

# beamerswitch — Convenient mode selection in Beamer documents

Alex Ball

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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 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.

## 2 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>shelless</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.

## 3 Loading the class

The class is loaded in the usual way:

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

The various options are described below.

### 3.1 Choosing the mode of the current run

The `beamerswitch` 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}
```

## 3.2 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 manage 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`.

See the [Implementation](#) section below for the default definition. Again, if you want to pre-define this to do something else, you have to do it before loading the class:

```
\newcommand{\BeamerswitchSpawn}[1]{%
  \ShellEscape{...}%
}
\documentclass{beamerswitch}
```

### 3.3 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, `beamerswitch` 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.

## 4 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 6. 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.

**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.

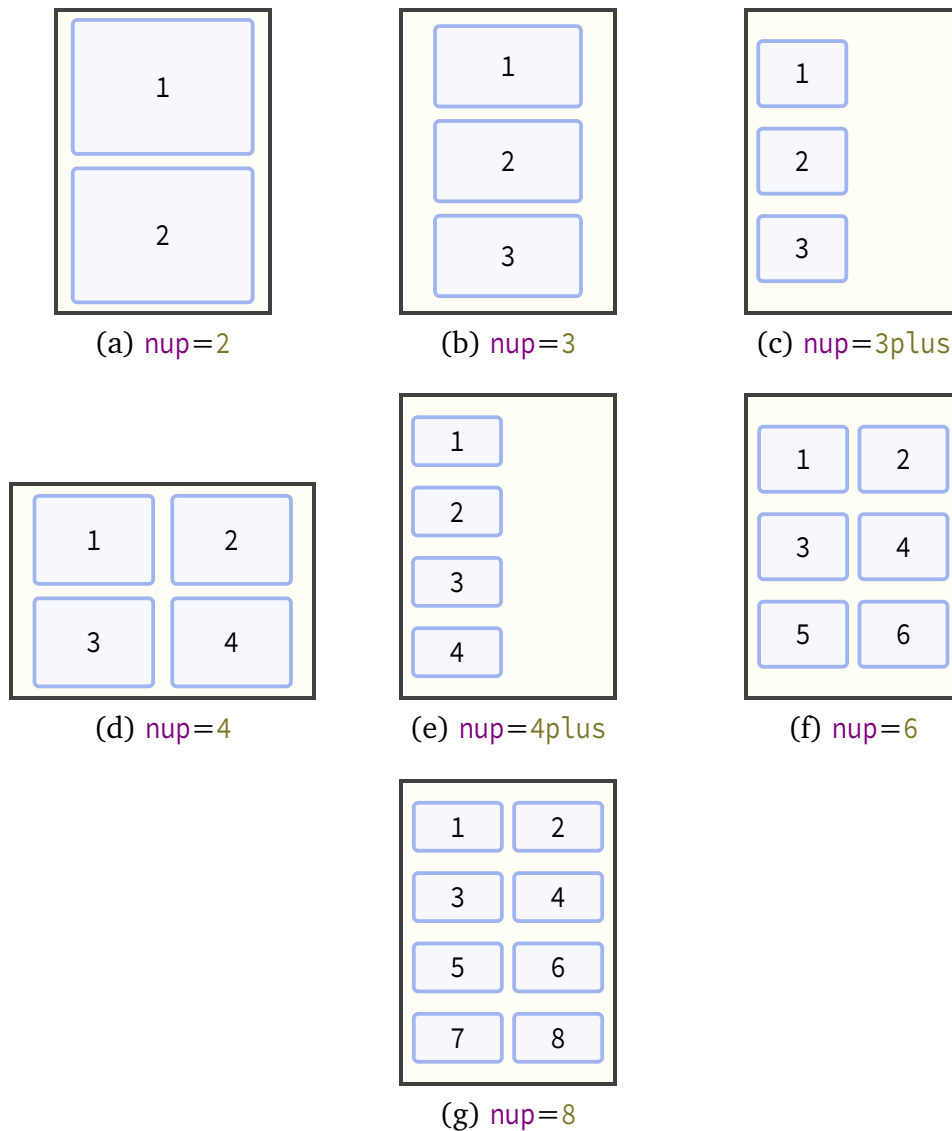


Figure 1: Handout layouts provided by `beamerswitch`

## `pnos`

Adds page numbers to the bottom of each page.

(no value, initially unset)

## 5 Changing the look of article mode

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

`\articlelayout{<options>}`

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

## `maketitle`

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

(no value, initially unset)

- 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}
```

**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`.

## 6 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}
}
```

## 7 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.

## 8 Implementation

### 8.1 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}
```

### 8.2 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>

```

## 8.3 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  $\TeX$  processes. We allow for the possibility of the user overriding this routine with another one, perhaps using a different automation tool.

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

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.

