VGD2 | LESSON 5.4

Basic JavaScript Syntax

TOPIC 1: WHAT'S THE DEAL WITH GRAMMAR POLICE?

Most of us hate grammar. And most of us hate grammar because it has to do with the rules of writing. We just want to write the way we want to write. And we don't like for people to tell us how to write. But there is a really good reason that grammar exists. A good reason that teachers try to teach good writing.

1. THEY'RE = THEY ARE
2. THEIR = SHOWS POSSESSION
3. THERE = SPECIFIES A LOCATION
4. YOU'RE = YOU ARE
5. YOUR = SHOWS POSSESSION
6. IT'S = IT IS
7. ITS = SHOWS POSSESSION
8. WE'RE = WE ARE
9. WERE = PAST TENSE OF 'ARE'
10. WHERE = SPECIFIES A LOCATION
11. LOOSE = NOT FIXED IN PLACE
12. LOSE = CEASE TO KEEP
13. AFFECT = ACTION
14. EFFECT = A RESULT
15. COULD'VE = COULD HAVE

Can you think of ONE grammar rule that EVERYONE follows?

If you have something that you want to communicate with someone, but you write in a way that makes no sense, the person you're trying to communicate with will not understand. So to some extent, you already follow a few rules. You put spaces between your words. You put periods at the end of sentences. You capitalize the beginning of sentences. You might not do this all the time, but you do it most of the

time because you realize that if you don't, the person reading will have a harder time understanding your message.

Grammar is a set of basic rules about how to write properly so that most readers can understand what we are trying to say. And in the same way, the word *syntax* has to do with the basic rules of how to write a proper code, depending on the language. You could also say that syntax is the proper arrangement of letters, words, and symbols that you might see within a specific coding language. Syntax might include brackets, slashes, equal signs, quotation marks, or even colons and semicolons. But like grammar, syntax might also include the words, the letters, and the numbers in a code. See the examples below.

```
<body>
<h2>A Header</h2>
<p>This is a paragraph with one sentence.</p>
</body>
```

```
<body<
<2h>A Header<\h2>
<p>This is a paragraph with one sentence.</p>
/bdy>
```

TOPIC 2: THE CODES AND THE CODEBREAKERS

During World War II, the Germans created a machine called the Enigma, which could send messages coded as ciphertext. These were messages hidden inside of a complicated filler text.

After the Germans set up the Enigma and were able to successfully move their armies around Europe, other nations at war with Germany started looking for ways to fight back. So governments began to hire some of the most brilliant minds in some of the best schools. In Great Britain, for example, the government created a secret location called Bletchley Park, where they hired math experts, historians, and even a couple of chess champions to work as a team to break codes. But why would the government think that these kinds of people would be good at breaking a code?

Below is an example of the kinds of codes that the Bletchley Park codebreakers would crack.

1. **CIPHERTEXT (ORIGINAL MESSAGE)**
   TUKAQYYOOHVKJQTDVSBKRDDAZLOYXHRDEOZSPZOTBZMSBEIYASHHJKIMCZWYIKYJ OEWQHDZWFNOADOEIOYKAUWVFPMHSYNUGIKEVFGBBAYPCGOTYSEPLSXQHKZNB

2. **PLAINTEXT (TRANSLATED FROM CIPHER)**
   UMSUEDDREIYYVIEGINSCHAUERNBISFUENFWOLKIGVEREINZELTSCHAUERKKBEREICH DORABISEINSXFUENFXABENDSKKSICHTACHTYYZEHNSMSEEZWOYBDREIDBV

3. **INTERPRETATION (SPACED OUT AND TRANSLATED TO GERMAN)**
   Um Süd 3 – 4 in Schauern bis 5 wolkig vereinzelt Schauer "(Bereich Dora bis 1.5. Abends)" Sicht 8-10 Seemeilen Seegang 2-3 (DBV)

4. **FINAL TRANSLATION (IN ENGLISH)**
   [Wind from] around the south [force] 3 to 4 [with] showers, up to [force] 5 cloudy [with] isolated showers. (Area D up to evening of 1st May.) Visibility 8 to 10 nautical miles, sea state 2 to 3.

TOPIC 3: TRY IT YOURSELF

Now that you know about the Bletchley Park codebreakers, let's try a simple activity to see if you can break a similar ciphercode. Without getting any help from a neighbor or a team, see if you can crack the code. And write down the answer in the blanks below.

1. CIPHERTEXT (ORIGINAL MESSAGE)
VNOVEDOCVDNAVMLACVPEEKV

2. FINAL TRANSLATION (IN ENGLISH)

TOPIC 4: SYNTAX = GRAMMAR

In the end, syntax is only a fancy word for grammar. Most of the time, normal people just call grammar *grammar*. But since it would be a little strange to talk about grammar in a code, programmers and coders have adopted the word "syntax" as a way of describing the rules for each programming language. Syntax is the set of rules, like grammar, that help JavaScript (and other programming languages) run properly. On the next page, you will find some examples of good and bad syntax in HTML, CSS, and JavaScript.

