DWA_02.8 Knowledge Check_DWA2

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1. What do ES5, ES6 and ES2015 mean - and what are the differences between them?

Each programming language has its own standardised way of writing code. And JavaScript follows both ES5 and ES6 scripting language specification but when writing a JavaScript code using these standards, there are slight differences between ES5 and ES6.

ECMAScript 5 (ES5) which was released in 2009, is used to create dynamic web pages and is the basis of several programming languages, including JavaScript. It is a function contractors focused on how the objects are created. For ES5 you have to write a function keyword and return, to be used to define the function, like normal general JavaScript language.

ES6, also known as ES2015, was released in 2015 and introduced many new features such as let and const declarations, arrow functions, classes, modules, and template literals, and destructuring assignment.

Here are some differences between ES5 and ES6:

Variables - In ES5, there is a one way of defining variables using var keyword. But ES6 has introduced two more ways of defining variables using keywords let and const. However, let and const use block scope while var uses function scope. Also, the variables that are defined using const are immutable.

```
> //ES5
  var age = 20;
  //ES6
  let days = 5;
  const pi = 3; // immutable
```

Define Objects - ES6 provides an easy way to define objects when the keys and the variable names are the same.

```
> var fullName = 'John Moore';
  var age = 25;
  var gender = 'Male';
  var city = 'London'
  // ES5
  var student = { fullName: fullName, age: age, gender: gender, city: city };
  // ES6
  var student = { fullName, age, gender, city };
```

Object Destructuring - In ES5, Objects are extracted one by one manually. But ES6 has made it to one line of code.

```
> var student = { fullName: 'John Moore', age: 25, gender: 'Male', city: 'London' };
  //ES5
  var fullName = student.fullName;
  var age = student.age;
  var gender = student.gender;
  var city = student.city;
  //ES6
  var { fullName, age, gender, city } = student;
```

String Interpolation - In ES5, Concatenation operator is used to join strings. But ES6 has introduced Template Literal(`) which allows to perform the string interpolation in a convenient way.

```
> var fullName = 'Malebo Legodi';
  var age = 33;
  var gender = 'Female';
  var city = 'Johannesburg'
  //ES5
  var intro = 'Hello, I am ' + fullName + '. I am ' + age + ' years old ' + gender + '
  student from ' + city + '.';
  //ES6
  var intro = `Hello, I am ${fullName}. I am ${age} years old ${gender} student from
  ${city}.`;
```

Import Module - ES5 uses require keyword while ES6 uses import keyword. ES6 allows to import child modules as well.

```
> //ES5
  var App = require('./App');
  //ES6
  import App from './App';
  import { Header, Sticky } from '@primer/components'; //child modules
```

Export Module - ES6 allows to export child modules and variables as well.

```
> var Student = { fullName: 'John Moore', age: 25, gender: 'Male', city: 'London' };
  //ES5
  module.exports = Student;
  //ES6
  export default Student;
  export const fullName = 'John Moore'; //child variables
  export const age = 25;
```

Arrow Function - ES6 has introduced the arrow function. It does not require the keyword function.

```
> //ES5
  function sayHello(name) {
   console.log('Hello, ' + name);
  }
  //ES6
  const sayHello = (name) => {
   console.log(`Hello, ${name}`);
  }
  const sayHello = name => console.log(`Hello, ${name}`); //You can ignore parenthesis, if
  the function contains a single parameter and only one statement
```

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2. What are JScript, ActionScript and ECMAScript - and how do they relate to JavaScript?

- ECMAScript (ES) is a scripting language specification standardized by ECMA International. It is used to create dynamic web pages and is the basis of several programming languages, including JavaScript. ES versions have been abbreviated to ES1, ES2, ES3, ES5, and ES6. Since 2016, versions are named by year (ECMAScript 2016, 2017, 2018, 2019, 2020).
- JavaScript is a high-level programming language that conforms to the ECMAScript specification. It was developed by Netscape and first released in 1995. JavaScript is used primarily for creating interactive web pages and user interfaces.
- JScript is Microsoft's implementation of the ECMAScript specification. It was first released in 1996 and is used primarily for server-side scripting in Microsoft's Internet Information Services (IIS).
- ActionScript is a scripting language based on ECMAScript that is used primarily for creating interactive applications and video games in Adobe Flash Player.

