

The `gridpapers` package

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All development happens at the repo: <https://github.com/mcnees/LaTeX-Graph-Paper>.

1 Introduction

Make your own quadrille, graph, hex, etc. paper! Uses the PGF/TikZ package for L^AT_EX, which should be part of any modern T_EX installation. Lots of preset defaults to get started with ease, yet all colors and spacing are customizable.

There are example .tex files in the `examples` directory to help get you started with customization. Each tex file has an almost-empty body, with a `\usepackage` statement that you can customize. For example, `engineer-pad.tex` looks like this:

```
engineer-pad.tex
1 \documentclass{article}
2
3 \usepackage[pattern=majmin, colorset=engineer]{gridpapers}
4
5 \begin{document}
6 \thispagestyle{empty}
7 ~
8 \end{document}
```

(The ~ in the body forces a non-empty body, or else latex wouldn't generate a PDF).

2 Usage

2.1 Options

Your graph paper is configured through a number of key/value options to the `\usepackage` command. Let's go through these options.

`pattern={\langle name \rangle}`
Default: `std`

Which of the predefined patterns to use for the page or textarea background. The current list of pattern names is: `std`, `stdeight`, `majmin`, `dot`, `hex`, `tri`, `iso`, `lightcone`, `ruled`, `doubleruled`. We describe each of these patterns in Sec. 2.2. Patterns come with default

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page geometry (size and margins; see `geometry`), and default ‘fullness’ (whether they fill the page or not; see options `fullpage` and `textarea`).

<code>colorset={\name}</code> Default: <code>std</code>	Color presets. Valid color preset names are: <code>std</code> , <code>precocious</code> , <code>brickred</code> , <code>engineer</code> , <code>plumpad</code> . A preset determines the <code>majorcolor</code> , <code>minorcolor</code> , and <code>bgcolor</code> all at once. But, you can start from a preset and then override some colors.
<code>majorcolor={\color}</code>	Override the preset “major” color. This can be a named color, or using the syntax from <code>xcolor</code> to mix colors together.
<code>minorcolor={\color}</code>	Override the preset “minor” color. As above.
<code>bgcolor={\color}</code>	Override the preset background color. As above.
<code>patternsize={\length}</code>	Override the preset pattern size. The meaning of this length argument is different for each pattern; see Sec. 2.2 for more.
<code>dotsize={\length}</code> Default: <code>.7pt</code>	Controls the size of the dots themselves for <code>pattern=dot</code> .
<code>fullpage</code>	Make the pattern fill the whole page.
<code>textarea</code>	Make the pattern fill only the text area of the document. At most one of the <code>fullpage</code> or <code>textarea</code> can be specified. If one is specified, it will override the default ‘fullness’ setting of the pattern.
<code>geometry={\geometry spec}</code>	Page geometry specification, using the syntax of the <code>geometry</code> package. This specification will override the pattern’s default page geometry. However, if the <code>geometry</code> package was loaded before <code>gridpapers</code> , this option will be ignored.

2.2 Patterns

The current set of patterns:

<code>std</code>	Quadrille, ten squares per inch. The <code>patternsize</code> option controls the side of a square. Default is <code>patternsize=0.1in</code> .
<code>stdeight</code>	Quadrille, eight squares per inch. The <code>patternsize</code> option controls the side of a square. Default is <code>patternsize=0.125in</code> .
<code>majmin</code>	Graph paper, eight squares per inch with a major grid every half-inch. The <code>patternsize</code> option controls the side of a small square (the larger squares are four times bigger). Default is <code>patternsize=0.125in</code> .
<code>dot</code>	Grid of dots. The size of an individual dot is set by <code>dotsize</code> . The <code>patternsize</code> option controls the distance between dots. Default is <code>patternsize=0.1in</code> .
<code>hex</code>	Grid of hexagons. The <code>patternsize</code> option controls the side length of a hexagon. Default is <code>patternsize=0.1666in</code> .
<code>tri</code>	Triangle grid. The <code>patternsize</code> option controls the side length of a triangle. Default is <code>patternsize=0.25in</code> .
<code>iso</code>	Isometric grid. The <code>patternsize</code> option controls the side length of a triangle. Default is <code>patternsize=0.25in</code> .
<code>lightcone</code>	A grid with light cones (45° lines) on a square grid. The <code>patternsize</code> option controls the side of a horizontal square (not the tipped squared). Default is <code>patternsize=0.25in</code> .

