

## Understanding What Makes a PDF Accessible

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## Tags

### What is the purpose of a tag?

In a PDF file, tags identify the textual content within a document and establishes it's role in the document.

Common tags you'll likely see in a PDF are H1 (Heading Level 1), H2 (Heading Level 2), P (Paragraph), Table, etc.

The importance of tags becomes relevant when a user of assistive technology is reading a document. Many of the tags particularly the headings are voiced as the content is being read. For example the heading on this page would be voiced as TAGS heading level 2. The fact that the content is voiced as a heading is less important as the capability that is provided to the AT user as they are reading the document.

As a sighted user, when a newspaper, magazine, or on-line article is being read, headlines are used to segregate the information in the article or document to determine what content is of interest or to locate specific content within the document. Users of AT gain the same capability when a document is being read by tapping the H key on their keyboard. Performing this step reads all of the headings in the document to help the user understand what that section of the article or

document is about and to determine if they'd like to read more about that section. Generating a PDF file with no headings is the equivalent of reading a newspaper or magazine with no headings. Your only choice is to read the content from beginning to end with no way to segregate the information.

### How do I add Tags to a Document?

How tags are added to a document depends largely on how the PDF file is being generated. If you are starting with a PDF file (maybe one that is provided to you), you'll need to add the tags using Adobe Acrobat or another 3rd party application. In this situation, the process of adding tags to the PDF file is a very manual one. It's time consuming, it's mundane, and honestly expensive. I encourage users to avoid this method whenever possible however some situations leave the user with no other choice than to take this approach.

A more reliable and powerful approach is to utilize a source application that provides the capability to include accessibility information which will be included when a PDF file is generated from the source file. Common applications that provide this capability are:

- Microsoft Word
- Microsoft PowerPoint
- Microsoft Excel
- Adobe InDesign

One of the key benefits to leveraging a source application when creating an accessible PDF file is that any attributes that you apply in the source file are repeatable. So if changes to the document need to be made, when you re-export the PDF file, all of the accessibility attributes will be included in the new PDF file. This saves a lot of re-work time. Imagine if you had remediated a PDF file directly only to have changes come in or a new file supplied. All of the work that you performed directly on that PDF file would have to be redone from the beginning.

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## Microsoft Word

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## Microsoft Word

Microsoft Word is a really good choice as a source application for creating accessible PDF files. This is because of the popularity of Microsoft Word as an authoring application but also because Word provides tools that can be leveraged in facilitating the creation of an accessible PDF file.

Because Word contains a natural top-to-bottom flow, it's easy to define the tag order provided you leverage that natural flow. Inserting elements such as text boxes can cause order issues when exporting to the PDF format from Microsoft Word.

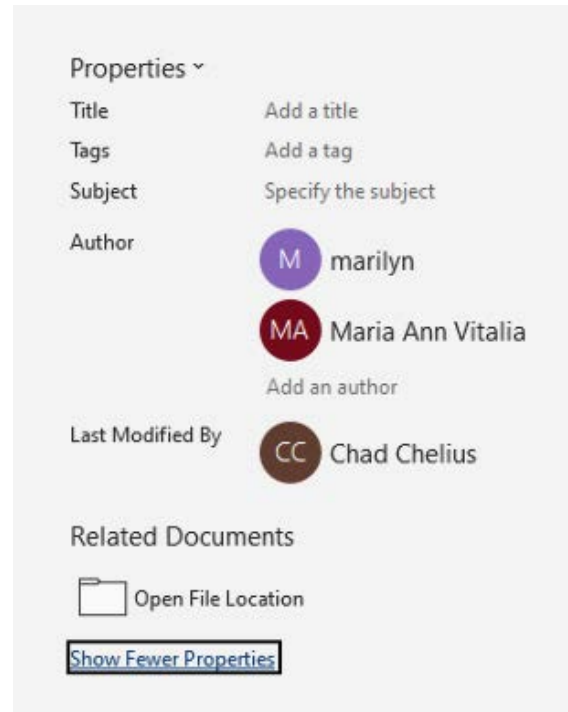
### Adding a Document Title

All accessible PDF files need a document title and that title needs to be displayed when the PDF file is opened in a PDF reader such as Adobe Acrobat or Adobe Acrobat Reader. Microsoft Word gives us the ability to add a title that will be included when creating an accessible PDF file.