```
86 \IfEndWith*{\jobname}{\BeamerSuffix}{%
87   \setkeys[DC]{beamerswitch}{beamer=true}
88 }{%
89   \IfEndWith*{\jobname}{\TransSuffix}{%
90     \setkeys[DC]{beamerswitch}{trans=true}
91   }{%
92     \IfEndWith*{\jobname}{\HandoutSuffix}{%
93       \setkeys[DC]{beamerswitch}{handout=true}
94     }{%
95       \IfEndWith*{\jobname}{\ArticleSuffix}{%
96         \setkeys[DC]{beamerswitch}{article=true}
97       }{%
98         \ifbool{DC@beamerswitch@alsobeamer}{%
99           \BeamerswitchSpawn{\BeamerSuffix}%
100         }{}
101         \ifbool{DC@beamerswitch@alsotrans}{%
102           \BeamerswitchSpawn{\TransSuffix}%
103         }{}
104         \ifbool{DC@beamerswitch@alsohandout}{%
105           \BeamerswitchSpawn{\HandoutSuffix}%
106         }{}
107         \ifbool{DC@beamerswitch@alsoarticle}{%
108           \BeamerswitchSpawn{\ArticleSuffix}%
109         }{}
110       }%
111     }%
112   }%
113 }
```

```

112 }%
113 }%

```

## 8.4 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.

```

114 \ifbool{DC@beamerswitch@article}{%
115   \LoadClass{article}
116   \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`.

```

117 \ifbool{DC@beamerswitch@nohyperref}{}{%
118   \RequirePackage[bookmarks=true,%
119     bookmarksopen=true,%
120     pdfborder={0 0 0},%
121     pdfhighlight={/N},%
122     linkbordercolor={.5 .5 .5}]{hyperref}%
123 }

```

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`.

```

124 \AtBeginDocument{%
125   \@ifpackageloaded{hyperref}{%
126     \pdfstringdefDisableCommands{\def\<#1>#2{ - #2}}
127     \begingroup
128     \hypersetup{pdftitle={\@title}}%
129     \def\and{\unskip, }%
130     \let\thanks=\@gobble
131     \let\inst=\@gobble
132     \hypersetup{pdfauthor={\@author}}%
133     \endgroup
134   }{}%
135 }
136 {}%

```

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`.

```

137 \ifbool{DC@beamerswitch@handout}{%
138   \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.

```
139 \RequirePackage{pgfpages}
```

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

```
140 }{%
141 \ifbool{DC@beamerswitch@trans}{%
142 \LoadClass[ignorenonframetext,trans]{beamer}
143 }{%
144 \LoadClass[ignorenonframetext]{beamer}
145 }%
146 }
147 }
```

## 8.5 Mode-independent layout

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

```
148 \ifbool{DC@beamerswitch@textinst}{%
149 \def\beamer@insttitle#1{\textsuperscript{#1}}
150 \def\beamer@instinst#1{\textsuperscript{#1}\ignorespaces}
151 }{}
```

## 8.6 Handout layout

We set up a command for drawing borders around the slides in handout mode. This is initially set up to do nothing.

```
152 \newcommand*{\beamerswitch@border}{\relax}
```

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.

```
153 \mode<handout>{%
154 \pgfpagesdeclarelayout{1 by 2}
155 {
156 \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
157 \edef\pgfpageoptionwidth{\the\paperheight}
158 \def\pgfpageoptionborder{0pt}
159 \def\pgfpageoptionfirstshipout{1}
160 }
161 {
162 \pgfpagesphysicalpageoptions
163 {%
164 logical pages=2,%
165 physical height=\pgfpageoptionheight,%
166 physical width=\pgfpageoptionwidth,%
167 current logical shipout=\pgfpageoptionfirstshipout%
168 }
```

```

169 \ifdim\paperheight>\paperwidth\relax
170 % put side-by-side
171 \pgfpageslogicalpageoptions{1}
172 {%
173   border shrink=\pgfpageoptionborder,%
174   border code=\beamerswitch@Border,%
175   resized width=.5\pgfphysicalwidth,%
176   resized height=\pgfphysicalheight,%
177   center=\pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
178 }%
179 \pgfpageslogicalpageoptions{2}
180 {%
181   border shrink=\pgfpageoptionborder,%
182   border code=\beamerswitch@Border,%
183   resized width=.5\pgfphysicalwidth,%
184   resized height=\pgfphysicalheight,%
185   center=\pgfpoint{.75\pgfphysicalwidth}{.5\pgfphysicalheight}%
186 }%
187 \else
188 % stack on top of one another
189 \pgfpageslogicalpageoptions{1}
190 {%
191   border shrink=\pgfpageoptionborder,%
192   border code=\beamerswitch@Border,%
193   resized width=\pgfphysicalwidth,%
194   resized height=.5\pgfphysicalheight,%
195   center=\pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
196 }%
197 \pgfpageslogicalpageoptions{2}
198 {%
199   border shrink=\pgfpageoptionborder,%
200   border code=\beamerswitch@Border,%
201   resized width=\pgfphysicalwidth,%
202   resized height=.5\pgfphysicalheight,%
203   center=\pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight}%
204 }%
205 \fi
206 }

```

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

```

207 \pgfpagesdeclarelayout{1 by 3}
208 {
209   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
210   \edef\pgfpageoptionwidth{\the\paperheight}
211   \def\pgfpageoptionborder{0pt}
212   \def\pgfpageoptionfirstshipout{1}
213 }
214 {
215   \pgfpagesphysicalpageoptions
216   {%
217     logical pages=3,%
218     physical height=\pgfpageoptionheight,%
219     physical width=\pgfpageoptionwidth,%
220     current logical shipout=\pgfpageoptionfirstshipout%
221   }

```

