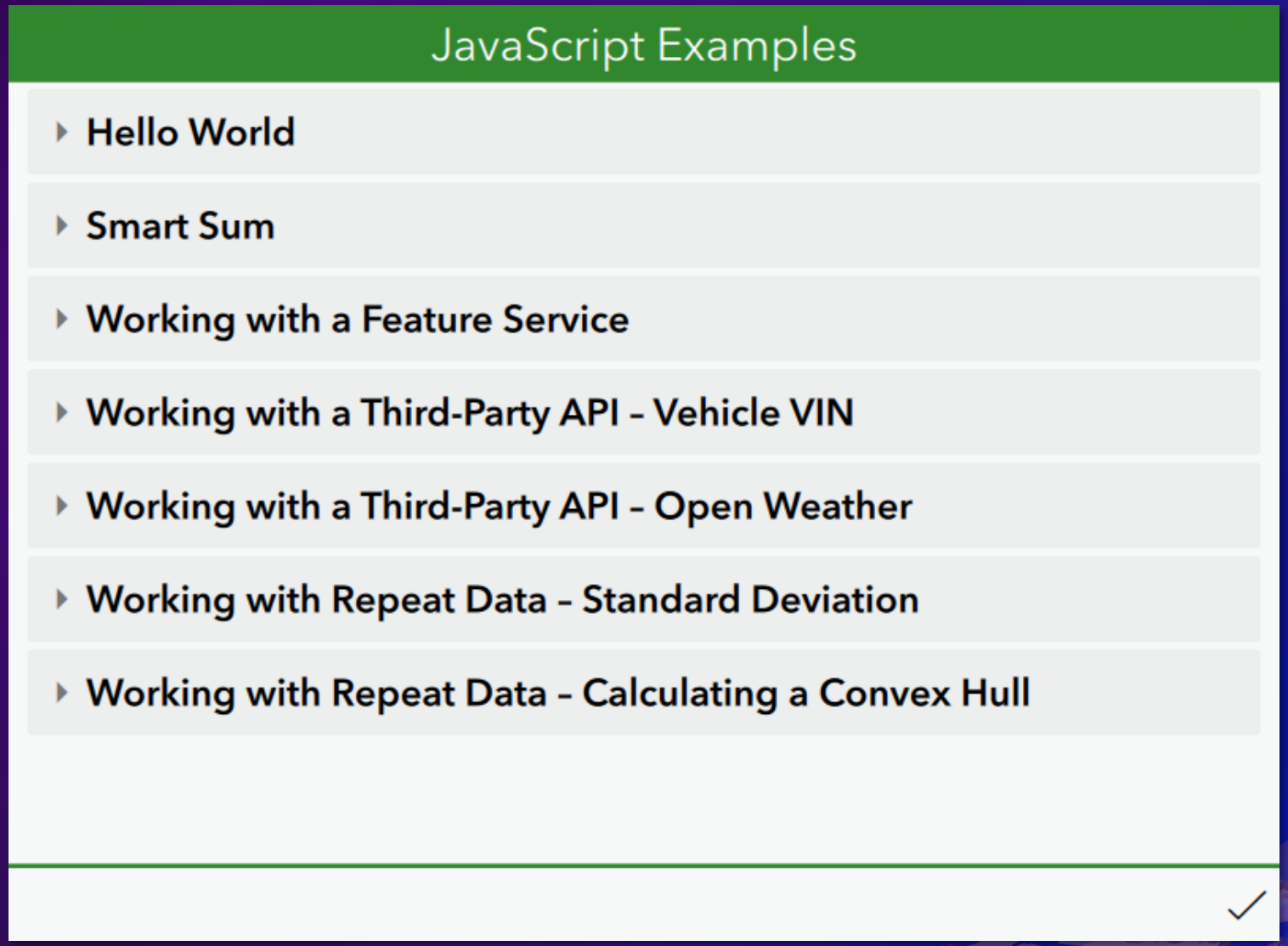
JavaScript file name

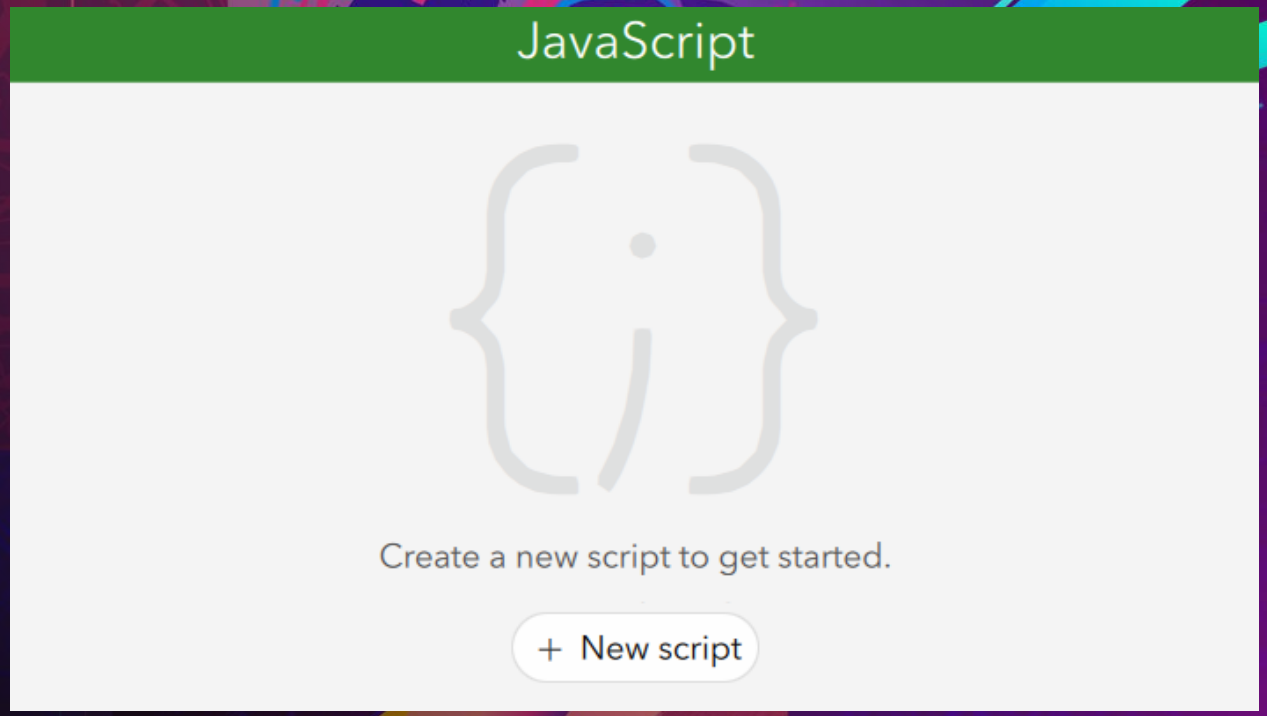
Function parameter

XLSForm sample in Connect



XLSForm sample in Connect





JavaScript functions

Limitations

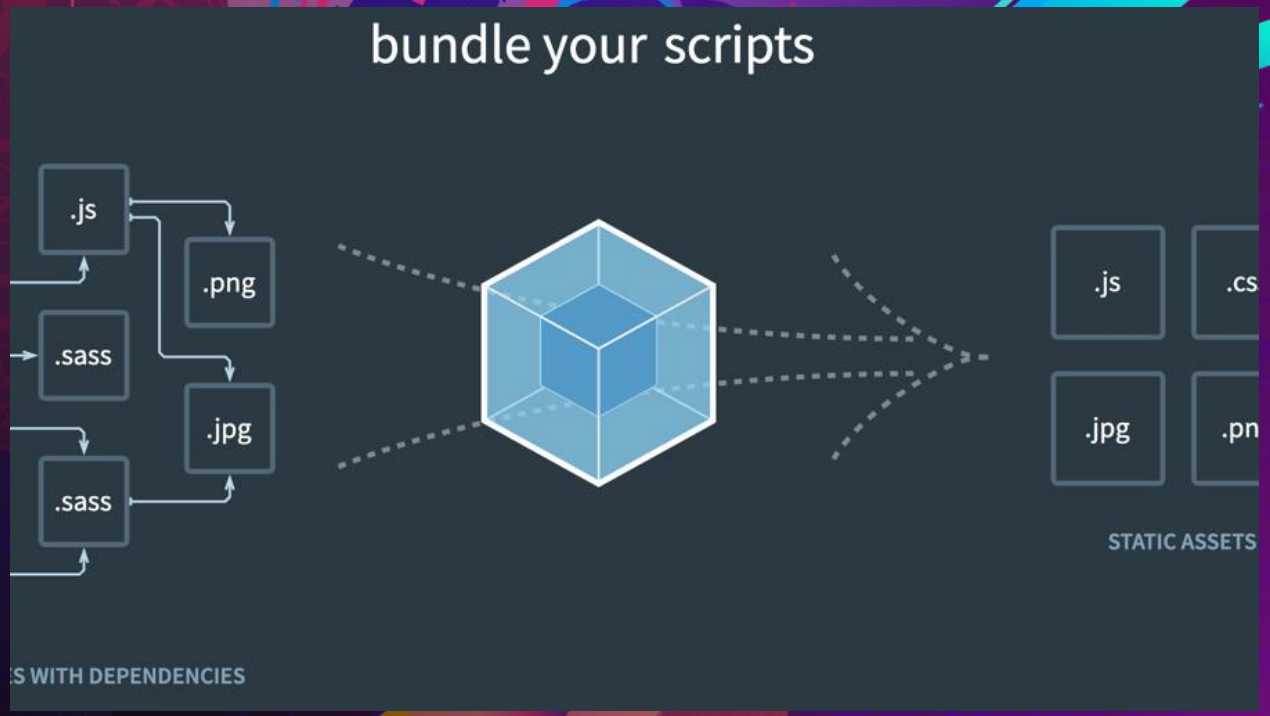
- JavaScript functions are not supported in public surveys
- Signed in users must be members of the same organization as the survey’s author
- You cannot access local files
- Asynchronous calls are not supported
- Document Object Model (DOM) is not supported
- Frameworks such as JQuery, Ember, and Angular are not supported
- A pulldata("@javascript") function cannot be called inside a pulldata("@json") function in the Survey123 web app

Learn more (The Basics)

- **Esri Community blog post:**
  - Extending Survey123 smart forms with custom JS functions
- **Documentation:**
  - JavaScript functions in survey forms
- **JavaScript XLSForm sample in Survey123 Connect**

Agenda

- The Basics, by Ismael Chivite (20 minutes)
  - Why should you care about custom JS functions in Survey123?
  - Common uses – with examples!
  - Demonstration
  - Limitations
- Advanced topics, by Travis Butcher (20 minutes)
  - Getting serious with webpack
- Where to learn more
- Live Q&A