To add a title in Word, choose File > Info. In the Properties category on the right side of the screen, you'll see an area where you can enter an appropriate document title. Although the title is the only required metadata element for accessibility, because these documents will likely be published on-line, it can be beneficial to add other metadata that will carry over to the PDF file including:

- Tags (keywords)
- Subject
- Author

Microsoft Word defines the logged in user of the person creating the document as the author. This typically doesn't make sense for a published document. You can right-click on an existing author and choose "remove person" and then type in a new author in its place.



Metadata properties can be added in Word by choosing File > Info.

## Defining Tags

### Default Styles in Word

In order for content to output as the appropriate tag in an exported PDF file, it's imperative that styles are used to format text in a Word document. The easiest way to apply the appropriate heading tags to text in a PDF is to use the default heading styles in Microsoft Word. Those default heading styles are named:

- Heading 1
- Heading 2
- Heading 3
- Heading 4
- Heading 5
- Heading 6

Although Word contains more than six heading levels, only headings 1 through 6 will map to the appropriate tags in the PDF file. A lot of Word users are put off by the default appearance of the headings but it's important to remember that you can modify the appearance of those styles very easily by changing the appearance of the

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## Defining Tags

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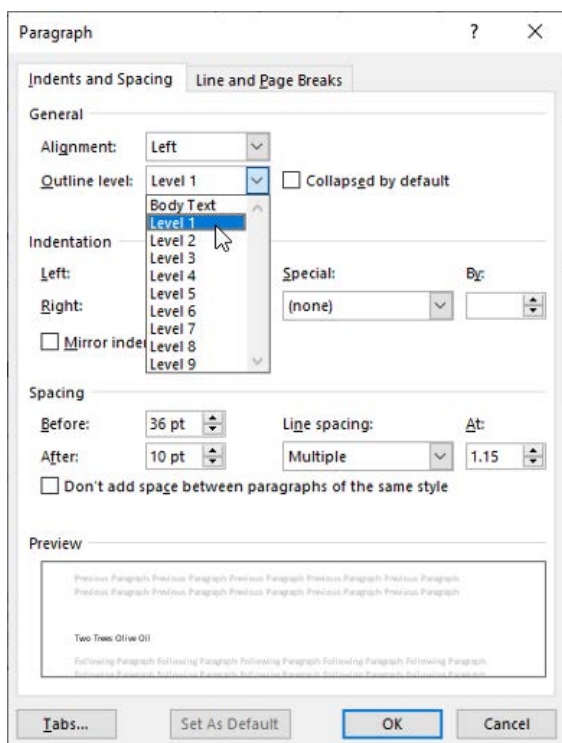
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text to your desired appearance and then clicking to the right of the style name in the Styles pane and choosing "Update [style name] to match selection".

### Custom Styles in Word

Sometimes you may choose to create your own style from scratch instead of using one of the default styles in Word. This is a fine approach, however if that style is to serve as a heading at any level, it will not work by default as user-created styles will always map to a <P> tag in the exported PDF. In order to get a user-created style to map to any tag other than a <P> tag, special care must be taken.

To control what tag the user-created style will map to, click on the triangle to the right of the name of the style in the Styles pane, and choose Modify. In the Modify Style dialog box, click on the Format button in the lower-left corner of the dialog box and choose Paragraph. In the Paragraph dialog box, you'll see an Outline level drop-down menu. The default outline level is Body Text which maps to a <P> tag in the exported PDF file. But Level 1, Level 2, etc. maps to the equivalent heading tag in the exported PDF file.



Defining the outline level in a Microsoft Word style.

