

# beamerswitch — Convenient mode selection in Beamer documents

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This class is a wrapper around the `beamer` class to make it easier to use the same document to generate the different forms of the presentation: the slides themselves, an abbreviated slide set for transparencies or online reference, an n-up handout version, and a transcript or set of notes using the `article` class.

To contact the author about this package, please visit the GitHub page where the code is hosted: <https://github.com/alex-ball/beamerswitch>.

## 1 Quick start guide

Here are the key facts:

- The `beamerswitch` class makes it easier to switch between `beamer` modes.
- It is aimed at you if you want to generate handouts from your presentation, whether printouts of your slides or something more like a paper or article.
- It is *not* a drop-in replacement for `beamer`.

If you have an existing `beamer` presentation and want convert it to use `beamerswitch` instead, here's what you need to do.

1. Have you specified class options other than `ignorenonframetext`? If so, start by rewriting your `\documentclass` line in terms of `\PassOptionsToClass` – note that the optional argument (in square brackets) becomes mandatory (in curly braces):

Before	After
<code>\documentclass[10pt]{beamer}</code>	<code>\PassOptionsToClass{10pt}{beamer}</code>

Then add `\documentclass{beamerswitch}` directly below.

Otherwise, simply replace your `\documentclass` line with the `beamerswitch` one.

2. If you did *not* specify `ignorenonframetext` as one of your `beamer` options, add a `\mode<all>` line directly after `\begin{document}`.

3. Wrap any preamble content intended only for your slides (like `\usetheme` or `\usepackage` commands) with ‘`\mode<presentation>\{...}`’ or something more specific, as required.

In summary, here is an example:

Before	After
<pre>\documentclass[10pt]{beamer}  \usetheme{metropolis}  \title{Test presentation} \begin{document}    \maketitle \end{document}</pre>	<pre>\PassOptionsToClass{10pt}{beamer} \documentclass{beamerswitch} \mode&lt;presentation&gt;{%   \usetheme{metropolis} } \title{Test presentation} \begin{document} \mode&lt;all&gt;   \maketitle \end{document}</pre>

At this point the document should compile exactly as before.

If you intend to use article mode at all, I strongly suggest that you proceed by converting your document body so it that works without the ‘`\mode<all>`’ line. That means making sure all slide content is in a `frame` environment, new command definitions are moved to the preamble, and so on.

Lastly, read through the rest of this manual and see what `beamerswitch` can do for you!

## 2 Introduction

With `beamer`, it is possible to typeset the same document code in different ways to get different effects. The result you get depends on a potentially confusing mix of options, modes, and indeed classes.

Beamer has five modes for typesetting content. There are three modes that produce regular slides:

- The `beamer` mode relates to the normal, default slide set.
- The `trans` class option switches to the mode of the same name. It is intended for transparencies, but is really just an alternative mode that ignores ‘bare’ overlay specifications.
- The `handout` class option switches to the mode of the same name. It is intended for print-friendly versions, but is really just another alternative mode that ignores ‘bare’ overlay specifications.

The `beamer` manual shows how to use `handout` mode in conjunction with `pgfpages` to get several slides on a single side of A4 (or Letter) paper.

Beamer can also produce a double-height or double-width slide set, with the intention that each half will be shown on a different display (e.g. one for the audience, one for the speaker). There are three variations of this, activated using `\setbeameroption`:

- `show notes on second screen` uses the second screen for text marked up using `\note{<text>}`.
- `second mode text on second screen` uses the second screen for showing the slide typeset in `second` mode rather than `beamer`. Unlike `trans` and `handout`, `second` responds to ‘bare’ overlay specifications.
- `previous slide on second screen`, uses the second screen either for showing the previous slide or, if the slide has the `typeset second` option set, for showing the current slide typeset in `second` mode.

The final variation is to use a different class altogether, such as `article`, in conjunction with `beamerarticle`. In this case the content is set free-flowing in `article` mode, without any of the frame furniture.

The `beamer` manual suggests coping with all these variations by having the document code in one file, and using it as input to other files that each set up a different mode of operation. This is fine but a bit of a fiddle. It would be nice to be able to get the same effect using a single file and, ideally, a single command invocation.

The `beamerswitch` class addresses this issue by acting as a wrapper around the various options, and providing a common interface for switching between modes. More specifically, it has three main functions:

1. To provide more choice of handout-mode layouts than `pgfpages` gives you out-of-the-box. Additionally, I hope you will find the method for selecting them more memorable.
2. To enable you to switch to `article` mode with a simple change of class option, instead of having to fiddle with commented-out `\documentclass` and `\usepackage` lines.
3. To allow you to override the `beamer` mode from the command line, by choosing a given jobname suffix. Primarily this is to allow you to generate the different versions programmatically. Indeed, the class provides facilities for generating multiple versions with a single command.

### 3 Dependencies

To use `beamerswitch`, you will need to have the following packages available and reasonably up to date on your system. All of these ship with recent  $\text{\TeX}$  distributions.

- |                         |                         |                        |
|-------------------------|-------------------------|------------------------|
| • <code>beamer</code>   | • <code>iftex</code>    | • <code>xkeyval</code> |
| • <code>etoolbox</code> | • <code>pgf</code>      | • <code>xstring</code> |
| • <code>hyperref</code> | • <code>shellesc</code> |                        |

One feature of the class uses `latexmk` by default, though you can configure it to use something else if you need or want to.

## 4 Loading the class

The class is loaded in the usual way:

```
\documentclass[options]{beamer}
```

The various options are described below.

### 4.1 Choosing the mode of the current run

The `beamer` class, as explained above, does not do much itself but rather helps you to switch between `beamer` modes, specifically `article`, `beamer`, `trans` and `handout`. Note that it loads `beamer` with the `ignorenonframetext` option, so that text outside frames is only shown in `article` mode.

The normal way of choosing the mode is to use the respective class options.

**article** (no value, initially unset)

Switches to `article` mode, which uses the `article` class and resembles a normal article.

**beamer** (no value, initially set)

Switches to `beamer` mode, which uses the `beamer` class and resembles a normal slideshow.

**handout** (no value, initially unset)

Switches to `handout` mode, which uses the `beamer` class but uses a different series of overlay specifications. It resembles a set of printed pages with multiple slides shown on each page.

**trans** (no value, initially unset)

Switches to `trans` mode, which uses the `beamer` class and resembles a normal slideshow, but uses a different series of overlay specifications.

There is, however, a sneaky second way of setting the mode that overrides the first, and that is to use the `\jobname`. By default, this is the name of your `TEX` file minus the `.tex` extension, but you can set it to something else when you run `TEX`. If you set the `\jobname` to end in one of the following suffixes, the mode will automatically switch:

- `-article` will switch to `article` mode.
- `-handout` will switch to `handout` mode.
- `-slides` will switch to `beamer` mode.
- `-trans` will switch to `trans` mode.

The idea is that you can keep your source document the same, but by running `TEX` with an alternative `\jobname`, you can get a different version out with a meaningfully different file name.

Of course, you may not want to use those suffixes. Perhaps you want them in German; perhaps your document's file name already ends in one of them; perhaps 'article' or 'trans' doesn't describe what you're using those modes for. The suffixes are provided by the following commands:

### **\ArticleSuffix**

Holds the `\jobname` suffix that triggers `article` mode.

### **\BeamerSuffix**

Holds the `\jobname` suffix that triggers `beamer` mode.

### **\HandoutSuffix**

Holds the `\jobname` suffix that triggers `handout` mode.

### **\TransSuffix**

Holds the `\jobname` suffix that triggers `trans` mode.

The CamelCase is an admittedly rather obscure signal to you that, if you want to change them to something else, you should do so via `\newcommand` before loading the class:

```
\newcommand*\ArticleSuffix{-script}
\documentclass{beamerswitch}
```

## 4.2 Using more than one mode at once

Another handy feature of the class is that it can spawn parallel compilations, so you could in theory generate all four versions from a single command. It achieves this magic by escaping to the shell and running `latexmk`. Thus for it to work you need to run `TeX` with shell escape enabled and you need `latexmk` to be installed.

**alsoarticle** (no value, initially unset)

Spawns a new compilation process in `article` mode.

**alsobeamer** (no value, initially unset)

Spawns a new compilation process in `beamer` mode.

**alsohandout** (no value, initially unset)

Spawns a new compilation process in `handout` mode.

**alsotrans** (no value, initially unset)

Spawns a new compilation process in `trans` mode.

**also**=`{⟨comma-separated list of modes⟩}` (no default, initially empty)

Spawns compilation processes in each of the specified modes. Note that the list has to be wrapped in braces, and only the four aforementioned modes are recognized.

If you would rather use a tool other than `latexmk` to managed your spawned compilation processes, it is possible to do that. Bear in mind, though, that `beamerswitch` is not clever enough to spot if you have already compiled the other version on a previous run so you have to take care of that yourself. The command that does the business is this:

### **\BeamerswitchSpawn{⟨suffix⟩}**

Spawns a new compilation process with `⟨suffix⟩` appended to the `\jobname`.

By default, `\BeamerswitchSpawn` checks which `TeX` engine you are running, and then runs the matching one of `\SpawnedPDFTeX`, `\SpawnedXeTeX`, `\SpawnedLuaTeX`, or if all the tests fail, `\SpawnedTeX`, with the converted `\jobname`. These commands all add an engine-selecting option to a base command, `\SpawnedCompiler`, which by default is `latexmk` with `synctex` enabled, shell escape disabled and interaction set to batch mode. See the [Implementation](#) section below for details.