ruled	Ruled page with bold lines. The <code>patternsizes</code> option controls the vertical distance between lines. Default is <code>patternsizes=0.2in</code> .
doubleruled	Ruled page with bold lines alternating with light lines. The <code>patternsizes</code> option controls the vertical distance between neighboring lines. Default is <code>patternsizes=0.125in</code> .

3 Examples

3.1 Plenty of customization

Let's say you want to use the `tri` pattern, which by default fills the page. But you want it to fill just the text area of an A4 page with 2cm margins, and you want the triangles to be .75cm long. Finally, you like the colors of the engineer set, but want a white background. Then you would write:

```
\usepackage[pattern=tri,
  patternsizes=0.75cm,
  textarea,
  colorsset=engineer,
  bgcolor=white,
  geometry={a4paper, margin=2cm}]{gridpapers}
```

3.2 Custom colors

Using named or blended custom colors is demonstrated in the example file `custom-colors.tex`:

```

1  \documentclass{article}
2
3  \usepackage{xcolor}
4
5  % See the documentation of the xcolor package to learn about different
6  % color models for specifying colors
7  \definecolor{mydeepgreen}{rgb}{0.07, 0.56, 0.04}
8
9  % You can easily mix colors by using the ! syntax from xcolor. Here
10 % we use it to mix 40% of our color with 60% white.
11 \usepackage[pattern=majmin,
12   majorcolor=mydeepgreen,
13   minorcolor={mydeepgreen!40}]{gridpapers}
14
15 \begin{document}
16 \thispagestyle{empty}
17 ~
18 \end{document}
```

4 Implementation

1 \NeedsTeXFormat{LaTeX2e}[1994/06/01]

```

2 \ProvidesPackage{gridpapers}
3   [2021/03/14 v1.0.0 Graph paper backgrounds]
4
5 \RequirePackage{xkeyval}
6 \RequirePackage{kvoptions}
7 \RequirePackage{xcolor}
8 \RequirePackage{tikz}
9 \usetikzlibrary{patterns.meta,calc}
10 \RequirePackage{tikzpagenodes}
11 %% everypage has been superseded -- try to use the new builtin
12 %% approach, but fall back to everypage-1x if needed
13 %% This code is roughly taken from the new everypage code
14 \@ifundefined{AddToHook}{%
15   \RequirePackage{everypage-1x}
16 }{%
17   \newcommand*{\AddEverypageHook}[1]{%
18     \AddToHook{shipout/background}{\put(1in,-1in){#1}}}
19 }
20 \RequirePackage{pagecolor}
21
22 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
23 %% Option parsing
24 %% Declare switches for processing the options.
25
26 \newif\ifGP@geometrypreviouslyloaded
27 \newif\ifGP@fullnessset
28 \newif\ifGP@fullpage
29 \newif\ifGP@textarea
30 \GP@geometrypreviouslyloadedfalse
31 \GP@fullnesssetfalse
32 \GP@fullpagefalse
33 \GP@textareafalse
34
35 \SetupKeyvalOptions{%
36   family=GP,%
37   prefix=GPOpt@%
38 }
39
40 \DeclareStringOption[std]{pattern}
41 \DeclareStringOption[std]{colorset}
42
43 \DeclareStringOption{majorcolor}
44 \DeclareStringOption{minorcolor}
45 \DeclareStringOption{bgcolor}
46
47 \DeclareStringOption{patternsizesize}
48 \DeclareStringOption[.7pt]{dotsizesize}
49
50 \DeclareVoidOption{fullpage}{\GP@fullpagetrue}
51 \DeclareVoidOption{textarea}{\GP@textareatrue}
52
53 \DeclareStringOption{geometry}
54
55 \ProcessKeyvalOptions*
56
57 %% Can only have one of fullpage or textarea
58 \ifGP@fullpage
59   \ifGP@textarea
60     \PackageError{gridpapers}{%

