WCAG 2.0 A and AA Requirements

Name of Product	**Knovel**
Date Last Updated	June 24, 2019
Completed by	Jay Nemchik (Digital Accessibility Team, Dayton)
Document Description	This document rates Knovel according to the W3C WCAG 2.0 A and AA requirements.
Contact for More Information	Ted Gies Principal User Experience Specialist ted.gies@elsevier.com accessibility@elsevier.com
Testing Tools and Methods	Hands-on keyboard operation Firebug/Code inspection Firefox Web Developer Toolbar (removing style sheets) JAWS 18 on Mozilla Firefox 63 and MS IE 11 on Windows 10 NVDA screen reader v2018.2.1 Wave Extension Color Contrast Analyzer W3C WAI Pages Elsevier Accessibility Checklist: http://romeo.elsevier.com/accessibility_checklist/
Document Sections	The review document below includes all WCAG 2 A and AA checkpoints and is organized into 6 logical sections: • Visuals • Keyboard • Headings and Structure • Labeling • Multimedia • Usability
Pages Covered	Header, Footer, Navigation, Homepage, Search Results, Browse, Material Property Search, Unit Converter, Table of Contents, PDF Viewer, Table Viewer.
Note from W3C on Conformance	https://www.w3.org/TR/UNDERSTANDING-WCAG20/conformance.html "If there is no content to which a success criterion applies, the success criterion is satisfied."
Notes/Terminology	"AT" stands for Assistive Technology such as screen readers, voice input, etc.

WCAG 2.0 Success Criterion	Level	Evaluation
1.1.1: Non-text Content	A	Partially supports
1.2.1: Audio-only and Video-only (Prerecorded)	A	Supports (N/A)
1.2.2: Captions (Prerecorded)	A	Supports (N/A)
1.2.3: Audio Description or Full Text Alternative	A	Supports (N/A)
1.2.4: Captions (Live)	AA	Supports (N/A)
1.2.5: Audio Description	AA	Supports (N/A)
1.3.1: Info and Relationships	A	Partially supports
1.3.2: Meaningful Sequence	A	Partially supports
1.3.3: Sensory Characteristics	A	Supports
1.4.1: Use of Color	A	Partially supports
1.4.2: Audio Control	A	Supports (N/A)
1.4.3: Contrast (Minimum)	AA	Partially supports
1.4.4: Resize text	AA	Partially supports
1.4.5: Images of Text	AA	Supports
2.1.1: Keyboard	A	Partially supports
2.1.2: No Keyboard Trap	A	Does not support
2.2.1: Timing Adjustable	A	Supports
2.2.2: Pause, Stop, Hide	A	Partially supports
2.3.1: Three Flashes or Below Threshold	A	Supports (N/A)
2.4.1: Bypass Blocks	A	Partially supports
2.4.2: Page Titled	A	Supports
2.4.3: Focus Order	A	Partially supports
2.4.4: Link Purpose (In Context)	A	Partially supports
2.4.5: Multiple Ways	AA	Supports
2.4.6: Headings and Labels	AA	Supports
2.4.7: Focus Visible	AA	Partially supports
3.1.1: Language of Page	A	Partially supports
3.1.2: Language of Parts	AA	Supports (N/A)
3.2.1: On Focus	A	Partially supports
3.2.2: On Input	A	Supports
3.2.3: Consistent Navigation	AA	Supports
3.2.4: Consistent Identification	AA	Supports
3.3.1: Error Identification	A	Partially supports
3.3.2: Labels or Instructions	A	Does not support
3.3.3: Error Suggestion	AA	Supports (N/A)
3.3.4: Error Prevention (Legal, Financial, Data)	AA	Supports (N/A)
4.1.1: Parsing	A	Supports
4.1.2: Name, Role, Value	A	Does not support