```

222 \ifdim\paperheight>\paperwidth\relax
223 % put side-by-side
224 \pgfpageslogicalpageoptions{1}
225 {%
226   border shrink=\pgfpageoptionborder,%
227   border code=\beamerswitch@Border,%
228   resized width=.333\pgfphysicalwidth,%
229   resized height=\pgfphysicalheight,%
230   center=\pgfpoint{.167\pgfphysicalwidth}{.5\pgfphysicalheight}%
231 }%
232 \pgfpageslogicalpageoptions{2}
233 {%
234   border shrink=\pgfpageoptionborder,%
235   border code=\beamerswitch@Border,%
236   resized width=.333\pgfphysicalwidth,%
237   resized height=\pgfphysicalheight,%
238   center=\pgfpoint{.5\pgfphysicalwidth}{.5\pgfphysicalheight}%
239 }%
240 \pgfpageslogicalpageoptions{3}
241 {%
242   border shrink=\pgfpageoptionborder,%
243   border code=\beamerswitch@Border,%
244   resized width=.333\pgfphysicalwidth,%
245   resized height=\pgfphysicalheight,%
246   center=\pgfpoint{.833\pgfphysicalwidth}{.5\pgfphysicalheight}%
247 }%
248 \else
249 % stack on top of one another
250 \pgfpageslogicalpageoptions{1}
251 {%
252   border shrink=\pgfpageoptionborder,%
253   border code=\beamerswitch@Border,%
254   resized width=\pgfphysicalwidth,%
255   resized height=.333\pgfphysicalheight,%
256   center=\pgfpoint{.5\pgfphysicalwidth}{.833\pgfphysicalheight}%
257 }%
258 \pgfpageslogicalpageoptions{2}
259 {%
260   border shrink=\pgfpageoptionborder,%
261   border code=\beamerswitch@Border,%
262   resized width=\pgfphysicalwidth,%
263   resized height=.333\pgfphysicalheight,%
264   center=\pgfpoint{.5\pgfphysicalwidth}{.5\pgfphysicalheight}%
265 }%
266 \pgfpageslogicalpageoptions{3}
267 {%
268   border shrink=\pgfpageoptionborder,%
269   border code=\beamerswitch@Border,%
270   resized width=\pgfphysicalwidth,%
271   resized height=.333\pgfphysicalheight,%
272   center=\pgfpoint{.5\pgfphysicalwidth}{.167\pgfphysicalheight}%
273 }%
274 \fi
275 }

```

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

```

276 \pgfpagesdeclarelayout{1 by 3 narrow}
277 {
278   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
279   \edef\pgfpageoptionwidth{\the\paperheight}
280   \def\pgfpageoptionborder{0pt}
281   \def\pgfpageoptionfirstshipout{1}
282 }
283 {
284   \pgfpagesphysicalpageoptions
285   {%
286     logical pages=3,%
287     physical height=\pgfpageoptionheight,%
288     physical width=\pgfpageoptionwidth,%
289     current logical shipout=\pgfpageoptionfirstshipout%
290   }
291   \ifdim\paperheight>\paperwidth\relax
292     % put side-by-side
293     \pgfpageslogicalpageoptions{1}
294     {%
295       border shrink=\pgfpageoptionborder,%
296       border code=\beamerswitch@Border,%
297       resized width=.333\pgfphysicalwidth,%
298       resized height=.5\pgfphysicalheight,%
299       center=\pgfpoint{.167\pgfphysicalwidth}{.75\pgfphysicalheight}%
300     }%
301     \pgfpageslogicalpageoptions{2}
302     {%
303       border shrink=\pgfpageoptionborder,%
304       border code=\beamerswitch@Border,%
305       resized width=.333\pgfphysicalwidth,%
306       resized height=.5\pgfphysicalheight,%
307       center=\pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
308     }%
309     \pgfpageslogicalpageoptions{3}
310     {%
311       border shrink=\pgfpageoptionborder,%
312       border code=\beamerswitch@Border,%
313       resized width=.333\pgfphysicalwidth,%
314       resized height=.5\pgfphysicalheight,%
315       center=\pgfpoint{.833\pgfphysicalwidth}{.75\pgfphysicalheight}%
316     }%
317   \else
318     % stack on top of one another
319     \pgfpageslogicalpageoptions{1}
320     {%
321       border shrink=\pgfpageoptionborder,%
322       border code=\beamerswitch@Border,%
323       resized width=.5\pgfphysicalwidth,%
324       resized height=.333\pgfphysicalheight,%
325       center=\pgfpoint{.25\pgfphysicalwidth}{.833\pgfphysicalheight}%
326     }%
327     \pgfpageslogicalpageoptions{2}
328     {%
329       border shrink=\pgfpageoptionborder,%
330       border code=\beamerswitch@Border,%
331       resized width=.5\pgfphysicalwidth,%

```

```

332     resized height=.333\pgfphysicalheight,%
333     center=\pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
334 }%
335 \pgfpageslogicalpageoptions{3}
336 {%
337     border shrink=\pgfpageoptionborder,%
338     border code=\beamerswitch@Border,%
339     resized width=.5\pgfphysicalwidth,%
340     resized height=.333\pgfphysicalheight,%
341     center=\pgfpoint{.25\pgfphysicalwidth}{.167\pgfphysicalheight}%
342 }%
343 \fi
344 }

```

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