Any of these commands can be pre-defined to something else, depending on what you want to do. So, for example, if you want to change the base `latexmk` options, pre-define `\SpawnedCompiler` to `latexmk` plus your chosen options:

```
\newcommand*\SpawnedCompiler{%
  latexmk -silent -shell-escape -interaction=nonstopmode}
\documentclass{beamer-switch}
```

If you want to switch to using `rubber`, say, pre-define `\SpawnedPDFTeX` and friends accordingly (perhaps taking advantage of `\SpawnedCompiler` to reduce repetition):

```
\newcommand*\SpawnedCompiler{rubber -q --synctex}
\newcommand*\SpawnedPDFTeX{\SpawnedCompiler -m pdftex}
\newcommand*\SpawnedXeTeX{\SpawnedCompiler -m xelatex}
\documentclass{beamer-switch}
```

If you don't need the engine selection routine provided, simply pre-define `\BeamerSwitchSpawn` to do whatever you need it to do:

```
\newcommand*\BeamerSwitchSpawn[1]{%
  \ShellEscape{... -jobname=\jobname#1 \jobname}%
}
\documentclass{beamer-switch}
```

If you want to use `arara` to compile everything, the class options won't help you as `arara` does not let you change `\jobnames` on the command line. That's no problem, though, because you can do it manually within your list of directives:

```
% arara: lualatex
% arara: lualatex: { options: "-jobname beamer-switch-example-article" }
% arara: lualatex: { options: "-jobname beamer-switch-example-handout" }
% arara: lualatex: { options: "-jobname beamer-switch-example-trans" }
\documentclass{beamer-switch}
```

## 4.3 Improving compatibility

### `nohyperref`

(no value, initially unset)

The `beamer` class loads `hyperref` for you, but when you switch to `article` mode, `beamerarticle` doesn't, so it is easy for you to get caught out. To protect you from this, `beamer-switch` does load `hyperref` in `article` mode, with the pleasing side effect that `\subject` and `\keywords` then work as intended instead of throwing errors.

To achieve this, the class has to load `hyperref` quite early on, which can cause trouble with certain other packages. If you would rather load `hyperref` yourself at a different point, use this option.

### `textinst`

(no value, initially unset)

In all modes, patches the `\inst` command so that it prints its argument using `\textsuperscript` instead of a mathematical superscript. This helps avoid unnecessary font changes.

## 5 Setting the layout of the handouts

The class provides a simplified interface to the `pgfpages` package. By default, it prints six slides to a side of A4 paper, but you can change this by using the following command in the preamble.

**`\handoutlayout{<options>}`**

Configures the layout of the page when using `handout` mode. It has no effect in other modes. The available `<options>` are listed below.

**`paper=<paper size>`** (no default, initially `a4paper`)

Selects the size of paper to use for `handout` mode. The value is passed directly to `pgfpages`, so consult the documentation of that package for the allowed values. You can find them under the documentation for the `resize to` layout.

**`nup=2|3|3plus|4|4plus|6|8`** (no default, initially `6`)

Selects how many slides are shown on a single page in `handout` mode. The ‘plus’ layouts leave blank space for recipients to make handwritten notes next to each slide. The effects of the various values are shown in Figure 1 on page 8. Note that the `2`, `3plus`, `4` and `6` layouts are intended for slides in the usual 4:3 aspect ratio, while the `3`, `4plus` and `8` layouts are intended for widescreen slides.

**`pnos`** (no value, initially unset)

Adds page numbers to the bottom of each page. The number appears at a distance of `\handoutpnobaseline` (initially 5mm) from the bottom edge of the page. You change this with `\setlength`.

**`border=<length>`** (default 0.4pt, initially 0pt)

Puts a rectangular border of thickness `<length>` around each slide. Note that the borders are drawn regardless of whether a slide is actually printed, so you may end up with empty boxes on the last page.

**`margin=<length>`** (default 0pt, initially 5mm)

Sets how much extra space to leave around each slide on the page. To achieve this it uses the `border shrink` option from `pgfpages`. If you add page numbers, this value will increase if necessary to prevent the number colliding with the slides.

**`align`** (no value, initially unset)

When `margin` is non-zero, the effective page margins are approximately half the size of the gaps between slides (some additional white space comes from preserving the aspect ratio of the slides). When set, this option tweaks the positions of the slides so that the page margins are approximately the same as the interior gaps.

## 6 Changing the look of article mode

Some additional options can be set by using the following command in the preamble.

**`\articlayout{<options>}`**

Configures the appearance of `article` mode. It has no effect in other modes. The available `<options>` are listed below.

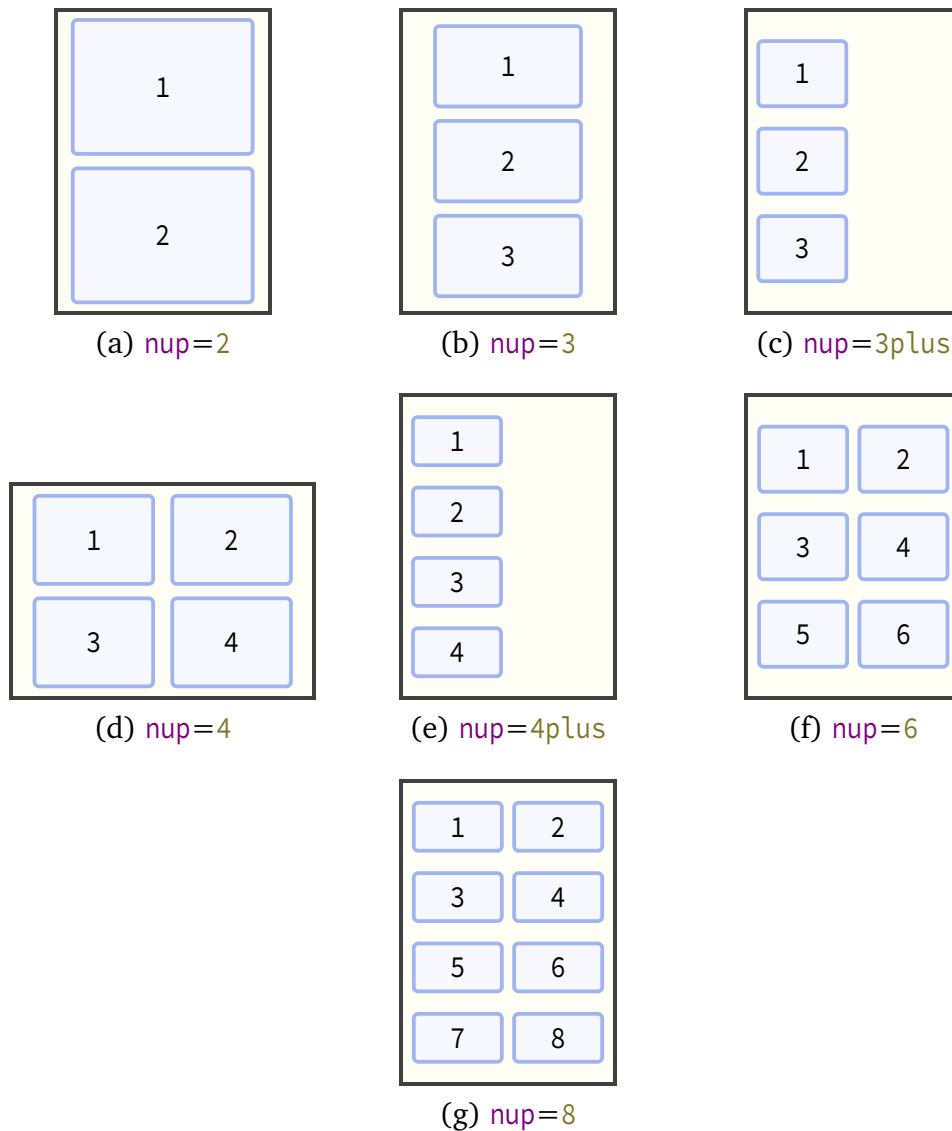


Figure 1: Handout layouts provided by `beamerswitch`

**frametitles**=`para`|`margin`|`none` (no default, initially `para`)

In `article` mode, affects how frame titles are printed. By default, `beamerarticle` prints them as paragraph headings, represented by the value `para`. To have them printed in the margin (using `\marginpar`), use `margin`. To omit them altogether, use the value `none`.

**maketitle** (no value, initially unset)

In `article` mode, adjusts the `\maketitle` routine:

- The title is printed closer to the top margin.
- The subtitle is shown joined to the title using a colon (rather than on a new line).
- The institute is shown directly beneath the author name, similar to the `beamer` layout, so you can use `\inst` just as in `beamer` to tie authors to their affiliations.

If you have `xparse` (and hence `expl3`) installed, the class will detect cases where your title ends in a character like ‘?’ and will not add a colon to it in that case. You

can also suppress the colon manually with the following code (add it *after* using `\title` if automatic detection is in effect):

```
\toggletrue{titlepunct}
```

## 7 Tips for further configuration

There are some other ways to customize the behaviour of the various modes.

You can use the standard  $\TeX$  methods for customizing how the `article` and `beamer` classes are loaded:

```
\PassOptionsToClass{a4paper,11pt}{article} % for article mode
\PassOptionsToClass{utf8}{beamer} % for beamer, handout, trans modes
\documentclass{beamerswitch}
```

And of course there is the standard `beamer` way of passing different options to different modes:

```
\documentclass{beamerswitch}
\mode<article>{
  \usepackage[utf8]{inputenc}
}
\mode<beamer>{
  \setbeameroption{second mode text on second screen}
}
```

## 8 Feedback

I hope you find this class useful. Please report any bugs and add any suggestions for improvements or new features to the [Issue Tracker](#) on GitHub.

## 9 Implementation

### 9.1 Dependencies

We use the following packages:

- `xkeyval` with `xkvltxp` for setting options
- `etoolbox` for command patches and list processing
- `xstring` for comparisons
- `shellesc` for running parallel compilations
- `iftex` for determining which engine to use

```
19 \RequirePackage{xkeyval,xkvltxp,etoolbox,xstring,shellesc,iftex}
```

### 9.2 Class options

We recognize four main modes of operation: ‘beamer’, ‘trans’, ‘handout’, and ‘article’.