Visuals		
WCAG 2.0 Checkpoint	**Supporting Features**	**Remarks**
1.1.1: Non-Text Content (A) Provide text alternatives for non-text content (e.g. images)	Partially supports	Many images and icons include text equivalents. **Exceptions:** Navigation: Logos such as the Knovel Data Analytics image should be given alt="Knovel Data Analytics". The Recently Saved book or journal thumbnail images should be given alt="". Homepage: The various images used in the carousel need alt text indicative of their link destination. Browse: The featured mobile app images do not have alt text, which is necessary as they also serve as links. The individual book covers and "new" images do not have any alt text. Search Results: The Equation images do not have any alt text. The Related Concept mini-graphs do not have any alternative text. The icons depicting what category each result link is need alternative text. Table of Contents: The icons depicting what category each item within the table of contents is need alternative text. The preview book cover does not have alt text. In the "New In…" section, the individual book covers and "new" images do not have any alt text. PDF Viewer: The images of the PDF used in the viewer do not have any alt text. Unit Converter: The input unit keyboards do not have any alt text.
1.3.3: Sensory Characteristics (A) Do not rely on sensory characteristics of components such as shape, size, visual location, orientation, or sound	Supports	Content does not rely on sensory characteristics for all content.
1.4.1: Use of Color (A) Color is not used as the only visual means of conveying info	Partially supports	Color is not used as the only means of conveying information for most content. **Exceptions:** The links in the footer are non-underlined text and have a color that is the same as the surrounding Copyright text. This link text requires a contrast of at least 3:1 between it and the adjacent text.
1.4.3: Color Contrast (Minimum) (AA) Text has enough contrast with the background (4.5:1 for small text and 3:1 for	Partially supports	Most text has enough contrast with its corresponding background. **Exceptions:** Navigation: A currently active page's white text on orange background does not have enough contrast.

large text)		Homepage: The various orange texts on the page, such as Search Knovel and Advanced Search do not have enough contrast. Browse: The "All Subjects" orange text on light gray background does not have enough contrast. The current tab (Technical References, New Content) and current button (All Content, My Subscription) do not have enough contrast. Material Property Search: The Drag and Drop gray text on white background does not have enough contrast
1.4.4: Resize Text (AA) Text can be enlarged up to 200% without loss of functionality.	Partially supports	Text can be enlarged to 200% and most content remains functional. **Exceptions:** Navigation: A couple of the panels become cut-off at 200% magnification and cannot be accessed with a mouse.
1.4.5: Images of Text (AA) Text is used rather than images of text, except where the presentation of text is essential, such as logos	Supports (N/A)	No images of text are used other than for Logos or essential presentation.
2.3.1: Three Flashes or Below Threshold (A) No more than three flashes in a 1-second period, or the flashes are below the defined thresholds	Supports (N/A)	No flashing content exists.

Keyboard		
WCAG 2.0 Checkpoint	**Supporting Features**	**Remarks**
1.3.2: Meaningful Sequence (A) The correct reading sequence can be programmatically determined	Partially supports	The correct reading sequence is logical with the DOM order matching the visual order in most areas. **Exceptions:** PDF Viewer: The table of contents should appear after the toolbar in the DOM. Table Viewer: The table of contents should appear after the toolbar in the DOM. Unit Converter: The use of table to order content in the Unit converter causes the reading order of its content to not make much sense. The unit input popups appear after the page content, instead of directly after the activating element.
2.1.1: Keyboard (A) All functionality is available from a keyboard, except for tasks such as drawing	Partially supports	Most content is keyboard operable. **Exceptions**: Header: The Profile dropdown and the dropdown contents are not accessible by keyboard.

		Navigation: The Unit conversion type dropdown's options cannot be reached by keyboard. The individual unit buttons cannot be reached by keyboard. The individual unit dropdown content cannot be reached by keyboard.

Homepage: Users cannot reach the Video link. Users cannot navigate between the carousel panes with keyboard.

Browse: The chevron icons which expand/collapse the topic areas cannot be reached by keyboard. Cannot reach the subject areas with keyboard. Cannot reach the Preview Tables buttons with keyboard. Interactive content within tables cannot be reached with keyboard.

Search Results: Share Search Results and Save Search Query links are not keyboard accessible. All of the Related Concepts cannot be activated by keyboard. The Sort By dropdown and its contents cannot be reached by keyboard. The Include Out of Subscription Results checkbox toggle cannot be accessed by keyboard. Users cannot reach the "Save Result" or "More" buttons with the keyboard. When saving a result, the Select Target Folder dropdown's contents cannot be reached with keyboard.

Table of Contents: Users cannot activate the View More button with keyboard. The button to view tables can be activated but cannot be cancelled with keyboard. The expand/collapse buttons in the table of contents cannot be reached by keyboard.

PDF Viewer: The Add Note button cannot be reached by keyboard. Keyboard users cannot add notes, as it requires clicking a mouse. Users can reach, but not activate the Keyboard shortcuts button. Users cannot reach the links or thumbnails within the Table of Contents.

Table Viewer: Users cannot activate any of the checkboxes in the table.

Material Property Search: The And, Or, and Next radio buttons cannot be changed with the keyboard. It is expected for users to be able to use arrow keys to navigate between radio buttons of the same grouping. Users cannot activate add property filters when using a screen reader in Chrome.