```

345 \pgfpagesdeclarelayout{2 by 2}
346 {
347     \edef\pgfpageoptionheight{\the\paperheight}
348     \edef\pgfpageoptionwidth{\the\paperwidth}
349     \edef\pgfpageoptionborder{0pt}
350 }
351 {
352     \pgfpagesphysicalpageoptions
353     {%
354         logical pages=4,%
355         physical height=\pgfpageoptionheight,%
356         physical width=\pgfpageoptionwidth%
357     }
358     \pgfpageslogicalpageoptions{1}
359     {%
360         border shrink=\pgfpageoptionborder,%
361         border code=\beamerswitch@Border,%
362         resized width=.5\pgfphysicalwidth,%
363         resized height=.5\pgfphysicalheight,%
364         center=\pgfpoint{.25\pgfphysicalwidth}{.75\pgfphysicalheight}%
365     }%
366     \pgfpageslogicalpageoptions{2}
367     {%
368         border shrink=\pgfpageoptionborder,%
369         border code=\beamerswitch@Border,%
370         resized width=.5\pgfphysicalwidth,%
371         resized height=.5\pgfphysicalheight,%
372         center=\pgfpoint{.75\pgfphysicalwidth}{.75\pgfphysicalheight}%
373     }%
374     \pgfpageslogicalpageoptions{3}
375     {%
376         border shrink=\pgfpageoptionborder,%
377         border code=\beamerswitch@Border,%
378         resized width=.5\pgfphysicalwidth,%
379         resized height=.5\pgfphysicalheight,%
380         center=\pgfpoint{.25\pgfphysicalwidth}{.25\pgfphysicalheight}%
381     }%
382     \pgfpageslogicalpageoptions{4}
383     {%
384         border shrink=\pgfpageoptionborder,%

```



```

385     border code=\beamerswitch@Border,%
386     resized width=.5\pgfphysicalwidth,%
387     resized height=.5\pgfphysicalheight,%
388     center=\pgfpoint{.75\pgfphysicalwidth}{.25\pgfphysicalheight}%
389 }%
390 }

```

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).

```

391 \pgfpagesdeclarelayout{1 by 4 narrow}
392 {
393   \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
394   \edef\pgfpageoptionwidth{\the\paperheight}
395   \def\pgfpageoptionborder{0pt}
396   \def\pgfpageoptionfirstshipout{1}
397 }
398 {
399   \pgfpagesphysicalpageoptions
400   {%
401     logical pages=4,%
402     physical height=\pgfpageoptionheight,%
403     physical width=\pgfpageoptionwidth,%
404     current logical shipout=\pgfpageoptionfirstshipout%
405   }
406   \ifdim\paperheight>\paperwidth\relax
407     % put side-by-side
408     \pgfpageslogicalpageoptions{1}
409     {%
410       border shrink=\pgfpageoptionborder,%
411       border code=\beamerswitch@Border,%
412       resized width=.25\pgfphysicalwidth,%
413       resized height=.5\pgfphysicalheight,%
414       center=\pgfpoint{.125\pgfphysicalwidth}{.75\pgfphysicalheight}%
415     }%
416     \pgfpageslogicalpageoptions{2}
417     {%
418       border shrink=\pgfpageoptionborder,%
419       border code=\beamerswitch@Border,%
420       resized width=.25\pgfphysicalwidth,%
421       resized height=.5\pgfphysicalheight,%
422       center=\pgfpoint{.375\pgfphysicalwidth}{.75\pgfphysicalheight}%
423     }%
424     \pgfpageslogicalpageoptions{3}
425     {%
426       border shrink=\pgfpageoptionborder,%
427       border code=\beamerswitch@Border,%
428       resized width=.25\pgfphysicalwidth,%
429       resized height=.5\pgfphysicalheight,%
430       center=\pgfpoint{.625\pgfphysicalwidth}{.75\pgfphysicalheight}%
431     }%
432     \pgfpageslogicalpageoptions{4}
433     {%
434       border shrink=\pgfpageoptionborder,%
435       border code=\beamerswitch@Border,%
436       resized width=.25\pgfphysicalwidth,%

```

