

MathML Working Group Charter

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1. Background and Motivation

[MathML](#) is a markup language for encoding and communicating mathematics. The need for mathematical rendering on the web has been evident from the [earliest days of the Web at CERN](#): MathML was among the first specifications taken up and developed by the W3C in the mid to late-1990's XML/XHTML era. It received much attention and has created a vibrant ecosystem of implementations and integration outside of web browsers. It advanced on the Web itself becoming integrated, along with SVG, into the HTML Parser and the HTML Specification in the mid 2000s. Since then, much has happened. While MathML has much success in making

math accessible and has had wide adoption in the tools used to generate and consume math, browser adoption is not universal. The MathML 3 specification does not match some current Web realities; it does not contain precise enough requirements for interoperability within the now changed Web Platform; indeed, some features are either incompatible with, or subsumed by, new features added to the Web Platform outside MathML.

2. Scope

The MathML Refresh Community Group (CG) was formed to begin revision of MathML to address perceived difficulties in the MathML 3 spec. The Math Working Group will advance, refine, and clarify the work begun by that MathML Community Group and ensure MathML's relevance continues to evolve, grow and improve. In particular, there are three goals the group hopes to advance:

- Wide adoption by browsers of a core set of presentational elements so that authors can be assured that math will be displayed similarly in all browsers without having to rely on external libraries to do the display.
- Increased accessibility of Presentation MathML for both mathematics and chemical formulas by allowing a means of specifying relevant semantics in-place, as well as providing guidelines for common-place interpretations of Presentation MathML.
- Ensuring that mathematical formulations are better searchable.

The Working Group will begin by providing a thorough review and refinement of MathML Core Level 1, a restricted form of MathML created by the MathML Community Group, which has done the initial hard work of aligning with features of the current Web Platform and precisely defining MathML's rendering, including integration with current CSS and basic DOM, and providing tests and opening bugs.

The Working Group will take up new work, such as problems the CG identified as requiring better solutions in order to move MathML in the Web Platform forward, in proposing a MathML Core Level 2.

The Working Group will also overhaul MathML 3 by building upon these fundamentals and experience with needs for wide accessibility, and on many years of practical experience and usage patterns, to create a path forward to a MathML 4.

The scope of the Math Working Group includes the following:

- Development of Recommendations as outlined above.
- Development of a test suite to check conformance of implementations.

- Clarifications to the current use of Web Platform technologies, such as supported JavaScript APIs and CSS modules.
- Enhancements and improvements to internationalization.
- Continued integration of errata and bug fixes.
- Integration of new and existing Web Platform technologies, including, but not limited to:
 - Hyperlinks
 - DOM APIs
 - Shadow DOM and Custom Elements
 - CSS
- Integration with tools above and beyond browsers
- Improvements to the MathML markup and processing model to enhance accessibility and searchability
- Identification of normative requirements needed to ensure accessibility
- Removal of elements and attributes from MathML that have had minimal adoption

Out of scope for the proposed activity of the Math Working Group:

- Adding new elements for use exclusively outside the Web Platform
- Changes that would cause legacy MathML with significant usage to stop working on the Web Platform or elsewhere.
- Changes to Content MathML. These will be considered at a later time after gaining experience and feedback from proposed additions to enhance accessibility and searchability in Presentation MathML.

3. Deliverables

a. Normative Specifications

The MathML Working Group Group will deliver the following W3C normative specifications:

- **MathML Core Level 1** - This specification provides an initial integration into the Web Platform with increased implementation details, focusing on a subset of MathML 3 which has had wide implementation and fits well with the Web Platform. It details and relies on automated Web Platform tests to improve MathML interoperability. It provides the core layer of MathML support upon which MathML 4 can build. Authors can implement remaining features, or more generally extend MathML Core, using modern web technologies (e.g., by polyfills).
- **MathML Core Level 2** - This specification will address some features left out of Level 1 due to time constraints and implementation difficulties. It will provide guidance on improving MathML within the evolving Web Platform and enhance the descriptions of generally polyfilling or extending

MathML, using technologies such as a Shadow DOM, Custom Elements, the CSS layout API or other Houdini APIs. It will also address questions such as linking and accessibility through suggested accessibility mappings of elements and attributes.

- **MathML 4** - This specification will present an overhaul of the existing MathML 3 specification, basing it on MathML Core Level 1. It will deprecate, make obsolete, or drop features that are not used and likely will not be. It may add methods to specify more information on Presentation MathML elements to enhance accessibility and searchability.

