

# **The Electric Book guide**

How to create high-quality books  
with open tools

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*The Electric Book guide*  
Text © Arthur Attwell

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# Preface

This guide serves three purposes. First, it explains how to use some popular open-source tools to make great-looking books, as print-ready PDFs, ebooks and dedicated websites.

Second, it documents our Classic theme, a vanilla design for books that is powerful and flexible.

And third, this guide is an example of the workflow and the Classic theme in action.

We originally developed this workflow at Electric Book Works for producing Bettercare books, before using it for other imprints and for client work at Fire and Lion.

This guide to the workflow is a work in progress. You can contribute from the project page: [github.com/electricbookworks/electric-book-workflow](https://github.com/electricbookworks/electric-book-workflow).

Arthur



# Quick new-book setup

This quick setup assumes you already have Jekyll (version 3.3 or higher) and Prince installed and working on your computer. There is more detail, and lots of more advanced guidance, in this guide.

1. Download the Jekyll template.
2. Open `_data/meta.yml` and replace the sample book information there with your series and book information.
3. In the `book` folder edit or remove the sample files, and add your book's content.
4. To modify the design, edit the `.scss` files for each output format in `book/styles`.
5. Run the `run-` script for your operating system. (On OSX and Linux, you need to give it permission.)





# Introduction

At Electric Book Works, we'd been producing books with InDesign for years. InDesign is awesome, but it makes publishing simultaneously to print and digital formats a real pain. No matter how we set things up, we always ended up with separate master files: one for print, one for the ebook, and one for the website. And keeping those in sync over time was almost impossible.

We needed a way to instantly create PDF (for high-end, professional book publishing), epub and website editions of a book from a single master source. We needed great version control and cloud backup. We wanted to be able to edit from anywhere, in a way that is easy for non-technical people to learn.

And we didn't want to be locked into any proprietary tools, whose price or availability could change at any time. We needed to use entirely open technologies to ensure our content was future-proof. And we didn't want to develop any code that others had already developed.

We spent several years piecing together a solution, bit by bit. Eventually, we settled on a workflow that is (relatively) simple and powerful:

1. We store a book's master files in plain text, formatted as markdown.
2. We turn that plain text into clean HTML instantly (using Jekyll).

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3. We apply different stylesheets to that HTML to get beautiful web versions, ebooks and print PDFs in minutes (using Sigil and PrinceXML).
4. Everything is stored securely with state-of-the-art version-control (using GitHub and similar services).

Markdown is so simple that non-technical people can learn how to create and edit it in under an hour. They can even work directly on the master files online using Prose.

Jekyll is great at generating clean HTML in flexible ways, and has a big, active development community and committed project owners. It also includes kramdown and Sass, which are critical to creating new book designs quickly.

While PrinceXML is proprietary software, it's our favourite implementation of the open standards for CSS Paged Media.

## Alternative tools

There are several digital-first book-publishing systems around. Some are also based on markdown, like ours. For example:

- Gitbook IO
- Penflip
- LeanPub (which uses Markua)
- PubPub
- MagicBook
- Phil Schatz's viewer.

PressBooks, which is built on Wordpress, is a superb, affordable service.

And if you're a serious publishing outfit, have a look at O'Reilly Atlas.

The Coko Foundation is building Editoria with their new PubSweet framework.

For converting HTML/CSS to print PDF, we use PrinceXML, which is proprietary. Other alternatives, which we haven't tested or don't yet support all the page-layout features we need, include:

## ALTERNATIVE TOOLS

- Antenna House, a proprietary, mature system
- WeasyPrint, an open-source PDF engine in active development
- Vivliostyle, which is partly open-source
- PDFReactor, a proprietary PDF engine
- DocRaptor, a cloud-service implementation of PrinceXML.



# Setting up

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## Technical overview

To set up the workflow, you still have to have some technical expertise. Once it's set up, non-technical editorial team members with a couple of hours training (taught or self-taught) can add and edit books in it.

The technical team members who run the workflow need to be familiar with a few concepts and tools:

- **HTML and CSS:** the fundamental building blocks of almost all digital content.
- **Markdown:** a simple, plain-text shortcut for creating HTML. (The original Markdown syntax reference is the easiest intro to basic mark-

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down. We use a markdown variant called kramdown. It lets us use attributes like classes, has a stricter syntax, and allows adding of IDs to elements.

- **Sass:** a way to create complex CSS from simple rules.
- **Jekyll:** software that turns markdown and Sass into HTML and CSS. (To learn about Jekyll, start here. If you're installing it on Windows, you'll also need this guide.) From version 0.4.0, our template requires at least Jekyll 3.2.
- **Bundler:** software that manages which version of Jekyll (and other Ruby gems) to apply to a project.
- **Git:** software for tracking a team's changes and syncing them with a remote server. We like to use GitHub and Bitbucket as our remotes.
- **Sigil:** an open-source epub editor, where we quickly assemble ebooks.
- **PrinceXML:** an app for creating PDFs from HTML and CSS (Prince is the only proprietary part of this stack).

To use the workflow on your own machine, you must have the following software installed:

- Ruby (ideally, via a Ruby version manager like RVM or Homebrew)
- Bundler (manages your Ruby gem versions)
- Jekyll (generates your source HTML)
- PrinceXML (for generating PDFs from source HTML)
- Sigil (for finishing epubs)
- Git (or similar, if you want good version control).

## Folder (repo) structure

A workflow folder (often tracked in Git as a repo) usually contains a series of related books. Its folders and files follow the standard Jekyll structure. We then put each book's content in its own folder. In the template, the first book folder is simply called `book`.

Pro tip: You could also store several series in one repo, each series with its own set of Jekyll files, and a single `_prose.yml` configuration in the root folder for all series subfolders. This is only useful if you don't need a live staging site or previews with GitHub Pages, since each Jekyll setup must be in its own repo for GitHub Pages to work out of the box.

## Using the template

The Electric Book repo (folder) is ready to use for a series of one or more books. In short, to get up and running, see the Quick Start guide.

Now, let's get into some more detail about how it all works. There are several folders and files in the series template repo:

- `_config.yml`: a file for setting configuration options for Jekyll, which will compile your book for output. There are several other smaller config files you can ignore. They are for changing specific config settings on output.
- `_prose.yml`: configuration settings for using prose.io for online book editing (generally, you won't have to edit this file).
- `book`: a folder for a book's content, stored here in a series of mark-down files
- `_data`: a folder for information about your books (aka metadata).
- `_includes`: snippets of HTML for Jekyll (you won't have to open this folder).
- `_html`: where Jekyll will generate the HTML versions of your books.
- `_output`: the folder where our output scripts will save your PDFs.
- `index.md`: the home page of your series when served as a website.
- various `.bat`, `.command` and `.sh` scripts for quickly generating books in different formats on various operating systems.

Let's explain some of these in more detail.

The default design, the Electric Book Classic theme gem, is imported

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automatically when you run `bundle install`.

That gem provides the basic design of your books. A theme is a collection of files (Sass, CSS, fonts, Javascript and hyphenation dictionaries) that define a book's design. We hope that in future we and others might design other themes. Classic is extremely versatile and powerful already. For most book design, you'll only have to edit the variables in each book's `print-pdf.scss`, `screen-pdf.scss`, `web.scss` and `epub.scss`, and add your own custom CSS as needed.

If you're familiar with Sass, you'll know that Jekyll will convert these `.scss` files into finished `.css` files. Sass, saved in `.scss` files, is to CSS what markdown is to HTML: an efficient way to write that lets software do the hard work of creating finished code.

## Creating a new book

The process of setting up a new book is covered briefly in our quick-start section. Here is more detail.

To create a new book in a new series:

1. The repo (or series folder) can hold one book or many, like a series of books that share similar metadata or features (e.g. they're all by the same author). Make a copy of the folder and, if you like, rename it for your series. E.g. `my-sci-fi`.
2. Inside `my-sci-fi`, open and edit these three files:
  - `_config.yml`: Edit the values there for your Jekyll setup. The comments will guide you.
  - `index.md`: Replace our template text with your own. Usually, a link to each book is useful, e.g. `[Space Potatoes](space-potatoes)`.
  - `README.md`: Replace our template text with any notes your collaborators might need to know about your series. (The README file is usually only read in the context of editing the files in your folder/



## CREATING BOOK CONTENT

- repo.)
3. Optionally, rename the `book` folder with a one-word, lowercase version of your book's title (e.g. `space-potatoes`). Use only lowercase letters and no spaces. If you're creating more than one book, make a folder for each book.
  4. In `_data`, edit the `meta.yml` file, filling in your series info and info about at least your first book.
  5. Inside a book's `text` folder, add a markdown file for each piece of your book, e.g. one file per chapter. Our template contains files we consider minimum requirements for most books: a cover, a title page, a copyright page, a contents page, and a chapter.
  6. Inside each book's folder, store images in the `images` folder. Add a `cover.jpg` image of your book's front cover there, too.
  7. In each book's `styles` folder, edit the values in `print-pdf.scss`, `screen-pdf.scss`, `web.scss` and `epub.scss`.

## Creating book content

Each markdown file in `space-potatoes` is a part of a book, such as a table of contents or a chapter. Each file must start with:

```
---  
---
```

And between those `---`s, we can and should specify some information about that part. This information is called YAML frontmatter.

In each file's YAML frontmatter (the info between `---`s at the top) we specify the book-part's `title` and (sometimes) the book-part's `style` to use for that part. The `style` specifies what kind of book-part it is, such as a `title-page` or `chapter`.

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Technical note: the `style` YAML sets the class attribute of the output HTML's `<body>` element. Themes use that class to control CSS and page structure.

When you create your book, we recommend following these conventions for file naming and YAML frontmatter `style` settings:

Book section	Sample file	Style in YAML
Front cover (for the ebook)	<code>0-0-cover.md</code>	<code>cover</code>
Title page	<code>0-1-titlepage.md</code>	<code>title-page</code>
Copyright page	<code>0-2-copyright.md</code>	<code>copyright-page</code>
Table of contents	<code>0-3-contents.md</code>	<code>contents-page</code>
Acknowledgements	<code>0-4-acknowledgements.md</code>	<code>frontmatter</code>
A first chapter	<code>1.md</code>	<code>chapter</code>
A second chapter	<code>2.md</code>	<code>chapter</code>

If you don't set the `style`, the page will default to `style: chapter`. So you actually don't need to ever set `style: chapter` in a YAML header. For most chapters in a book, then, your YAML frontmatter will simply include a chapter title:

```
---
title: "Chapter One: What are Space Potatoes?"
---
```

Page styles we've designed for in the Classic theme include:

- `index` for the home page of a collection
- `cover` for a front cover, which will appear in ebook editions
- `halftitle-page` for a book's halftitle page
- `previous-publications-page` for a book's list of the author's previous

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publications

- `title-page` for a book's title page
- `copyright-page` for the copyright or imprint page
- `contents-page` for the book's table of contents
- `dedication-page` for a dedication page
- `epigraph-page` for an epigraph page
- `frontispiece-page` for a frontispiece page
- `frontmatter` for other prelim pages not accounted for otherwise
- `chapter` for a book's default chapter page (and the global default)

You can also invent your own page styles, and use them in your custom CSS instead of these, though you may get unexpected results if you've been relying on a theme for existing styles like `chapter`.