```

437         resized height=.5\pgfphysicalheight,%
438         center=\pgfpoint{.875\pgfphysicalwidth}{.75\pgfphysicalheight}%
439     }%
440     \else
441     % stack on top of one another
442     \pgfpageslogicalpageoptions{1}
443     {%
444         border shrink=\pgfpageoptionborder,%
445         border code=\beamerswitch@Border,%
446         resized width=.5\pgfphysicalwidth,%
447         resized height=.25\pgfphysicalheight,%
448         center=\pgfpoint{.25\pgfphysicalwidth}{.875\pgfphysicalheight}%
449     }%
450     \pgfpageslogicalpageoptions{2}
451     {%
452         border shrink=\pgfpageoptionborder,%
453         border code=\beamerswitch@Border,%
454         resized width=.5\pgfphysicalwidth,%
455         resized height=.25\pgfphysicalheight,%
456         center=\pgfpoint{.25\pgfphysicalwidth}{.625\pgfphysicalheight}%
457     }%
458     \pgfpageslogicalpageoptions{3}
459     {%
460         border shrink=\pgfpageoptionborder,%
461         border code=\beamerswitch@Border,%
462         resized width=.5\pgfphysicalwidth,%
463         resized height=.25 \pgfphysicalheight,%
464         center=\pgfpoint{.25\pgfphysicalwidth}{.375\pgfphysicalheight}%
465     }%
466     \pgfpageslogicalpageoptions{4}
467     {%
468         border shrink=\pgfpageoptionborder,%
469         border code=\beamerswitch@Border,%
470         resized width=.5\pgfphysicalwidth,%
471         resized height=.25 \pgfphysicalheight,%
472         center=\pgfpoint{.25\pgfphysicalwidth}{.125\pgfphysicalheight}%
473     }%
474     \fi
475 }

```

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

```

476 \pgfpagesdeclarelayout{2 by 3}
477 {
478     \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
479     \edef\pgfpageoptionwidth{\the\paperheight}
480     \def\pgfpageoptionborder{0pt}
481     \def\pgfpageoptionfirstshipout{1}
482 }
483 {
484     \pgfpagesphysicalpageoptions
485     {%
486         logical pages=6,%
487         physical height=\pgfpageoptionheight,%
488         physical width=\pgfpageoptionwidth,%
489         current logical shipout=\pgfpageoptionfirstshipout%

```

```

490 }
491 \ifdim\paperheight>\paperwidth\relax
492 % put side-by-side
493 \pgfpageslogicalpageoptions{1}
494 {%
495   border shrink=\pgfpageoptionborder,%
496   border code=\beamerswitch@Border,%
497   resized width=.333\pgfphysicalwidth,%
498   resized height=.5\pgfphysicalheight,%
499   center=\pgfpoint{.167\pgfphysicalwidth}{.75\pgfphysicalheight}%
500 }%
501 \pgfpageslogicalpageoptions{2}
502 {%
503   border shrink=\pgfpageoptionborder,%
504   border code=\beamerswitch@Border,%
505   resized width=.333\pgfphysicalwidth,%
506   resized height=.5\pgfphysicalheight,%
507   center=\pgfpoint{.5\pgfphysicalwidth}{.75\pgfphysicalheight}%
508 }%
509 \pgfpageslogicalpageoptions{3}
510 {%
511   border shrink=\pgfpageoptionborder,%
512   border code=\beamerswitch@Border,%
513   resized width=.333\pgfphysicalwidth,%
514   resized height=.5\pgfphysicalheight,%
515   center=\pgfpoint{.833\pgfphysicalwidth}{.75\pgfphysicalheight}%
516 }%
517 \pgfpageslogicalpageoptions{4}
518 {%
519   border shrink=\pgfpageoptionborder,%
520   border code=\beamerswitch@Border,%
521   resized width=.333\pgfphysicalwidth,%
522   resized height=.5\pgfphysicalheight,%
523   center=\pgfpoint{.167\pgfphysicalwidth}{.25\pgfphysicalheight}%
524 }%
525 \pgfpageslogicalpageoptions{5}
526 {%
527   border shrink=\pgfpageoptionborder,%
528   border code=\beamerswitch@Border,%
529   resized width=.333\pgfphysicalwidth,%
530   resized height=.5\pgfphysicalheight,%
531   center=\pgfpoint{.5\pgfphysicalwidth}{.25\pgfphysicalheight}%
532 }%
533 \pgfpageslogicalpageoptions{6}
534 {%
535   border shrink=\pgfpageoptionborder,%
536   border code=\beamerswitch@Border,%
537   resized width=.333\pgfphysicalwidth,%
538   resized height=.5\pgfphysicalheight,%
539   center=\pgfpoint{.833\pgfphysicalwidth}{.25\pgfphysicalheight}%
540 }%
541 \else
542 % stack on top of one another
543 \pgfpageslogicalpageoptions{1}
544 {%
545   border shrink=\pgfpageoptionborder,%

```

```

546     resized width=.5\pgfphysicalwidth,%
547     resized height=.333\pgfphysicalheight,%
548     center=\pgfpoint{.25\pgfphysicalwidth}{.833\pgfphysicalheight}%
549 }%
550 \pgfpageslogicalpageoptions{2}
551 {%
552     border shrink=\pgfpageoptionborder,%
553     border code=\beamerswitch@Border,%
554     resized width=.5\pgfphysicalwidth,%
555     resized height=.333\pgfphysicalheight,%
556     center=\pgfpoint{.75\pgfphysicalwidth}{.833\pgfphysicalheight}%
557 }%
558 \pgfpageslogicalpageoptions{3}
559 {%
560     border shrink=\pgfpageoptionborder,%
561     border code=\beamerswitch@Border,%
562     resized width=.5\pgfphysicalwidth,%
563     resized height=.333\pgfphysicalheight,%
564     center=\pgfpoint{.25\pgfphysicalwidth}{.5\pgfphysicalheight}%
565 }%
566 \pgfpageslogicalpageoptions{4}
567 {%
568     border shrink=\pgfpageoptionborder,%
569     border code=\beamerswitch@Border,%
570     resized width=.5\pgfphysicalwidth,%
571     resized height=.333\pgfphysicalheight,%
572     center=\pgfpoint{.75\pgfphysicalwidth}{.5\pgfphysicalheight}%
573 }%
574 \pgfpageslogicalpageoptions{5}
575 {%
576     border shrink=\pgfpageoptionborder,%
577     border code=\beamerswitch@Border,%
578     resized width=.5\pgfphysicalwidth,%
579     resized height=.333\pgfphysicalheight,%
580     center=\pgfpoint{.25\pgfphysicalwidth}{.167\pgfphysicalheight}%
581 }%
582 \pgfpageslogicalpageoptions{6}
583 {%
584     border shrink=\pgfpageoptionborder,%
585     border code=\beamerswitch@Border,%
586     resized width=.5\pgfphysicalwidth,%
587     resized height=.333\pgfphysicalheight,%
588     center=\pgfpoint{.75\pgfphysicalwidth}{.167\pgfphysicalheight}%
589 }%
590 \fi
591 }

```

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

