SWIFT – will not do, need apple ios to make interesting presentation

Rust – to advanced

Go - <https://golang.org/> video on that page

Network applications live and die by concurrency, and Go's native concurrency features -- [goroutines](http://www.infoworld.com/article/2683845/google-go/164121-Fast-guide-to-Go-programming.html#slide7) and [channels](http://www.infoworld.com/article/2683845/google-go/164121-Fast-guide-to-Go-programming.html#slide8), mainly -- are well suited for such work. Consequently, many Go projects are for networking, distributed functions, or services: [APIs](https://github.com/mongolar/mongolar), [Web servers](https://github.com/mholt/caddy), [minimal frameworks for Web applications](http://go-bootstrap.io/), and the rest.

Go programmers like that the items they use most in such projects are either a part of the language, such as goroutines for threadlike behavior, or available in the standard library like Go's [http package](http://golang.org/pkg/net/http/).

HTML5 - <https://www.w3schools.com> good place to start has a your try these sections, make sure to have students create their own HTML5 code and run it without the help of try this at w3schools

Focus on:

* HTML Geolocation
* HTML Drag and Drop
* HTML Canvas/SVG
* HTML Media/Video/Audio

You can just mention what these do:

* HTML Local Storage
* HTML Application Cache
* HTML Web Workers
* HTML SSE

C-IPC – there are a few existing presentations and examples on D2L under the content tab

Inter-Process communication (IPC)

* Forks
* Pipes
* Signals
* Message Queues
* Semaphores
* Shared Memory
* Sockets

Use the router

Scrapy

extracting the data you need from websites, webcrawer

Writing a [spider](https://doc.scrapy.org/en/latest/topics/spiders.html#topics-spiders) to crawl a site and extract data

Exporting the scraped data, find what you need

- Spiders

 - Selectors

 - Items

  - Items Loader

  - Shell

  - Item Pipeline

  - Feed Exports

  - Request & Responses

  - Link Extractors

  - Exception

VB

* Drag and drop, interacting with controls

XML/DOM w3school.com good place to start

* What is XML/DOM
* Giving information show them how they could put XML tags around the data
* Parse tree
* Before programming let them create tree on a piece of paper, let them figure out the tags to get to the text in the parse tree they want
* You will need to pick a language to support it, C#, C++, python, etc
* Programming:
  + Read in XML data from a file or Students might find it interesting to download XML data from the web
  + Grab tags and display the text in the tags within the XML data that you read in
  + Grab all of the tag with the same tag name
  + Grab all of the data inside of a tag, that have tags within them
  + Creating xml and outputting it
* W3schools – the idea is take advantage of their try it code, but then make sure students can write their own code outside of try it and then run it

DOM Introduction

DOM Nodes

DOM Accessing

DOM Node Info

DOM Node List

DOM Traversing

DOM Navigating

DOM Get Values

DOM Change Nodes

DOM Remove Nodes

DOM Replace Nodes

DOM Create Nodes

DOM Add Nodes

DOM Clone Nodes

DOM Examples

They should be able to solve problems like the following:

Create an XML file with the following data in it:

<?xml version="1.0" encoding="UTF-8" standalone="no"?>

<BookStore>

<Author>

<Name>George</Name>

<BookTitle>Happy Tuesday</BookTitle>

<Price> 12.25</Price>

<BookTitle>Happy Friday</BookTitle>

<Price> 15.50</Price>

<BookTitle>Fall Projects</BookTitle>

<Price> 19.95</Price>

</Author>

<Author>

<Name>Betty</Name>

<BookTitle>Summer Activities</BookTitle>

<Price> 11.50</Price>

</Author>

<Author>

<Name>Henry</Name>

<BookTitle>Baseball Greats</BookTitle>

<Price> 11.50</Price>

<BookTitle>Soccer SuperStars</BookTitle>

<Price> 19.95</Price>

</Author>

</BookStore>

Using XML/DOM your program should print out like the following:

The Root element tag is: BookStore

There is a total of 3 authors in this XML file

The Name of author Number 1 is: George

This author wrote 3 books. The books are:

Happy Tuesday

Happy Friday

Fall Projects

The Name of author Number 2 is: Betty

This author wrote 1 books. The books are:

Summer Activities

The Name of author Number 3 is: Henry

This author wrote 2 books. The books are:

Baseball Greats

Soccer SuperStars

JavaScript/HTML/Debugger could do a little CSS but keep to a minimum

HTML – what is it, w2schools has nice easy examples (good site to use)

Let the students program some basic stuff Basic Tags:

Headings

Title

Paragraph

Body

Table

Image

Link

Lists

Button

line break (pre tag)

div tag

forms/input

radio buttons

drop down list/datalist

text area

check box

JavaScript - Can Change HTML Content, <https://www.w3schools.com/js/>

*USE THE TRY IT YOURSELF on this site*

JS HOME: use the site’s try it option

JS Introduction (just mention that onclick is an event, more about this later)

JS Where To

JS Output

Go through the below quickly, let them give it a try on the site:

JS Statements

JS Syntax

JS Comments

JS Variables

JS Operators

JS Arithmetic

JS Assignment

JS Data Types

JS Functions

JS Objects

JS Scope – review global

JS Events

JS Strings

Take a break from the website and do the below

* give them a simple JavaScript programs and show them

how to run it (stop using the try it on the website), let them actually do it themselves.