The `beamer` option triggers beamer mode.

```
20 \define@boolkey[DC]{beamerswitch}{beamer}[true]{%  
21   \ifbool{DC@beamerswitch@beamer}{%  
22     \setkeys[DC]{beamerswitch}{trans=false}  
23     \setkeys[DC]{beamerswitch}{handout=false}  
24     \setkeys[DC]{beamerswitch}{article=false}  
25   }{}%  
26 }
```

The `trans` option triggers trans mode.

```
27 \define@boolkey[DC]{beamerswitch}{trans}[true]{%  
28   \ifbool{DC@beamerswitch@trans}{%  
29     \setkeys[DC]{beamerswitch}{beamer=false}  
30     \setkeys[DC]{beamerswitch}{handout=false}  
31     \setkeys[DC]{beamerswitch}{article=false}  
32   }{}%  
33 }
```

The `handout` option triggers handout mode.

```
34 \define@boolkey[DC]{beamerswitch}{handout}[true]{%  
35   \ifbool{DC@beamerswitch@handout}{%  
36     \setkeys[DC]{beamerswitch}{beamer=false}  
37     \setkeys[DC]{beamerswitch}{trans=false}  
38     \setkeys[DC]{beamerswitch}{article=false}  
39   }{}%  
40 }
```

The `article` option triggers article mode.

```

41 \define@boolkey[DC]{beamerswitch}{article}[true]{%
42   \ifbool{DC@beamerswitch@article}{%
43     \setkeys[DC]{beamerswitch}{beamer=false}
44     \setkeys[DC]{beamerswitch}{trans=false}
45     \setkeys[DC]{beamerswitch}{handout=false}
46   }{}%
47 }

```

The `also` option allows the user to specify a set of alternative modes to typeset in parallel, in a comma-separated list. Alternatively, the user can specify the Boolean `also*` options directly.

```

48 \define@boolkey[DC]{beamerswitch}{alsobeamer}[true]{}
49 \define@boolkey[DC]{beamerswitch}{alsotrans}[true]{}
50 \define@boolkey[DC]{beamerswitch}{alsohandout}[true]{}
51 \define@boolkey[DC]{beamerswitch}{alsoarticle}[true]{}
52 \newcommand{\beamerswitch@SetAlso}[1]{%
53   \key@ifundefined[DC]{beamerswitch}{also#1}{%
54     \ClassWarning{beamerswitch}{`#1' is not a valid value for option `also'}%
55   }{}%
56   \setkeys[DC]{beamerswitch}{also#1}%
57 }%
58 }
59 \define@key[DC]{beamerswitch}{also}{%
60   \forcsvlist{\beamerswitch@SetAlso}{#1}%
61 }

```

The `nohyperref` option stops the class from loading the `hyperref` package in article mode.

```

62 \define@boolkey[DC]{beamerswitch}{nohyperref}[true]{}

```

The `textinst` option adjusts the superscript used for institution markers.

```

63 \define@boolkey[DC]{beamerswitch}{textinst}[true]{}

```

The default behaviour is to use beamer mode only.

```

64 \setkeys[DC]{beamerswitch}{beamer=true,alsobeamer=false,alsotrans=false,%
65   alsohandout=false,alsoarticle=false}

```

Now we process the options given by the user.

```

66 \ProcessOptionsX[DC]<beamerswitch>

```

### 9.3 Jobname-based mode switching

We define some default values for the special suffixes.

```

67 \providecommand*\BeamerSuffix{-slides}
68 \providecommand*\TransSuffix{-trans}
69 \providecommand*\HandoutSuffix{-handout}

```

```
70 \providecommand*\ArticleSuffix{-article}
```

We provide a special routine for spawning new  $\text{\LaTeX}$  processes. We allow for the possibility of the user overriding this routine with another one, perhaps using a different automation tool; it should take one argument, being the jobname suffix.

```
71 \providecommand{\SpawnedCompiler}{latexmk -silent -synctex=1
   ↪ -interaction=batchmode }
72 \providecommand{\SpawnedTeX}{\SpawnedCompiler}
73 \providecommand{\SpawnedPDFTeX}{\SpawnedCompiler -pdf }
74 \providecommand{\SpawnedLuaTeX}{\SpawnedCompiler -pdf lua }
75 \providecommand{\SpawnedXeTeX}{\SpawnedCompiler -pdf x e }
76 \providecommand{\BeamerswitchSpawn}[1]{%
77   \ifbool{PDFTeX}{%
78     \ShellEscape{\SpawnedPDFTeX -jobname=\jobname#1 \jobname}
79   }{%
80     \ifbool{LuaTeX}{%
81       \ShellEscape{\SpawnedLuaTeX -jobname=\jobname#1 \jobname}
82     }{%
83       \ifbool{XeTeX}{%
84         \ShellEscape{\SpawnedXeTeX -jobname=\jobname#1 \jobname}
85       }{%
86         \ShellEscape{\SpawnedTeX -jobname=\jobname#1 \jobname}
87       }%
88     }%
89   }%
90 }
```

We check for special jobnames and use them to override the above mode-related options. Note that if this happens, the `also*` options are ignored.

```
91 \IfEndWith*\jobname{\BeamerSuffix}{%
92   \setkeys[DC]{beamerswitch}{beamer=true}
93 }{%
94   \IfEndWith*\jobname{\TransSuffix}{%
95     \setkeys[DC]{beamerswitch}{trans=true}
96   }{%
97     \IfEndWith*\jobname{\HandoutSuffix}{%
98       \setkeys[DC]{beamerswitch}{handout=true}
99     }{%
100       \IfEndWith*\jobname{\ArticleSuffix}{%
101         \setkeys[DC]{beamerswitch}{article=true}
102       }{%
103         \ifbool{DC@beamerswitch@alsobeamer}{%
104           \BeamerswitchSpawn{\BeamerSuffix}%
105         }{}
106         \ifbool{DC@beamerswitch@alsotrans}{%
107           \BeamerswitchSpawn{\TransSuffix}%
108         }{}
109         \ifbool{DC@beamerswitch@alsohandout}{%
110           \BeamerswitchSpawn{\HandoutSuffix}%
111         }{}
112         \ifbool{DC@beamerswitch@alsoarticle}{%
113           \BeamerswitchSpawn{\ArticleSuffix}%
114         }{}
115       }
116     }
117   }
118 }
```

```

115     }%
116   }%
117 }%
118 }%

```

## 9.4 Setting up modes

For article mode, we load the `article` class and the `beamerarticle` support package. Apologies for anyone hoping for `scrartcl` or `memoir` alternatives.

```

119 \ifbool{DC@beamerswitch@article}{%
120   \LoadClass{article}
121   \RequirePackage{beamerarticle}

```

It seems as though `beamerarticle` expects `hyperref` to be loaded, but doesn't actually do it itself. So we oblige, using the default options specified by `beamer`.

```

122   \ifbool{DC@beamerswitch@nohyperref}{}{%
123     \RequirePackage[bookmarks=true,%
124       bookmarksopen=true,%
125       pdfborder={0 0 0},%
126       pdfhighlight={/N},%
127       linkbordercolor={.5 .5 .5}]{hyperref}%
128   }

```

While `beamer` takes care of adding presentation metadata to the PDF properties, `beamerarticle` misses the title and author properties. (It does manage to set the subject and keywords, though.) We achieve parity with some additional `\hypersetup`. Note that `beamerarticle` appends the subtitle to `\@title` with a linebreak and this does odd things in the context of `pdftitle`, so we fix it with `\pdfstringdefDisableCommands`.

```

129   \AtBeginDocument{%
130     \@ifpackageloaded{hyperref}{%
131       \pdfstringdefDisableCommands{\def\<#1>#2{ - #2}}
132       \begingroup
133       \hypersetup{pdftitle={\@title}}%
134       \def\and{\unskip, }%
135       \let\thanks=\@gobble
136       \let\inst=\@gobble
137       \hypersetup{pdfauthor={\@author}}%
138       \endgroup
139     }{}%
140   }
141 }%

```

For the presentation modes, we load the `beamer` class with appropriate options. Since we are targeting users wanting different versions of their presentations with the same code, we activate `ignorenonframetext`.

```

142   \ifbool{DC@beamerswitch@handout}{%
143     \LoadClass[ignorenonframetext,handout]{beamer}

```

Handout mode lays multiple slides out on a single page. For this we use `pgfpages`. The actual configuration is handled later.

```
144 \RequirePackage{pgfpages}
```

We also activate `ignorenonframetext` for the other two modes.

```
145 }{%
146 \ifbool{DC@beamerswitch@trans}{%
147 \LoadClass[ignorenonframetext,trans]{beamer}
148 }{%
149 \LoadClass[ignorenonframetext]{beamer}
150 }%
151 }
152 }
```

## 9.5 Mode-independent layout

We implement the option that formats institution markers in text mode rather than math mode.

```
153 \ifbool{DC@beamerswitch@textinst}{%
154 \def\beamer@insttitle#1{\textsuperscript{#1}}
155 \def\beamer@instinst#1{\textsuperscript{#1}\ignorespaces}
156 }{}
```

## 9.6 Handout layout

In theory it would be nice to anticipate the paper size that the article mode would use, and pass that as an option to `\pgfpagesuselayout` but as that's unlikely to be clean code, we settle here for setting it with an option.

```
157 \def\beamerswitch@handoutpaper{a4paper}
158 \define@key[HL]{beamerswitch}{paper}{%
159 \def\beamerswitch@handoutpaper{#1}%
160 }
```

The `nup` option specifies how many slides to include per page. The ‘plus’ keyword indicates a layout with additional gaps for writing.

```
161 \newcounter{beamerswitch@nupcase}
162 \setcounter{beamerswitch@nupcase}{5}
163 \define@choicekey+{HL}[beamerswitch]{nup}{\val\nr}{2, 3, 3plus, 4, 4plus, 6, 8}{%
164 \setcounter{beamerswitch@nupcase}{\nr}
165 }{%
166 \ClassWarning{beamerswitch}{Value of `nup' not recognized.
167 Allowed values are 2, 3, 3plus, 4, 4plus, 6, and 8.}%
168 }
```

The `borders` option switches on borders around the slides on handout pages (and gaps where slides would appear if there were enough). The value is used to set the width of the border.