### Set 'page number one'

Many books have two 'page ones':

1. the half-title or title page and,
2. if the prelims have roman-numeral page numbers, the first chapter.

You should specify those pages so that Prince knows where to start numbering when creating PDFs.

Why? Well, for example, in print output if you use `frontmatter` on a book-part, by default it will have roman-numeral page numbers. When the first `chapter` starts, it will have decimal page numbers. However, the page numbering will be consecutive from roman through decimal. That is, it will run 'ix, x, 11, 12'. You reset the numbering to 1 at the start of the first `chapter` to avoid this.

You reset page numbering by adding the class `page-1` to the first block-level element on the relevant page.

You can do this in two ways:

1. If a markdown document starts at 'page one', add the class to the `style` YAML header. E.g.

```
---
```

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```
title: Half-title page
style: halftitle-page page-1
---
```

And at the first chapter:

```
---
title: Chapter One
style: chapter page-1
---
```

Remember that `chapter` is the default, so you normally don't have to specify it. *But* if you want to *add* a class in addition to `chapter`, you must specify both classes. This is because, if you were to use `style: page-1` in a YAML header, the class `page-1` would override the default `style: chapter`, not add to it.

2. Alternatively, add the `page-1` class to the first block-level element in the chapter by adding the tag `{:.page-1}` in the line immediately after it. But for this to work, the element must *not* have a CSS float applied to it. So often this doesn't work as well as specifying `page-1` in YAML frontmatter.

### File naming

Name each book's markdown files in perfectly alphabetical order. We recommend using a numbering system, where prelims (frontmatter) files start with a 0, e.g. `0-1-titlepage.md`, `0-2-copyright.md`, and chapter files are numbered for their chapter number, e.g. `01.md`, `02.md`, and so on. The alphabetical order makes it easy to see the documents in the right order at all times, and it makes ordering outputted HTML files easy when dropping them into Prince for PDF output.

## THE IMAGES FOLDER

Note: We recommend using leading zeros in file-name numbers – that is, `02.md` rather than `2.md` – because that sorts correctly in most file browsers. Otherwise, some file browsers will sort `10.md` before `2.md`. In the rare event that you have over 99 chapters, use two leading zeros: `001.md`.

## The `images` folder

Alongside the content files in a book's folder is an `images` folder, for images that belong to that book only.

A book's folder should only ever need to contain markdown files and images. If you're embedding other kinds of media you could add folders for that alongside `images`. We don't recommend sharing images or media between books, in case you want to move a book from one series to another later. (So, for example, copy the publisher logo into each book's `images` folder separately.)

If your series home page requires images, you will need to create an `images` folder for that in the main series folder.



# Markdown

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This guide explains how to edit text for the workflow. On its own, it's also a handy guide to markdown in general.

If you get your markdown right, the workflow can zap out an almost-

print-ready PDF, website or ebook from your files in a matter of minutes. That is, we go straight from edited manuscript to page proofs – no type-setting!

To edit for the workflow, you need to have a rough idea how HTML works, and you need to learn markdown. If you're new to HTML and markdown, don't worry: it's much easier than you think.

## How HTML works

HTML is a computer language. It's a way for us to mark up or tag text, so that a computer knows how to display it beautifully to humans. That is, software (most commonly a web browser) reads the HTML code and *renders* it as nice-looking, readable text and images.

In HTML, each piece of content (e.g. a paragraph) starts and ends with a tag that a computer can recognise. Tags are always in elbow brackets, like this paragraph tag: `<p>`.

```
<p>
This text is tagged in HTML as a paragraph.
</p>
```

The slash 'closes' the tag.

The `<p>` tag is one of about a hundred possible tags, maybe ten of which you'll see in a book, such as tags for headings (e.g. `<h1>`, `<h2>`), bold and italic, lists, images, tables, and blockquotes.

But not all paragraphs are the same: there are opening paragraphs, pull-quote paragraphs, blurb paragraphs and more. If I want to tell the computer what *kind* of paragraph it is, I can put it in a special class. Say, the 'blurb' class of paragraph. To write this in HTML, I would make the tag `<p class="blurb">`. Unlike its limited set of specific tags, HTML classes are infinite, because we can make up class names as we need them.

HTML is very simple and very powerful (which is why it's the language behind almost every web page). We can mark up everything in a book



using HTML tags and classes. In our workflow, we store books in HTML, with each book part (title page, contents page, chapter, etc.) in its own HTML file.

Then, to create print-ready PDFs, websites and ebooks from that HTML, we combine the files with CSS stylesheets. CSS is another computer language that defines design: font sizes, indentation, colour, etc. A CSS file will say ‘make all headings bold’, for instance, or ‘indent block-quotes by 1em’.

If we combine a book’s HTML with a stylesheet designed for print, we can get a print-ready PDF. If we combine the same HTML with a stylesheet for the web, we get the book as a website. This way, we only ever store the book’s content once, and use different stylesheets to generate alternative editions from that single source.

Unfortunately HTML tags are very, very time consuming to type by hand. But we have a shortcut! It’s called markdown, and it’s amazing.

## How markdown works

Markdown is just plain text, neatly structured. Plain text as in `.txt` files. It’s so neatly structured that software can work out, just from the structure of your text, what HTML you intended, and convert it instantly to finished HTML, tags and all. No way! Yes way.

Markdown was invented by two very smart people in 2004: John Gruber and Aaron Swartz. Since their work, others have added new features to markdown. So today there are many variations of markdown. We use a variation called kramdown.

As you work with markdown, you’ll get to know it really well. That can take as little as a few hours. And hopefully you’ll come to love it as much as we do. To do that, you’ll need to keep the kramdown syntax reference handy. For now, though, we’ll explain the most common, important things you’ll need to edit simple books.

To quickly test any basic markdown yourself, go to <http://kramdown.herokuapp.com>. Type markdown in the left, and see the rendered HTML on the right.

## Paragraphs

This is easy: a paragraph is a line of text separated from any other text by empty lines.

You can even have line breaks in a paragraph, and markdown will just ignore them (or, rather, replace them with spaces). That is, markdown is looking for an empty line before it ends a paragraph.

```
This is a paragraph.
```

```
This is another  
paragraph.
```

Result:

This is a paragraph.

This is another paragraph.

## Headings

You can use up to six levels of heading, from level one to level six. To make a heading, just put one or more hash signs, #, and a space, before the heading. For a first-level heading, use one hash sign; for a second-level heading, use two; and so on. Like with paragraphs, separate the heading from everything else with an empty line space.

```
## This is a second-level heading
```

```
This is a paragraph.
```

## Italics

Just put \* before and after the italicised words: `is it really *this* easy?`. It's really *this* easy.

## Bold

Just put two \*s before and after the bold text: `good for **shouting**`.

## Shouting.

### Lists

There are two kinds of lists: bulleted and numbered. For a bulleted list, start each line with a `*` and a tab. For a numbered list, start each line with a number, a full stop and a tab (you can use any number, because the software will always create an HTML list that starts with 1; but it's best to use 1 or the actual numbers you intend, just to make things neat). Markdown:

```
1.      Apples
2.      Oranges
3.      Pears

*       Apples
*       Oranges
*       Pears
```

Result:

1. Apples
2. Oranges
3. Pears

- Apples
- Oranges
- Pears

### Simple tables

You can create simple tables in markdown. You can make them really neat, or you can make them really efficient. Markdown:

---

Tip: If you use bold in a first-level heading (e.g. `# **Chapter 1**` `Lost at Sea`), our Classic theme's typography will put that bold text onto its own line, set off from the heading. This is useful for chapter numbers that should look separate from the chapter title, but in the underlying HTML need to be part of the heading, for instance when software generates tables of contents.

## MARKDOWN

```
| Fruit | Quantity |
|-----|-----|
| Apples | 2 |
| Oranges | 5 |
| Pears | 0 |

| Fruit | Quantity
|---|---
| Apples | 2
| Oranges | 5
| Pears | 0
```

Result:

<b>Fruit</b>	<b>Quantity</b>
Apples	2
Oranges	5
Pears	0

<b>Fruit</b>	<b>Quantity</b>
Apples	2
Oranges	5
Pears	0

To make more complex tables with merged or individually styled cells, you have to use actual HTML table markup. See the Tables chapter for more detail.

### Blockquotes

Remember how old email programs put a `>` at the start of each line when you hit

Note the minimum three hyphens in the lines that creates the border between the table head and table body. (Kramdown doesn't require three, but GitHub previews do, so it's best practice.)

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'Reply'? Ah, `>` means blockquote. Start each line with `>` and a space to make text a blockquote. Markdown:

```
> This is text in a blockquote.
```

Result:

This is text in a blockquote.

In our workflow we use blockquote HTML for more than just quotations, though. We also use it for figures and poetry. We'll come back to this later.

### Hyperlinks

If you want your final HTML to include a clickable link:

- surround the text you want clickable with `[` and `]`
- put the URL it should point to between `(` and `)` immediately afterwards.

Markdown:

```
To learn more, [click here](http://google.com).
```

Result:

To learn more, click here.

### Images

To place an image, you include a line telling the computer where to find the image file. This looks like a hyperlink, but with a `!` at the start of the line. Inside the square brackets, you include a brief description of the image (this is useful to screen readers for the visually impaired).