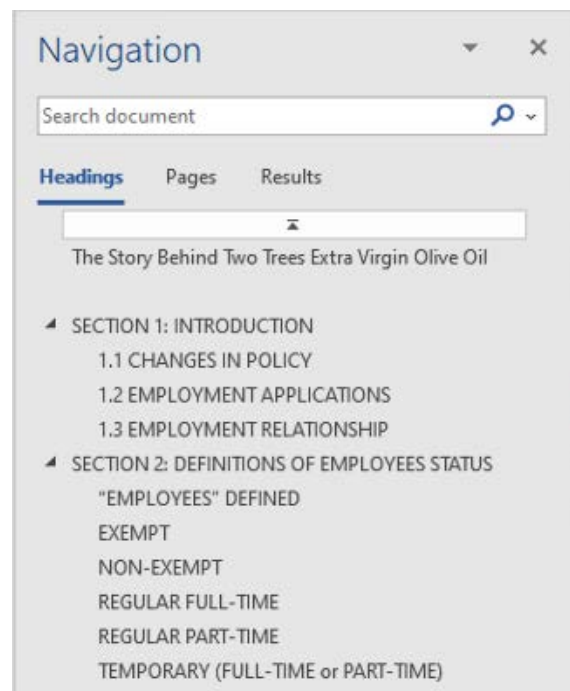
### Bulleted and Numbered Lists

When creating lists in Microsoft Word, it's important to leverage the bulleted or numbered list formatting buttons located in the Home tab of the ribbon. Using these buttons will not only automatically apply bullets or numbers to selected text, but it will also ensure that they will be tagged as a list in the exported PDF document. Lists can be customized in Microsoft Word to use items other than a standard bullet or to use letters, roman numerals, etc. for numbered lists.

### Navigation Benefits

A side-benefit of using the default heading styles in Word and customizing styles to use outline levels, is that the Navigation pane in Word populates with the text that has those styles applied.

The benefit of the Navigation pane is that it makes it very easy to see how headings are applied in a document and how the document is structured. In addition, the Navigation pane can be used to quickly and easily navigate throughout the document by clicking on an item within the Navigation pane.



Heading styles in Word appear in the Navigation pane for easy structure analysis.

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## Creating PDFs

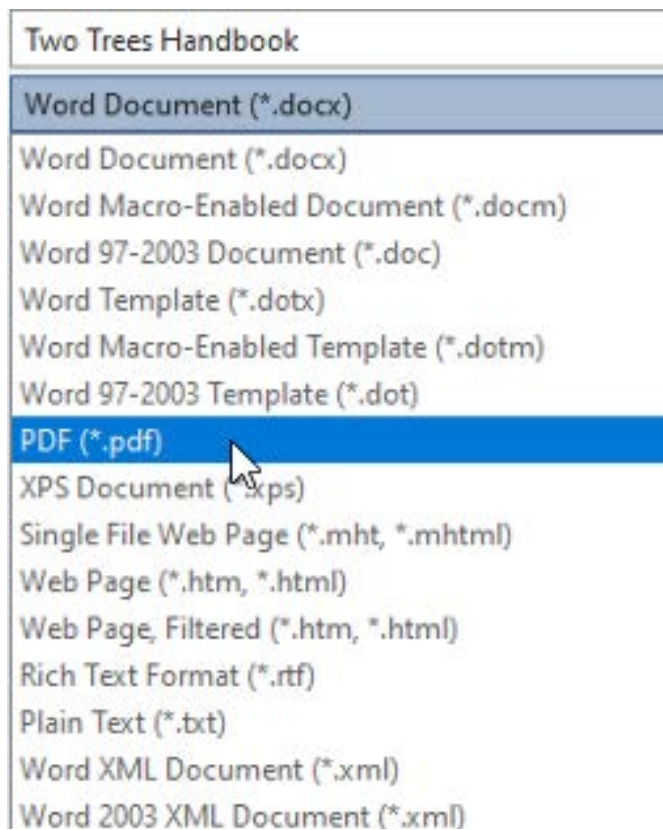
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## Creating PDFs

### Microsoft Method

Microsoft Word provides possibly two methods of creating an accessible PDF file depending on your setup. The first method is achieved by choosing File > Save As or File > Save A Copy and choosing PDF from the format drop-down menu. To define the accessibility properties of the PDF, click on the More options link below the format drop-down menu.