HTML EXAMPLES:

<button>Click Here</button>

Good Syntax

<button>Click Here<button>

<button>Click Here</button

In HTML, the most common mistakes include forgetting to close a tag with a forward slash (/) or forgetting an angle bracket at the end of a tag. Other common mistakes include a mispelled word or no opening tag.

CSS EXAMPLES:

button { width:300px;background:red; }

Good Syntax

button { width300px;backgroundred; }

button widh:300px;backroud:red; }

In CSS, the most common mistakes include forgetting to open or close the curly brackets, forgetting to use colons and semicolons as a way of seperating parts of a style command, and mispelling words.

JAVASCRIPT EXAMPLES:

var z = x + y;

Good Syntax

var z = x + y

z = x + y;

In JavaScript, many of the same mistakes from HTML and CSS can show up again. For example, at the end of almost any JavaScript statement (like the one in green on the left), there should be a semi-colon that works like a period at the end of a sentence. Also, if you create a variable, you have to start with VAR.

TOPIC 5: BASIC JAVASCRIPT VOCABULARY

In just a couple of weeks, you will be asked to take a Quarter Quiz and this is where you will need to know a few basic ideas about JavaScript. For example, you will need to know that JavaScript depends on a skeleton/format language called HTML and a skin/style language called CSS. You will need to know that JavaScript controls the *behavior* of a web page. And you will need to know that "syntax" is a way of describing the proper way to write a programming language. All of those things are important and you will need to know them for the quiz, but you will also need to know some of the Basic JavaScript Vocabulary.

BASIC JAVASCRIPT VOCABULARY

JavaScript

JavaScript is an Object Oriented Programming Language. That means it's a language used to create objects and do things with those objects.

Variable

A variable (written as "var") is a container that stores a specific value. For example, if x = 3, x is the variable because it stores a value of 3.

Value

A value can either be a specific number, a series of numbers that have to be calculated, or something that will be provided later in the code.

Objects

In JavaScript, almost everything is an object because everything has a purpose. Think of objects as a collection of specific values.

Assignment

Variables are usually given assignments like y = 5 where "=" is the assignment operator. Assignments are like homework for variables.

Operators

Operators are the symbols used to assign, solve, compare certain values. They can be as simple as "+" (plus) or as weird as "!=" (not equal).

Method

Methods are the actions that can be performed on various objects and variables. They are written like myMethod(), dodge(), or fatCat().

String

A string is the series of characters (like letters, numbers, and symbols) inside quotes. For example, "I play games" is a string of text.

Characters

Every letter, number, symbol, or even space that takes up space in a document is called a Unicode character. I, t, $, and _ are all characters.

Syntax

Syntax is the set of rules, like grammar, that help JavaScript run properly. A sentence without a period is endless. JavaScript needs rules to work.

Statements

A statement in JavaScript is basically a single instruction that a web browser (Chrome, Firefox, etc) is supposed to do. It ends with a semicolon.

Semicolons

The semicolon is probably the *most* used kind of punctuation in JavaScript because it ends every statement. It looks like " ; " and is next to the L.

Array

Arrays are used to store multiple values within a single variable. For example, "var fruit = ["apple", "orange", "kiwi"];" is an array.

Functions

Functions are blocks of code (found inside { and } brackets) written to perform a specific task whenever asked, or called to do so.

Conditions

A condition is a statement (usually written with "if" or "else" or both) used to perform different actions that can be either true or false.

Events

An event is a "thing" that happens to an HTML element on a page. For example, if clicking on a button makes a box pop up, that was an event.

TOPIC 6: EIGHT FOR EIGHT

During today's design, you will be learning EIGHT of the basic JavaScript vocabulary words through practice. But before we get to the design, let's look at these EIGHT words a little more carefully:

CHARACTERS IN A CODE

Every letter, number, symbol, or even space that takes up space in a document is called a character. Below are all examples:

I	is one character
	is one character
r	is one character
e	is one character
a	is one character
d	is one character

Altogether, the characters make up a STRING of 6 total spaces ("I read")

STRINGS IN A CODE

A string is a series of characters inside of quotes. Below are all examples:

"Kerri turned 14 last week" (25 Character String)
"Do you want to meet after school?" (33 Character String)

SIX WORDS IN ONE

VARIABLE
A variable is a container that stores a specific value. For example, on the right, the variable "bakery" will always have a value of "12" because it was assigned that value and "bakery" now contains ONLY that value.

OPERATOR
Operators are the symbols used to assign, solve, or compare values.

VALUE
A value can either be a specific number, a series of numbers that have to be calculated, or something that will be provided later in the code.

SEMICOLON
The semicolon is probably the most used punctuation in JavaScript because it ends every statement.

```
var   bakery   =   12   ;
var   bakery   =   12   ;
```

ASSIGNMENT
Variables are usually given ASSIGNMENTS like this where "=" is the operator. Assignments are like homework for variables.

STATEMENT
In JavaScript, a STATEMENT is a single instruction that a web browser is supposed to know. And a statement always ends with a semicolon.