In summary, ECMAScript is a standard for scripting languages that JavaScript, JScript, and ActionScript are all based on. JavaScript is the most widely used implementation of ECMAScript and is used primarily for creating interactive web pages. JScript is Microsoft's implementation of ECMAScript and is used primarily for server-side scripting in IIS. ActionScript is a scripting language based on ECMAScript that is used primarily for creating interactive applications and video games in Adobe Flash Player.

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3. What is an example of a JavaScript specification - and where can you find it?

An example of a JavaScript specification is the ECMA-262 specification. It is the most in-depth, detailed, and formalized information about JavaScript. It defines the language and is the most trustworthy source of information about the language details.

The latest version of the specification is ECMAScript 2023. You can find the latest draft of the specification at http://www.ecma-international.org/ecma-262/5.1/ECMA-262.pdf.

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4. What are v8, SpiderMonkey, Chakra and Tamarin? Do they run JavaScript differently?

- **V8** is a JavaScript compiler developed by Google for the Chrome browser. It compiles JavaScript code to machine code for faster execution.
- **SpiderMonkey** is a JavaScript compiler developed by Mozilla for the Firefox browser. It compiles JavaScript code to bytecode, which is then interpreted by the compiler.
- **Chakra** is a JavaScript compiler developed by Microsoft for the Edge browser. It compiles JavaScript code to bytecode, which is then interpreted by the compiler.
- **Tamarin** is a JavaScript compiler developed by Adobe for the Flash Player. It compiles ActionScript (a language based on ECMAScript) to bytecode, which is then interpreted by the compiler.

All of these compilers run JavaScript differently. They use different techniques to optimise and execute JavaScript code. For example, V8 compiles JavaScript code to machine code, while SpiderMonkey and Chakra compile it to bytecode. This difference in compilation can lead to differences in performance and memory usage between compilers.