```

```

61      Can not specify both fullpage and textarea, please remove one option}{-}
62      \fi
63      \GP@fullnesssettrue
64 \fi
65
66 \ifGP@textarea
67   \GP@fullnesssettrue
68 \fi
69
70 %% We keep track of this to know whether or not we would be overriding
71 %% a previously-set page geometry
72 \@ifpackageloaded{geometry}
73   {\GP@geometrypreviouslyloadedtrue}
74   {\GP@geometrypreviouslyloadedfalse}
75   \PassOptionsToPackage{\GPOpt@geometry}{geometry}%
76   \RequirePackage{geometry}%
77 }
78
79 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
80 %% Actual package code
81 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
82
83 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
84 %% Some nice colors.
85 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
86 \definecolor{plum}{rgb}{0.36078, 0.20784, 0.4}
87 \definecolor{chameleon}{rgb}{0.30588, 0.60392, 0.023529}
88 \definecolor{cornflower}{rgb}{0.12549, 0.29020, 0.52941}
89 \definecolor{scarlet}{rgb}{0.8, 0, 0}
90 \definecolor{brick}{rgb}{0.64314, 0, 0}
91 \definecolor{sunrise}{rgb}{0.80784, 0.36078, 0}
92 \definecolor{rosiebg}{RGB}{250,247,232}
93 \definecolor{rosiegrid}{RGB}{186,137,113}
94
95 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
96 %% The color to use for the null directions when drawing lightcones.
97 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
98 \colorlet{lightlines}{scarlet!30}
99
100 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
101 %% Pre-defined Color schemes
102 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
103 %% Here are some pre-defined color schemes for the paper background
104 %% and the major and minor grid lines. These are switched by using
105 %% the option colorset=<name>. The allowed values for colorset are in
106 %% the list below.
107 \define@choicekey*{GP}{colorset}[\val\nr]%
108 %% Allowed values for colorset:
109 {std,precocious,brickred,engineer,plumpad}[std]{%
110   \ifcase\nr\relax
111     %% std
112     \colorlet{minorcolor}{cornflower!30}
113     \colorlet{majorcolor}{cornflower!50}
114     \colorlet{bgcolor}{white}
115   \or
116     %% precocious
117     \colorlet{minorcolor}{rosiegrid!50}
118     \colorlet{majorcolor}{rosiegrid}
119     \colorlet{bgcolor}{rosiebg}

```

```

120 \or
121   %% brickred
122   \colorlet{minorcolor}{brick!35}
123   \colorlet{majorcolor}{brick!60}
124   \colorlet{bgcolor}{scarlet!8}
125 \or
126   %% engineer
127   \colorlet{minorcolor}{chameleon!50}
128   \colorlet{majorcolor}{chameleon!80}
129   \colorlet{bgcolor}{chameleon!10}
130 \or
131   %% plumpad
132   \colorlet{minorcolor}{cornflower!40}
133   \colorlet{majorcolor}{cornflower!70}
134   \colorlet{bgcolor}{plum!10}
135 \fi
136 }
137
138 %% Get the specified color set from the options
139 \def\@setkeyhelper#1#2{%
140   \setkeys{GP}{#2=#1}
141 }
142 \expandafter\@setkeyhelper\expandafter{\GPOpt@colorset}{colorset}
143
144 %% If the user further specified majorcolor, minorcolor, and/or
145 %% bgcolor, we now override the selected colorset
146 \ifx\GPOpt@majorcolor\@empty
147 \else
148   \colorlet{majorcolor}{\GPOpt@majorcolor}
149 \fi
150 \ifx\GPOpt@minorcolor\@empty
151 \else
152   \colorlet{minorcolor}{\GPOpt@minorcolor}
153 \fi
154 \ifx\GPOpt@bgcolor\@empty
155 \else
156   \colorlet{bgcolor}{\GPOpt@bgcolor}
157 \fi
158
159 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
160 %% The size parameter -- different meanings for different patterns
161 %% Will be reset by pattern code
162 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
163 \newcommand{\GP@patternsizel}{0.1in}
164
165 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
166 %% This section sets up a routine for filling a shape with
167 %% hexagons. Uses code from:
168 %% http://tex.stackexchange.com/questions/6019/drawing-hexagons/6128#6128
169 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
170
171 %% We have to delay this definition until after \GP@patternsizel is
172 %% redefined (by the pattern selection and/or user override)
173 \newcommand{\GP@declarehexpat}{
174   \pgfdeclarepatternformonly
175     {hexagons}%% name
176     {\pgfpointorigin}%% lower left
177     {\pgfpoint{3*\GP@patternsizel}{0.866025*2*\GP@patternsizel}}
178     {\pgfpoint{3*\GP@patternsizel}{0.866025*2*\GP@patternsizel}}