```

592 \pgfpagesdeclarelayout{2 by 4}
593 {
594     \edef\pgfpageoptionheight{\the\paperwidth} % landscaped by default
595     \edef\pgfpageoptionwidth{\the\paperheight}
596     \def\pgfpageoptionborder{0pt}
597     \def\pgfpageoptionfirstshipout{1}
598 }

```

```

599 {
600   \pgfpagesphysicalpageoptions
601   {%
602     logical pages=8,%
603     physical height=\pgfpageoptionheight,%
604     physical width=\pgfpageoptionwidth,%
605     current logical shipout=\pgfpageoptionfirstshipout%
606   }
607   \ifdim\paperheight>\paperwidth\relax
608   % put side-by-side
609   \pgfpageslogicalpageoptions{1}
610   {%
611     border shrink=\pgfpageoptionborder,%
612     border code=\beamerswitch@Border,%
613     resized width=.25\pgfphysicalwidth,%
614     resized height=.5\pgfphysicalheight,%
615     center=\pgfpoint{.125\pgfphysicalwidth}{.75\pgfphysicalheight}%
616   }%
617   \pgfpageslogicalpageoptions{2}
618   {%
619     border shrink=\pgfpageoptionborder,%
620     border code=\beamerswitch@Border,%
621     resized width=.25\pgfphysicalwidth,%
622     resized height=.5\pgfphysicalheight,%
623     center=\pgfpoint{.375\pgfphysicalwidth}{.75\pgfphysicalheight}%
624   }%
625   \pgfpageslogicalpageoptions{3}
626   {%
627     border shrink=\pgfpageoptionborder,%
628     border code=\beamerswitch@Border,%
629     resized width=.25\pgfphysicalwidth,%
630     resized height=.5\pgfphysicalheight,%
631     center=\pgfpoint{.625\pgfphysicalwidth}{.75\pgfphysicalheight}%
632   }%
633   \pgfpageslogicalpageoptions{4}
634   {%
635     border shrink=\pgfpageoptionborder,%
636     border code=\beamerswitch@Border,%
637     resized width=.25\pgfphysicalwidth,%
638     resized height=.5\pgfphysicalheight,%
639     center=\pgfpoint{.875\pgfphysicalwidth}{.75\pgfphysicalheight}%
640   }%
641   \pgfpageslogicalpageoptions{5}
642   {%
643     border shrink=\pgfpageoptionborder,%
644     border code=\beamerswitch@Border,%
645     resized width=.25\pgfphysicalwidth,%
646     resized height=.5\pgfphysicalheight,%
647     center=\pgfpoint{.125\pgfphysicalwidth}{.25\pgfphysicalheight}%
648   }%
649   \pgfpageslogicalpageoptions{6}
650   {%
651     border shrink=\pgfpageoptionborder,%
652     border code=\beamerswitch@Border,%
653     resized width=.25\pgfphysicalwidth,%
654     resized height=.5\pgfphysicalheight,%

```