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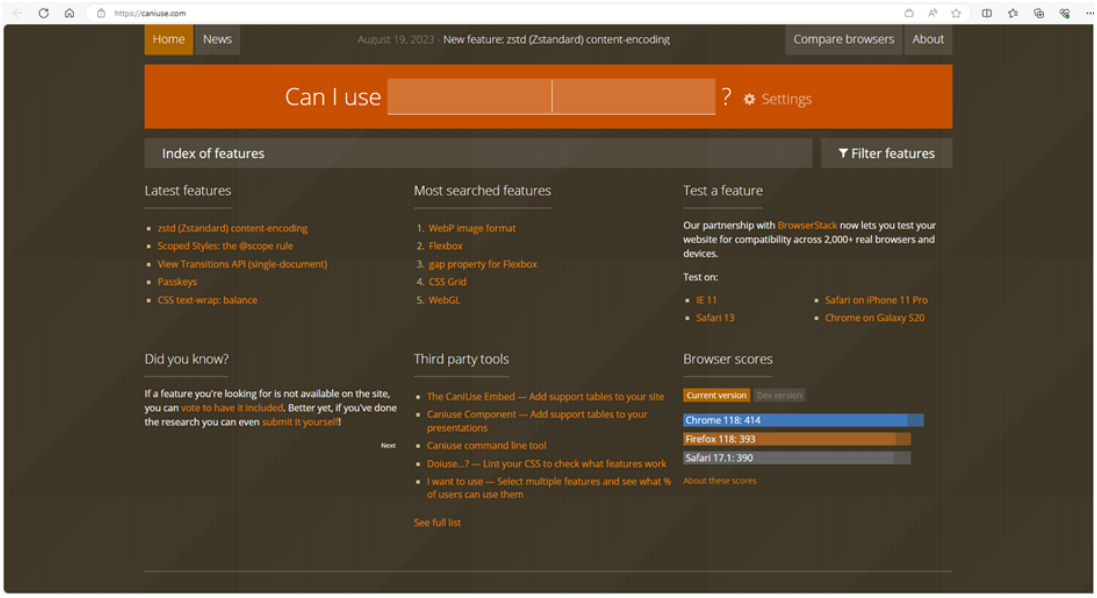
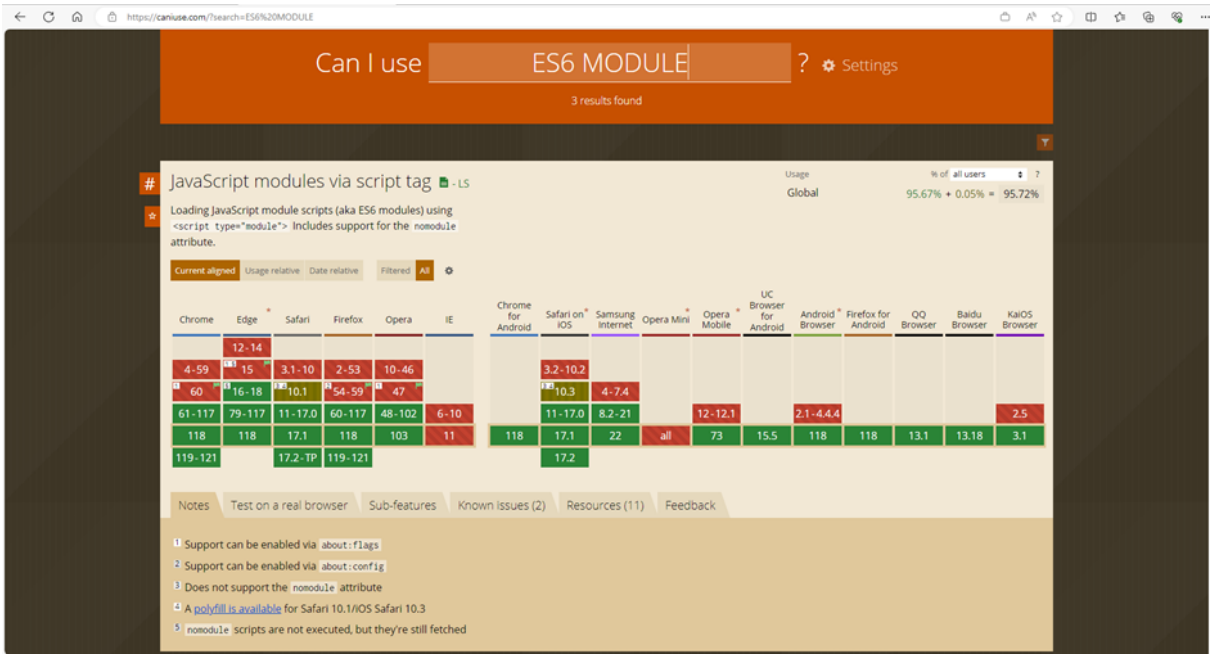
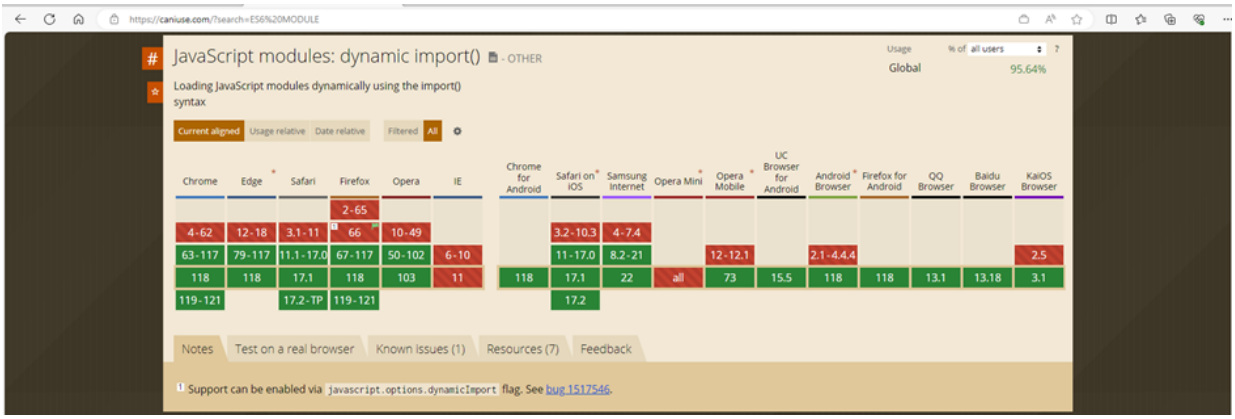