```

```

179 {
180   \pgfsetlinewidth{0.6pt}
181   \pgftransformshift{\pgfpoint{0mm}{0.866025*\GP@patternsiz}}
182   \pgfpathmoveto{\pgfpoint{0mm}{0mm}}
183   \pgfpathlineto{\pgfpoint{0.5*\GP@patternsiz}{0mm}}
184   \pgfpathlineto{\pgfpoint{\GP@patternsiz}{-0.866025*\GP@patternsiz}}
185   \pgfpathlineto{\pgfpoint{2*\GP@patternsiz}{-0.866025*\GP@patternsiz}}
186   \pgfpathlineto{\pgfpoint{2.5*\GP@patternsiz}{0mm}}
187   \pgfpathlineto{\pgfpoint{3*\GP@patternsiz}{0mm}}
188   \pgfpathmoveto{\pgfpoint{0.5*\GP@patternsiz}{0mm}}
189   \pgfpathlineto{\pgfpoint{\GP@patternsiz}{0.866025*\GP@patternsiz}}
190   \pgfpathlineto{\pgfpoint{2*\GP@patternsiz}{0.866025*\GP@patternsiz}}
191   \pgfpathlineto{\pgfpoint{2.5*\GP@patternsiz}{0mm}}
192   \pgfusepath{stroke}
193 }
194 }
195
196 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
197 %% This section sets up a routine for filling a shape with
198 %% triangles.
199 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
200
201 %% We have to delay this definition until after \GP@patternsiz is
202 %% redefined (by the pattern selection and/or user override)
203 \newcommand{\GP@declaretripat}{
204 \pgfdeclarepatternformonly
205   %% Name of the pattern
206   {triangles}
207   %% Set the lower left corner of the pattern
208   {\pgfpointorigin}
209   %% Set the upper right corner of the pattern
210   {\pgfpoint{\GP@patternsiz}{2*0.8660254*\GP@patternsiz}}
211   %% Declare the size of the pattern blocks
212   {\pgfpoint{\GP@patternsiz}{2*0.8660254*\GP@patternsiz}}
213   %% Draw the pattern
214   {
215     \pgfsetlinewidth{0.6pt}
216     \pgfpathmoveto{\pgfpoint{0mm}{0mm}}
217     \pgfpathlineto{\pgfpoint{\GP@patternsiz}{2*0.8660254*\GP@patternsiz}}
218     \pgfpathlineto{\pgfpoint{0mm}{2*0.8660254*\GP@patternsiz}}
219     \pgfpathmoveto{\pgfpoint{0mm}{0.8660254*\GP@patternsiz}}
220     \pgfpathlineto{\pgfpoint{\GP@patternsiz}{0.8660254*\GP@patternsiz}}
221     \pgfpathmoveto{\pgfpoint{0mm}{2*0.8660254*\GP@patternsiz}}
222     \pgfpathlineto{\pgfpoint{\GP@patternsiz}{0mm}}
223     \pgfpathlineto{\pgfpoint{0mm}{0mm}}
224     \pgfusepath{stroke}
225   }
226 }
227 \newcommand{\GP@declareisopat}{
228 \pgfdeclarepatternformonly
229   %% Name of the pattern
230   {isometric}
231   %% Set the lower left corner of the pattern
232   {\pgfpointorigin}
233   %% Set the upper right corner of the pattern
234   {\pgfpoint{2*0.8660254*\GP@patternsiz}{\GP@patternsiz}}
235   %% Declare the size of the pattern blocks
236   {\pgfpoint{2*0.8660254*\GP@patternsiz}{\GP@patternsiz}}
237   %% Draw the pattern