This is implemented as a PGF drawing command, which is initially set up to do nothing but gets filled out if the option is selected.

```

169 \newcommand*{\beamerswitch@border}{\relax}
170 \define@key[HL]{beamerswitch}{border}[0.4pt]{%
171   \RequirePackage{pgf}%
172   \ifdimcomp{#1}{>}{0pt}{%
173     \renewcommand*{\beamerswitch@border}{\pgfsetlinewidth{#1}\pgfstroke}%
174   }%
175   \renewcommand*{\beamerswitch@border}{\relax}%
176 }%
177 }

```

The `margin` option controls how much white space is added around each slide on handout pages. It corresponds to the `border shrink` option of `\pgfpagesuselayout`.

```

178 \newlength{\beamerswitch@margin}
179 \setlength{\beamerswitch@margin}{5mm}
180 \define@key[HL]{beamerswitch}{margin}[0pt]{%
181   \setlength{\beamerswitch@margin}{#1}%
182 }

```

The `align` option chooses whether to rejig the positions of the slides on the page so that the effective page margin is the same as, rather than half, the space between adjacent slides.

```

183 \define@boolkey[HL]{beamerswitch}{align}[true]{}

```

The `pnos` option switches on page numbers for handout pages. The height at which the baseline of the number sits, relative to the bottom edge of the paper, is given by the length `\handoutpnobaseline`.

```

184 \newlength{\handoutpnobaseline}
185 \setlength{\handoutpnobaseline}{5mm}
186 \define@boolkey[HL]{beamerswitch}{pnos}[true]{}

```

We set up the `\handoutlayout` command for applying these options.

```

187 \newlength{\beamerswitch@pnoadjust}
188 \newcommand*{\handoutlayout}[1]{%
189   \only<handout>{%
190     \setlength{\beamerswitch@pnoadjust}{1em}%
191     \setkeys[HL]{beamerswitch}{#1}%
192     \ifbool{HL@beamerswitch@pnos}{%
193       \def\pgfsys@endpicture{%
194         \raisebox{\the\handoutpnobaseline}[0pt][0pt]{%
195           \makebox[\pgfphysicalwidth]{%
196             \the\numexpr(\value{page} - 2 + (\beamerswitch@nup / 2))%
197             / \beamerswitch@nup\relax
198           }%

```

```

199     }\par
200 }%
201 \ifbool{HL@beamerswitch@align}{%
202     \ifcase\value{beamerswitch@nupcase}\relax
203         \addtolength{\beamerswitch@pnoadjust}{-0.333\beamerswitch@margin}%
204     \or
205         \addtolength{\beamerswitch@pnoadjust}{-0.5\beamerswitch@margin}%
206     \or
207         \addtolength{\beamerswitch@pnoadjust}{-0.5\beamerswitch@margin}%
208     \or
209         \addtolength{\beamerswitch@pnoadjust}{-0.333\beamerswitch@margin}%
210     \or
211         \addtolength{\beamerswitch@pnoadjust}{-0.6\beamerswitch@margin}%
212     \or
213         \addtolength{\beamerswitch@pnoadjust}{-0.5\beamerswitch@margin}%
214     \or
215         \addtolength{\beamerswitch@pnoadjust}{-0.6\beamerswitch@margin}%
216     \fi
217 }{}%
218 \ifdimcomp{\beamerswitch@margin}{<}%
219     {\handoutpnobaseline + \beamerswitch@pnoadjust}{%
220     \setlength{\beamerswitch@margin}%
221     {\the\dimexpr\handoutpnobaseline + \beamerswitch@pnoadjust\relax}%
222 }{}%
223 }{}%
224 \def\pgfsys@endpicture{%
225 }%
226 \ifcase\value{beamerswitch@nupcase}\relax
227     \def\beamerswitch@nup{2}%
228     \pgfpagesuselayout{1 by 2}[\beamerswitch@handoutpaper,%
229         border shrink=\the\beamerswitch@margin]%
230 \or
231     \def\beamerswitch@nup{3}%
232     \pgfpagesuselayout{1 by 3}[\beamerswitch@handoutpaper,%
233         border shrink=\the\beamerswitch@margin]%
234 \or
235     \def\beamerswitch@nup{3}%
236     \pgfpagesuselayout{1 by 3 narrow}[\beamerswitch@handoutpaper,%
237         border shrink=\the\beamerswitch@margin]%
238 \or
239     \def\beamerswitch@nup{4}%
240     \pgfpagesuselayout{2 by 2}[\beamerswitch@handoutpaper,%
241         landscape,border shrink=\the\beamerswitch@margin]%
242 \or
243     \def\beamerswitch@nup{4}%
244     \pgfpagesuselayout{1 by 4 narrow}[\beamerswitch@handoutpaper,%
245         border shrink=\the\beamerswitch@margin]%
246 \or
247     \def\beamerswitch@nup{6}%
248     \pgfpagesuselayout{2 by 3}[\beamerswitch@handoutpaper,%
249         border shrink=\the\beamerswitch@margin]%
250 \or
251     \def\beamerswitch@nup{8}%
252     \pgfpagesuselayout{2 by 4}[\beamerswitch@handoutpaper,%
253         border shrink=\the\beamerswitch@margin]%
254 \fi

```

```

255 }%
256 }

```

We initialize the class with the defaults set above.

```

257 \AtEndPreamble{%
258   \ifdef{\beamerswitch@nup}{}{}%
259   \handoutlayout{}%
260 }%
261 }

```

Though `pgfpages` defines some perfectly fine layouts, we need to add configurability to the existing ones and provide some new ones.

The ‘1 by 2’ layout is similar to the normal 2 on 1 layout.

```

262 \mode<handout>{%
263   \pgfpagesdeclarelayout{1 by 2}
264   {
265     \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
266     \edef\pgfpageoptionwidth{\the\paperheight}
267     \def\pgfpageoptionborder{0pt}
268     \def\pgfpageoptionfirstshipout{1}
269   }
270   {
271     \pgfpagesphysicalpageoptions
272     {%
273       logical pages=2,%
274       physical height=\pgfpageoptionheight,%
275       physical width=\pgfpageoptionwidth,%
276       current logical shipout=\pgfpageoptionfirstshipout%
277     }
278     \ifdim\paperheight>\paperwidth\relax
279     % put side-by-side
280     \pgfpageslogicalpageoptions{1}
281     {%
282       border shrink=\pgfpageoptionborder,%
283       border code=\beamerswitch@Border,%
284       resized width=.5\pgfphysicalwidth,%
285       resized height=\pgfphysicalheight,%
286       center=\ifbool{HL@beamerswitch@align}{}%
287         \pgfpoint{.25\pgfphysicalwidth +
288           ↪ 0.333\beamerswitch@margin}{.5\pgfphysicalheight}%
289       }{%
290         \pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
291       }%
292     }%
293     \pgfpageslogicalpageoptions{2}
294     {%
295       border shrink=\pgfpageoptionborder,%
296       border code=\beamerswitch@Border,%
297       resized width=.5\pgfphysicalwidth,%
298       resized height=\pgfphysicalheight,%
299       center=\ifbool{HL@beamerswitch@align}{}%
300         \pgfpoint{.75\pgfphysicalwidth -
301           ↪ 0.333\beamerswitch@margin}{.5\pgfphysicalheight}%

```

```

300     }{%
301     \pgfpoint{.75\pgfphysicalwidth}{.5\pgfphysicalheight}%
302     }%
303 }%
304 \else
305 % stack on top of one another
306 \pgfpageslogicalpageoptions{1}
307 {%
308     border shrink=\pgfpageoptionborder,%
309     border code=\beamerswitch@Border,%
310     resized width=\pgfphysicalwidth,%
311     resized height=.5\pgfphysicalheight,%
312     center=\ifbool{HL@beamerswitch@align}{%
313     \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight -
314     ↪ 0.333\beamerswitch@margin}%
315     }{%
316     \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
317     }%
318 \pgfpageslogicalpageoptions{2}
319 {%
320     border shrink=\pgfpageoptionborder,%
321     border code=\beamerswitch@Border,%
322     resized width=\pgfphysicalwidth,%
323     resized height=.5\pgfphysicalheight,%
324     center=\ifbool{HL@beamerswitch@align}{%
325     \pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight +
326     ↪ 0.333\beamerswitch@margin}%
327     }{%
328     \pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight}%
329     }%
330 }%
331 \fi
332 }

```

The ‘1 by 3’ layout is similar to the ‘1 by 2’, but with an extra row.

```

332 \pgfpagesdeclarelayout{1 by 3}
333 {
334     \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
335     \edef\pgfpageoptionwidth{\the\paperheight}
336     \def\pgfpageoptionborder{0pt}
337     \def\pgfpageoptionfirstshipout{1}
338 }
339 {
340     \pgfpagesphysicalpageoptions
341     {%
342         logical pages=3,%
343         physical height=\pgfpageoptionheight,%
344         physical width=\pgfpageoptionwidth,%
345         current logical shipout=\pgfpageoptionfirstshipout%
346     }
347     \ifdim\paperheight>\paperwidth\relax
348     % put side-by-side
349     \pgfpageslogicalpageoptions{1}
350     {%

```

```

351 border shrink=\pgfpageoptionborder,%
352 border code=\beamerswitch@Border,%
353 resized width=.333\pgfphysicalwidth,%
354 resized height=\pgfphysicalheight,%
355 center=\ifbool{HL@beamerswitch@align}{%
356   \pgfpoint{.167\pgfphysicalwidth +
357     ↪ 0.5\beamerswitch@margin}{.5\pgfphysicalheight}%
358 }{%
359   \pgfpoint{.167\pgfphysicalwidth}{.5\pgfphysicalheight}%
360 }%
361 \pgfpageslogicalpageoptions{2}
362 {%
363   border shrink=\pgfpageoptionborder,%
364   border code=\beamerswitch@Border,%
365   resized width=.333\pgfphysicalwidth,%
366   resized height=\pgfphysicalheight,%
367   center=\pgfpoint{.5\pgfphysicalwidth}{.5\pgfphysicalheight}%
368 }%
369 \pgfpageslogicalpageoptions{3}
370 {%
371   border shrink=\pgfpageoptionborder,%
372   border code=\beamerswitch@Border,%
373   resized width=.333\pgfphysicalwidth,%
374   resized height=\pgfphysicalheight,%
375   center=\ifbool{HL@beamerswitch@align}{%
376     \pgfpoint{.833\pgfphysicalwidth -
377       ↪ 0.5\beamerswitch@margin}{.5\pgfphysicalheight}%
378 }{%
379   \pgfpoint{.833\pgfphysicalwidth}{.5\pgfphysicalheight}%
380 }%
381 }%
382 % stack on top of one another
383 \pgfpageslogicalpageoptions{1}
384 {%
385   border shrink=\pgfpageoptionborder,%
386   border code=\beamerswitch@Border,%
387   resized width=\pgfphysicalwidth,%
388   resized height=.333\pgfphysicalheight,%
389   center=\ifbool{HL@beamerswitch@align}{%
390     \pgfpoint{.5\pgfphysicalwidth}{.833\pgfphysicalheight -
391       ↪ 0.5\beamerswitch@margin}%
392 }{%
393   \pgfpoint{.5\pgfphysicalwidth}{.833\pgfphysicalheight}%
394 }%
395 \pgfpageslogicalpageoptions{2}
396 {%
397   border shrink=\pgfpageoptionborder,%
398   border code=\beamerswitch@Border,%
399   resized width=\pgfphysicalwidth,%
400   resized height=.333\pgfphysicalheight,%
401   center=\pgfpoint{.5\pgfphysicalwidth}{.5\pgfphysicalheight}%
402 }%
403 \pgfpageslogicalpageoptions{3}