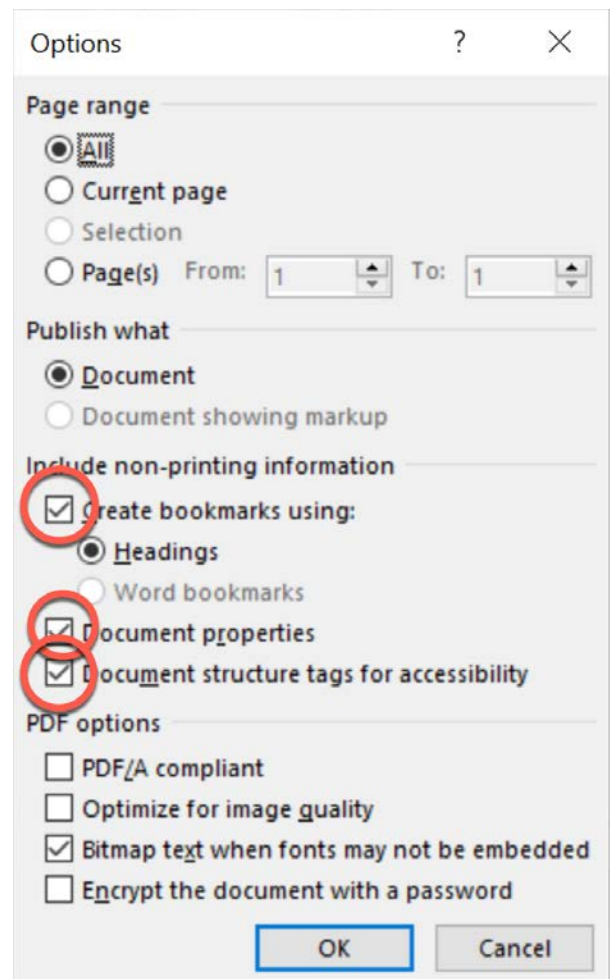
Choose PDF from the Format drop-down menu.

Now click on the Options button at the bottom of the dialog box. In the Options dialog box, make sure that the following options are chosen:

- Create bookmarks using headings
- Document properties
- Document structure tags for accessibility.

These three options do a lot including adding the document metadata from Word to the PDF. Adding tags to the PDF, and adding bookmarks in the PDF file based on the heading styles used. With these properties set, click OK and save the PDF file. The resulting PDF will be tagged, contain bookmarks, and include the metadata added from Word.

As an aside, bookmarks are required for documents containing 9 or more pages. Including bookmarks in the PDF file satisfies this requirement.



Defining the accessibility properties in the Options dialog box.



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## Creating PDFs

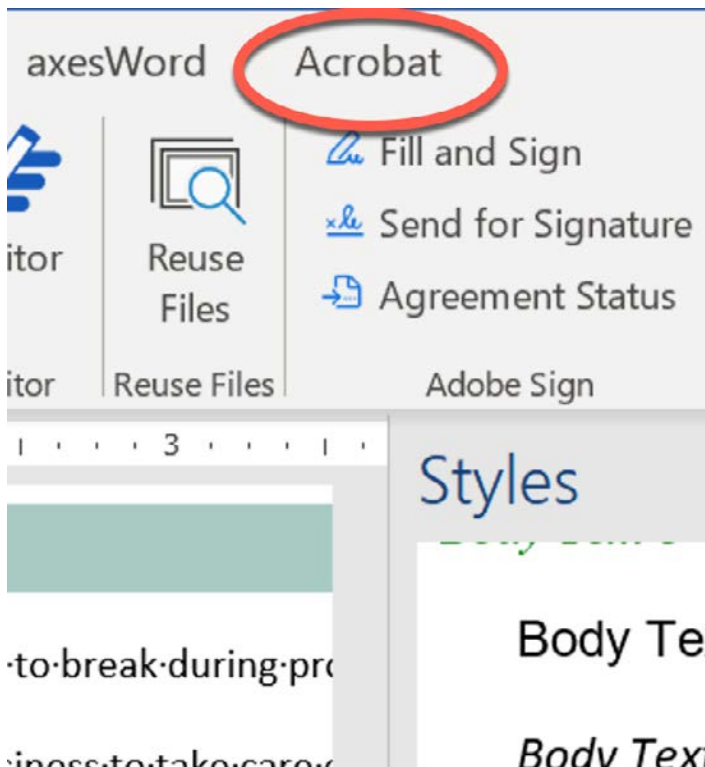
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### Adobe Method

If you've installed Adobe Acrobat Pro on your computer, the installer will add a component to the Office applications on your computer (including Microsoft Word) called the PDFMaker. The PDFMaker is an Adobe plug-in for Microsoft Word that adds the capability to create PDFs (including accessible ones) from Microsoft Word.