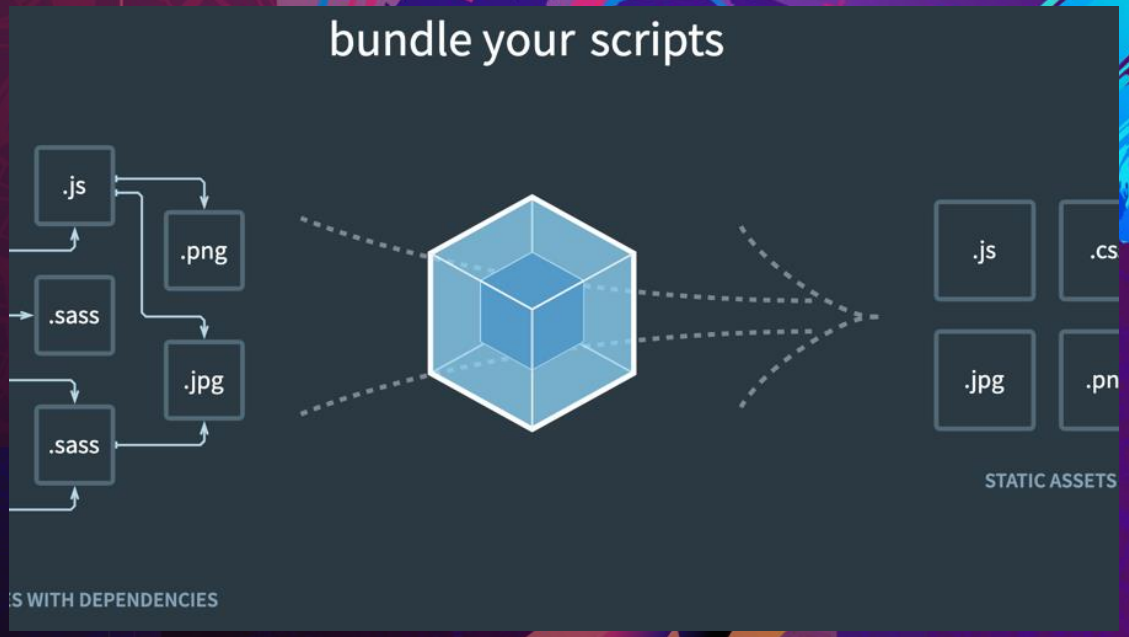


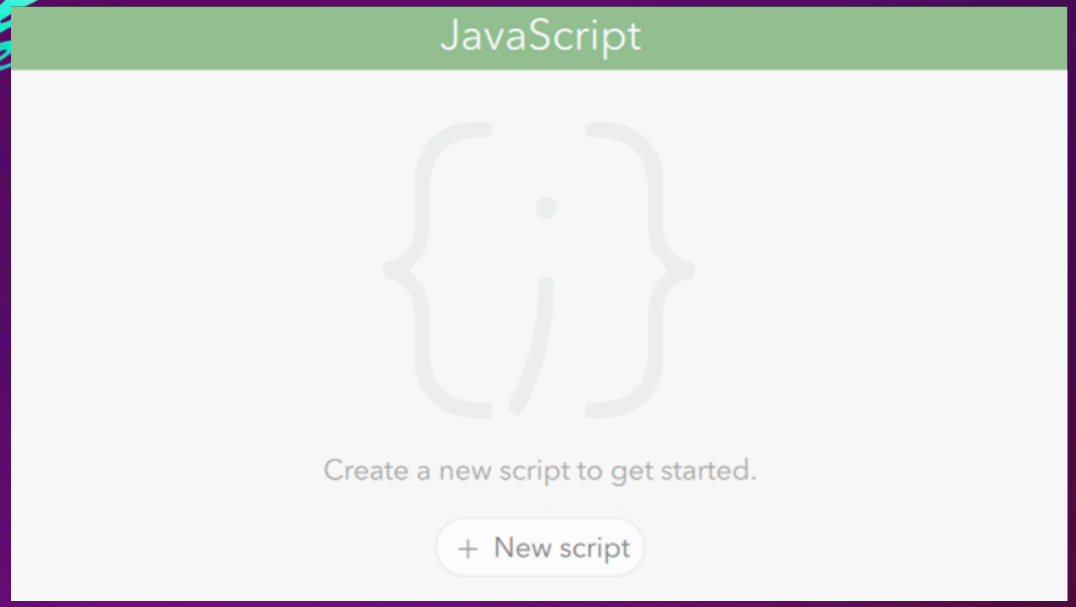
JavaScript functions with Webpack

Getting serious with webpack

JavaScript functions in ArcGIS Survey123 with Webpack

- Use third party libraries not included JavaScript
- Bundles function to single library to include with form
- Allows to store functions separately and reuse across multiple form easily





Demo: Survey123 with Webpack

Learn more (Advanced)

- **GitHub Repository**
  - https://github.com/EsriPS/survey123-webpack
- **Developer Tech Session**
  - https://www.youtube.com/watch?v=iahSB3P4q1A
- **WebPack**
  - https://webpack.js.org/

Live Q&A

Ismael Chivite

Travis Butcher