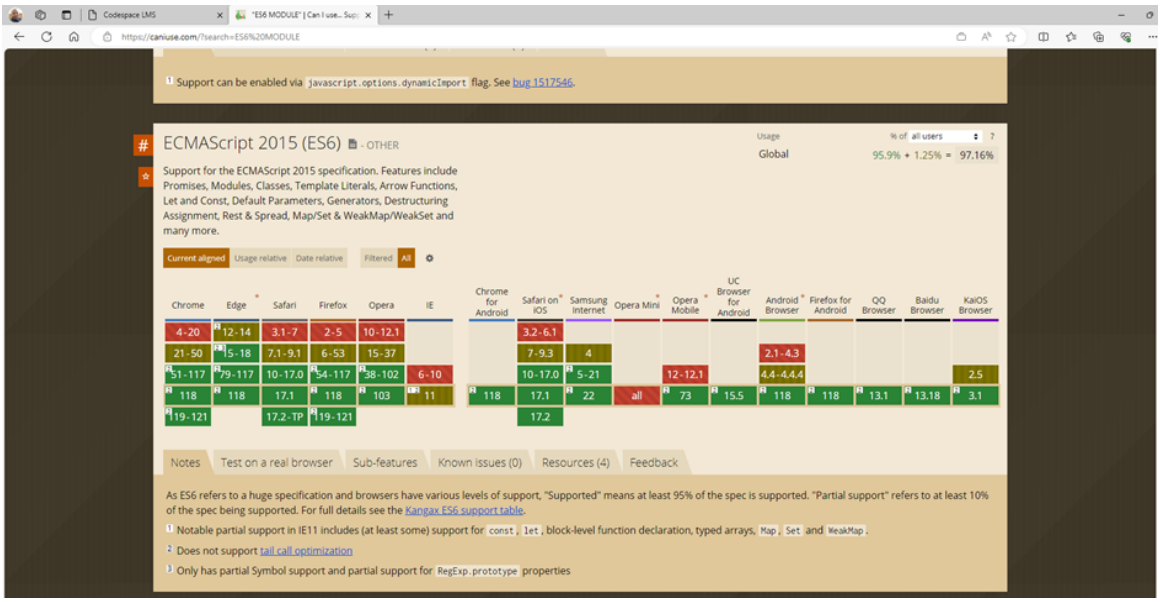
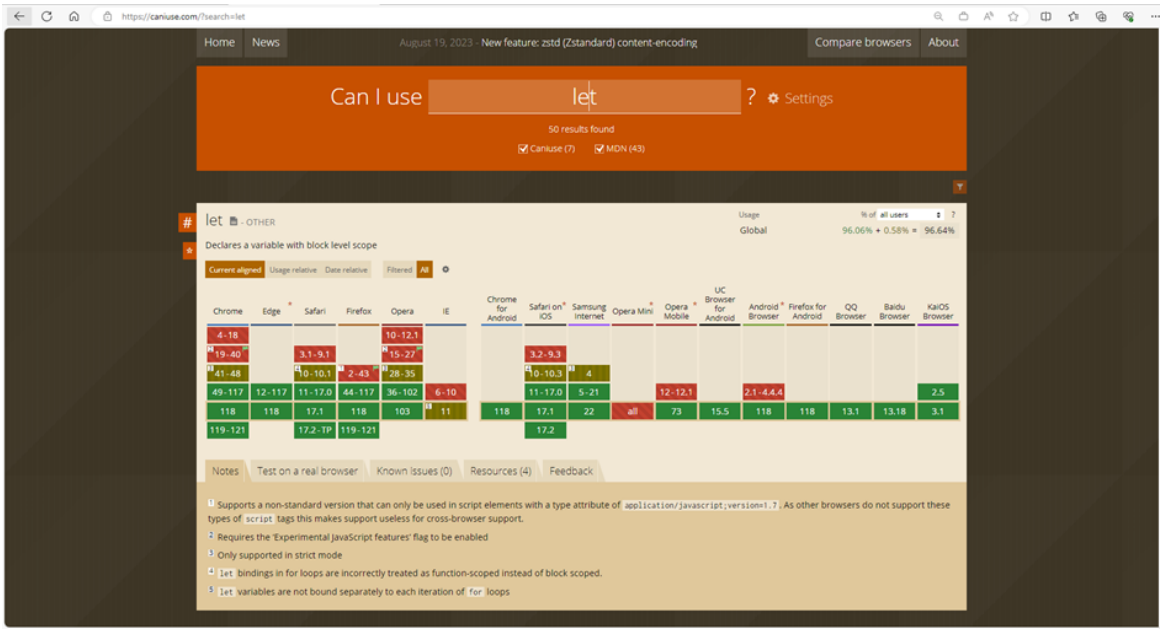
5. Show a practical example using caniuse.com and the MDN compatibility table.