To see if the PDFMaker is installed on your computer, open Microsoft Word and look at the tabs above the Ribbon in the Word interface. If the PDFMaker is installed, you'll see an Acrobat tab above the Ribbon.



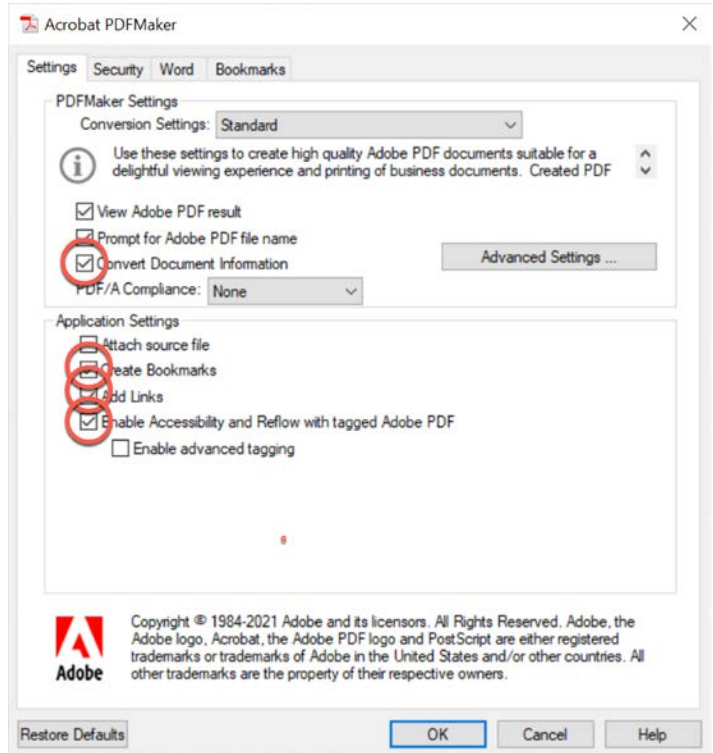
The Acrobat tab in Microsoft Word indicating that the PDFMaker has been installed.

Click on the Acrobat tab to make it active. Now click on the Preferences button to control the properties of how the PDF file will be generated.

In the Acrobat PDFMaker dialog box, make sure that the following options are enabled:

- Convert Document Information
- Create Bookmarks
- Add Links
- Enable Accessibility and Reflow with Tagged PDF

Enabling these options will ensure that you create a tagged PDF with all of the necessary accessibility elements. Notice that this is where you control whether bookmarks will be created in the exported PDF file.



Setting the appropriate accessibility options in the Acrobat PDF-Maker dialog box.

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## Creating PDFs

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### Tables

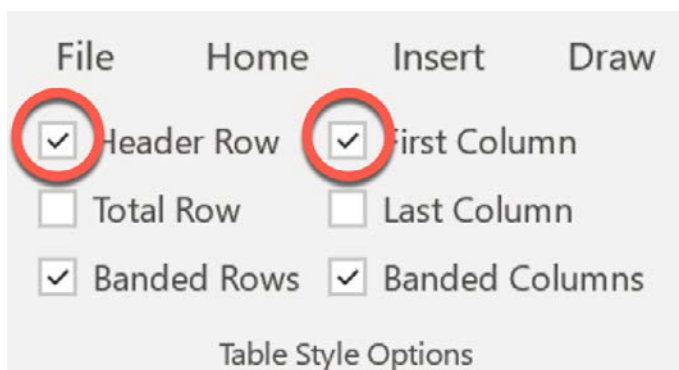
In an accessible PDF files, tables require special attention. Probably most importantly, every table requires a header row. That header row can be at the top of the table, or along the left edge of the table (first column) or both. But without a header row, the table will fail validation in all checkers.