```

```

404 {%
405   border shrink=\pgfpageoptionborder,%
406   border code=\beamerswitch@Border,%
407   resized width=\pgfphysicalwidth,%
408   resized height=.333\pgfphysicalheight,%
409   center=\ifbool{HL@beamerswitch@align}{%
410     \pgfpoint{.5\pgfphysicalwidth}{.167\pgfphysicalheight +
411       ↪ 0.5\beamerswitch@margin}%
412   }{%
413     \pgfpoint{.5\pgfphysicalwidth}{.167\pgfphysicalheight}%
414   }%
415 }%
416 \fi

```

The ‘1 by 3 narrow’ layout is like the ‘1 by 3’ layout but restricted to the left (or top) half of the page.

```

417 \pgfpagesdeclarelayout{1 by 3 narrow}
418 {
419   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
420   \edef\pgfpageoptionwidth{\the\paperheight}
421   \def\pgfpageoptionborder{0pt}
422   \def\pgfpageoptionfirstshipout{1}
423 }
424 {
425   \pgfpagesphysicalpageoptions
426   {%
427     logical pages=3,%
428     physical height=\pgfpageoptionheight,%
429     physical width=\pgfpageoptionwidth,%
430     current logical shipout=\pgfpageoptionfirstshipout%
431   }
432   \ifdim\paperheight>\paperwidth\relax
433     % put side-by-side
434     \pgfpageslogicalpageoptions{1}
435     {%
436       border shrink=\pgfpageoptionborder,%
437       border code=\beamerswitch@Border,%
438       resized width=.333\pgfphysicalwidth,%
439       resized height=.5\pgfphysicalheight,%
440       center=\ifbool{HL@beamerswitch@align}{%
441         \pgfpoint{.167\pgfphysicalwidth + 0.5\beamerswitch@margin}%
442         {.75\pgfphysicalheight - 0.5\beamerswitch@margin}%
443       }{%
444         \pgfpoint{.167\pgfphysicalwidth}{.75\pgfphysicalheight}%
445       }%
446     }%
447     \pgfpageslogicalpageoptions{2}
448     {%
449       border shrink=\pgfpageoptionborder,%
450       border code=\beamerswitch@Border,%
451       resized width=.333\pgfphysicalwidth,%
452       resized height=.5\pgfphysicalheight,%
453       center=\ifbool{HL@beamerswitch@align}{%

```

```

454 \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight -
    ↪ 0.5\beamerswitch@margin}%
455 }{%
456 \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
457 }%
458 }%
459 \pgfpageslogicalpageoptions{3}
460 {%
461 border shrink=\pgfpageoptionborder,%
462 border code=\beamerswitch@Border,%
463 resized width=.333\pgfphysicalwidth,%
464 resized height=.5\pgfphysicalheight,%
465 center=\ifbool{HL@beamerswitch@align}{%
466 \pgfpoint{.833\pgfphysicalwidth - 0.5\beamerswitch@margin}%
467 {.75\pgfphysicalheight - 0.5\beamerswitch@margin}%
468 }{%
469 \pgfpoint{.833\pgfphysicalwidth}{.75\pgfphysicalheight}%
470 }%
471 }%
472 \else
473 % stack on top of one another
474 \pgfpageslogicalpageoptions{1}
475 {%
476 border shrink=\pgfpageoptionborder,%
477 border code=\beamerswitch@Border,%
478 resized width=.5\pgfphysicalwidth,%
479 resized height=.333\pgfphysicalheight,%
480 center=\ifbool{HL@beamerswitch@align}{%
481 \pgfpoint{.25\pgfphysicalwidth + 0.5\beamerswitch@margin}%
482 {.833\pgfphysicalheight - 0.5\beamerswitch@margin}%
483 }{%
484 \pgfpoint{.25\pgfphysicalwidth}{.833\pgfphysicalheight}%
485 }%
486 }%
487 \pgfpageslogicalpageoptions{2}
488 {%
489 border shrink=\pgfpageoptionborder,%
490 border code=\beamerswitch@Border,%
491 resized width=.5\pgfphysicalwidth,%
492 resized height=.333\pgfphysicalheight,%
493 center=\ifbool{HL@beamerswitch@align}{%
494 \pgfpoint{.25\pgfphysicalwidth +
    ↪ 0.5\beamerswitch@margin}{.5\pgfphysicalheight}%
495 }{%
496 \pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
497 }%
498 }%
499 \pgfpageslogicalpageoptions{3}
500 {%
501 border shrink=\pgfpageoptionborder,%
502 border code=\beamerswitch@Border,%
503 resized width=.5\pgfphysicalwidth,%
504 resized height=.333\pgfphysicalheight,%
505 center=\ifbool{HL@beamerswitch@align}{%
506 \pgfpoint{.25\pgfphysicalwidth + 0.5\beamerswitch@margin}%
507 {.167\pgfphysicalheight + 0.5\beamerswitch@margin}%

```

```

508     }{%
509     \pgfpoint{.25\pgfphysicalwidth}{.167\pgfphysicalheight}%
510     }%
511   }%
512   \fi
513 }

```

The ‘2 by 2’ layout is similar to the normal 4 on 1 layout.

```

514 \pgfpagesdeclarelayout{2 by 2}
515 {
516   \edef\pgfpageoptionheight{\the\paperheight}
517   \edef\pgfpageoptionwidth{\the\paperwidth}
518   \edef\pgfpageoptionborder{0pt}
519 }
520 {
521   \pgfpagesphysicalpageoptions
522   {%
523     logical pages=4,%
524     physical height=\pgfpageoptionheight,%
525     physical width=\pgfpageoptionwidth%
526   }
527   \pgfpageslogicalpageoptions{1}
528   {%
529     border shrink=\pgfpageoptionborder,%
530     border code=\beamerswitch@Border,%
531     resized width=.5\pgfphysicalwidth,%
532     resized height=.5\pgfphysicalheight,%
533     center=\ifbool{HL@beamerswitch@align}{%
534       \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
535       {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
536     }{%
537       \pgfpoint{.25\pgfphysicalwidth}{.75\pgfphysicalheight}%
538     }%
539   }%
540   \pgfpageslogicalpageoptions{2}
541   {%
542     border shrink=\pgfpageoptionborder,%
543     border code=\beamerswitch@Border,%
544     resized width=.5\pgfphysicalwidth,%
545     resized height=.5\pgfphysicalheight,%
546     center=\ifbool{HL@beamerswitch@align}{%
547       \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
548       {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
549     }{%
550       \pgfpoint{.75\pgfphysicalwidth}{.75\pgfphysicalheight}%
551     }%
552   }%
553   \pgfpageslogicalpageoptions{3}
554   {%
555     border shrink=\pgfpageoptionborder,%
556     border code=\beamerswitch@Border,%
557     resized width=.5\pgfphysicalwidth,%
558     resized height=.5\pgfphysicalheight,%
559     center=\ifbool{HL@beamerswitch@align}{%
560       \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%

```

```

561         {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
562     }{%
563         \pgfpoint{.25\pgfphysicalwidth}{.25\pgfphysicalheight}%
564     }%
565 }%
566 \pgfpageslogicalpageoptions{4}
567 {%
568     border shrink=\pgfpageoptionborder,%
569     border code=\beamerswitch@Border,%
570     resized width=.5\pgfphysicalwidth,%
571     resized height=.5\pgfphysicalheight,%
572     center=\ifbool{HL@beamerswitch@align}{%
573         \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
574         {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
575     }{%
576         \pgfpoint{.75\pgfphysicalwidth}{.25\pgfphysicalheight}%
577     }%
578 }%
579 }

```

The ‘1 by 4 narrow’ layout puts four slides in a column on the left half of the page (or in a row on the top half).

```

580 \pgfpagesdeclarelayout{1 by 4 narrow}
581 {
582     \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
583     \edef\pgfpageoptionwidth{\the\paperheight}
584     \def\pgfpageoptionborder{0pt}
585     \def\pgfpageoptionfirstshipout{1}
586 }
587 {
588     \pgfpagesphysicalpageoptions
589     {%
590         logical pages=4,%
591         physical height=\pgfpageoptionheight,%
592         physical width=\pgfpageoptionwidth,%
593         current logical shipout=\pgfpageoptionfirstshipout%
594     }
595     \ifdim\paperheight>\paperwidth\relax
596     % put side-by-side
597     \pgfpageslogicalpageoptions{1}
598     {%
599         border shrink=\pgfpageoptionborder,%
600         border code=\beamerswitch@Border,%
601         resized width=.25\pgfphysicalwidth,%
602         resized height=.5\pgfphysicalheight,%
603         center=\ifbool{HL@beamerswitch@align}{%
604             \pgfpoint{.125\pgfphysicalwidth + 0.6\beamerswitch@margin}%
605             {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
606         }{%
607             \pgfpoint{.125\pgfphysicalwidth}{.75\pgfphysicalheight}%
608         }%
609     }%
610     \pgfpageslogicalpageoptions{2}
611     {%
612         border shrink=\pgfpageoptionborder,%