Unit Converter: The My Settings and Info links cannot be reached by keyboard. The options within the Gauge Conversions dropdown cannot be reached by keyboard. Users cannot change the significant digits input with the keyboard. The input keyboard icons cannot be reached by keyboard. All of the unit input popup's content cannot be reached by keyboard. The various Unit buttons (Select Input Unit, New Unit, etc.) cannot be reached by keyboard. The help text next to each text input cannot be read by those using keyboards only. |
| 2.1.2: No Keyboard Trap (A)
The user can use the | Does not support | **Exceptions:**
The search field on the Homepage, Header, and Search Results causes a keyboard trap if any search suggestions appear. |

keyboard to move through page elements and is not trapped on a particular element		Note: While using Firefox, in the Table Viewer, after closing one of the table header options, focus becomes trapped on an invisible element.
2.4.3: Focus Order (A) Users can tab through the elements of a page in a logical order	Partially supports	Tab order is logical on the site for the most part. **Exceptions**: Closing dialog boxes should return keyboard focus to the element that activated the dialog. Homepage: There are several non-interactive elements that have been giving tabindexes. Search Results: Disabled elements, such as the "Previous" pagination link when on the first page of results should not be reached by keyboard. The Save To My Knovel dialog does not trap focus properly. The focus ordering of content before the results or filters does not make logical sense. Users should not reach hidden Related Concepts when they are visually hidden. Many search results "See Inside" content have two interactive links that both lead to the same page. Table of Contents: There are a few unnecessary tab stops on the page, including before the View More button (book description) and the View All button (New In… content). Also, several headings can be tabbed to, which should not happen (page h1, New In…, Additional Information). Each of the table of contents links has two interactive links that both lead to the same page. PDF Viewer: The table of contents should appear after the toolbar in the DOM and tabbing order. Table Viewer: There are many unnecessary tab stops in the table content. The table of contents should appear after the toolbar in the DOM and tabbing order. Users should not reach disabled elements with keyboard (page navigation buttons). Material Property Search: The Share URL and Save to My Knovel links should not be reached after the Video link. The Save to My Knovel link has two tab-stops. Unit Converter: The unit input popups should be tabbed into directly after the activating elements.
2.4.7: Focus Visible (AA) The page element with the current keyboard focus has a visible focus indicator	Partially supports	Most elements use a visible focus. **Exceptions:** Navigation: The "Current" active navigation link needs a visible focus. Most of the elements within the My Knovel panel do not have a visible focus. Homepage: Elements within the carousel panes do not have a visible focus. The "Current" selected tab needs a visible focus.

		Browse: Interactive elements with preview tables do not have a visible focus. The "Current" selected tab (Technical References or New Content, All Content or My Subscription) needs a visible focus.
		Search Results: All Related Concepts do not have a visible focus. Currently selected tab and pagination does not have a visible focus.
		PDF Viewer: The "Current" selected table of contents' tab (List View or Thumbnail View) needs a visible focus. The Page arrows and Keyboard shortcuts buttons need a visible focus.
		Table Viewer: Nearly all elements on the page do not have a visible focus (except the table header option buttons and contents).
		Unit Converter: The Knovel Unit Converter text does not receive a visible focus. The down arrow for opening the Gauge Conversion does not have a visible focus. All of the buttons in the actual Unit Converter do not receive a visible focus.
3.2.1: On Focus (A) When a UI component receives focus, this does not trigger unexpected actions.	Partially supports	Most focusable elements do not cause unexpected actions when receiving focus. **Exceptions:** Material Property Search: When within the search region, interacting with certain components quickly, such as the Property Dropdowns can cause keyboard focus to reset to the top of the page.

Headers and Structure

WCAG 2.0 Checkpoint	Supporting Features	Remarks
1.3.1: Information and Relationships (A) Info, structure, and relationships can be programmatically determined	Partially supports	There are headings used on some pages. Landmarks are used sparingly. **Exceptions:** Nearly all pages need headings, at least an h1, and preferably more to structure the rest of the content as well. Homepage: Text such as My Knovel, What Can You Do With Knovel, and Featured should be headings (h2 in this case). Browse: The content underneath each section should be in a single unordered list if possible, instead of two separate ones. Under "New Content", Subject Area, Technical References, and Tables should be h2s. Preview table headers need proper scope attributes. Search Results: The page needs an h1. A heading should be before the search results content. It would be beneficial for each search result to have its own heading. Table of Contents: There should be a heading before the actual table of contents. "New In..." text should be a heading. Additional Information should be an h2.

| | | PDF Viewer: The page needs an h1. The toolbar buttons should be in an unordered list.