The value of a header row is to provide the user with a category for the data cells in a table. The header cell is voiced before the value of the data cell, letting the user of AT know what the heading is for that information.

Microsoft Word makes it easy to add a header row to a table. To do so, simply click in the table in which you want to add a header row, then click on the Table Design tab above the Ribbon. To the far left of the Ribbon, you'll see the Table Style Options section which includes checkboxes to add both a Header Row (the top row of the table) and a First Column (the left most column of the table).

Although Microsoft Word does a pretty good job of adding header rows to a table, the feature isn't complete. For accessibility, header rows need to either have cell IDs created to associate data and header cells (for complex tables), or the scope defined for the header cells (column, row, or both). Microsoft does neither of these so regardless of what you do, some additional touch-up is required in Adobe Acrobat after the PDF file is generated.

Additionally, one area where Microsoft Word fails significantly is when cells are merged in a table. Those merged cells are not handled well in the exported PDF and will definitely require additional remediation in Adobe Acrobat after the PDF file is generated.



Enabling header rows for a table in Microsoft Word

### Hyperlinks

Hyperlinks are an important part of a PDF file as they provide a quick and efficient way to obtain additional information on the web and other locations. Adobe Acrobat auto-detects implicit hyperlinks which means any spelled-out url or email address is detected and that link make clickable within the application. This can be misleading because it gives the illusion that all of those links are both clickable and accessible. However those links are only clickable and not at all accessible. For this reason it's important to properly create hyperlinks in Microsoft word so that those links are properly tagged and accessible to users of assistive technology.

To create a hyperlink in Microsoft Word, simply select the text that you want to add a link to. Then right-click on the selected text and choose Link. The Insert Hyperlink dialog box will appear providing you with several options for the type of link you want to create. You can create the following types of links in the Insert Hyperlink dialog box:

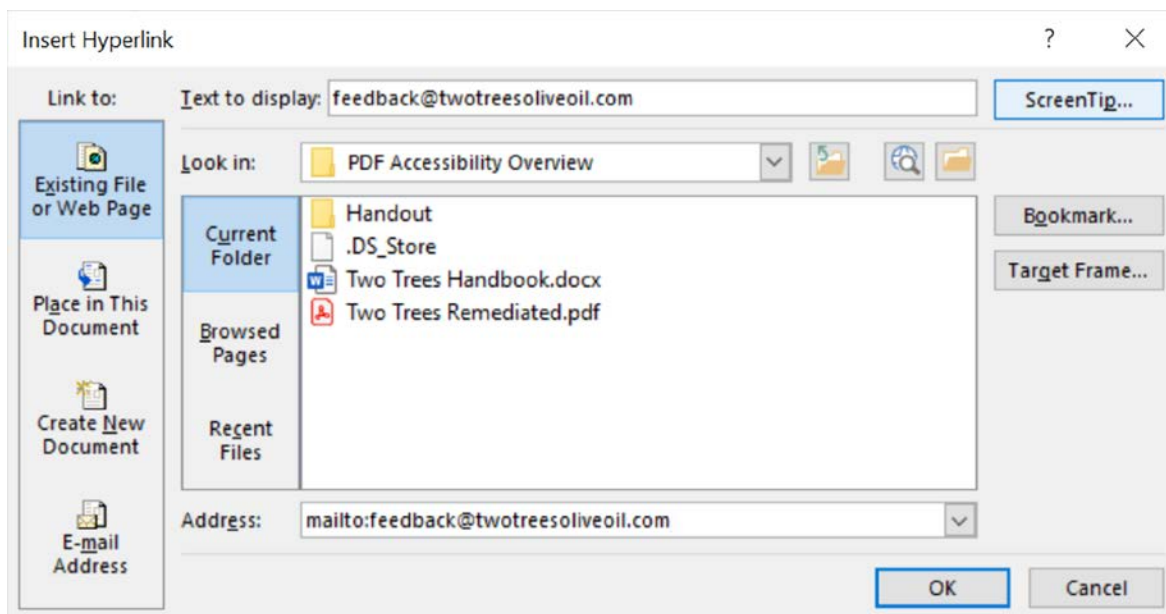
- Link to an existing file or web page
- Link to a location in the document
- Link to an email address

Choose the type of link that you want to create and then enter the destination url (if appropriate). Click OK and the link will be created.