```

```

613 border code=\beamerswitch@Border,%
614 resized width=.25\pgfphysicalwidth,%
615 resized height=.5\pgfphysicalheight,%
616 center=\ifbool{HL@beamerswitch@align}{%
617   \pgfpoint{.375\pgfphysicalwidth + 0.2\beamerswitch@margin}{%
618     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
619   }{%
620     \pgfpoint{.375\pgfphysicalwidth}{.75\pgfphysicalheight}%
621   }%
622 }%
623 \pgfpageslogicalpageoptions{3}
624 {%
625   border shrink=\pgfpageoptionborder,%
626   border code=\beamerswitch@Border,%
627   resized width=.25\pgfphysicalwidth,%
628   resized height=.5\pgfphysicalheight,%
629   center=\ifbool{HL@beamerswitch@align}{%
630     \pgfpoint{.625\pgfphysicalwidth - 0.2\beamerswitch@margin}{%
631       {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
632     }{%
633       \pgfpoint{.625\pgfphysicalwidth}{.75\pgfphysicalheight}%
634     }%
635   }%
636 \pgfpageslogicalpageoptions{4}
637 {%
638   border shrink=\pgfpageoptionborder,%
639   border code=\beamerswitch@Border,%
640   resized width=.25\pgfphysicalwidth,%
641   resized height=.5\pgfphysicalheight,%
642   center=\ifbool{HL@beamerswitch@align}{%
643     \pgfpoint{.875\pgfphysicalwidth - 0.6\beamerswitch@margin}{%
644       {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
645     }{%
646       \pgfpoint{.875\pgfphysicalwidth}{.75\pgfphysicalheight}%
647     }%
648   }%
649 \else
650   % stack on top of one another
651   \pgfpageslogicalpageoptions{1}
652   {%
653     border shrink=\pgfpageoptionborder,%
654     border code=\beamerswitch@Border,%
655     resized width=.5\pgfphysicalwidth,%
656     resized height=.25\pgfphysicalheight,%
657     center=\ifbool{HL@beamerswitch@align}{%
658       \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}{%
659         {.875\pgfphysicalheight - 0.6\beamerswitch@margin}%
660       }{%
661         \pgfpoint{.25\pgfphysicalwidth}{.875\pgfphysicalheight}%
662       }%
663     }%
664   \pgfpageslogicalpageoptions{2}
665   {%
666     border shrink=\pgfpageoptionborder,%
667     border code=\beamerswitch@Border,%
668     resized width=.5\pgfphysicalwidth,%

```

```

669     resized height=.25\pgfphysicalheight,%
670     center=\ifbool{HL@beamerswitch@align}{%
671         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
672         {.625\pgfphysicalheight - 0.2\beamerswitch@margin}%
673     }{%
674         \pgfpoint{.25\pgfphysicalwidth}{.625\pgfphysicalheight}%
675     }%
676 }%
677 \pgfpageslogicalpageoptions{3}
678 {%
679     border shrink=\pgfpageoptionborder,%
680     border code=\beamerswitch@Border,%
681     resized width=.5\pgfphysicalwidth,%
682     resized height=.25 \pgfphysicalheight,%
683     center=\ifbool{HL@beamerswitch@align}{%
684         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
685         {.375\pgfphysicalheight + 0.2\beamerswitch@margin}%
686     }{%
687         \pgfpoint{.25\pgfphysicalwidth}{.375\pgfphysicalheight}%
688     }%
689 }%
690 \pgfpageslogicalpageoptions{4}
691 {%
692     border shrink=\pgfpageoptionborder,%
693     border code=\beamerswitch@Border,%
694     resized width=.5\pgfphysicalwidth,%
695     resized height=.25 \pgfphysicalheight,%
696     center=\ifbool{HL@beamerswitch@align}{%
697         \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
698         {.125\pgfphysicalheight + 0.6\beamerswitch@margin}%
699     }{%
700         \pgfpoint{.25\pgfphysicalwidth}{.125\pgfphysicalheight}%
701     }%
702 }%
703 \fi
704 }

```

The ‘2 by 3’ layout positions the slides as three rows of two slides each.

```

705 \pgfpagesdeclarelayout{2 by 3}
706 {
707     \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
708     \edef\pgfpageoptionwidth{\the\paperheight}
709     \def\pgfpageoptionborder{0pt}
710     \def\pgfpageoptionfirstshipout{1}
711 }
712 {
713     \pgfpagesphysicalpageoptions
714     {%
715         logical pages=6,%
716         physical height=\pgfpageoptionheight,%
717         physical width=\pgfpageoptionwidth,%
718         current logical shipout=\pgfpageoptionfirstshipout%
719     }
720     \ifdim\paperheight>\paperwidth\relax
721         % put side-by-side

```

```

722 \pgfpageslogicalpageoptions{1}
723 {%
724   border shrink=\pgfpageoptionborder,%
725   border code=\beamerswitch@Border,%
726   resized width=.333\pgfphysicalwidth,%
727   resized height=.5\pgfphysicalheight,%
728   center=\ifbool{HL@beamerswitch@align}{%
729     \pgfpoint{.167\pgfphysicalwidth + 0.5\beamerswitch@margin}%
730     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
731   }{%
732     \pgfpoint{.167\pgfphysicalwidth}{.75\pgfphysicalheight}%
733   }%
734 }%
735 \pgfpageslogicalpageoptions{2}
736 {%
737   border shrink=\pgfpageoptionborder,%
738   border code=\beamerswitch@Border,%
739   resized width=.333\pgfphysicalwidth,%
740   resized height=.5\pgfphysicalheight,%
741   center=\ifbool{HL@beamerswitch@align}{%
742     \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight -
743     ↪ 0.333\beamerswitch@margin}%
744   }{%
745     \pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
746   }%
747 }%
748 \pgfpageslogicalpageoptions{3}
749 {%
750   border shrink=\pgfpageoptionborder,%
751   border code=\beamerswitch@Border,%
752   resized width=.333\pgfphysicalwidth,%
753   resized height=.5\pgfphysicalheight,%
754   center=\ifbool{HL@beamerswitch@align}{%
755     \pgfpoint{.833\pgfphysicalwidth - 0.5\beamerswitch@margin}%
756     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
757   }{%
758     \pgfpoint{.833\pgfphysicalwidth}{.75\pgfphysicalheight}%
759   }%
760 }%
761 \pgfpageslogicalpageoptions{4}
762 {%
763   border shrink=\pgfpageoptionborder,%
764   border code=\beamerswitch@Border,%
765   resized width=.333\pgfphysicalwidth,%
766   resized height=.5\pgfphysicalheight,%
767   center=\ifbool{HL@beamerswitch@align}{%
768     \pgfpoint{.167\pgfphysicalwidth + 0.5\beamerswitch@margin}%
769     {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
770   }{%
771     \pgfpoint{.167\pgfphysicalwidth}{.25\pgfphysicalheight}%
772   }%
773 }%
774 \pgfpageslogicalpageoptions{5}
775 {%
776   border shrink=\pgfpageoptionborder,%
777   border code=\beamerswitch@Border,%

```

```

777 resized width=.333\pgfphysicalwidth,%
778 resized height=.5\pgfphysicalheight,%
779 center=\ifbool{HL@beamerswitch@align}{%
780   \pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight +
781     ↪ 0.333\beamerswitch@margin}%
782 }{%
783   \pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight}%
784 }%
785 \pgfpageslogicalpageoptions{6}
786 {%
787   border shrink=\pgfpageoptionborder,%
788   border code=\beamerswitch@Border,%
789   resized width=.333\pgfphysicalwidth,%
790   resized height=.5\pgfphysicalheight,%
791   center=\ifbool{HL@beamerswitch@align}{%
792     \pgfpoint{.833\pgfphysicalwidth - 0.5\beamerswitch@margin}%
793     {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
794   }{%
795     \pgfpoint{.833\pgfphysicalwidth}{.25\pgfphysicalheight}%
796   }%
797 }%
798 \else
799 % stack on top of one another
800 \pgfpageslogicalpageoptions{1}
801 {%
802   border shrink=\pgfpageoptionborder,%
803   resized width=.5\pgfphysicalwidth,%
804   resized height=.333\pgfphysicalheight,%
805   center=\ifbool{HL@beamerswitch@align}{%
806     \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
807     {.833\pgfphysicalheight - 0.5\beamerswitch@margin}%
808   }{%
809     \pgfpoint{.25\pgfphysicalwidth}{.833\pgfphysicalheight}%
810   }%
811 }%
812 \pgfpageslogicalpageoptions{2}
813 {%
814   border shrink=\pgfpageoptionborder,%
815   border code=\beamerswitch@Border,%
816   resized width=.5\pgfphysicalwidth,%
817   resized height=.333\pgfphysicalheight,%
818   center=\ifbool{HL@beamerswitch@align}{%
819     \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
820     {.833\pgfphysicalheight - 0.5\beamerswitch@margin}%
821   }{%
822     \pgfpoint{.75\pgfphysicalwidth}{.833\pgfphysicalheight}%
823   }%
824 }%
825 \pgfpageslogicalpageoptions{3}
826 {%
827   border shrink=\pgfpageoptionborder,%
828   border code=\beamerswitch@Border,%
829   resized width=.5\pgfphysicalwidth,%
830   resized height=.333\pgfphysicalheight,%
831   center=\ifbool{HL@beamerswitch@align}{%

```

```

832     \pgfpoint{.25\pgfphysicalwidth +
      ↪ 0.333\beamerswitch@margin}{.5\pgfphysicalheight}%
833   }{%
834     \pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
835   }%
836 }%
837 \pgfpageslogicalpageoptions{4}
838 {%
839   border shrink=\pgfpageoptionborder,%
840   border code=\beamerswitch@Border,%
841   resized width=.5\pgfphysicalwidth,%
842   resized height=.333\pgfphysicalheight,%
843   center=\ifbool{HL@beamerswitch@align}{%
844     \pgfpoint{.75\pgfphysicalwidth -
      ↪ 0.333\beamerswitch@margin}{.5\pgfphysicalheight}%
845   }{%
846     \pgfpoint{.75\pgfphysicalwidth}{.5\pgfphysicalheight}%
847   }%
848 }%
849 \pgfpageslogicalpageoptions{5}
850 {%
851   border shrink=\pgfpageoptionborder,%
852   border code=\beamerswitch@Border,%
853   resized width=.5\pgfphysicalwidth,%
854   resized height=.333\pgfphysicalheight,%
855   center=\ifbool{HL@beamerswitch@align}{%
856     \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
857     {.167\pgfphysicalheight + 0.5\beamerswitch@margin}%
858   }{%
859     \pgfpoint{.25\pgfphysicalwidth}{.167\pgfphysicalheight}%
860   }%
861 }%
862 \pgfpageslogicalpageoptions{6}
863 {%
864   border shrink=\pgfpageoptionborder,%
865   border code=\beamerswitch@Border,%
866   resized width=.5\pgfphysicalwidth,%
867   resized height=.333\pgfphysicalheight,%
868   center=\ifbool{HL@beamerswitch@align}{%
869     \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
870     {.167\pgfphysicalheight + 0.5\beamerswitch@margin}%
871   }{%
872     \pgfpoint{.75\pgfphysicalwidth}{.167\pgfphysicalheight}%
873   }%
874 }%
875 \fi
876 }

