ECMAScript Process Documents

Language	Count
ECMAScript	437 / 437
Zig	50 / 437

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ECMAScript vs JavaScript?

- ECMAScript == JavaScript

  - "JavaScript" is trademarked by Oracle

  - "ECMAScript" is a registered trademark by Ecma International
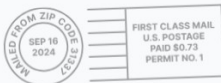
Scope:

Standardization of the general purpose, cross platform, vendor-neutral programming language ECMAScript$^{®}$ (JavaScript^{TM}). This includes the language syntax, semantics, and libraries and complementary technologies that support the language.

19388 Signatures

Ecma International

- Ecma International
  - Standardization Organization
  - Standards: ECMA-1 → ECMA-499
    - Notable mentions
      - ECMA-334: C# Programming Language
      - ECMA-404: JSON
      - ECMA-408: Dart Programming Language

- ECMAScript Specifications:
  - ECMA-262: ECMAScript Language Specification
  - ECMA-402: ECMAScript Internationalization API Specification

- Technical Committee and Task Groups
  - TC39 works on ECMAScript

TC39	ECMAScript	
TC39-TG1	General ECMAScript® language
TC39-TG2	ECMAScript® internationalization API specification
TC39-TG3	Security
TC39-TG4	Source map specification
TC39-TG5	Experiments in programming language standardization

https://en.wikipedia.org/wiki/List_of_Ecma_standards

TC39 Process

- Overview:

  - Ecma Technical Committee 39 (TC39) is responsible for evolving the ECMAScript programming language and authoring the specification.

  - The committee operates by consensus.

  - Operate by 6 Stages

    - Stage 0

    - Stage 1

    - Stage 2

    - Stage 2.7

    - Stage 3

    - Stage 4

  - The committee must approve proposal to progress to next stage

https://tc39.es/process-document/

Roles

- Champion
  - Author of proposals
  - Responsible for evolution of the proposal
  - Presenting the proposal to the committee
- Reviewer
  - Assigned to a proposal
  - Give feedback to the Champions
  - Anyone can be a reviewer but cannot be a Champion of the proposal in question
- Editors
  - Responsible for structure and coherence of the specification and spec-texts
  - Provide guidance and feedback to spec text authors to assist in proposal maturation
  - May or may not be a Champion
- Committee delegate
  - Vote on approval of a proposal
  - Can give feedback on proposals
  - Can give conditional approval and work with the Champion to work towards approval

Stage 0

- Anyone can submit a proposal
  - Non-delegates must register

Stage	Status	Entrance Criteria	Purpose
0	This is a new proposal. It is not currently being considered by the committee.	None. New proposals are assigned this stage by their authors outside of the usual advancement process.	Ideation and exploration. Define a problem space in which the committee and the champions can focus their efforts. • Make the case for an improvement • Describe the shape of some possible solutions • Identify potential challenges • Research how the problem is dealt with using available facilities today • Research how the problem has been solved by other languages or in the library ecosystem

Stage 1

- TC39 owned Github repositories from Stage 1
- Planning and designing a solution

1	This proposal is under consideration. The committee expects to devote time to examining the identified problem space, the full breadth of possible solutions, and cross-cutting concerns.	- Identified a champion or champion group who will advance the addition - Prose outlining the problem/need and the general shape of a solution - Discussion of key algorithms, abstractions, and semantics - Identification of potential cross-cutting concerns and implementation challenges/complexity - A publicly available repository for the proposal that captures the above requirements	Designing a solution. - Make the case for a particular solution or solution space - Resolve any cross-cutting concerns

https://github.com/tc39/proposals

Stage 2

- Solution has been chosen and refining solution

- Inital spec text

| 2 | The committee has chosen a preferred solution or solution space, but the design is a draft and may still change significantly. The committee expects the feature to be developed and eventually included in the standard, but due to reasons that may not be apparent at this stage, the feature may never be included in the standard. | • Proposal document describes all high-level APIs and syntax
• Illustrative examples of usage
• Initial spec text including all major semantics, syntax, and APIs. Placeholders, TODOs, and editorial issues are acceptable | Refining the solution.
• Work out minor details such as ordering of observable effects, handling of invalid inputs, API names, etc.
• Receive and address spec text reviews from the assigned reviewers and the appropriate editor group
• Produce experimental implementations such as loosely-correct (not for production use) polyfills to aid in validating the design and exploring the details
• Investigate integration with relevant host APIs, if necessary |