The importance of performing this step is that now when the PDF file is generated, that link will contain a <Link> tag with a Link-OBJR object within that tag making that hyperlink accessible to users of assistive software.

### Screen tips

When trying to meet PDF/UA compliance, an additional requirement for hyperlinks is that each hyperlink contains alternate text. This may seem like overkill, but it stems from a time when it was common to use phrases such as "click here" for a hyperlink which isn't very descriptive and doesn't tell a reader where the link is taking them. Microsoft Word allows you to add alternate text to hyperlinks by clicking on the ScreenTip button at the top-right of the Insert Hyperlink dialog box. Here you can add descriptive text that will satisfy the alt-text requirement.



*Creating a hyperlink in Microsoft Word.*

## Creating a Table of Contents

A table of contents can be a significant benefit to both sighted users and users of assistive technology. Creating them however needs to be done properly in order for the table of contents to function and be accessible. The key to generating an accessible table of contents is to simply leverage the table of contents feature in Microsoft Word. By using this feature, the table of contents in the exported PDF file will create links for all of the table of contents entries that will link to the appropriate section of the document. In addition, the table of contents in the exported PDF file will be properly tagged. Word generates a table of contents based on the heading styles used in the document. Each heading becomes an entry in the table of contents when it is created.

To create a table of contents in Microsoft Word, start by inserting your cursor in the document where you would like the table of contents to appear. Click on the References tab at the top of the Ribbon and click the Table of Contents button. Word is pretty intelligent here as it will automatically generate some Automatic Tables of Contents form which you can choose. There's also an option at the bottom of the list called Custom Table of Contents that you can choose if you want to customize

the table of contents to your liking. For this example, let's choose an Automatic Table of Contents and you'll see that the table of contents is inserted at your cursor location.

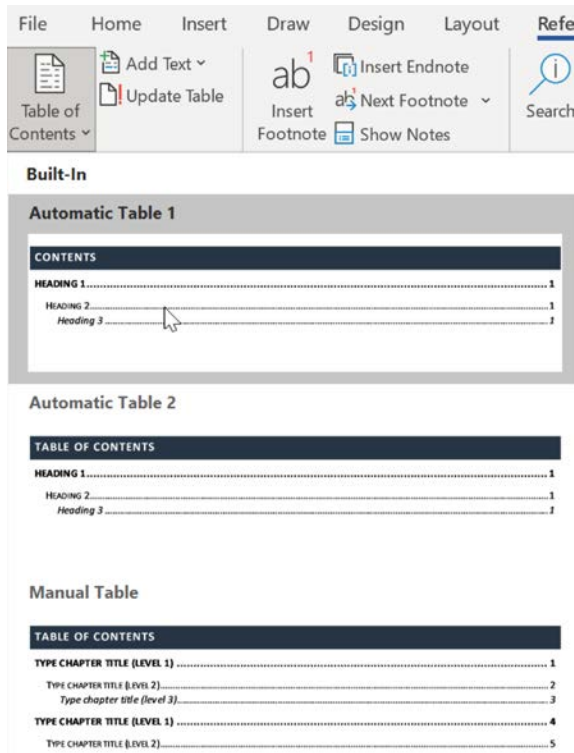
A table of contents in Word is dynamic which means it maintains an association to the data that is generating the entries in the table of contents. So as you're working, if you decide to add, remove, or adjust any of the content in the document, you can simply update the table of contents with the new information. To update a table of contents in Microsoft Word, click anywhere within the table of contents, and click the update badge at the top of the table of contents. In the resulting Update Table of Contents dialog box, you can choose whether to update the entire table of contents or the page numbers only. Choosing either option and clicking OK will update the table of contents appropriately.