```

```

238 {
239   \pgfsetlinewidth{0.6pt}
240   \pgfpathmoveto{\pgfpoint{0mm}{0mm}}
241   \pgfpathlineto{\pgfpoint{2*0.8660254*\GP@patternsize}{\GP@patternsize}}
242   \pgfpathlineto{\pgfpoint{2*0.8660254*\GP@patternsize}{0mm}}
243   \pgfpathlineto{\pgfpoint{0mm}{\GP@patternsize}}
244   \pgfpathlineto{\pgfpoint{0mm}{0mm}}
245   \pgfpathmoveto{\pgfpoint{0.8660254*\GP@patternsize}{0mm}}
246   \pgfpathlineto{\pgfpoint{0.8660254*\GP@patternsize}{\GP@patternsize}}
247   \pgfusepath{stroke}
248 }
249 }
250
251 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
252 %% This section sets up a routine for filling the squares in a
253 %% grid with null lines.
254 %% %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
255 %% TODO Still can't figure out the correct pattern shift!!
256 \newcommand{\GP@declarelightconepat}{
257 \pgfkeys{
258   /pgf/pattern keys/myshift/.store in=\myshift,
259   /pgf/pattern keys/myshift/.initial={(0,0)},
260 }
261 \tikzdeclarepattern{
262   name=lightcones,
263   type=uncolored,
264   parameters={\myshift},
265   bounding box={{(0,0) and (\GP@patternsize,\GP@patternsize)},
266   tile size={{(\GP@patternsize, \GP@patternsize)},
267   tile transformation={
268     shift=\myshift,
269   },
270   defaults={
271     myshift/.store in=\myshift,myshift={{(0,0)},
272   },
273   code={
274     %% TODO Make the dashing an option
275     \tikzset{lightlines/.style={line width=0.4pt,dash=on 0.05cm off 0.05cm phase 0.025cm}}
276     \draw [lightlines] (0,0) -- (\GP@patternsize,\GP@patternsize);
277     \draw [lightlines] (0,\GP@patternsize) -- (\GP@patternsize,0);
278   },
279 }
280 }
281 %% \pgfdeclarepatternformonly
282 %% {lightcones}% name
283 %% {\pgfpointorigin}% lower left
284 %% {\pgfpoint{\GP@patternsize}{\GP@patternsize}}% upper right
285 %% {\pgfpoint{\GP@patternsize}{\GP@patternsize}}% tile size
286 %% {% shape description
287 %%   \pgfsetlinewidth{0.4pt}
288 %%   %% TODO Make an option
289 %%   %Comment out this line for solid lines on light cones, instead of dashes.
290 %%   \pgfsetdash{{0.05cm}{0.05cm}}{0.025cm}
291 %%   \pgfpathmoveto{\pgfpoint{0in}{0in}}
292 %%   \pgfpathlineto{\pgfpoint{\GP@patternsize}{\GP@patternsize}}
293 %%   \pgfpathmoveto{\pgfpoint{0in}{\GP@patternsize}}
294 %%   \pgfpathlineto{\pgfpoint{\GP@patternsize}{0in}}
295 %%   \pgfusepath{stroke}
296 %% }