- Committee designates reviewer – not by champion

- "When reviewers are designated, a target meeting for Stage 2.7 should be identified."

- Sign off by reviewer means Stage 2.7

Stage 2.7

- Proposal is approved and solution is complete

- Testing stage and completion of spec text

| 2.7 | The proposal is approved in principle and undergoing validation. The solution is complete and no further work is possible without feedback from tests, implementations, or usage. No changes to the proposal will be requested by the committee aside from those elicited through testing, implementation, or usage experience. | • Complete spec text: all semantics, syntax, and APIs are completely described
• Assigned reviewers have signed off on the current spec text
• Relevant editor group has signed off on the current spec text | Testing and validation.
• Validate the design of the feature through the development of a rigorous and comprehensive test suite
• Develop spec-compliant prototypes to validate implementability, as necessary, or aid in test development |

- Test262 authored and submitted

Stage 3

- "Solution is complete"

- Integration and implementation stage

3	The proposal has been recommended for implementation. No changes to the proposal are expected, but some necessary changes may still occur due to web incompatibilities or feedback from production-grade implementations.	• The feature has sufficient testing and appropriate pre-implementation experience	Gaining implementation experience and discovering any web compatibility or integration issues.

Stage 4

- Shipped 🚀

| 4 | The proposed feature is complete and ready to be included in the standard. No further changes will be made to the proposal. | Two compatible implementations which pass the Test262 acceptance tests Significant in-the-field experience with shipping implementations, such as that provided by two independent VMs A pull request has been sent to tc39/ecma262 or tc39/ecma402, as appropriate, with the integrated spec text The relevant editor group has signed off on the pull request | Integration into the draft specification and eventual inclusion in a yearly standard publication. |

Yearly approval of new standard

- February 1: Candidate Draft is produced.
- February - March: 60 day royalty-free opt-out period.
- March TC39 Meeting: Stage 4 proposals are incorporated, final semantics are approved, and the new spec version is branched from `main`. Only editorial changes are accepted from this point forward.
- April-June: Ecma Executive Committee (ExeCom) and Ecma General Assembly (GA) review period.
- July: Approval of new standard by the Ecma General Assembly

My Process

- Challenges
  - Block off knowledge
  - Assumptions
  - Yes, but no questions

My Impressions

- Well documented
- Promotes cooperation and efficiency
- Promotes flexibility

Promotes cooperation and efficiency

- Tips for achieving conensus

    - "Feedback and concerns should be raised early and asynchronously to help the champion resolve any issues efficiently."

- Document reason for not advancing

    - "This helps us understand issues in the proposal and similar proposals in a cohesive way."

- Conditional advance

    - Urges delegate and champions to work together to solve issues

    - "The delegate should give the champion an actionable request for how to facilitate the analysis"

    - "Conditional advancement is time-limited, giving the person raising the concern time to discuss with the champions and authors about their concerns."

    - "If the issue is resolved, the proposal automatically reaches the next stage without further discussion by the committee. If the issue cannot be resolved, the proposal does not advance. "

Promotes Flexibility

- No concept of rejection
  - "When possible, it is preferable to raise an actionable constraint. The committee does not have an established concept of a rejected proposal--it is always possible for the champion to make changes and come back to ask for consensus. "
  - But this means potential for many inactive proposals

- Champions can adopt proposals

- A champion can demote or withdraw their proposals
  - But must give a reason

- "The committee may elide the process based on the scope of a change under consideration, as it sees fit."