```
![A dog chasing a bus.](images/dogbus.jpg)
```

## MARKDOWN

In the parentheses above, the `images/` part says that the `dogbus.jpg` image is in the `images` folder, which is alongside the markdown file. In our workflow, we always put images in the `images` folder like this.

See the Images chapter for more detail.

### Endnotes

Endnotes in our workflow appear at the end of a document (that is, a web page or a book chapter).<sup>1</sup>

- put a `[^1]` where the footnote reference should appear (the `1` there can be any numbers or letters, and should be different for each footnote in a document);
- anywhere in the document (we recommend after the paragraph containing the footnote reference), put `[^1]: Your footnote text here.`

We'll explain how to create notes on the side or bottom of a page (footnotes) later when we talk about classes.

(By the way, endnote references are `<sup>` in kramdown's HTML, not unicode numbers like <sup>2</sup>. The Classic theme includes styling for these and for `<sub>`, as in H<sub>2</sub>O.)

See the Notes chapter for more detail.

### Definition lists

A definition list is a list of definitions, not surprisingly. Think of a dictionary. A definition list comprises one or more entries, and each entry has a headword and a definition. Even if you're not editing a dictionary, you might need to create a short glossary or define a word or two at some point. To create a definition entry in markdown, put the headword on its own line, and the definition on the next, after a colon and a tab. Markdown:

```
Editor
:      Someone who spends more time learning new tricks
      than making money.
```

Result:

Editor

Someone who spends more time learning new tricks than making money.

To create a whole list of definition entries, just put one of these after the other, with a line space between them.

## Using class tags

We're going to get a bit more advanced now. Get some tea.

As we mentioned earlier, sometimes we have to tell our software what *kind* of paragraph or list or blockquote we want. These *kinds* of text are called *classes*. To give something a class, we add a kramdown tag in curly braces, with a colon, and a dot before the class name. Markdown:

```
This paragraph should be in a box.  
{:.box}
```

Result:

This paragraph should be in a box.

For the resulting HTML to actually appear in a box, when we turn your markdown into a finished book, we'll have to combine it with a CSS stylesheet that includes formatting instructions for the `box` class. If you're just editing in markdown, you don't have to think about the stylesheets. Our default stylesheets include designs for `box` as well as several other classes. (Which we'll list in a moment.)

But if your book needs classes that aren't already supported in the Clas-

sic theme, you'll need to ask a CSS-savvy designer to write you some CSS rules for your new class, to add to the bottom of your theme's master `.scss` files as custom CSS.

### Inventing classes

If you invent new classes, make sure you name them for their semantic *purpose*, not their appearance. For instance, `important-tip` is a better class name than `shaded-bold`. Also, class names should always be lowercase and have no spaces.

In addition to boxes, our default stylesheets include lots of other classes for common book features.

### Block and inline elements

Attribute tags like classes can be applied to two kinds of element: *block* elements and *inline* elements.

A block element is anything that should (in print or on screen) start and end with a line break, like a paragraph or a list. An inline element is anything that appears inside a line of running text, like bold and italic.

Most of the Classic theme's pre-designed classes are for either block or inline elements, and sometimes both.

When you apply an attribute tag to a block-level element in kramdown, you put the tag on the line immediately following the element.

When you apply an attribute tag to an inline element, it appears immediately at the end of a span (a span is any contiguous series of inline characters inside a block element). Spans in kramdown can be marked off with asterisks as if they are italics: mark off the text you're tagging with asterisks (`*`), as you would italics, and put your tag immediately after the closing `*`, on the same line. E.g.



`*Make this small-caps.*{:smallcaps}`. The Classic theme will then apply the correct styling to the span, instead of the default italic.

To see all the classes that our Classic theme supports, see the Supported classes section.

## Editing reflowable text

When you're working in markdown, you're creating text that might reflow in an infinite number of ways on screens and onto page layouts. This changes the way you edit, because nothing is static.

For instance, you can use special HTML codes to insert non-breaking spaces, discretionary ('soft') hyphens and non-breaking hyphens.

I need to	Use this
Prevent ellipses falling after a line break	Add a non-breaking space ( <code>&amp;nbsp;</code> ) before ellipses.
Prevent dashes falling after a line break	Add a non-breaking space ( <code>&amp;nbsp;</code> ) before the dash: <code>the en-dash&amp;nbsp;- as I've explained&amp;nbsp;- is tricky.</code>
Prevent line breaks between numbers and units	Use a non-breaking space: e.g. for '3 pm, 24 May' type <code>3&amp;nbsp;pm, 24&amp;nbsp;May</code>
Prevent line breaks between adjectives and their units	Use a non-breaking space: e.g. for 'Grade 2' type <code>Grade&amp;nbsp;2</code>
Prevent line breaks inside big numbers	Use a non-breaking space: e.g. for '40 000' type <code>40&amp;nbsp;000</code>
Prevent a line break at a hyphen	Use <code>&amp;#x2011;</code> for a non-breaking hyphen, e.g. <code>D&amp;#x2011;Space</code> for 'D-Space'

## MARKDOWN

---

<b>I need to</b>	<b>Use this</b>
Allow a word to hyphenate at the end of a line	Insert a discretionary ('soft') hyphen code: <code>&amp;shy;</code> . E.g. <code>mark&amp;shy;down</code>

---

1. In kramdown syntax, unfortunately, endnotes are called footnotes; so it's easy to confuse them. In book parlance, there is a big difference between footnotes and endnotes.

# Supported classes

Our Classic theme includes styling for a range of classes. You can apply these to elements in markdown.

## Formatting

Use these classes in your markdown to create specific formatting effects.

Feature	Workflow class	Block or inline	Explanation	Supports edition suffix
Bibliography list	<code>.bibliography</code>	Block	Styles a list as a bibliography, for instance at the end of an academic book.	No
Box	<code>.box</code>	Block	Puts the element in a box, to set it off from the rest of the text.	No

## SUPPORTED CLASSES

Feature	Workflow class	Block or inline	Explanation	Supports edition suffix
Chapter number	<code>.chapter-number</code>	Block	Used for a chapter number before a chapter heading. (See the tip at <b>Bold</b> in the chapter on <b>Markdown</b> for another way to handle chapter numbers.	No
Dedication	<code>.dedication</code>	Block	A dedication, for instance at the start of a book or chapter	No
Epigraph source	<code>.epigraph-source</code>	Block	The person to whom the epigraph is attributed.	No
Epigraph	<code>.epigraph</code>	Block	An epigraph at the start of a book or chapter.	No
Figure	<code>.figure</code>	Block	A figure is an image with a caption. Read about how to manage them properly in our workflow guide.	No
Figure: extra small	<code>.x-small</code>	Block	Add to the <code>.figure</code> tag, e.g. <code>{:.figure .x-small}</code> .	No
Figure: fixed position	<code>.fixed</code>	Block	Add to the <code>.figure</code> tag, e.g. <code>{:.figure .fixed}</code> . For figures that must keep their position in the text flow, and must not float to the top of the page.	No

## FORMATTING

Feature	Workflow class	Block or inline	Explanation	Supports edition suffix
Figure: large	<code>.large</code>	Block	Add to the <code>.figure</code> tag, e.g. <code>{:.figure .large}</code> .	No
Figure: medium	<code>.medium</code>	Block	Add to the <code>.figure</code> tag, e.g. <code>{:.figure .medium}</code> .	No
Figure: small	<code>.small</code>	Block	Add to the <code>.figure</code> tag, e.g. <code>{:.figure .small}</code> .	No
Figure height	<code>.height-1</code> to <code>.height-50</code>	Block	Sets the height of an element to a multiple of the default line height. Use in figures, on line after image (the <code>&lt;p&gt;</code> containing the <code>&lt;img&gt;</code> ), to maintain baseline grid.	Yes
First paragraph	<code>.first</code>	Block	For any paragraph that starts a new set of paragraphs, flush left and with a gap above it.	No
Float to top	<code>.float-top</code>	Block	Floats the element to the top of its page. Useful for boxes. Applies to print output only.	Yes
Float to bottom	<code>.float-bottom</code>	Block	Floats the element to the bottom of its page. Useful for boxes. Applies to print output only.	Yes

## SUPPORTED CLASSES

Feature	Workflow class	Block or inline	Explanation	Supports edition suffix
Footnote	<code>.sidenote .bottom</code>	Block or inline	When you add <code>.bottom</code> to <code>.sidenote</code> , the note appears at the foot of the page in print output. It remains on the side on screens. (Also see the chapter ‘Footnotes, endnotes and sidenotes’.)	No
Fraction	<code>.fractions</code>	Block or inline	If your font supports it, converts characters like <code>1/2</code> into fraction characters.	No
Frontmatter references	<code>.frontmatter-reference</code>	Inline	Tag links in the Table of Contents whose page numbers must match your frontmatter reference style set in CSS.	No
Glossary	<code>.glossary</code>	Block	Use this after the last entry in a series of definition lists to define the entire list of definitions as a glossary.	No
Hide from print	<code>.non-printing</code>	Block or inline	Hides the element from print output. Useful for things like clickable buttons, which are only intended for screens, not paper.	No

## FORMATTING

Feature	Workflow class	Block or inline	Explanation	Supports edition suffix
Keep together	<code>.keep-together</code>	Block	Prevents an element from breaking across pages. (E.g. you want to keep a short list on the same page.)	No
Keep with next	<code>.keep-with-next</code>	Block	Prevents a page break between this element and the next one.	No
Logo image	<code>.logo</code>	Block	Used for making images small, especially for small logos in text like on acknowledgements pages.	No
Page break after	<code>.page-break-after</code>	Block	Creates a page break after the element.	No
Page break after, end of book	<code>.page-break-after-right</code>	Block	When applied to the very last element in the book, ensures a blank verso for an even-numbered page extent.	No
Page break before	<code>.page-break-before</code>	Block	Starts its element on a new page.	No
Page break: allow	<code>.allow-break</code>	Block	Allows an element to break over a page where the default styles would normally prevent that. Apply the class to the parent element.	No

## SUPPORTED CLASSES

Feature	Workflow class	Block or inline	Explanation	Supports edition suffix
Page numbering restart	<code>.page-1</code>	Block	Restarts page numbering from 1. Can be added to the first block element on a page, or to the YAML header, in addition to the main style, e.g. <code>style: halftitle-page page-1</code> or <code>style: chapter page-1</code> . Recommended for any document that starts a book interior (e.g. title page), to retain correct pagination when creating a PDF ebook with a front cover	No
Poetry	<code>.verse</code>	Block	Designing poetry is tricky and important. Read about how to manage this in our workflow guide.	No
Pull quote	<code>.pullquote</code>	Block	Displays a paragraph as a pull quote.	No
Sidenote	<code>.sidenote</code>	Block or inline	A sidenote appears in a sidebar to the right of the text.	No
Small caps (lowercase only)	<code>.smallcaps</code>	Block or inline	If your font supports proper small-caps glyphs. Only affects the lowercase letters. Add <code>.italics</code> or <code>.bold</code> if needed to italicise or bold.	No



## FORMATTING

Feature	Workflow class	Block or inline	Explanation	Supports edition suffix
Small caps throughout	<code>.allsmallcaps</code>	Block or inline	If your font supports proper small-caps glyphs, all characters are small caps. Add <code>.italics</code> or <code>.bold</code> if needed to italicise or bold.	No
Source after a quotation	<code>.source</code>	Block	The name and/or title of the source for a preceding quotation.	No
Table caption	<code>.table-caption</code>	Block	Add <code>{:.table-caption}</code> in the line immediately after a table caption. Table captions must always appear above tables, not after them.	No
Title page: author	<code>.title-page-author</code>	Block	The book's author(s) on the title page.	No
Title page: logo	<code>.title-page-logo</code>	Block	A logo, as an image, on the title page.	No
Title page: subtitle	<code>.title-page-subtitle</code>	Block	The book's subtitle on the title page.	No
Title page: title	<code>.title-page-title</code>	Block	The book's title on the title page.	No
Tracking: tighten	<code>.tighten-1</code> to <code>.tighten-50</code>	Block or inline	Each increment tightens the space between letters by 0.001em (1/1000 of a em). <i>Affects print output only.</i>	Yes

## SUPPORTED CLASSES

Feature	Workflow class	Block or inline	Explanation	Supports edition suffix
Tracking: loosen	<code>.loosen-1</code> to <code>.loosen-50</code>	Block or inline	Each increment loosens the space between letters by 0.001em (1/1000 of a em). <i>Affects print output only.</i>	Yes
Valediction	<code>.valuediction</code>	Block	Used for the sign-off at the end of a letter, preface or foreword.	No

## Reserved classes

You may also need to create your own classes for other uses. If you do, avoid using the same already-supported class names above. You should also avoid using the following ones, which are reserved for specific structural elements.

Class name	Reserved for
<code>index</code>	The home page of a collection, used for the <code>style</code> value in file YAML headers
<code>cover</code>	A front cover, which will appear in ebook editions, used for the <code>style</code> value in file YAML headers
<code>halftitle-page</code>	A book's halftitle page, used for the <code>style</code> value in file YAML headers
<code>previous-publications-page</code>	A book's list of the author's previous publications, used for the <code>style</code> value in file YAML headers
<code>title-page</code>	A book's title page, used for the <code>style</code> value in file YAML headers
<code>copyright-page</code>	copyright or imprint page, used for the <code>style</code> value in file YAML headers

## THE EDITION SUFFIX

Class name	Reserved for
<code>contents-page</code>	A book's table of contents, used for the <code>style</code> value in file YAML headers
<code>dedication-page</code>	A dedication page, used for the <code>style</code> value in file YAML headers
<code>epigraph-page</code>	An epigraph page, used for the <code>style</code> value in file YAML headers
<code>frontispiece-page</code>	A frontispiece page, used for the <code>style</code> value in file YAML headers
<code>frontmatter</code>	For other prelim pages not accounted for otherwise, used for the <code>style</code> value in file YAML headers
<code>chapter</code>	A book's default chapter page (and the global default), used for the <code>style</code> value in file YAML headers

## The edition suffix

If you want to produce more than one print edition of a book from the same source file, you can't use the same classes that affect text-flow – like `.tighten-1`, for instance – in both editions, because the text will flow differently in each edition.

Our workflow has a way to manage that. In the print CSS file, you can specify an edition suffix. For instance, if you're producing a schools edition of a book, you might make your suffix `-schools-edn`. That suffix will be appended to the end of certain class names for that stylesheet. The default `.tighten-1` class will become `.tighten-1-schools-edn` in your final print CSS.

(It's a good idea to start a suffix with a hyphen and use all lowercase letters, to keep your output CSS neat. Never use spaces.)

Only some classes are affected – see the table above for which ones. The most important are the classes used for tightening and loosening letter-spacing, which are mostly used to control widows and orphans in print layout.

## SUPPORTED CLASSES

In your markdown, then, you'd use `{:.tighten-1-schools-edn}` instead of `{:.tighten-1}`, and that class will then only have an effect on your schools edition. If you had another edition, say a large-print edition with a `-large-print` suffix, you'd use a `{:.tighten-1-large-print}` tag in the markdown. These would match the classes automatically generated in each edition's CSS.

Of course, one element can carry both classes. For instance, you might end up with a paragraph tagged with `{:.tighten-1-schools-edn .tighten-1-large-print}`. That paragraph would then be tightened in both print layouts.

## Deprecated classes

Early versions of the EBW used the following classes, which are no longer supported:

- `shrink`
- `tighten`, `tight`, `x-tight`, `xx-tight`, `xxx-tight`
- `loosen`, `loose`, `x-loose`

# Tables of contents

A table of contents should be its own markdown file containing a list of the book's parts. Each list item should be a link to a location in the book – ideally a fragment identifier to ensure that print page references are always accurate. Here is a simple example:

```
---  
title: Contents  
style: contents-page  
---  
  
# Contents  
  
1. [Chapter 1](1.html#chapter-1)  
1. [Chapter 2](2.html#chapter-2)
```

For more advanced markup and styling, you may need to do more. In this example, each element is tagged.

```
---
```

## TABLES OF CONTENTS

```
title: Contents
style: contents-page
---

# Contents

1.
[*Acknowledgements*{:.toc-chapter-title}](0-5-acknowledgements.html#acknowledgements)
1.
[*Preface*{:.toc-chapter-title}](text.html#preface){:.frontmatter-reference}
1. [*1*{:.toc-chapter-number} *Early Days in
Mavambe*{:.toc-chapter-title}](text.html#early-days-in-mavambe)
1. [*2*{:.toc-chapter-number} *Baragwanath Hospital and
Beyond*{:.toc-chapter-title}](text.html#baragwanath-hospital-and-beyond)
```

Note the `.frontmatter-reference` in particular: our default styles format that page number according to the style you set for the `$frontmatter-reference-style` variable in your stylesheet. The other classes in this example are for custom formatting.

Tip: We recommend using a numbered list, even though our default styles hide the numbers. This is to make it easier to convert your TOC to EPUB3, which requires that the `nav` element on your contents page contains only an ordered list.

# Images

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## Adding images in markdown

We use standard markdown to embed images:

```
![A description of the image](../{{ site.image-set  
}}/filename.svg)
```

Let's break that down:

- the exclamation mark and square and round brackets make up the

## IMAGES

basic markdown image syntax: `![Description](filename)`. The description is especially important for screen-readers used by the visually impaired.

- `../` means ‘go up, out of the `text` folder’
- `{{ site.image-set }}/` means ‘go into the folder containing our preferred set of images’ (as defined in `_config.yml`). The default image-set folder is `images`.
- finally, the image file name.

Many images are in figures. That is, they include an image followed by a caption. We put these together in a `<blockquote>` element with a `.figure` class. We can then control placement by styling the `<blockquote>`.

The reason we use a blockquote is that it lets us keep images and their captions together. A `<figure>` element would be better HTML, but it won’t validate in EPUB2, and can’t be created with kramdown.

Here’s an example of markdown for a figure:

```
> ![Line drawing of a book](../{{ site.image-set }}/book.jpg)
>
> This is not a book.
{: .figure}
```

Every line (except the `{: .figure}` class tag at the end) starts with a `>` and a space. These wrap the figure (image and caption) in a `blockquote` element.

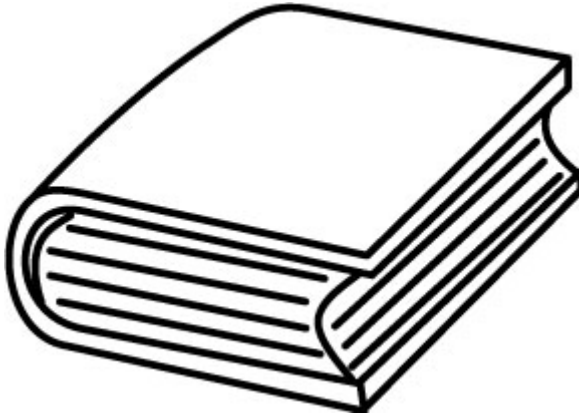
The first line is the image reference. As noted above, it consists of:

- an exclamation mark telling markdown that we’re placing an image
- the `alt` attribute in square brackets
- the path to the image file.

The third line is the figure caption, followed by the kramdown tag `{: .figure}`, which lets our stylesheets format the `blockquote` as a figure. (For instance, preventing a page break between the image and the cap-



## ALTERNATIVE IMAGE SETS



*This is not a book.*

tion in print.)

This will display like this.

If your image has no caption, just skip the empty line and caption line:

```
> ![Figure 2-A: The Ballard scoring method](../{{
site.image-set }}/fig-2-A.svg)
{: .figure}
```

If it's important to you that the image isn't in a blockquote, and there is no caption, you can use:

```
![Figure 2-A: The Ballard scoring method](../{{
site.image-set }}/fig-2-A.svg)
{: .figure}
```

## Alternative image sets

There are often good reasons for producing books with different sets of

## IMAGES

images. For instance, one edition may have colour images and another black-and-white. Or your print edition might call for high-res images, but you want low-res ones for the ebook.

By default, your markdown looks for images in the book's `images` folder. You can set your config file to switch to an alternative set of images (in a subfolder of `images`) when needed. We do this by using the `{{ site.image-set }}` tag to refer to whatever images folder we need at the time.

For example:

```

```

The default `image-set` is `images`. You can change that for each output as needed. For instance, you might create a subfolder for high-res images in `images` called `print`. In `_config.yml` you can set that subfolder as the default images folder.

```
image-set: "images/hi-res"
```

Whenever you build your HTML, you then switch which set of images to use by commenting out the `image-set` setting(s) you don't want. For example, when creating the high-res edition, in `_config.yml` you might comment out the default image path so that the HTML uses the high-res images:

```
#image-set: "images"  
image-set: "images/print"
```

Remember that your images in your alternative images folder must have exactly the same file names as your default image set. The HTML will be looking for the same file names in a different folder.

To always use a specific image file for any given image, irrespective of

the `images-set` config, simply hard-code your image path in markdown – that is, without using the `{{ site.image-set }}` tag. For example, for a given image you might specify the default images folder `` or a specific subfolder ``.

## Image placement

You may need to control how an image is sized and placed on the page – especially in print – depending on its detail or aspect ratio and nearby images or other elements. You do this by adding a class tag to the line following the image or figure created with a `>` blockquote. (This applies a class to the blockquote in HTML.)

In the Classic theme, you have two broad options:

The lazy way: use these class attributes:

- `.x-small` limits the image height. In print, to 30mm.
- `.small` limits the image height. In print, to 45mm.
- `.medium` limits the image height. In print, to 65mm, which allows two figures with shortish captions to fit on a page.
- `.large` fills the width and most of a printed page, up to 150mm tall. Try to put these images at the end of a section, because they cause a page break.
- `.fixed` keeps the figure in its place in the text flow, and will not float it to the top or bottom of a page. For instance, when an image must appear in a step-by-step list of instructions.

You add these classes to the `{:.figure}` tag like this:

```
{:.figure .small}
```

```
{:.figure .fixed}
```

and so on. You can combine size and placement classes like this, too:

```
{:.figure .fixed .small}
```

The more accurate way: use a class tag to specify the exact height of the image in lines. This is important if you're maintaining a baseline grid on your pages. For instance, `{:.height-5}` will limit the image to a height of five lines. Unlike the lazy way above, this tag should be applied to the

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image, not the figure. So a complete figure element might look like this in markdown:

```
> ![Potatoes on the moon](Images/1-moon-potatoes.jpg)
> {:.height-12}
>
> Potatoes grow well on the moon if well watered.
{:.figure}
```

CSS tip: If you're having trouble with SVGs having space around them, in your CSS make sure you set the height of the `img` element. SVGs are inline elements by default, and will add white space around them.

## Preparing images

- Wherever possible, convert images to SVG so that they scale beautifully but also remain small in file-size for web use.
- Ensure that raster images, or raster/bitmap elements in SVG, are high-res enough for printing (e.g. 300dpi at full size).
- Embed images placed in your SVG image, don't just link them.
- Create a JPG version of every SVG image with the same file name (e.g. `bear.svg` and `bear.jpg`). You'll need the JPG fallback for EPUB. (We recommend JPG over GIF or PNG as a general default. One reason is that transparency seems like a good idea until your end-user switches their e-reader to 'night mode', and your black line-art disappears into the background.)
- Save images in the book's `images` folder.

Here's our most common workflow for converting images to SVG:

- If the image was created in InDesign (e.g. a flowchart made of InDesign frames): open in InDesign, group the frames that make up the image, copy, and paste into a new Illustrator file. Adjust Illustrator file art-

## PREPARING IMAGES

boards as necessary, then save as SVG.

- If the image was created in Photoshop or other raster format: open the original, copy into Illustrator. Live trace the image. (We mostly use the ‘Detailed Illustration’ preset.) Save as SVG. You can also use the trace function in Inkscape instead of Illustrator.
- If you save SVG from Adobe Illustrator (and possibly other creators, too), choose to convert type to outlines. (For us, the main reason for this is that PrinceXML gives unpredictable results with type in SVG. But it’s probably safest generally to convert type to outlines for consistent output.)

### Recommended image sizes

We like to use these settings where possible:

- Default width: 115mm
- Aspect ratios: 4:3 (portrait or landscape), a closer ratio, or square. Images at wider ratios (e.g. 16:9) than 4:3 make layout more difficult.
- Therefore, maximum height is 150mm. (That’s very slightly less than a 4:3 height:width ratio.)

Using Illustrator? Different SVG editors treat image size differently. For instance, a 2-inch-wide image in Illustrator will appear 1.6 inches wide in Prince and Inkscape. Why? Because when creating the SVG’s XML, Illustrator includes its dimensions in pixels, and *assumes a 72dpi resolution*, where Prince and Inkscape follow the W3C SVG spec and assume 90dpi. As a result, images coming out of Illustrator always appear 80% of their intended size. So, if you’re creating images in Illustrator, set your image sizes to 125% of what you intend to appear in the book. That means:

- default width  $115\text{mm} \times 125\% = 143.75\text{mm}$
- max height (at 4:3) = 190mm

Check out Adobe’s guidance on saving SVGs.

### Resolution

- For SVG images, the editor you use will determine underlying resolution. Illustrator uses 72dpi, and Inkscape 90dpi. We favour and assume

## IMAGES

90dpi, but can rescale SVG images with our stylesheets just in case.

- For JPGs, our default resolution should be 200dpi and image quality of 80 ('very high' in Adobe presets). This allows for reasonable print quality while keeping file sizes sensible for web delivery. The higher resolution also allows ebook users to zoom in for more detail.
- To get a 200dpi JPG that is 115 mm wide, the image must be 906 pixels wide. (115mm is 4.53 inches, which contains 906 pixels at 200 pixels per inch, aka 200 dpi.)
- Try to keep JPG file sizes below 127KB: Amazon Kindle may automatically downsample images above that, and it's better if you control the downsampling for quality than let their servers do it. However, for raster-only images (e.g. x-rays or photos) if a larger size is required for acceptable print quality then larger is fine.

### Image styles

We like these approaches to artwork, where possible:

- Default style: Black and white line art, with average 1mm line thickness.
- Use shades of grey only where needed, and as few shades as possible.
- Use the same font and size for all labels. (We like Source Sans Pro at 10pt on 115mm-wide images, 11pt on 145mm-wide images (see note above on using Illustrator).
- Fit artboards to artwork bounds; there must be no white space around the art in an image. (We control space with styling.) Since you're creating images to a specific size, you need to **expand artwork to fit the artboard**, *not* fit artboards to artwork bounds, which would make your whole image smaller.

If you use live trace to create art from a raster source, you must clean up the file to remove unnecessary fills that add to file size but do little for clarity.

Settings:

- Default file format: SVG
- Convert type to outlines (the alternative to embed and subset fonts doesn't work reliably in print output currently)

## PREPARING IMAGES

- Raster elements embedded, not linked
- Transparent background

Where images *must* be raster (e.g. x-rays, photos), they should follow the sizing constraints above and be saved as jpg (since Amazon Kindle only uses JPG or GIF, avoid PNG or other formats). Save as RGB.

Where labels are added to a raster image, the image should be saved as SVG with an embedded raster image. Labels and other text should *not* be rasterised.

If you're creating images from InDesign originals using Illustrator, a suggested workflow:

- If the image was created in InDesign (e.g. a flowchart made of InDesign frames): open in InDesign, group the frames that make up the image, copy, and paste into a new Illustrator file. Adjust Illustrator file artboards as necessary, then save as SVG.
- If the image was created in Photoshop or other raster format: open the original, copy into Illustrator. Live trace the image. I mostly used the 'Detailed Illustration' preset. Save as SVG.
- For filenames, use the convention 1-2.svg, as in chapter-figure.svg. For skills workshops images, that might be 1E-B.svg for workshop 1E, figure B. All the images go in an images folder inside the folder with the markdown files.
- If you save SVG from Adobe Illustrator (and possibly other creators, too), choose to convert type to outlines. Currently, PrinceXML does not support fonts in type in SVG reliably.
- To save a little more on file size, also convert all strokes to fills.

### Image file sizes

If you SVGs seem big, read up on optimising SVGs, and/or (if you're comfortable using Python scripts) run your SVGs through Scour.

### Cover images

Add the front-cover image to the book's `images` folder. Ensure colour settings are RGB and the DPI is set to 72. We recommend creating the image in three sizes:

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- `cover.jpg`: 960px high (in keeping with epub best practice these are just under 1000px on their longest side)
- `cover-thumb.jpg`: 300px wide
- `cover-large.jpg`: 2000px high

The first is mandatory. The thumbnail and large images are for your convenience. For instance, when uploading a book to Amazon Kindle, you must provide a cover image this large.



# Embedding video

You can include any iframe in markdown to embed a video. We've created a simple way to embed YouTube videos and have them look consistent across your web version.

1. Find the video's YouTube ID: a code in the URL that looks like this:  
`MqlyxZiDo0A`
2. In the markdown, use the ID in this tag: `{% include youtube id="MqlyxZiDo0A" %}`

This will embed the video in an iframe. (In epub output, you can replace it with a link to watch the video online.)

Note: Our default iframe code gives the iframe a `.non-printing` class, so that your theme can hide the video from the PDF edition.

For now, this only works with YouTube. If you're embedding from any other service, instead of using our `include` tags:

## VIDEO

- use their standard embed iframe
- try to select a width of around 850 px
- add `style="max-width: 100%;"` and `class="non-printing"` to the iframe tag.

# Footnotes, endnotes and sidenotes

Our default theme provides three options for notes.

**Footnotes** appear at the end of a document (web page or book chapter). In book parlance, they are therefore actually endnotes, but we call them footnotes because that's what kramdown calls them. To create them in markdown, follow the kramdown syntax for footnotes:

- put a `[^1]` where the footnote reference should appear (the `1` there can be any numbers or letters, and should be different for each footnote in a document);
- anywhere in the document (we recommend after the paragraph containing the footnote reference), put `[^1]: Your footnote text here.`

**Sidenotes** appear in a box to the right of the text. On wide screens, they float far right of the text. On narrower screens, the text wraps around them. In print, the text wraps around them, too. To create a sidenote, put a `*` at the start of the sidenote text and `*{: .sidenote}` at the end (with no spaces). (Technically, you're creating an `<em>` span with a kramdown IAL.)

In print, you can put **sidenotes at the bottom of the page**. By adding `.bottom` to the `{: .sidenote}` tag, your sidenote sits at the bottom of the page rather than on the right with text wrap, replicating a traditional

## FOOTNOTES, ENDNOTES AND SIDENOTES

footnote. So the markdown looks like this: `*This is a sidenote at the bottom of the page in print.*{: .sidenote .bottom}`. On screen, these are just regular sidenotes.

To create footnote-like sidenotes, you can tag a reference and footnote-like text to create the bottom-of-page-footnote effect:

```
This is body text with a footnote at the
end.[1](#fn-1){: .fnref #fnref-1}

[1](#fnref-1){: #fn-1}. This is the footnote text
{: .sidenote .bottom}
```

This markdown makes [1](#) a link in the body text, which points to the footnote text (ID `fn-1`). The number [1](#) at the footnote text is a link to the reference (ID `fnref-1`).

Unlike proper kramdown footnotes, these do not autonumber. You must manage the numbering manually. This means this is only suitable for books that have a few footnotes. The kramdown contributors are looking into alternative syntax that will let you place a kramdown footnote anywhere in the text.

# Tables

Kramdown (and most markdown variants) can only handle very simple tables. For these you can create the Markdown layout manually. See the chapter on markdown for guidance on formatting simple tables.

You can also use online tools to convert tables into a markdown format.

- Senseful. For instance, working from InDesign:
  - Click and drag over some cells in the InDesign table (not the header row). Then Ctrl+A to select the whole table.
  - Ctrl+C to copy, then paste into a blank spreadsheet.
  - Select all the relevant cells in your spreadsheet, and copy. The table text is now on your clipboard, with the cells separated by tabs.
  - Paste into the online Format Text as Table Input field.
  - Click 'Create Table'. (The default settings are usually fine. Play with them only if you need to.)
  - Copy the Output and paste it into your markdown file.
- Ascii Table:
  - Paste tab-delimited table text
  - Select 'GitHub Markdown' for the output style
  - Copy the resulting plain-text table into your markdown.

Table formatting in markdown can differ between flavours of markdown.

## TABLES

You may need to tweak it. For instance, Senseful starts some table borders with + where kramdown needs a |. In that case, manually change the starting + in any row with a |.

### Complex tables with HTML

For complex tables – anything with merged cells, for instance – you must create an HTML table and paste that HTML (from `<table>` to `</table>`) into your markdown files. It's easiest to use a WYSIWYG HTML editor. For instance, Dreamweaver lets us paste a table from a formatted source like Word or LibreOffice, and then clean up the HTML easily before pasting the whole `<table>` element into our markdown document.

### Table captions

In markdown, add `{:.table-caption}` in the line immediately after a table caption paragraph. This applies the class `table-caption` to the paragraph, which the theme can style. For instance, in the Classic theme `print.css` avoids a page break after the caption, before the table. (According to publishing best-practice, table captions must always appear above tables, not after them.)

# Indexes

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## Introduction

An index (the long list with the page numbers at the end of a book) is an important part of many non-fiction print books (many ebooks don't include indexes, and instead rely on ebook app's search function). Traditionally, indexes are created by professional indexers, who read the final page proofs and compile a list of entries and page numbers manually. They do not only add words to the index, but entire concepts. For instance, a good indexer will include an entry for 'democracy' in an index if the concept is discussed, even if the word 'democracy' is never used. This is why good indexes cannot be generated by computers.

In this workflow, the challenge is in managing page numbers: our workflow allows you to reflow the content into new formats, so page numbers are never quite fixed. Well, you might decide that a particular format's pages are fixed enough for allow for manual page numbers in an

## INDEXES

index, but then you cannot reuse that index in another format.

So here we'll describe how to create an index where the page numbers are dynamic. That is, the index is a list of concepts that point to a particular point in the book. The page numbers in the index (and clickable hyperlinks in an ebook version) are then generated on the fly whenever you output to PDF. This also means you can index early in the production process, such as during editing, rather than waiting for pages to be finalised.

Note: Be careful not to confuse an index in a book with the `index` page of a website. When talking about websites, the `index` page is the home page of a directory. So never give your reference index the file name `index` (e.g. `index.md` or `index.html`). To avoid confusion, in our code we refer to the `reference-index` when we mean a book's index.

To create an index you have to do two things:

1. In the text, tag the words that their index entries will point to.
2. Create an index document with a list of entries.

## How to tag indexed words

To tag a word in the text, we make it a link, and we give that link:

- a target that points to the index
- a class (`.indexed`) to control what it looks like
- an ID (e.g. `#democracy-1`) to uniquely identify it.

The link target should point to the index entry for that word. This way, clicking the word in the text will take you to the right place in the index. And clicking the page reference in the index will take you to the word in the text.

Here's an example of the link in the text:

```
Late that night, [Bob](reference-index.html#bob-1){:.indexed
```



## HOW TO CREATE THE INDEX LIST

```
#bob-1} realised the key was in his pocket.
```

And then when Bob appears later in the book:

```
Eventually, [Bob](reference-index.html#bob-2){:.indexed  
#bob-2} called her to confess.
```

Note that the ID must be unique for every instance of Bob.

## How to create the index list

Then in the index itself, you create a list of entries. After each entry, you add links to each instance of that entry you've tagged in the text. And you give each link the ID that you've pointed to in your tagged word's link target.

Tech tip: To make it easy for us to manage, we use the same ID for the tagged word and the index entry. You don't have to use the same ID. For instance, your tagged word's ID might be `#text-bob-1` and your index entry's link `#index-bob-1`. If like us you use the same ID in both cases, remember that your index must be in a separate file from your text, since IDs must be unique within each file.

Here is what your markdown for the index might look like. Here we've included examples of sub-entries, and the tag to use for the entire list to style it as an index: `{:.reference-index}`.

```
* Alice  
[1](1.html#alice-1){:#alice-1}  
[2](3.html#alice-2){:#alice-2}  
* Bob
```

## INDEXES

```
[1](1.html#bob-1)
[2](9.html#bob-2)
* key
[1](4.html#key-1)
  - private
    [1](4.html#key-private-1)
  - public
    [1](4.html#key-public-1)
{:.reference-index}
```

In this example, we've used numbers as the link text. On screen, these will stay numbers, e.g.:

Alice 1, 2

The stylesheet will add the commas between entries (so you could globally replace with semicolons or otherwise). In print output (using PrinceXML), the stylesheet will replace those numbers with page references.

## Future development

We hope to find more concise ways to create indexes from tags in running text in future. We'd also like to align this work the IDPF's recommendations on indexes in ebooks.

# Poetry

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## Basic poetry markdown

Encoding poetry can be tricky. Usually, poetry in HTML is structured by tagging each stanza as a paragraph, with line breaks after each line. You can do this by adding markdown line breaks (with double spaces or `\` at the end of each line) and tagging the paragraph with `{:.verse}`. However, this structure means it is impossible to have browsers, ereaders and PDF engines correctly indent runover lines (because there is no `nth-line` selector in CSS, unless you resort to a Javascript method that will bloat your code and won't run on many ereaders).

Tech note: Some text and code editors (e.g. Atom) strip out spaces at the ends of lines automatically. So use `\` for line breaks, not double-spaces.

## POETRY

We prefer another approach: the poem is an unordered list (`ul`) and each line (including each blank line between stanzas) is a list item (`li`). We just hide any list markers (bullets) with `list-style-type: none`. This way, we can control indents on runover lines. This is a non-semantic use of HTML, since a poem is technically not a list. But it's a healthy hack with universal browser and ereader support.

Our convention is to mark each line of a stanza with a hyphen `-`, and tag the list with `{:.verse}`:

```
-      I wandered lonely as a cloud
-      That floats on high o'er vales and hills,
-      When all at once I saw a crowd,
-      A host, of golden daffodils;
-      Beside the lake, beneath the trees,
-      Fluttering and dancing in the breeze.
{:.verse}
```

We can also indent individual lines, where the poet wanted indents, by tagging individual list items.

```
-      Alas for man! day after day may rise,
-      {:.indent-3}Night may shade his thankless head,
-      He sees no God in the bright, morning skies
-      {:.indent-3}He sings no praises from his guarded
bed.
{:.verse}
```

The `2` in `{:.indent-2}` refers to the number of em spaces to indent by. Our CSS allows for indents from 1 (`{:.indent-1}`) to 30 (`{:.indent-30}`).

(Big gaps between words in a line must be created with `&nbsp;` in the poem text.)

## Advanced poetry markdown

But wait, there's more! Best practice for poetry layout is that – in print – a poem should be centered on its longest line. That is *not* centering the lines of poetry, but placing the left-justified poem in the horizontal middle of the page. Put another way, the poem should be indented till its longest line is centered on the page.

To achieve this, put the entire poem, including its title, in a blockquote, by adding `>` to the start of each line. Tag the whole blockquote as `{:.verse}`, too. Finally, decide how wide you want the poem to be in multiple of 10 per cent. That is, if you reckon this poem's longest line reaches across 90 per cent of the page, use `.width-90`.

```
> -      ### To One Who Has Been Long in City Pent
> -      To one who has been long in city pent,
> -      {:.indent-2}'Tis very sweet to look into the fair
> -      {:.indent-2}And open face of heaven,—to breathe
a prayer
> -      Full in the smile of the blue firmament.
> -      Who is more happy, when, with heart's content,
> -      {:.indent-2}Fatigued he sinks into some pleasant
lair
> -      {:.indent-2}Of wavy grass, and reads a debonair
> -      And gentle tale of love and languishment?
> -
> -      Returning home at evening, with an ear
> -      {:.indent-2}Catching the notes of Philomel,—an
eye
> -      Watching the sailing cloudlet's bright career,
> -      {:.indent-2}He mourns that day so soon has glided
by:
> -      E'en like the passage of an angel's tear
> -      {:.indent-2}That falls through the clear ether
silently.
```

## POETRY

```
> {:.verse}
{:.verse .width-90}
```

In verse structured as a list like this, our CSS preserves white space. That is, if you type, say, three spaces you get three spaces. Normally, HTML collapses multiple spaces into one – which is great *except* when you want to deliberately use extra spaces, as some poets do. However, this doesn't work at the start of lines, where markdown strips leading spaces. There you must use HTML space entities (like `&nbsp;`) or our indent tags explained above.

**However**, the `whitespace: pre-wrap` CSS we use for this is not currently supported on Kindle. If that's important, it's best to stick to using HTML space entities like `&nbsp;`.

# Page numbers

In print output in the Classic theme, the YAML header's `style` setting determines how the pages are numbered:

- all book parts set to `style: frontmatter` have roman-numeral page numbers;
- all book parts set to `style: chapter` (or, since that's the default fallback, all those without a `style` setting) have decimal page numbers;
- other book parts (e.g. `style: copyright-page`) have no page numbers (nor any other headers and footers).

So if you use `frontmatter` on a book-part (e.g. for a preface, foreword or acknowledgements section), by default it will have roman-numeral page numbers. And when the first `chapter` starts, that chapter will have decimal page numbers.

However, the page numbering will increment consecutively from roman to decimal, unless you tell PrinceXML to start from 1 at the first `chapter`. That is, 'ix, x, 11, 12'. To reset the numbering to 1 at the start of the relevant `chapter`, you have two options:

1. Add the page class `.page-1` to the first element (e.g. the first heading) of the first chapter. In markdown, you do that with the tag `{:.page-1}` in the line immediately after the heading. This only works if that element is not set to `float` in the CSS. (That is, the ele-

## PAGE NUMBERS

ment must appear in the normal flow of text.)

2. Add `page-1` to the `style` YAML setting, *in addition* to specifying `chapter`, not overriding it. That is, the first chapter in your book should have the YAML style set as: `style: chapter page-1`.



# Using Javascript

Wherever possible, we like to create books without Javascript. Printing and ebooks is simpler without it, and it can quickly bloat websites. That said, if you need to use Javascript, it may be best to place scripts in each book's own `js` folder.

To add them to your `<head>` elements, link to them by adding `<script>` tags to `_includes/head-elements`. You can also link to remote scripts here, without the need to place the actual scripts in the `js` folder.

Keep in mind that anything you add to `head-elements` will be added to all books in the series folder. If necessary, advanced Jekyll users can try applying different scripts to different books by using Liquid logic tags. For instance, `if page.path contains book`, where `book` is your book's folder.



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## Suggested steps

This is what we do when we convert one of our textbooks from a traditional InDesign workflow to markdown for this workflow. You'll probably develop your own process for turning existing books into markdown. Maybe this will help.

1. Open the InDesign file and copy all the text.
2. Paste the text with formatting into your text editor.
3. Search and replace (S&R) all line breaks with double line breaks:
  - Tick 'Regular expression' (because you're using the regex `\n` to mean 'line break', not actually searching for the characters 'slash' and 'lowercase en').
  - Find `\n`
  - Replace with `\n\n`

4. Comparing to a laid-out, up-to-date version of the book, mark all headings with markdown's heading hashes (#) according to their heading level. E.g.:
  - `h1 = #`
  - `h2 = ##`
  - `h3 = ###`, and so on.
5. At the same time, you may want to manually create Markdown lists using `*` for bullets and `1.`, `2.`, `3.` etc. for numbered lists. Note that list indents can get complicated, so check previous chapters and test your markdown-to-HTML conversion when you hit a tricky one (e.g. a note inside a bullet list nested inside a numbered list).
6. Add Markdown image references. See the images section below for detail on how best to do this.
7. Search for every instance of italic, bold and bold-italic, and manually mark these in markdown with asterisks: in markdown, `*one asterisk*` is *italic*, `**two**` is **bold**, and `***three***` is ***bold-italic***. Remember that in some fonts, italic and bold may have different names in InDesign, like 'oblique' and 'black'.
8. Look out for special characters, especially degree symbols (°), superscripts and subscripts. It's best to search the InDesign document (search by style and basic character formats, e.g. 'Position' for superscript and subscript) for these instances so you don't miss any. Most superscripts and subscripts in InDesign and similar are created by formatting normal text. In text-only, there is no formatting, so you should use the unicode character for each superscript or subscript character. E.g. when typing the symbol for oxygen, O<sub>2</sub>, the subscript 2 is <sub>2</sub>, unicode character U+2082. To type these characters, you may need special software (e.g. for Windows, Google unicodeinput.exe), or copy-paste from an online reference. In Windows, you can also find symbols in Character Map, e.g. search in Character Map for 'Subscript Two'.

## Search-and-replace in InDesign

InDesign is great for prepping text you've received in InDesign or Word,

because it has very powerful search-and-replace. In particular, it's worth getting to know GREP search-and-replace. The learning curve is steep, but your conversions will be much faster once you've mastered GREP. Here are some GREP learning resources.

For instance, if you want to convert all italics to markdown:

1. In the Find dialog, choose GREP.
2. Click in the Format box and set the font style to Italic.
3. In the Find box, search for `(.+)`.
4. In the Replace box, replace with `*$1*`.

Remember that search-and-replace is rarely flawless, so proceed with caution. For instance, regarding italics: in markdown, it's very important that the starting `*` and ending `*` that mark the italics are right up against the words they wrap. I.e.:

- Correct: `I want to *emphasise* this.`
- Incorrect: `I want to *emphasise *this.`

However, many (human) editors often mark the spaces on either side of a word as italic, probably because clicking and dragging with a mouse can be inaccurate, and because double-clicking a word often highlights the word as well as the space after it. This means that when we automate 'search for italics and wrap with `*`', we end up wrapping the space into the markdown as well. Also, sometimes spaces in the manuscript are italic, even though the words on either side of the space are not (this is probably caused by editing or pasting phrases that were once italic). In Word and InDesign, you'd never spot those italic spaces by eye. But in the markdown, you end up with this:

`I went to* *the shops.`

Markdown reads that as meaning that there is an actual asterisk after 'to', and italics start from 'the' and continue (at least) to the end of the paragraph:

`I went to* the shops.`

These problems have to be fixed with a combo of clever searches and manual spotting.

The same thing happens with bold, but luckily bold is usually used

## CONVERTING FROM INDESIGN

more sparingly than italic, and is therefore easier to fix manually.

# Print output

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## Introduction

We use PrinceXML to turn Jekyll's HTML into beautiful, print-ready book files. We haven't found anything as good as Prince, so we reckon it's worth its price tag. And you can use the trial version to get your print output perfect before committing to the price. So our CSS files for print are designed specifically for Prince.

If you want to learn about using CSS to control print output using Prince, this is a great tutorial.

## Quick output

Run the template's `-pdf` script for your operating system. For these to work, you must already have Jekyll and Prince installed and working.

- On Windows, run `win-print-pdf.bat` by double-clicking it from your file explorer.
- On Linux, run `linux-print-pdf.sh`. You may have to run it from a terminal, and first enter `chmod +x linux-print-pdf.sh` to give it permissions, then `bash linux-print-pdf.sh`.
- On Mac OSX, double-click `mac-print-pdf.command` in Finder. You may need to give the file permission to run first. To do this, in a Terminal in the same folder as the script, type `chmod +x mac-print-pdf.command`.

The same applies to the other scripts (e.g. `-screen-pdf`).

## Detail

### Creating PDF files with the Prince GUI

1. Find your book's HTML files in your `_html` folder. (Remember to run Jekyll locally to generate the latest version; if you're getting your HTML from a GitHub repo's `_html` folder, trust that the last contributor synced up-to-date, reliable HTML generated by their local Jekyll instance.)
2. Drag the HTML files into Prince. Make sure they're in the right order. Only include the files you need in print. For instance, you'll usually leave out `index.html`. You'll usually only include `cover.html` when creating a PDF ebook.
3. Tick 'Merge all..' and **specify an output file** location and name. Do not let Prince output to your `_html` folder. (If you skip this, Prince will output to your `_html` folder, which will cause permissions issues when you want to modify or delete the file, because Jekyll owns the `_html` folder and can overwrite it, and because Git will try to commit and sync the output PDF, which you probably don't want.)



## DETAIL

- Prince will find your book's print CSS, which you specified in `_config.yml`. If you want a PDF with a completely different CSS file, either:
  - change it in `_config.yml` and restart Jekyll to update your files with the new config, or
  - leave it blank (`stylesheet-print: ""`) and manually add the output CSS to Prince.
- Click Convert.

Tech detail: Our default HTML `head` includes links to both the screen stylesheet and the print stylesheet specified in `_config.yml`. Prince knows which one to use because they're specified with `media="screen"` and `media="print"`.

### **Creating PDFs with Prince from the command line**

For general instructions, see the official PrinceXML user guide. We like to use this workflow:

## PRINT OUTPUT

1. In each book's folder (alongside the markdown) we keep a file called `file-list`. The `file-list` file is just a list of the HTML files that must be included in the print PDF. E.g.:

```
0-1-titlepage.html
0-2-copyright.html
0-3-contents.html
1.html
2.html
3.html
```

If you include the list of files for a given output format in `meta.yml`, this file is automatically generated by the default `file-list` file in our template.

2. At your command prompt, navigate to the book's folder in `_html`. (With the right settings, you can launch your command line app in the right folder from a file explorer in Windows, Mac and Linux.)
3. At the prompt, type `prince -l file-list -o /temp/filename.pdf`.

In that last step, `/temp` is an existing folder at the root of your drive (e.g. `C:/temp` if you're working on your C drive in Windows) and `filename` is a sensible file name. If you just used `filename.pdf` without the folder path, the PDF would be saved to the same folder as the HTML in `_html`. We don't recommend this because Jekyll will overwrite that whole folder if you build new HTML, and you'll lose your PDF.

### Refining print layout

You will doubtless want to refine your print layout by editing your markdown and adding custom CSS to the `print.scss` file in your theme.

For instance, to save widows and orphans, when using the Classic theme, you can tighten letter-spacing by adding `{:.tighten-5}` and

`{:.loosen-5}` tags to the lines after paragraphs. The number in the tag refers to how many thousands of an em you're affecting letter-spacing by. For instance, `{:.tighten-10}` will tighten letter-spacing by 10/1000 em. In good typography, you should avoid tightening or loosening by more than 10/1000 wherever possible.

And to add manual hyphens to improve spacing, use discretionary hyphens (aka soft hyphens) by adding the HTML entity `&shy;` where you want the soft hyphen.

### *Faster print refinement*

When refining print layout (e.g. fixing widows and orphans) with the EBWorkflow, this is happening:

1. You edit the markdown
2. Jekyll generates new HTML
3. You convert to PDF in Prince
4. You open the new PDF to see your changes.

There are two delays in this process:

1. Jekyll can take several seconds to regenerate the entire book (even with `--incremental` enabled)
2. You have to click 'Convert' and Prince must regenerate the file(s)
3. If your PDF viewer locks the file you're viewing, you have to close it before generating a new PDF in Prince.

To speed this up:

1. Temporarily stop Jekyll generating any files you aren't working on. In `_config.yml`, add a line that excludes those files. In this example, I've listed the CSS folder and all my book's chapters, and them commented out with `#` the one I'm working on, so that Jekyll does regenerate that:

```
# Jekyll will ignore these files and folders.
# Useful for temporarily speeding up processing for
particular files.
exclude: [
```

## PRINT OUTPUT

```
CSS,  
book-one/0-0-cover.md,  
book-one/0-1-half-title.md,  
book-one/0-2-titlepage.md,  
book-one/0-3-copyright.md,  
book-one/0-4-contents.md,  
#book-one/1.md,  
book-one/2.md,  
book-one/3.md,  
]
```

2. Using Prince there isn't a universal way to speed up conversion, except to only convert the files you really need to be working on. For instance, in your `file-list`, comment out files you're not working on; or if you're generating your `file-list` from a list in `meta.yml`, comment out the relevant lines there. (Also, if you've used Javascript in your HTML, that can slow Prince down. We wrap scripts, like Google Analytics tags, in a test that checks for Prince.)
3. Use a PDF Viewer that doesn't lock the file.
  - On Windows, Sumatra is perfect for this, unlike Acrobat and Windows Preview, which locks the file. If you edit/regenerate a PDF it has open, Sumatra will allow that to happen and will automatically reload the new file, at the same page you had open.
  - On Mac OSX, Preview does the same, though we've found it doesn't open the regenerated file to the page you were on, sending you back to the start of the book, which is a pain. A much better alternative on OSX is Skim, an open-source PDF reader. In its Preferences > Sync, set Skim to watch for file changes and update automatically. You may also want to set PDFs to open to the last viewed page in Preferences > General.

### Managing hyphenation in Prince

Our default stylesheets ask Prince to hyphenate paragraphs and lists (`p`, `ul`, `ol`, `dl`), with a few exceptions (such as text on the title and contents

pages). Prince includes a range of hyphenation dictionaries by default, which do a good job. However, you might need to add dictionaries or lists of specific words that Prince doesn't support. You can find `.dic` files online for various languages and specialities, or you can compile your own.

We provide a blank `.dic` file for you to add your own list of hyphenation rules to. It is at `css/dictionaries/hyph.dic`. Our `print.css` asks Prince to look here when hyphenating.

A `.dic` file is a plain-text file with one word or word-fragment on each line. Each one is called a pattern.

- If the pattern starts with a `.`, it will apply to, or match, any word that starts with that pattern. E.g. `.foo` will match the words 'food' and 'foobar' but not 'fastfood'.
- If the pattern ends with a `.`, it will apply to any word that ends with that pattern. E.g. `port.` will match 'port' and 'sport' but not 'portico'.
- Thus, if the pattern starts *and* ends with a `.`, it will apply to only that pattern exactly. E.g. `.port.` will only ever match 'port'.

To show where a word or word-fragment can hyphenate, you add digits (1 to 9) to the pattern. The digits have special meanings:

- Insert odd digits (1, 3, 5, 7, 9) where the word may hyphenate.
- Insert even digits (2, 4, 6, 8) where the word should not hyphenate.
- The higher the number, the more important the rule. That is, a `1` says 'hyphenate here if you must', but a `9` says 'this is the best place to hyphenate'. A `2` says 'don't hyphenate here if you can help it', but an `8` says 'Do not, not, not hyphenate here.'

For user discussion, see the Prince forums here: If you need to hack Prince's built-in hyphenation dictionaries more deeply, see this forum post.



# Epub output

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## Quick output

On **Windows**, generate HTML for epub by running `win-epub.bat`, which you'll find in the series root folder. Just double-click it from your file explorer. For it to work, you must already have Jekyll installed and working.

The script tells Jekyll to compile epub-ready HTML, opens Sigil, and opens `0-0-cover.html` there, which automatically imports your book's metadata into the epub. It also opens a file browser to the epub-ready HTML files.

In Sigil, then, add the remaining content files, define file semantics, and generate a TOC.

For **OSX and Linux** (until we create similar scripts): in a terminal in the same folder as the scripts, run `bundle exec jekyll b --config="_config.yml,_config.epub.yml"`. Then from Sigil, open the `0-0-cover.html` file in `_html/book/text`. That will import book metadata, and you can then assemble the epub in Sigil.

Technical background: To get the metadata to import to Sigil, you must *open* one of your book's HTML files in Sigil (the cover is best, since it's the first file). That is, don't 'Add Existing Files...' to a new, blank epub. Only by opening a single HTML file (as in 'File > Open...', then select the HTML file) will Sigil read and import the file's Dublin Core metadata. After that, you can add the remaining files in Sigil using 'Add Existing Files...'.

## Assembling the epub

We like to assemble our epubs (as EPUB2 for compatibility with older readers) in Sigil. If we're not changing something major, it takes five minutes. (See the pro tip below for an even quicker way.)

1. Put the HTML files from `_html` into your `Text` folder.
2. If it's not automatically imported, put the finished `epub.css` (from your book's `styles` folder in `_html`) into your Sigil `Styles` folder. (Our `epub.css` file is not the same as `web.css`. It does not link to font files and avoids CSS3 features, like `@fontface`, some pseudo classes and media queries, to work better with popular readers with poor or buggy CSS support, such as Adobe Digital Editions.)
3. **Replace any SVG images** in the `Images` folder with JPG equivalents. And:
4. Search-and-replace any links to `.svg` in your HTML files with `.jpg`.
5. **Copy any fonts** into the `Fonts` folder, if you want them embedded. (If you don't want to embed fonts, remove any `@font-face` rules from your stylesheet to avoid file-not-found validation errors. We don't rec-



ommend embedding fonts unless they are required for meaning or unusual character sets.)

6. **Remove videos** in iframes (iframes are invalid in EPUB2 XHTML 1.1). We recommend replacing videos with a link to an online version, e.g. to a YouTube page. This is best done manually. Search for `videowrapper` to find instances of embedded videos. To **replace** the standard video wrapper with a link to the video:

- Search (with DotAll regex) for:

```
(?s).<div class="videowrapper
non-printing">(.*src="(.*?)"(.*</div>(.*?<!--.videowrapper-->
```

This will find the videowrapper and store the URL of the embedded video in memory.

- Replace with

```
<a href="\2" class="button">Watch</a>
```

This will replace the entire wrapper with a link to the same iframe URL it memorised (at `\2`). Replace `Watch` with whatever phrase you want to be the clickable text.

7. If your book includes endnotes (kramdown footnotes), replace `fnref:` with `fnref-` and `fn:` with `fn-`. (Background: If you have a colon in any element ID – for instance if you’ve used kramdown’s footnote syntax – EpubCheck will return an ‘invalid NCName’ error. You need to replace those colons with another character. If your invalid IDs follow a set pattern (as kramdown’s footnote references do), you can replace all quickly.)
8. **Check your epub’s metadata** using Sigil’s Metadata Editor, and edit if necessary. Include at least:
  - title: subtitle
  - author
  - date of creation

- publisher
  - ISBN (or other identifier like a UUID)
  - Relation ISBN (if any; we use the print ISBN as a parent ISBN)
9. **Add file semantics** (right click the file name in Sigil for the semantics context menu) to:
    - key HTML files
    - the cover JPG.
  10. **Generate the epub's table of contents** (Tools > Table Of Contents...). This TOC is generated only from the headings (`h1` to `h6`) in the text. So it does not include the cover, which has no heading, or any other files without a heading (e.g. sometimes the copyright page). If you need to add a cover to the TOC:
    - a. Go to Tools > Table Of Contents > Edit Table Of Contents...
    - b. Click on the first entry in the TOC list.
    - c. Click 'Add Above'.
    - d. Click 'Select Target' and select the cover HTML file (usually `0-0-cover.html`).
    - e. In the blank space under 'TOC Entry', double-click and type 'Cover'.
    - f. Click Okay.
    - g. Use the same process for adding any other files you need to add to the TOC.
  11. If fonts are important (you've either embedded fonts or the difference between serif and sans-serif is semantically significant), add iBooks XML. (See below for detail.)
  12. Validate the epub in Sigil and fix any validation errors. Sigil let's some things past that EpubCheck flags, so also validate with EpubCheck directly. You can use:
    - the IDPF's online version of EpubCheck
    - epubcheck installed locally, and run from the command line; or
    - pagina EPUB-Checker.

Tip: If you get validation errors about images, check that your paths to images are correct and case-sensitive. For instance, Sigil needs

images to be in `Images` not `images`.

For general guidance on creating epub's with Sigil, check out EBW's training material and the Sigil user guide.

### Quick-epub process checklist

Here's a handy checklist for assembling an epub in Sigil:

1. File > Open... and select the first HTML file in `_html/book/text`. (Our `-epub` script does this itself).
2. Right-click the Text folder > Add Existing Files... and select the remaining HTML files for the epub.
3. Right-click the Text or Styles folder > Add Existing Files... and select the epub's CSS file from `_html/book/styles`.
4. Tools > Table Of Contents > Generate Table Of Contents
5. Add file semantics (right-click HTML files > Add Semantics... and right-click the cover jpg > Cover Image).
6. Save, and validate with the Flightcrew plugin and separately with EPUBCheck.

Depending on your needs, you may also need to:

- search-and-replace (as described above) for SVG images, footnotes, or video;
- add the cover (or other files) to your table of contents (as described above)
- add font files if you're embedding fonts;
- split large files (as described below)
- add the iBooks display-options XML (as described below).

### Splitting large files

If you have very large text files that, in the epub output, you'd like to split up into separate HTML files, Sigil can help. Using this tag in HTML, you can mark where Sigil must split your HTML file(s):

## EPUB OUTPUT

```
<hr class="sigil_split_marker" />
```

To create that in markdown, use a three-asterisk divider with a `sigil_split_marker` class, like this:

```
***  
{:.sigil_split_marker}
```

Also, remember to hide those markers in print output (and web and elsewhere as needed) with this in your CSS:

```
.sigil_split_marker {  
    display: none;  
}
```

Then, when you're assembling the epub in Sigil, just run Edit > Split At Markers.

Sigil will then split the HTML file into separate HTML files at the markers, and remove the `<hr>` element.

A common use case for this is books with end-of-book endnotes. To create end-of-book endnotes using kramdown footnotes you must put all content with endnotes in one markdown (and therefore HTML) file. This file is too large for sensible epub use, so splitting is important. Sigil is smart enough to update your internal links when you run 'Split At Markers'.

**NB: Before running Split At Markers: save, close, and reopen your epub.** At least till Sigil 0.9.3, there is an issue with updating internal links when using Split At Markers. In order for internal links to update correctly, Sigil must *first* have rewritten all link paths to HTML files according to its `../Text/` folder structure (e.g. the links to chapters in a Table of Contents file). Sigil only rewrites all these paths when an epub file is opened. So to make sure

## EPUB3 CONVERSION

links are updated when running Split At Markers, you need to save, close, and reopen the epub first. This may be fixed from Sigil 0.9.5.

### Mobi conversion

These days, you should not need to create a mobi file for Amazon. It's better to upload an epub and let Amazon convert it.

If you really do need a mobi file, we recommend putting your EPUB into the Kindle Previewer, which automatically converts to mobi using KindleGen and saves the mobi file to a folder beside your epub.

If Previewer cannot convert the epub, we've found that adding it to Calibre first, then (without converting) give Calibre's version to Kindle Previewer. Calibre gives you greater control over specific ebook conversions, but we've found Kindle Previewer converts some CSS better (e.g. floats and borders).

If you need to dig into a mobi file's code to troubleshoot, try the KindleUnpack plugin for Calibre.

### EPUB3 conversion

To convert an EPUB2 to EPUB3 in Sigil, use Kevin Hendricks' EPUB-itizer plugin.

Note that EPUB3 prefers all files to have `.xhtml` filename extensions, while Jekyll uses `.html`. So, before you run the EPUB3-itizer:

1. Make sure your EPUB2 validates under FlightCrew and EpubCheck
2. In Sigil's BookBrowser window select all `.html` files
3. Right click on your selection and select Rename
4. In the "Rename Files Starting At" dialog, remove everything and replace it with `.xhtml` and click "OK".

## Adding iBooks display-options file

If you need to add the `com.apple.ibooks.display-options.xml` file to your epub for iBooks display options, you can use the AddiBooksXML plugin in Sigil.

A very basic display-options file contains this XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<display_options>
  <platform name="*">
    <option name="specified-fonts">true</option>
    <option name="interactive">false</option>
    <option name="fixed-layout">false</option>
    <option name="open-to-spread">false</option>
    <option name="orientation-lock">none</option>
  </platform>
</display_options>
```

The file should be in the epub's META-INF folder, which Sigil does not let you edit by default, hence the need for the plugin.

To install the plugin:

- Download the zip file.
- In Sigil, go to Plugins > Manage Plugins.
- Click Add Plugin and locate and select the zip file you downloaded.

To use the plugin:

- First, in a plain-text/code editor create an `com.apple.ibooks.display-options.xml` file containing only the XML shown above. If necessary, change the five options settings in it. Save the XML file with your source material for the book for future use/reference.
- In Sigil, with the epub open, go to Plugins > Edit > AddiBooksXML and find and select the `com.apple.ibooks.display-options.xml` file you just created.

# Troubleshooting and tips

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## Markdown

Use a good text editor that colour-codes markdown as you work. We like Sublime Text (with MarkdownEditing installed and set to MultiMarkdown) or Notepad++ (with this markdown highlighter).

- If you're working on Windows, set your default character encoding for your documents to 'UTF-8 without BOM', aka UTF-8, and *not* a 'UTF-with-BOM' option. (Jekyll will break if you don't.)
- To check how your markdown converts to HTML while you work, you can use this Online Kramdown Editor by Daniel Perez Alvarez.
- Keep the kramdown quick reference handy.
- In lists, kramdown lets you use a space *or* a tab between the list marker (e.g. \* or 1. etc.) and the list text. If only to solve an issue with nesting blockquotes in lists, *use a tab* between the list marker and the start of the list text, and the same tab at the start of the blockquote line. That is, the indentation (the tab) must be exactly the same for the blockquote to nest correctly in the list. (A local Jekyll instance may correctly parse

nested lists even with a space after the list marker and a tab before the blockquote `>`. But GitHub Pages is much stricter and requires exactly the same indentation.) E.g. see our book *Newborn Care 12-5*.

- Keep spans within block elements. For instance, if you have two paragraphs in italic, don't start the italics with `*` in the first paragraph and end the span with a second `*` in the next paragraph. The HTML needs one span (e.g. `<em>` span) in the first para, and another in the second para. The converter isn't smart enough to split your intended italics into two spans. Rather end the first span in the first para, and start another one in the second.

## Jekyll and GitHub

- When running Jekyll locally, and *if* your repo is a project using GitHub Pages (not an organisation or user site), you'll need to add `--baseurl` `'` when running Jekyll at the command line. Here's how and why.
- You may get different results between a local Jekyll install and GitHub Pages, even if both are using kramdown. Always check (at least spot check) both places.
- Jekyll may break if you use a colon ( `:` ) in YAML frontmatter like a title. For instance, `title: Beans: The musical fruit`. While you can either use another character (e.g. `title: Beans–The musical fruit` or the HTML `&#58;` for the colon, `title: Beans&#58; The musical fruit`), it's easier to just wrap your title in double quotes: `title: "Beans: The musical fruit"`.
- We recommend setting `.gitignore` to ignore the `_html` folder, where Jekyll will store HTML output locally. If you choose *not* to `.gitignore` your `_html` folder, it'll contain (and sync to GitHub) your local machine's most recent Jekyll HTML output. (The `_html` folder has nothing to do with what GitHub Pages publishes.) In theory, committing the `_html` folder makes it easy for collaborators without Jekyll to grab a book's output HTML from the repo. But it comes with problems: committers have a responsibility to make sure their Jekyll



## JEKYLL AND GITHUB

instance does a good job, and that their `_html` output is up-to-date with the latest changes to the underlying markdown. Importantly, if you have more than one committer on a book, you'll get lots of merge conflicts in the `_html` folder, and this will make your head hurt.