The MathML Core specifications are intended to define only those parts of MathML that are, or will be, implemented by all major browser engines.

b. Other deliverables

Other non-normative documents may be created such as:

- Test suites and implementation reports for the specification.
- MathML Accessibility Technique Notes.
- Guides on annotating Presentation MathML for accessibility and search purposes including:
 - A living catalog for annotations beyond those defined in a MathML 4 recommendation.
 - Sample code that employs heuristics to add annotations to Presentation MathML that lacks them.
 - Code to convert (Pragmatic) Content MathML to Presentation MathML with informative annotations.
 - Sample code for conversion of annotated Presentation MathML to an external form such as speech and/or Content MathML.

c. Timeline

These dates are not meant as deadlines; work may need to continue after these dates to ensure the quality of the deliverables.

- i. Add
- ii. Some
- iii. Dates
- iv. Here

4. Success Criteria

The MathML Working Group's work is considered a success if:

- There are independent, interoperable native implementations of MathML Core Level 1 that are widely used.
- The larger Web Platform ecosystem shows signs of movement toward creating and using new MathML content, including direct use of Core and other features by MathML authoring tools and converters.
- There is proven advancement and interest by implementers in MathML Core Level 2, exploring linking, better alignment with how the larger Web Platform evolves (Shadow DOM, Custom Elements, CSS).
- A MathML Full specification (to be MathML 4), based on MathML Core, is drafted.
- Each specification contains a section detailing all known security and privacy implications for implementers, Web authors, and end users.
- There are significant testing plans and all testable changes have tests.
- There is an AAM (Accessibility API Mapping) for MathML Core and there are considerations of its benefits and impacts, including ways specification features can be used to address them, and recommendations for maximizing accessibility in implementations.

5. Coordination

For all specifications, this Working Group will seek horizontal review for accessibility, internationalization, performance, privacy, and security issues with the relevant Working and Interest Groups, and with the TAG. Invitation for review must be issued during each major standards-track document transition, including FPWD. The Working Group is expected to engage collaboratively with the horizontal review groups throughout development of each specification. The Working Group will seek a review at least 3 months before first entering CR and proactively notify the horizontal review groups when major changes occur in a specification following a review.

Additional technical coordination with the following Groups will be made, per the [W3C Process Document](#):

a. W3C Groups

- [CSS Working Group](#) The Math Working Group will coordinate work with the CSS Working Group in aligning the development and testing of CSS functionalities of interest to the MathML community. The group will

designate liaisons to work with the CSS Working Group on issues as needed. Liaisons will, ideally, be participants of both groups.

- [Web Incubator Community Group \(WICG\)](#) The Web Platform Incubator Community Group ([WICG](#)) provides a lightweight venue for proposing and discussing new web platform features, like new HTML features or Web Platform APIs. Also, new technical features arising during the development of MathML may have relevance for the Web Platform in general, or ideas about the Web Platform in general developing in [WICG](#) could be relevant to MathML. The Math WG will make an effort to make sure all these are explored further together within incubations in the Web Platform Incubator Community Group where appropriate.
- [Accessible Platform Architectures Working Group](#) The APA WG provides horizontal reviews of potential accessibility issues in the Web's architecture, including knowledge domains for STEM accessibility, as well as of the accessibility impact of a specification. The Math WG will request reviews and coordinate with the APA WG, and may nominate liaisons to ensure that these groups are aligned and working in concert toward accessible mathematics.
- [ARIA Working Group](#) The ARIA Working Group is responsible for the development of ARIA and related Accessibility Mappings. The Math WG will appoint a liaison and coordinate with the ARIA Working Group to provide the [MathML AAM](#) and continue to improve the accessibility of MathML.
- [Publishing Working Group](#) The Publishing Working Group's goal is to enable all publications to be first class citizens of the web. MathML is used by many technical and textbook publishers in their workflows. The Math WG will work with the PWG to ensure their needs are met with updates to the MathML recommendations.
- [SVG Working Group](#) The SVG Working Group is responsible for the development of [SVG](#). While largely non-overlapping technically, the two share similar origin stories and are both distinguished by their integration with the HTML Parser specification and integration as [embedded content](#). As such they have many similar challenges in efforts to align with the larger Web Platform and they share common interests in providing common developer experiences and expectations. The Math Working Group will make attempts to coordinate these efforts together with the SVG Working Group (and the [SVG CG](#)).
- [Chemistry for the Web and Publishing Community Group](#) Chemical Formulas make use of mathematical notations. The Chem CG is concerned about the accessibility challenges of using math notations and having them spoken and brailled appropriately. The MathML CG has worked with the Chem CG to ensure appropriate access to chemical

formulas; the Math WG will continue this effort.