Table Viewer: The page needs an h1. The tables do not have any actual table headers. The checkboxes in the table should not have their own table elements.

Material Property Search: Consider adding a role="region" to each large section and labelling them so they can be understood and moved between easily with a screen reader.

Unit Converter: The use of a table to structure content within the unit converter causes confusion when navigating its content. Tables within tables within tables are used. |
|---|---|---|
| 2.4.1: Bypass Blocks (A) Users can bypass repeated blocks of content. | Partially supports | No "skip" link exists to skip the navigation. Only a few headings or landmarks exist, so screen reader users could struggle to skip past blocks of content. |
| 2.4.6: Headings and Labels (AA) Headings and labels are clear and consistent. | Supports | The headings that are used on the site and clear and consistent. |
| 3.1.1: Language of Page (A) The language of the page is specified | Partially supports | The language is defined as lang="en" on most pages.

Exceptions: The Unit Converter page does not have a defined language. |
| 3.1.2: Language of Parts (AA) Specify the language of text passages that are in a different language than the default language of the page. | Supports (N/A) | None of the site-wide UI or functionality uses a different language than the default. |
| 4.1.1: Parsing (A) Use valid, error-free HTML | Supports | HTML and CSS passes concerning these 4 specific criteria: (i) elements have complete start and end tags, (ii) elements are nested according to their specifications (iii) elements do not contain duplicate attributes (iv) any IDs are unique, except where the specifications allow these features. |

Labeling		
WCAG 2.0 Checkpoint	**Supporting Features**	**Notes**
2.4.2: Page Titled (A) The page has a title describing its topic or purpose	Supports	The title changes accordingly for each page and is typically descriptive.
2.4.4: Link Purpose (In Context) (A) The purpose of each link can be determined from the link text or	Partially supports	Most links used have an identifiable purpose from the link text or surrounding context.

Exceptions: Navigation: The Home link does not have any link text, due to display: |

surrounding context.		none being used on the hidden text (text should be clipped or moved off-screen). Footer: The RELX Group link does not have any link text (a title alone is not sufficient). Homepage: The featured app images in the carousel are used as links, but do not have any alt text.
3.2.4: Consistent Identification (AA) UI components used across the web site are identified consistently on every page.	Supports	Most UI components are consistent across the site.
3.3.1: Error Identification (A) Input errors are clearly marked and described to the user.	Partially supports	Errors are given and described well, but need work in order to announce them to screen readers. **Exceptions:** Material Property Search: The errors are identified and described visually, but not communicated programmatically through the label or input.
3.3.2: Labels and Instructions (A) Items requiring user input are clearly labeled or have clear instructions.	Does not support	Most input areas use titles or placeholder attributes, but are missing true labels. **Exceptions:** Navigation: The unit inputs for Unit Conversion do not have any labels. The button dropdown needs a label to describe what the user is selecting. Header: The search input at the top needs a true label, a placeholder attribute alone is not sufficient. Homepage: The search input should let the user know there are suggested search options, and how to peruse them. Browse: Topic Quickfinder input needs a true label, a placeholder attribute alone is not sufficient. Search Results: The search input needs a proper label. Table of Contents: The Search Within input needs a proper label. After performing a Search Within, the new search results state should announce itself to screen readers (currently nothing is read out). PDF Viewer: Search Within does not have a proper label. Search table of contents does not have a proper label. Table Viewer: Filter Table does not have a proper label. Search table of contents does not have a proper label. Material Property Search: The Search input needs a proper label, as a rotating placeholder or title is not sufficient. The dropdown for choosing