```

The ‘2 by 4’ layout layout positions the slides as four rows of two slides each.

```

877 \pgfpagesdeclarelayout{2 by 4}
878 {
879   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
880   \edef\pgfpageoptionwidth{\the\paperheight}
881   \def\pgfpageoptionborder{0pt}
882   \def\pgfpageoptionfirstshipout{1}

```

```

883 }
884 {
885   \pgfpagesphysicalpageoptions
886   {%
887     logical pages=8,%
888     physical height=\pgfpageoptionheight,%
889     physical width=\pgfpageoptionwidth,%
890     current logical shipout=\pgfpageoptionfirstshipout%
891   }
892   \ifdim\paperheight>\paperwidth\relax
893   % put side-by-side
894   \pgfpageslogicalpageoptions{1}
895   {%
896     border shrink=\pgfpageoptionborder,%
897     border code=\beamerswitch@Border,%
898     resized width=.25\pgfphysicalwidth,%
899     resized height=.5\pgfphysicalheight,%
900     center=\ifbool{HL@beamerswitch@align}{%
901       \pgfpoint{.125\pgfphysicalwidth + 0.6\beamerswitch@margin}{%
902         {.75\pgfphysicalheight - 0.333\beamerswitch@margin}}%
903     }{%
904       \pgfpoint{.125\pgfphysicalwidth}{.75\pgfphysicalheight}%
905     }%
906   }%
907   \pgfpageslogicalpageoptions{2}
908   {%
909     border shrink=\pgfpageoptionborder,%
910     border code=\beamerswitch@Border,%
911     resized width=.25\pgfphysicalwidth,%
912     resized height=.5\pgfphysicalheight,%
913     center=\ifbool{HL@beamerswitch@align}{%
914       \pgfpoint{.375\pgfphysicalwidth + 0.2\beamerswitch@margin}{%
915         {.75\pgfphysicalheight - 0.333\beamerswitch@margin}}%
916     }{%
917       \pgfpoint{.375\pgfphysicalwidth}{.75\pgfphysicalheight}%
918     }%
919   }%
920   \pgfpageslogicalpageoptions{3}
921   {%
922     border shrink=\pgfpageoptionborder,%
923     border code=\beamerswitch@Border,%
924     resized width=.25\pgfphysicalwidth,%
925     resized height=.5\pgfphysicalheight,%
926     center=\ifbool{HL@beamerswitch@align}{%
927       \pgfpoint{.625\pgfphysicalwidth - 0.2\beamerswitch@margin}{%
928         {.75\pgfphysicalheight - 0.333\beamerswitch@margin}}%
929     }{%
930       \pgfpoint{.625\pgfphysicalwidth}{.75\pgfphysicalheight}%
931     }%
932   }%
933   \pgfpageslogicalpageoptions{4}
934   {%
935     border shrink=\pgfpageoptionborder,%
936     border code=\beamerswitch@Border,%
937     resized width=.25\pgfphysicalwidth,%
938     resized height=.5\pgfphysicalheight,%

```

```

939 center=\ifbool{HL@beamerswitch@align}{%
940   \pgfpoint{.875\pgfphysicalwidth - 0.6\beamerswitch@margin}{%
941     {.75\pgfphysicalheight - 0.333\beamerswitch@margin}%
942   }{%
943     \pgfpoint{.875\pgfphysicalwidth}{.75\pgfphysicalheight}%
944   }%
945 }%
946 \pgfpageslogicalpageoptions{5}
947 {%
948   border shrink=\pgfpageoptionborder,%
949   border code=\beamerswitch@Border,%
950   resized width=.25\pgfphysicalwidth,%
951   resized height=.5\pgfphysicalheight,%
952   center=\ifbool{HL@beamerswitch@align}{%
953     \pgfpoint{.125\pgfphysicalwidth + 0.6\beamerswitch@margin}{%
954       {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
955     }{%
956       \pgfpoint{.125\pgfphysicalwidth}{.25\pgfphysicalheight}%
957     }%
958   }%
959 \pgfpageslogicalpageoptions{6}
960 {%
961   border shrink=\pgfpageoptionborder,%
962   border code=\beamerswitch@Border,%
963   resized width=.25\pgfphysicalwidth,%
964   resized height=.5\pgfphysicalheight,%
965   center=\ifbool{HL@beamerswitch@align}{%
966     \pgfpoint{.375\pgfphysicalwidth + 0.2\beamerswitch@margin}{%
967       {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
968     }{%
969       \pgfpoint{.375\pgfphysicalwidth}{.25\pgfphysicalheight}%
970     }%
971   }%
972 \pgfpageslogicalpageoptions{7}
973 {%
974   border shrink=\pgfpageoptionborder,%
975   border code=\beamerswitch@Border,%
976   resized width=.25\pgfphysicalwidth,%
977   resized height=.5\pgfphysicalheight,%
978   center=\ifbool{HL@beamerswitch@align}{%
979     \pgfpoint{.625\pgfphysicalwidth - 0.2\beamerswitch@margin}{%
980       {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
981     }{%
982       \pgfpoint{.625\pgfphysicalwidth}{.25\pgfphysicalheight}%
983     }%
984   }%
985 \pgfpageslogicalpageoptions{8}
986 {%
987   border shrink=\pgfpageoptionborder,%
988   border code=\beamerswitch@Border,%
989   resized width=.25\pgfphysicalwidth,%
990   resized height=.5\pgfphysicalheight,%
991   center=\ifbool{HL@beamerswitch@align}{%
992     \pgfpoint{.875\pgfphysicalwidth - 0.6\beamerswitch@margin}{%
993       {.25\pgfphysicalheight + 0.333\beamerswitch@margin}%
994     }{%

```

```

995     \pgfpoint{.875\pgfphysicalwidth}{.25\pgfphysicalheight}%
996 }%
997}%
998\else
999% stack on top of one another
1000\pgfpageslogicalpageoptions{1}
1001{%
1002    border shrink=\pgfpageoptionborder,%
1003    border code=\beamerswitch@Border,%
1004    resized width=.5\pgfphysicalwidth,%
1005    resized height=.25\pgfphysicalheight,%
1006    center=\ifbool{HL@beamerswitch@align}{%
1007        \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
1008        {.875\pgfphysicalheight - 0.6\beamerswitch@margin}%
1009    }{%
1010        \pgfpoint{.25\pgfphysicalwidth}{.875\pgfphysicalheight}%
1011    }%
1012}%
1013\pgfpageslogicalpageoptions{2}
1014{%
1015    border shrink=\pgfpageoptionborder,%
1016    border code=\beamerswitch@Border,%
1017    resized width=.5\pgfphysicalwidth,%
1018    resized height=.25\pgfphysicalheight,%
1019    center=\ifbool{HL@beamerswitch@align}{%
1020        \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
1021        {.875\pgfphysicalheight - 0.6\beamerswitch@margin}%
1022    }{%
1023        \pgfpoint{.75\pgfphysicalwidth}{.875\pgfphysicalheight}%
1024    }%
1025}%
1026\pgfpageslogicalpageoptions{3}
1027{%
1028    border shrink=\pgfpageoptionborder,%
1029    border code=\beamerswitch@Border,%
1030    resized width=.5\pgfphysicalwidth,%
1031    resized height=.25\pgfphysicalheight,%
1032    center=\ifbool{HL@beamerswitch@align}{%
1033        \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
1034        {.625\pgfphysicalheight - 0.2\beamerswitch@margin}%
1035    }{%
1036        \pgfpoint{.25\pgfphysicalwidth}{.625\pgfphysicalheight}%
1037    }%
1038}%
1039\pgfpageslogicalpageoptions{4}
1040{%
1041    border shrink=\pgfpageoptionborder,%
1042    border code=\beamerswitch@Border,%
1043    resized width=.5\pgfphysicalwidth,%
1044    resized height=.25\pgfphysicalheight,%
1045    center=\ifbool{HL@beamerswitch@align}{%
1046        \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
1047        {.625\pgfphysicalheight - 0.2\beamerswitch@margin}%
1048    }{%
1049        \pgfpoint{.75\pgfphysicalwidth}{.625\pgfphysicalheight}%
1050    }%