```



```

297
298 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
299 %% This section sets up a routine for filling a region with dots
300 %% Slightly modified version of code added by Leo
301 %% Stein (@duetosymmetry on Twitter).
302 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
303 %% We have to delay this definition until after \GP@patternsiz is
304 %% redefined (by the pattern selection and/or user override)
305 \newcommand{\GP@declaredotpat}{
306 \pgfdeclarepatternformonly
307   {\dotgrid}%% name
308   {\pgfpoint{-0.5*\GP@patternsiz}{-0.5*\GP@patternsiz}}%% lower left
309   {\pgfpoint{0.5*\GP@patternsiz}{0.5*\GP@patternsiz}}%% upper right
310   {\pgfpoint{\GP@patternsiz}{\GP@patternsiz}}%% tile size
311   {%% shape description
312     \pgfpathcircle{\pgfqpoint{0pt}{0pt}}{\GP@dotsiz}
313     \pgfusepath{fill}
314   }
315 }
316
317 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
318 %% Begin pattern execution infrastructure
319 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
320
321 %% This inner code will be set by the choicekey pattern=...
322 \newcommand{\GP@innerpatterncode}{
323 %% This is the "outer" code to hook into every page
324 \newcommand{\GP@patterncode}{% No blank lines in this code!
325 \begin{tikzpicture}[remember picture, overlay]
326 %%
327 %% Change "thin" to "very thin" if the lines are too thick.
328 \tikzset{
329   minorgrid/.style={minorcolor, thin},
330   majorgrid/.style={majorcolor, thin},
331 }
332 \ifGP@fullpage%
333 \coordinate (a) at (current page.south west);
334 \coordinate (b) at (current page.north east);
335 \else%
336 \coordinate (a) at (current page text area.south west);
337 \coordinate (b) at (current page text area.north east);
338 \fi
339 %%
340 \GP@innerpatterncode%
341 %%
342 \end{tikzpicture}
343 }
344
345 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
346 %% Begin pattern definition code
347 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
348
349 \define@boolkey{GP}{patterndefaultfullness}{}
350 \newcommand{\GP@patterndefaultgeometry}{}
351 \newcommand{\GP@patterndefaultsize}{}
352
353 %% Pattern-definer-helper
354 %% The interface is:
355 %% \GP@setpattern

```

```

356 %%      {<true for default fullpage, false for default textarea>}
357 %%      {<default geometry config>}
358 %%      {<default pattern size>} %% NOTE, not tile length
359 %%      {<contents of inner pattern code>}
360 \newcommand{\GP@setpattern}[4]{%
361 \setkeys{GP}{patterndefaultfullness=#1}
362 \renewcommand{\GP@patterndefaultgeometry}{#2}
363 \renewcommand{\GP@patterndefaultsize}{#3}
364 \renewcommand{\GP@innerpatterncode}{#4}
365 }
366
367 \define@choicekey*{GP}{pattern}[\val\nr]%
368 %% Allowed values for pattern:
369 {std,stdeight,majmin,dot,hex,tri,iso,lightcone,ruled,doubleruled}{%
370 \ifcase\nr\relax
371 %% std
372 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
373 %% Quadrille, ten squares per inch.
374 %% %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
375 \GP@setpattern{false}{letterpaper, margin=0.2in}{0.1in}{%
376 %% Draw a grid with 10 squares per inch.
377 \draw[style=minorgrid, shift={(a)}] (0,0) grid [step=\GP@patternsiz] (b);
378 %%
379 %% Draw a frame around the grid.
380 \draw[style=majorgrid] (a) rectangle (b);
381 }
382 \or
383 %% stdeight
384 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
385 %% Quadrille, eight squares per inch.
386 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
387 \GP@setpattern{false}{letterpaper, margin=0.1875in}{0.125in}{%
388 %% Draw a grid with 10 squares per inch.
389 \draw[style=minorgrid, shift={(a)}] (0,0) grid [step=\GP@patternsiz] (b);
390 %%
391 %% Draw a frame around the grid.
392 \draw[style=majorgrid] (a) rectangle (b);
393 }
394 \or
395 %% majmin
396 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
397 %% Graph paper, eight squares per inch with a major grid
398 %% every half-inch.
399 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
400 \GP@setpattern{false}{letterpaper, margin=0.25in}{0.125in}{%
401 %% Draw a grid with 10 squares per inch.
402 \draw[style=minorgrid, shift={(a)}] (0,0) grid [step=\GP@patternsiz] (b);
403 %%
404 \draw[style=majorgrid, shift={(a)}] (0,0) grid [step=4*\GP@patternsiz] (b);
405 %%
406 %% Draw a frame around the grid.
407 \draw[style=majorgrid] (a) rectangle (b);
408 }
409 \or
410 %% dot
411 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
412 %% Dot grid
413 %% Slightly modified version of code added by Leo
414 %% Stein (@duetosymmetry).