```

655     center=\pgfpoint{.375\pgfphysicalwidth}{.25\pgfphysicalheight}%
656 }%
657 \pgfpageslogicalpageoptions{7}
658 {%
659     border shrink=\pgfpageoptionborder,%
660     border code=\beamerswitch@Border,%
661     resized width=.25\pgfphysicalwidth,%
662     resized height=.5\pgfphysicalheight,%
663     center=\pgfpoint{.625\pgfphysicalwidth}{.25\pgfphysicalheight}%
664 }%
665 \pgfpageslogicalpageoptions{8}
666 {%
667     border shrink=\pgfpageoptionborder,%
668     border code=\beamerswitch@Border,%
669     resized width=.25\pgfphysicalwidth,%
670     resized height=.5\pgfphysicalheight,%
671     center=\pgfpoint{.875\pgfphysicalwidth}{.25\pgfphysicalheight}%
672 }%
673 \else
674 % stack on top of one another
675 \pgfpageslogicalpageoptions{1}
676 {%
677     border shrink=\pgfpageoptionborder,%
678     border code=\beamerswitch@Border,%
679     resized width=.5\pgfphysicalwidth,%
680     resized height=.25\pgfphysicalheight,%
681     center=\pgfpoint{.25\pgfphysicalwidth}{.875\pgfphysicalheight}%
682 }%
683 \pgfpageslogicalpageoptions{2}
684 {%
685     border shrink=\pgfpageoptionborder,%
686     border code=\beamerswitch@Border,%
687     resized width=.5\pgfphysicalwidth,%
688     resized height=.25\pgfphysicalheight,%
689     center=\pgfpoint{.75\pgfphysicalwidth}{.875\pgfphysicalheight}%
690 }%
691 \pgfpageslogicalpageoptions{3}
692 {%
693     border shrink=\pgfpageoptionborder,%
694     border code=\beamerswitch@Border,%
695     resized width=.5\pgfphysicalwidth,%
696     resized height=.25\pgfphysicalheight,%
697     center=\pgfpoint{.25\pgfphysicalwidth}{.625\pgfphysicalheight}%
698 }%
699 \pgfpageslogicalpageoptions{4}
700 {%
701     border shrink=\pgfpageoptionborder,%
702     border code=\beamerswitch@Border,%
703     resized width=.5\pgfphysicalwidth,%
704     resized height=.25\pgfphysicalheight,%
705     center=\pgfpoint{.75\pgfphysicalwidth}{.625\pgfphysicalheight}%
706 }%
707 \pgfpageslogicalpageoptions{5}
708 {%
709     border shrink=\pgfpageoptionborder,%
710     border code=\beamerswitch@Border,%

```

```

711     resized width=.5\pgfphysicalwidth,%
712     resized height=.25 \pgfphysicalheight,%
713     center=\pgfpoint{.25\pgfphysicalwidth}{.375\pgfphysicalheight}%
714 }%
715 \pgfpageslogicalpageoptions{6}
716 {%
717     border shrink=\pgfpageoptionborder,%
718     border code=\beamerswitch@Border,%
719     resized width=.5\pgfphysicalwidth,%
720     resized height=.25 \pgfphysicalheight,%
721     center=\pgfpoint{.75\pgfphysicalwidth}{.375\pgfphysicalheight}%
722 }%
723 \pgfpageslogicalpageoptions{7}
724 {%
725     border shrink=\pgfpageoptionborder,%
726     border code=\beamerswitch@Border,%
727     resized width=.5\pgfphysicalwidth,%
728     resized height=.25 \pgfphysicalheight,%
729     center=\pgfpoint{.25\pgfphysicalwidth}{.125\pgfphysicalheight}%
730 }%
731 \pgfpageslogicalpageoptions{8}
732 {%
733     border shrink=\pgfpageoptionborder,%
734     border code=\beamerswitch@Border,%
735     resized width=.5\pgfphysicalwidth,%
736     resized height=.25 \pgfphysicalheight,%
737     center=\pgfpoint{.75\pgfphysicalwidth}{.125\pgfphysicalheight}%
738 }%
739 \fi
740 }
741 }

```

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.

```

742 \define@key[HL]{beamerswitch}{paper}{%
743 \def\beamerswitch@handoutpaper{#1}%
744 }

```

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

```

745 \newcounter{beamerswitch@nupcase}
746 \define@choicekey+{HL}[beamerswitch]{nup}{\val{nr}}{2, 3, 3plus, 4, 4plus, 6, 8}{%
747 \setcounter{beamerswitch@nupcase}{\nr}
748 }{%
749 \ClassWarning{beamerswitch}{Value of `nup' not recognized.
750 Allowed values are 2, 3, 3plus, 4, 4plus, 6, and 8.}%
751 }

```

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.

```

752 \define@key[HL]{beamerswitch}{border}[0.4pt]{%
753   \RequirePackage{pgf}%
754   \renewcommand*{\beamerswitch@Border}{\pgfsetlinewidth{#1}\pgfstroke}%
755 }

```

The `pnos` option switches on page numbers for handout pages.

```

756 \define@boolkey[HL]{beamerswitch}{pnos}[true]{}

```

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

```

757 \newcommand*{\handoutlayout}[1]{%
758   \only<handout>{%
759     \setkeys[HL]{beamerswitch}{#1}%
760     \ifcase\value{beamerswitch@nupcase}\relax
761     \def\beamerswitch@nup{2}
762     \pgfpagesuselayout{1 by 2}[\beamerswitch@handoutpaper,border shrink=5mm]%
763   \or
764     \def\beamerswitch@nup{3}
765     \pgfpagesuselayout{1 by 3}[\beamerswitch@handoutpaper,border shrink=5mm]%
766   \or
767     \def\beamerswitch@nup{3}
768     \pgfpagesuselayout{1 by 3 narrow}[\beamerswitch@handoutpaper,border
769       ↪ shrink=5mm]%
770   \or
771     \def\beamerswitch@nup{4}
772     \pgfpagesuselayout{2 by 2}[\beamerswitch@handoutpaper,landscape,border
773       ↪ shrink=5mm]%
774   \or
775     \def\beamerswitch@nup{4}
776     \pgfpagesuselayout{1 by 4 narrow}[\beamerswitch@handoutpaper,border
777       ↪ shrink=5mm]%
778   \or
779     \def\beamerswitch@nup{6}
780     \pgfpagesuselayout{2 by 3}[\beamerswitch@handoutpaper,border shrink=5mm]%
781   \fi
782   \ifbool{HL@beamerswitch@pnos}{%
783     \def\pgfsys@endpicture{%
784       \raisebox{5mm}[0pt][0pt]{%
785         \makebox[\pgfphysicalwidth]{%
786           \the\numexpr\value{page}/\beamerswitch@nup\relax
787         }%
788       }%
789     }%
790   }{}%
791 }%
792 }

```

We initialize the class with a layout of six slides on A4 paper.