b. External Organizations

- The [WHATWG](#) is responsible for the development of [HTML](#) and [DOM](#). This may have an influence on the future evolution of MathML. Efforts to align MathML Core with the Web Platform may lead to alignment requirements for these (consider issues such as a new IDL, focusability, support for ideas like ShadowDOM, support for attributes, etc). As they arise, such technical issues will be explored further together with the WHATWG (and the [WICG](#)).

6. Participation

To be successful, this Working Group is expected to have 6 or more active participants for its duration, including representatives from the key implementers of this specification, and active Editors and Test Leads for each specification. The Chairs, specification Editors, and Test Leads are expected to contribute half of a working day per week towards the Working Group. There is no minimum requirement for other Participants.

The group encourages questions, comments and issues on its public mailing lists and document repositories, as described in the Communication section.

The group also welcomes non-Members to contribute technical submissions for consideration upon their agreement to the terms of the W3C Patent Policy.

Participants in the group are required (by the W3C Process) to follow the W3C Code of Ethics and Professional Conduct.

7. Communication

Technical discussions for this Working Group are conducted in [public](#): the meeting minutes from teleconference and face-to-face meetings will be archived for public review, and technical discussions and issue tracking will be conducted in a manner that can be both read and written to by the general public. Working Drafts and Editors' Drafts of specifications will be developed on a public repository and may permit direct public contribution requests. The meetings themselves are not open to public participation, however.

Information about the group (including details about deliverables, issues, actions, status, participants, and meetings) will be available from the [Math Working Group home page](#).

Most MathML Working Group teleconferences will focus on discussion of particular specifications, and will be conducted on an as-needed basis and/or on a regular schedule as decided by the consensus of the participants and chairs.

The Math WG will primarily conduct its technical work on [GitHub issues](#). The public is invited to review, discuss and contribute to this work.

The WG may use a Member-confidential mailing list for administrative purposes and, at the discretion of the Chairs and members of the group, for member-only discussions in special cases when a participant requests such a discussion.

8. Decision Policy

This group will seek to make decisions through consensus and due process, per the W3C Process Document (section 3.3). Typically, an editor or other participant makes an initial proposal, which is then refined in discussion with members of the group and other reviewers, and consensus emerges with little formal voting being required.

However, if a decision is necessary for timely progress and consensus is not achieved after careful consideration of the range of views presented, the Chairs may call for a group vote and record a decision along with any objections.

To afford asynchronous decisions and organizational deliberation, any resolution (including publication decisions) taken in a face-to-face meeting or teleconference will be considered provisional. A call for consensus (CfC) will be issued for all resolutions (for example, via email, issue tracker, and/or web-based survey), with a response period from 10 to 20 working days, depending on the chair's evaluation of the group consensus on the issue. The chair will attempt to reach out to relevant parties (major browser engine implementers, AT implementers, etc) if they are not part of the WG to ensure that there is positive support from at least two relevant parties and none are opposed. If no objections are raised on the mailing list by the end of the response period, the resolution will be considered to have consensus as a resolution of the Working Group Group.

All decisions made by the group should be considered resolved unless and until new information becomes available, or unless reopened at the discretion of the Chairs or the W3C Director.

This charter is written in accordance with the W3C Process Document (Section 3.4, Votes) and includes no voting procedures beyond what the Process Document requires.

9. Patent Policy

This Working Group operates under the [W3C Patent Policy](#) (Version of 5 February 2004 updated 1 August 2017). To promote the widest adoption of Web standards, W3C seeks to issue Recommendations that can be implemented, according to this policy, on a Royalty-Free basis. For more information about disclosure obligations for this group, please see the [W3C Patent Policy Implementation](#).

10. Licensing

This Working Group Group will use the [W3C Software and Document license](#) for all its deliverables.

11. About this charter

This charter has been created according to [section 5.2](#) of the [Process Document](#). In the event of a conflict between this document or the provisions of any charter and the W3C Process, the W3C Process shall take precedence.