https://caniuse.com/?search=ES6%20MODULE
Can I use ES6 MODULE ? Settings
3 results found
JavaScript modules via script tag - LS
Loading JavaScript module scripts (aka ES6 modules) using <script type="module"> Includes support for the nomodule attribute.
Usage
Global
% of all users
95.67% + 0.05% = 95.72%
Current aligned Usage relative Date relative Filtered All
Chrome Edge Safari Firefox Opera IE
Chrome for Android Safari on iOS Samsung Internet Opera Mini Opera Mobile UC Browser for Android Android Browser Firefox for Android QQ Browser Baidu Browser KaiOS Browser
Notes Test on a real browser Sub-features Known issues (2) Resources (11) Feedback
1 Support can be enabled via about:flags
2 Support can be enabled via about:config
3 Does not support the nomodule attribute
4 A polyfill is available for Safari 10.1/iOS Safari 10.3
5 nomodule scripts are not executed, but they're still fetched


https://caniuse.com/?search=ES6%20MODULE
JavaScript modules: dynamic import() - OTHER
Loading JavaScript modules dynamically using the import() syntax
Usage
Global
% of all users
95.64%
Current aligned Usage relative Date relative Filtered All
Chrome Edge Safari Firefox Opera IE
Chrome for Android Safari on iOS Samsung Internet Opera Mini Opera Mobile UC Browser for Android Android Browser Firefox for Android QQ Browser Baidu Browser KaiOS Browser
Notes Test on a real browser Known issues (1) Resources (7) Feedback
1 Support can be enabled via javascript.options.dynamicImport flag. See bug 1517546.


Codespace LMS
"ES6 MODULE" | Can I use... Sup
https://caniuse.com/?search=ES6%20MODULE
1 Support can be enabled via javascript.options.dynamicImport flag. See bug 1517546.
ECMAScript 2015 (ES6) - OTHER
Support for the ECMAScript 2015 specification. Features include Promises, Modules, Classes, Template Literals, Arrow Functions, Let and Const, Default Parameters, Generators, Destructuring Assignment, Rest & Spread, Map/Set & WeakMap/WeakSet and many more.
Usage
Global
% of all users
95.9% + 1.25% = 97.16%
Current aligned Usage relative Date relative Filtered All
Chrome Edge Safari Firefox Opera IE
Chrome for Android Safari on iOS Samsung Internet Opera Mini Opera Mobile UC Browser for Android Android Browser Firefox for Android QQ Browser Baidu Browser KaiOS Browser
Notes Test on a real browser Sub-features Known issues (0) Resources (4) Feedback
As ES6 refers to a huge specification and browsers have various levels of support, "Supported" means at least 95% of the spec is supported. "Partial support" refers to at least 10% of the spec being supported. For full details see the Kangax ES6 support table.
1 Notable partial support in IE11 includes (at least some) support for const, let, block-level function declaration, typed arrays, Map, Set and WeakMap.
2 Does not support tail call optimization
3 Only has partial Symbol support and partial support for RegExp.prototype properties


https://caniuse.com/?search=let
Home
News
August 19, 2023 · New feature: zstd (Zstandard) content-encoding
Compare browsers
About
Can I use
let
?
Settings
50 results found
Caniuse (7)
MDN (43)
let
OTHER
Declares a variable with block level scope
Usage
% of all users
Global
96.06% + 0.58% = 96.64%
Current aligned
Usage relative
Date relative
Filtered
All
Chrome
Edge
Safari
Firefox
Opera
IE
Chrome for Android
Safari on iOS
Samsung Internet
Opera Mini
Opera Mobile
UC Browser for Android
Android Browser
Firefox for Android
QQ Browser
Baidu Browser
KaiOS Browser
4-18
10-12.1
19-40
3.1-9.1
15-27
3.2-9.3
41-48
10-10.1
2-43
28-35
10-10.3
4
49-117
12-117
11-17.0
44-117
36-102
6-10
11-17.0
5-21
12-12.1
2.1-4.4.4
2.5
118
118
17.1
118
103
11
118
17.1
22
all
73
15.5
118
118
13.1
13.18
3.1
119-121
17.2-TP
119-121
17.2
Notes
Test on a real browser
Known issues (0)
Resources (4)
Feedback
1 Supports a non-standard version that can only be used in script elements with a type attribute of application/javascript;version=1.7. As other browsers do not support these types of script tags this makes support useless for cross-browser support.
2 Requires the 'Experimental JavaScript features' flag to be enabled
3 Only supported in strict mode
4 let bindings in for loops are incorrectly treated as function-scoped instead of block scoped.
5 let variables are not bound separately to each iteration of for loops