		the operator for each property name does not have a proper label. The actual value for a property input needs a proper label, as a title is not sufficient. Same for the Filter by Property Name input. The number of results should be communicated via a live region or similar. The material name search should let users know there are search options, and how to peruse them. Unit Converter: All inputs in the unit converter do not have labels.
3.3.3: Error Suggestion (AA) When the user makes an input error, give suggestions for valid input.	Supports	The error text given is sufficient for error suggestions in most cases.
4.1.2: Name, Role, Value (A) For all UI components, the name, value, and role can be programmatically determined.	Does not support	Most custom UI components do not have the proper ARIA attributes, and therefore, cannot communicate their state changes and roles to screen readers effectively. **Exceptions:** Header: Profile dropdown needs aria-expanded attribute. The search button does not have button text. The profile button should be a <button> element or be given role="button". Navigation: The dropdowns in the navigation panes need aria-expanded attributes. The 'X' icon for closing the tab panes is unlabeled. The '>' button for unit conversion does not have button text. The navigation tabs should be <button> elements or be given role="button". Homepage: Consider following the aria tabpanel ruleset for tabs. The Search button is unlabeled. The aria-current attributes being used for the tabs should be changed to aria-selected. Browse: Consider following the aria tabpanel ruleset for tabs. Apply aria-selected="true" to the active button (All Content, My Subscription) and aria-selected="false" to the inactive button. The chevron icons that expand/collapse the topic areas should be given aria-expanded attributes and need button text. Search Results: Consider following the aria tabpanel ruleset for tabs. The Sort By dropdown needs aria-expanded attributes. The More buttons (Related Concepts and Individual Results) and the See Inside button should have aria-expanded. All links on the page that cause same page changes, such as More, See Inside, Save Result, Sort By dropdown, etc. should be button elements. Table of Contents: All links on the page that cause same page changes, such as View More, Save to My Knovel, Citation, Save to Mobile, Share, and the Expand/Collapse table of contents elements should be button elements. The Expand/Collapse elements in the table of contents need aria-expanded attributes. PDF Viewer: All links on the page that cause same page changes, such as the toolbar buttons and the Expand/Collapse table of contents elements, should be button elements. The Expand/Collapse elements in the table of

		contents need aria-expanded attributes.
		Table Viewer: All links on the page that cause same page changes, such as the toolbar buttons and the Expand/Collapse table of contents elements, should be button elements. The Expand/Collapse elements in the table of contents need aria-expanded attributes.
		Material Property Search: The expandable content within the property name section needs to be given aria-expanded attributes. The Remove 'X' button for removing properties does not have a proper label. All of the interactive Property Names should be buttons (button elements or role="button"). The Property Names should be labelled in way that describes that activated them will add them to the search.
		Unit Converter: The currently selected button for notation should be given aria-pressed="true", and the others given aria-pressed="false". The Select Input/Output Unit and New Unit buttons need to be given aria-expanded attributes. The downward arrow to open Gauge Conversions does not have any button text. The Flip Units and Clear All buttons in the unit converter need button text. The buttons within the unit input popups have hidden text that is hidden using display: none, where the text could be hidden in a different way so the text could be read by screen readers.

Multimedia

WCAG 2.0 Checkpoint	Supporting Features	Remarks
1.2.1: Audio-only or Video-only (Prerecorded) (A) Provide alternatives for pre-recorded audio-only or video-only content.	Supports (N/A)	There is no pre-recorded audio-only or video-only content.
1.2.2: Captions (Prerecorded) (A) Provide captions for pre-recorded audio	Supports (N/A)	There is no pre-recorded audio or synchronized media in the applications.
1.2.3: Audio Description or Media Alternative (Prerecorded) (A) Provide alternatives for pre-recorded synchronized audio/video	Supports (N/A)	There is no synchronized media in the applications.
1.2.4: Captions (Live) (AA) Provide captions for live audio in synchronized audio/video.	Supports (N/A)	There is no live audio in synchronized audio/video.
1.2.5: Audio Description (Prerecorded) (AA)	Supports (N/A)	There is no pre-recorded video in the applications.

Provide an audio description of pre-recorded video.		
1.4.2: Audio Control (A) Audio can be paused and stopped, or the audio volume can be changed.	Supports (N/A)	There is no automatically playing audio on the site.
2.2.2: Pause, Stop, Hide (A) Users can stop, pause, or hide moving, blinking, scrolling, or auto-updating information.	Partially supports	There needs to be a way to stop the constantly changing placeholder text in the search field on the Homepage, as well as the changing placeholder text in the Material Property Search field.

Usability

WCAG 2.0 Checkpoint	Supporting Features	Remarks
2.2.1: Timing Adjustable (A) Users are warned of time limits shorter than 20 hours and time limits can be turned off or extended	Supports (N/A)	There does not appear to be a session timeout.
2.4.5: Multiple Ways (AA) More than one way is available to navigate to other web pages.	Supports	All pages can be accessed in multiple ways. There is also a sitemap in the footer.
3.2.2: On Input (A) Changing the setting of a checkbox, radio button, or other UI component does not trigger unexpected changes in context.	Supports	User inputs do not cause unexpected actions.
3.2.3: Consistent Navigation (AA) Navigation menus are in the same location and order on every web page.	Supports	Navigation menus are consistently in the same place and in same order.
3.3.4: Error Prevention (Legal, Financial, Data) (AA) For web pages with legal or financial commitments, input can be reviewed and corrected before final	Supports (N/A)	There are no submissions which require legal or financial commitments.

submission, and submissions can be reverted.		