```

793 \handoutlayout{paper=a4paper,nup=6}

```



## 8.7 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.

```
794 \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.

```
795 \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.

```
796 \IfFileExists{xparse.sty}{\@tempswattrue}{\@tempswafalse}
797 \if@tempswa
798   \RequirePackage{xparse}
799   \ExplSyntaxOn
800   \NewDocumentCommand{\bsw@punct@test}{m}{\l_bsw_punct_test:n {#1}}
801   \cs_new_protected:Nn \l_bsw_punct_test:n
802   {
803     \str_case:x:nnTF { \str_item:nn {#1} {-1} }
804     {
805       { , } { }
806       { ; } { }
807       { : } { }
808       { . } { }
809       { ! } { }
810       { ? } { }
811     }
812     { \global\toggletrue{titlepunct} }
813     { \global\togglefalse{titlepunct} }
814   }
815   \ExplSyntaxOff

```

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

```
816 \mode<article>{%
817   \renewcommand{\title}[2][\beamer@origtitle{#2}\bsw@punct@test{#2}]
818 }
819 \mode<presentation>{%
820   \long\def\beamer@title[#1]#2{%
821     \def\inserttitle{#2}%
822     \def\beamer@shorttitle{#1}%

```

```

823     \bsw@punct@test{#2}%
824   }
825 }
826 \else
827   \wlog{Beamerswitch: Auto-detection of title punctuation not available.}
828 \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.

```

829 \define@choicekey+{AL}{beamerswitch}{frametitles}{para, margin, none}{%
830   \def\beamerswitch@articleframetitles{#1}%
831 }{%
832   \ClassWarning{beamerswitch}{Value of `frametitles' not recognized.
833     Allowed values are para, margin, and none.}%
834 }

```

We provide a command for setting these options.

```

835 \newcommand{\articlelayout}[1]{%
836   \setkeys{AL}{beamerswitch}{#1}%

```

The following options are mode specific.

```

837 \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`.

```

838   \ifcsstring{beamerswitch@articleframetitles}{margin}{%
839     \setbeamertemplate{frametitle}{%
840       \marginpar[%
841         \raggedleft\noindent\emshape\textbf{\insertframetitle}\par
842         \noindent\insertframesubtitle\par
843       ]{%
844         \raggedright\noindent\emshape\textbf{\insertframetitle}\par
845         \noindent\insertframesubtitle\par
846       }%
847     }
848   }{%
849     \ifcsstring{beamerswitch@articleframetitles}{none}{%
850       \setbeamertemplate{frametitle}{}
851     }{%
852       \ifcsstring{beamerswitch@articleframetitles}{para}{%
853         \setbeamertemplate{frametitle}[default]
854       }{}%
855     }%
856   }

```

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.

```
857 \ifbool{AL@beamerswitch@maketitle}{%
858   \renewcommand{\subtitle}[2][]{%
859     \def\insertsubtitle{##2}\gappto{@title{\iftoggle{titlepunct}{:}{}} ##2}%
860   }
```

We add support for printing the institute information.

```
861 \ifundef{\beamer@originstitute}{%
862   \renewcommand{\institute}[2][]{\def\insertinstitute{##2}}%
863 }{%
864   \renewcommand{\institute}[2][]{\def\insertinstitute{##2}\beamer@originsti-
865     ↪ tute{##2}}%
866 }
```

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

```
866 \def\@maketitle{%
867   \newpage
868   \null
869   \begin{center}%
870     \let\footnote\thanks
871     {\LARGE \@title \par}%
872     \vskip 1.5em%
873     {%
874       \large\lineskip .5em%
875       \begin{tabular}[t]{c}%
876         \@author
877         \end{tabular}\par
878     }%
879 }
```

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

```
879 \ifdefvoid{\insertinstitute}{}{%
880   {%
881     \normalsize\lineskip .5em%
882     \begin{tabular}[t]{c}%
883       \insertinstitute
884     \end{tabular}\par
885   }%
886 }%
887 \vskip 1em%
888 {\large \@date}%
889 \end{center}%
890 \par\vskip 1.5em%
891 }%
892 }{}%
893 }
```

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.

```

894 \mode<presentation>{%
895 \ifbool{AL@beamerswitch@maketitle}{%
896 \ifbool{beamer@autopdfinfo}{%
897 \patchcmd{\beamer@firstminutepatches}{%
898 \inserttitle\ifx\insertsubtitle\empty\else\ - \insertsubtitle\fi
899 }{%
900 \inserttitle\ifx\insertsubtitle\empty\else\iftoggle{titlepunct}{\{:}
    ↪ \insertsubtitle\fi
901 }{}{}%
902 }{}%
903 }{}%
904 }%
905 }

```

There is no more.

```

906 \endinput

```

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