```

```

1051 }%
1052 \pgfpageslogicalpageoptions{5}
1053 {%
1054   border shrink=\pgfpageoptionborder,%
1055   border code=\beamerswitch@Border,%
1056   resized width=.5\pgfphysicalwidth,%
1057   resized height=.25 \pgfphysicalheight,%
1058   center=\ifbool{HL@beamerswitch@align}{%
1059     \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
1060     {.375\pgfphysicalheight + 0.2\beamerswitch@margin}%
1061   }{%
1062     \pgfpoint{.25\pgfphysicalwidth}{.375\pgfphysicalheight}%
1063   }%
1064 }%
1065 \pgfpageslogicalpageoptions{6}
1066 {%
1067   border shrink=\pgfpageoptionborder,%
1068   border code=\beamerswitch@Border,%
1069   resized width=.5\pgfphysicalwidth,%
1070   resized height=.25 \pgfphysicalheight,%
1071   center=\ifbool{HL@beamerswitch@align}{%
1072     \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
1073     {.375\pgfphysicalheight + 0.2\beamerswitch@margin}%
1074   }{%
1075     \pgfpoint{.75\pgfphysicalwidth}{.375\pgfphysicalheight}%
1076   }%
1077 }%
1078 \pgfpageslogicalpageoptions{7}
1079 {%
1080   border shrink=\pgfpageoptionborder,%
1081   border code=\beamerswitch@Border,%
1082   resized width=.5\pgfphysicalwidth,%
1083   resized height=.25 \pgfphysicalheight,%
1084   center=\ifbool{HL@beamerswitch@align}{%
1085     \pgfpoint{.25\pgfphysicalwidth + 0.333\beamerswitch@margin}%
1086     {.125\pgfphysicalheight + 0.6\beamerswitch@margin}%
1087   }{%
1088     \pgfpoint{.25\pgfphysicalwidth}{.125\pgfphysicalheight}%
1089   }%
1090 }%
1091 \pgfpageslogicalpageoptions{8}
1092 {%
1093   border shrink=\pgfpageoptionborder,%
1094   border code=\beamerswitch@Border,%
1095   resized width=.5\pgfphysicalwidth,%
1096   resized height=.25 \pgfphysicalheight,%
1097   center=\ifbool{HL@beamerswitch@align}{%
1098     \pgfpoint{.75\pgfphysicalwidth - 0.333\beamerswitch@margin}%
1099     {.125\pgfphysicalheight + 0.6\beamerswitch@margin}%
1100   }{%
1101     \pgfpoint{.75\pgfphysicalwidth}{.125\pgfphysicalheight}%
1102   }%
1103 }%
1104 \fi
1105 }
1106 }

```

## 9.7 Article layout

We provide some options for configuring the appearance of article mode.

The `\maketitle` option triggers adjustments in how the title block is printed.

```
1107 \define@boolkey[AL]{beamerswitch}{maketitle}[true]{} 
```

One will be to join the title and subtitle with a colon. There is an edge case where, if the user provides a title that ends in ‘!’ or ‘?’ *and* provides a subtitle while this option is in effect, they will end up with clashing punctuation in the middle of the displayed title (‘!.’ or ‘?:’). We therefore introduce a toggle that, if set true, suppresses the additional colon.

```
1108 \newtoggle{titlepunct} 
```

Of course, we would rather not bother the user with this, so we introduce a command for testing the title for final punctuation.

The only way I can seem to do this is by switching to `expl3` syntax. Rather than introduce extra hard dependencies to cope with what will probably be quite a rare issue, we make the dependency soft: it will only be applied if `xparse` is available. If there is demand for it, we could introduce a class option to switch this code on or off, but let’s see how we go.

```
1109 \IfFileExists{xparse.sty}{\@tempswattrue}{\@tempswafalse}  
1110 \if@tempswa  
1111   \RequirePackage{xparse}  
1112   \ExplSyntaxOn  
1113   \NewDocumentCommand{\bsw@punct@test}{m}{\l_bsw_punct_test:n {#1}}  
1114   \cs_new_protected:Nn \l_bsw_punct_test:n  
1115   {  
1116     \str_case:x:nnTF { \str_item:nn {#1} {-1} }  
1117     {  
1118       { , } { }  
1119       { ; } { }  
1120       { : } { }  
1121       { . } { }  
1122       { ! } { }  
1123       { ? } { }  
1124     }  
1125     { \global\toggletrue{titlepunct} }  
1126     { \global\togglefalse{titlepunct} }  
1127   }  
1128   \ExplSyntaxOff 
```

We insert this test into the definitions for `\title` introduced by `beamer/beamerarticle`.

```
1129 \mode<article>{%  
1130   \renewcommand{\title}[2][\beamer@origtitle{#2}\bsw@punct@test{#2}}  
1131 }  
1132 \mode<presentation>{%  
1133   \long\def\beamer@title[#1]#2{%  
1134     \def\inserttitle{#2}%  
1135     \def\beamer@shorttitle{#1}%  
1136   }  
1137 } 
```

```

1136     \bsw@punct@test{#2}%
1137   }
1138 }
1139 \else
1140   \wlog{Beamerswitch: Auto-detection of title punctuation not available.}
1141 \fi

```

We offer some alternatives for handling frame titles in article mode.

- `para` is what `beamerarticle` normally does.
- `margin` puts the frame titles in the margin.
- `none` gets rid of them entirely.

```

1142 \define@choicekey+{AL}{beamerswitch}{frametitles}{para, margin, none}{%
1143   \def\beamerswitch@articleframetitles{#1}%
1144 }{%
1145   \ClassWarning{beamerswitch}{Value of `frametitles' not recognized.
1146     Allowed values are para, margin, and none.}%
1147 }

```

We provide a command for setting these options.

```

1148 \newcommand{\articlelayout}[1]{%
1149   \setkeys{AL}{beamerswitch}{#1}%

```

The following options are mode specific.

```

1150   \mode<article>{%

```

Personally I find slide titles somewhat intrusive in article mode. They can easily end up duplicating section headings in running text, or captions in figures. You may have other ideas, so we keep this behaviour configurable.

The `margin` value is implemented using `\marginpar`.

```

1151   \ifcsstring{beamerswitch@articleframetitles}{margin}{%
1152     \setbeamertemplate{frametitle}{%
1153       \marginpar[%
1154         \raggedleft\noindent\emshape\textbf{\insertframetitle}\par
1155         \noindent\insertframesubtitle\par
1156       ]{%
1157         \raggedright\noindent\emshape\textbf{\insertframetitle}\par
1158         \noindent\insertframesubtitle\par
1159       }%
1160     }
1161   }{%
1162     \ifcsstring{beamerswitch@articleframetitles}{none}{%
1163       \setbeamertemplate{frametitle}{}
1164     }{%
1165       \ifcsstring{beamerswitch@articleframetitles}{para}{%
1166         \setbeamertemplate{frametitle}[default]
1167       }{}%
1168     }%
1169   }

```

This is where we make our adjustments to `\maketitle`. We start by joining the subtitle to the title by means of a colon instead of a newline.

```
1170 \ifbool{AL@beamerswitch@maketitle}{%
1171   \renewcommand{\subtitle}[2][{}]{%
1172     \def\insertsubtitle{##2}\gappto@title{\iftoggle{titlepunct}{:}{:} ##2}%
1173   }
```

We add support for printing the institute information.

```
1174 \ifundef{\beamer@originstitute}{%
1175   \renewcommand{\institute}[2][{}]{\def\insertinstitute{##2}}%
1176 }{%
1177   ↪ \renewcommand{\institute}[2][{}]{\def\insertinstitute{##2}\beamer@originstitute{##2}}%
1178 }
```

Our first change to `\maketitle` itself is to remove the initial vertical space.

```
1179 \def\@maketitle{%
1180   \newpage
1181   \null
1182   \begin{center}%
1183     \let\footnote\thanks
1184     {\LARGE \@title \par}%
1185     \vskip 1.5em%
1186     {%
1187       \large\lineskip .5em%
1188       \begin{tabular}[t]{c}%
1189         \@author
1190       \end{tabular}\par
1191     }%
```

The other is to add in a row for the institute information.

```
1192 \ifdefvoid{\insertinstitute}{%}{%
1193   {%
1194     \normalsize\lineskip .5em%
1195     \begin{tabular}[t]{c}%
1196       \insertinstitute
1197     \end{tabular}\par
1198   }%
1199 }%
1200 \vskip 1em%
1201 {\large \@date}%
1202 \end{center}%
1203 \par\vskip 1.5em%
1204 }%
1205 }{}%
1206 }
```

For consistency, if the `maketitle` option has been passed, we change the PDF metadata in the other modes to use the colon convention for joining the title and subtitle.

```

1207 \mode<presentation>{%
1208 \ifbool{AL@beamerswitch@maketitle}{%
1209 \ifbool{beamer@autopdfinfo}{%
1210 \patchcmd{\beamer@firstminutepatches}{%
1211 \inserttitle\ifx\insertsubtitle\empty\else\ - \insertsubtitle\fi
1212 }{%
1213 \inserttitle\ifx\insertsubtitle\empty\else\iftoggle{titlepunct}{\{:}
1214 \insertsubtitle\fi
1215 }{}{}%
1216 }{}{}%
1217 }{}%
1218 }

```

There is no more.

```

1219 \endinput

```

# Index

3plus value, 7, 14

4plus value, 7, 14

2 value, 7, 14

3 value, 7, 14

4 value, 7, 14

6 value, 7, 14

8 value, 7, 14

align key, 7, 15

also key, 5, 11

alsoarticle key, 5, 11

alsobeamer key, 5, 11

alsohandout key, 5, 11

alsotrans key, 5, 11

article key, 4, 10–11

\articlelayout, 7, 34–36

\ArticleSuffix, 5, 11–12

beamer key, 4, 10

\BeamerSuffix, 5, 11–12

\BeamerswitchSpawn, 5, 12

border key, 7, 14–15

frametitles key, 8, 34

handout key, 4, 10

\handoutlayout, 7, 15–17

\handoutpnobaseline, 15

\HandoutSuffix, 5, 11–12

## Keys

align, 7, 15

also, 5, 11

alsoarticle, 5, 11

alsobeamer, 5, 11

alsohandout, 5, 11

alsotrans, 5, 11

article, 4, 10–11

beamer, 4, 10

border, 7, 14–15

frametitles, 8, 34

handout, 4, 10

maketitle, 8, 33

margin, 7, 15

nohyperref, 6, 11

nup, 7, 14

paper, 7, 14

pnos, 7, 15

textinst, 6, 11

trans, 4, 10

maketitle key, 8, 33

margin key, 7, 15

margin value, 8, 34

nohyperref key, 6, 11

none value, 8, 34

nup key, 7, 14

paper key, 7, 14

para value, 8, 34

pnos key, 7, 15

\SpawnedCompiler, 12

\SpawnedLuaTeX, 12

\SpawnedPDFTeX, 12

\SpawnedTeX, 12

\SpawnedXeTeX, 12

textinst key, 6, 11

trans key, 4, 10

\TransSuffix, 5, 11–12

## Values

3plus, 7, 14

4plus, 7, 14

2, 7, 14

3, 7, 14

4, 7, 14

6, 7, 14

8, 7, 14

margin, 8, 34

none, 8, 34

para, 8, 34