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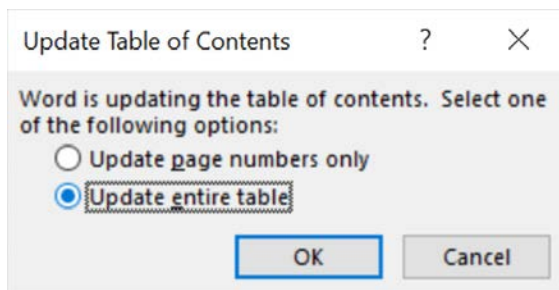
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Inserting a Table of Contents in Microsoft Word.



Updating a Table of Contents in Microsoft Word.

## Working with Images

Images require special attention when it comes to accessibility because fundamentally images contain no relevant information. Assistive software will voice an image as “graphic” but beyond that there’s no information about the image that can be read.

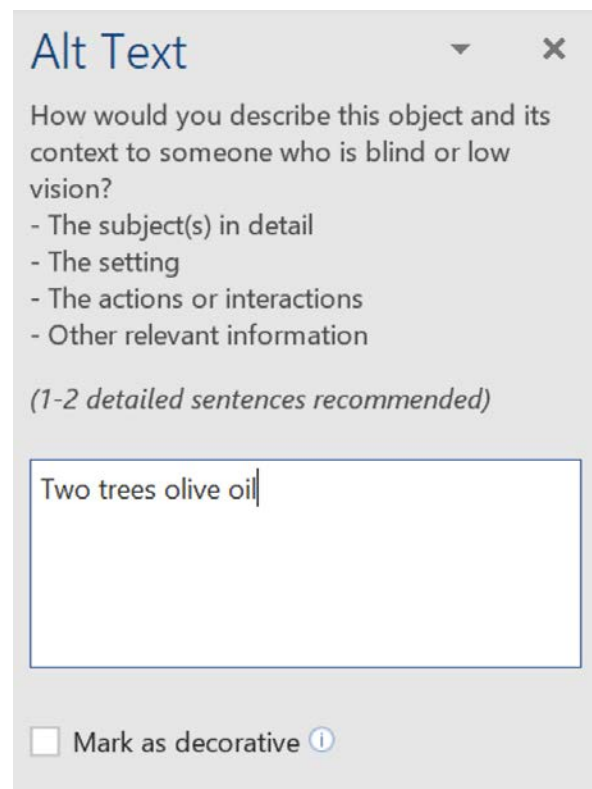
That’s where alternate text comes into play. Alternate text or Alternative text is text that describes in image in its context. Think about if you had to describe what you are seeing in an image. This is the job of alternate text. For more information on writing good alternate text, [read](#)

[this article from WebAIM](#) that discusses the topic in more detail.

Conversely, sometimes images are used in a document strictly for aesthetic reasons. They’re used to add visual interest in a document but they really don’t have much value in the context of the content of the document. For these images, a common practice is to artifact them. Artifacts is a term used to describe images that should not be read by assistive software. When an image is artifacted, assistive software ignores it as if it weren’t in the document at all.

To add alternate text to an image in Microsoft Word, click on the image to select it, then right click on the selected image and choose Edit Alt Text. An alt text pane will appear containing a field in which you can type the alternate text for the selected image.

If you’re using a recent version of Microsoft Word, you may also notice a check box at the bottom of the Alt Text pane called “Mark as decorative”. This check box when enabled will artifact the image so it is not read by assistive software.



Adding alternate text for an image in the Alt Text pane in Microsoft Word.



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## Creating PDFs

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### Tag Order

In addition to the tags themselves, the order in which the tags appear in a PDF file is of utmost importance. This is because the order in which the tags appear in the Tags pane of Adobe Acrobat is the order in which assistive software applications such as JAWS and NVDA read the content in a document.

If care is not taken to ensure that the tag order is correct, the experience to the end user could be confusing and not make sense.

### Reading Order

PDF documents contain an additional order of objects beyond the Tag Order which is referred to as the Reading Order. The Reading Order is visible in Adobe Acrobat when the Reading Order tool is activated or when the Order panel is activated. As stated before, although JAWS and NVDA utilize the tag order to determine the order in which content is read, some assistive technologies use the Reading Order instead. So to ensure that all technologies can read an accessible PDF file that you generate, and to meet WCAG success criteria 1.3.2, both orders need to be properly defined in an accessible PDF file to ensure that the document can be read by all users and all technologies.