* give them a problem to solving using the information they learned above and let them write it in JavaScript and run it

--------------------------------------------------------------------------------------------------------------

Go through the below quickly, let them give it a try on the site:

JS String Methods

JS Numbers

JS Number Methods

JS Arrays

JS Array Methods

JS Array Sort

JS Dates

JS Date Formats

JS Date Get Methods

JS Date Set Methods

JS Math

JS Random

JS Booleans

JS Comparisons

JS Conditions

JS Switch

JS Loop For

JS Loop While

JS Break

JS Type Conversion

JS Bitwise

JS RegExp

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in JavaScript and run it

--------------------------------------------------------------------------------------------------------------

Go through the below quickly, let them give it a try on the site:

JS Errors

JS Debugging

Slow down and take your time, use the website:

JS Forms

Forms API

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and write let them write it in JavaScript and run it
* give them ANOTHER problem to solving using the information they learned above and write let them write it in JavaScript and run it

--------------------------------------------------------------------------------------------------------------

JS Objects go through the below quickly, let them give it a try on the site:

Object Methods

Object Constructors

Object Prototypes

JS Functions go through these using the site, try this:

Function Definitions

Function Parameters

Function Invocation

Function Call

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and write let them write it in JavaScript and run it

Debugger – Firefox developer tool https://developer.mozilla.org/en-US/docs/Tools/Debugger

Php

Make sure that you integrate JavaScript, html and php together

Start simple just HTML and Php

Integrate JavaScript use functions

Variable scope

Start with some basic stuff filling out a form with 3 or 4 items on it and making sure that you can store the input in variables, put the value back to the screen

Usually filling out a form and putting the data in variables and validating the data is a good example

Help them create a form and capture data and based on the input from the user let different things happen on the page

Let the students create their own forms

*USE THE TRY IT YOURSELF on this site* [*https://www.w3schools.com/pHP/default.asp*](https://www.w3schools.com/pHP/default.asp), *USE THE TRY IT YOURSELF on this site*

PHP HOME use the site’s try it option

PHP Intro

What Can PHP Do? Just discuss/overview

* PHP can generate dynamic page content
* PHP can create, open, read, write, delete, and close files on the server
* PHP can collect form data
* PHP can send and receive cookies
* PHP can add, delete, modify data in your database (do not cover this, you will get an opportunity in DB class)
* PHP can be used to control user-access
* PHP can encrypt data

Go through the below quickly, let them give it a try on the site:

PHP Syntax

PHP Variables

PHP Echo / Print

PHP Data Types

PHP Strings

PHP Constants

PHP Operators

PHP If...Else...Elseif

PHP Switch

PHP While Loops

PHP For Loops

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

--------------------------------------------------------------------------------------------------------------

PHP Functions – use website

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

--------------------------------------------------------------------------------------------------------------

PHP Arrays – use website

PHP Sorting Arrays – use website

PHP Superglobals – use website

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

--------------------------------------------------------------------------------------------------------------

FORMS ARE VERY IMPORTANT SO SLOW DOWN FOR THESE

PHP Forms – use website

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

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PHP Form Handling – use website

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

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PHP Form Validation – use website

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

--------------------------------------------------------------------------------------------------------------

PHP Form Required – use website

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

--------------------------------------------------------------------------------------------------------------

PHP Form URL/E-mail – use website

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

--------------------------------------------------------------------------------------------------------------

PHP Form Complete – use website

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

--------------------------------------------------------------------------------------------------------------

File I/O – use the site

PHP File Handling

PHP File Open/Read

PHP File Create/Write

PHP File Upload

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

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Php other stuff – use the site

PHP Cookies

PHP Sessions

PHP Filters

PHP Error Handling

PHP Exception

Take a break from the website and do the below

* give them a problem to solving using the information they learned above and let them write it in PHP and run it

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C# - Jacob Rae & Jessica Silverstein

* Drag and drop, interacting with controls - Forms
  + Form Properties
  + C# Toolbox
  + Drag & Drop Operations
  + Table Layout
  + Column & Row Styles
  + Adding Controls to your Form
  + DEMO #3 Changing Flow Layout
  + Adding code to make Buttons work
  + Background Button Method
* Getting started with C#
  + What is C#? / History of C#
  + Language Features
  + Disadvantages
  + Where C# is just different from C++
  + C# Characteristics
  + Types of problems you can solve with C#
  + Popularity / Professional Use
  + Design Goals
* The .NET Framework
  + What is .NET VS.NET
  + ASP.net
  + Windows Forms
  + ADO.net
  + Base Class Library
  + Common Language Runtime
  + CLR Execution Model
* Understanding your IDE
  + Creating a C# Project in Visual Studio
  + DEMO #1: Hello World Example
* Understanding C# the Basics
  + Understanding the changes in syntax from C++.
  + Value Types / Reference Types Example
  + Classes and Structs Example
  + Interfaces Example
  + Enums
  + Delegates
  + Unified Type System. Everything is an Object!
  + Understanding Properties, Natural Syntax, Assessors and Inlining.
  + Events / Event Handlers
  + DEMO #2. Creating an Event Handler
* What is a Web Service? And how does it work.
  + HTML vs XML
  + Web Services with .NET
  + DEMO #4 Attributes / Create a web service by using WebMethod attribute.
  + DEMO #5 Comments. Show how the compiler can auto generate documentation from the source code using XML comments.
  + Statements & Expressions. Example.
  + Parameter Arrays
  + Operator Overloading
  + Versioning
  + Conditional Compilation
* Unsafe Code
  + How to declare code unsafe when working with low level code in C#
  + COM support
  + DEMO #6 Call a COM component from C#
* Putting it all together
  + Visual Studio .NET
  + DEMO #7 Windows Program with C# example.
* Conclusion
  + Review with Candy for correct answers! Everyone loves candy right?

Scala

Both function and object-oriented language

Functions and Methods

Classes, Objects, and Case Classes

Functional Language – some examples like we did in Lisp

Show integration with java

Regular Expressions (quickly)

Superclasses, subclass, mix

Generics

Inner Classes