```

```

415 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
416 \GP@setpattern{true}{0.1in}{%
417 \fill [pattern=dotgrid,pattern color=minorcolor] (a) rectangle (b);
418 }
419 \or
420 %% hex
421 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
422 %% Hex grid
423 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
424 \GP@setpattern{true}{0.1666in}{%
425 \fill [pattern=hexagons,pattern color=minorcolor] (a) rectangle (b);
426 }
427 \or
428 %% tri
429 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
430 %% Triangle grid, adjust triangle size in the preamble
431 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
432 \GP@setpattern{true}{0.25in}{%
433 \fill [pattern=triangles,pattern color=minorcolor] (a) rectangle (b);
434 }
435 \or
436 %% iso
437 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
438 %% Isometric grid
439 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
440 \GP@setpattern{true}{0.25in}{%
441 \fill [pattern=isometric, pattern color=minorcolor] (a) rectangle (b);
442 }
443 \or
444 %% lightcone
445 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
446 %% A grid with light cones.
447 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
448 \GP@setpattern{false}{letterpaper, margin=.125in}{0.25in}{%
449 %% Draw a grid with 4 squares per inch.
450 \draw[style=minorgrid, shift={(a)}] (0,0) coordinate grid [step=\GP@patternsiz] (b);
451 %%
452 %% Draw a border around the grid.
453 \draw[style=majorgrid, pattern={lightcones[myshift={(a)}]}, pattern color=lightlines] (a) rectangle (b);
454 }
455 \or
456 %% ruled
457 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
458 %% Ruled page with bold lines every 0.2in or 0.25in
459 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
460 \GP@setpattern{false}{letterpaper, body={8in,10.8in}}{0.2in}{%
461 %% Draw a ruled page with lines every 0.2in
462 \draw[style=majorgrid, shift={(a)}] (0,0) grid [ystep=\GP@patternsiz, xstep=\paperwidth] (b);
463 %% Draw a frame around the grid.
464 \draw[style=majorgrid] (a) rectangle (b);
465 }
466 \or
467 %% doubleruled
468 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
469 %% Ruled page with bold lines every 0.25in and light lines
470 %% every 0.125 in.
471 %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
472 \GP@setpattern{false}{letterpaper, margin=.25in}{0.125in}{%
473 %% Draw a ruled pattern with thin lines every 0.125 in and bold lines every 0.25 in.

```

```

474 \draw[style=minorgrid, shift={(a)}] (0,0) grid [ystep=\GP@patternsizel, xstep=\paperwidth] (b);
475 %%
476 \draw[style=majorgrid, shift={(a)}] (0,0) grid [ystep=2*\GP@patternsizel, xstep=\paperwidth] (b);
477 %%
478 %% Draw a frame around the grid.
479 \draw[style=majorgrid] (a) rectangle (b);
480 }
481 \fi
482 }
483
484 %% Use the passed package option to set the above key
485 \expandafter\@setkeyhelper\expandafter{\GPOpt@pattern}{pattern}
486
487 %% Determine whether or not to (re)set fullpage vs textarea
488 \ifGP@fullnessset
489 %% Respect their choice
490 \else
491 %% Reset the value of \GP@fullpage based on the pattern's default
492 %% There's probably a more idiomatic way to do this but I can't
493 %% figure it out
494 \ifKV@GP@patterndefaultfullness
495 \GP@fullpagetrue
496 \else
497 \GP@fullpagefalse
498 \fi
499 \fi
500
501 %% Determine whether or not to fiddle with the page geometry
502 \ifGP@geometrypreviouslyloaded
503 %% Respect their previous choice
504 \PackageWarning{gridpapers}'geometry' package was previously loaded, will not use pattern default
505 \else
506 %% Use the pattern's defaults,
507 \expandafter\geometry\expandafter{\GP@patterndefaultgeometry}
508 %% And then override with any more specific settings passed by the user
509 \expandafter\geometry\expandafter{\GPOpt@geometry}
510 \fi
511
512 %% Determine the correct pattern length
513 \ifx\GPOpt@patternsizel\empty
514 % Use the pattern's preferred length
515 \renewcommand{\GP@patternsizel}{\GP@patterndefaultsize}
516 \else
517 % Override with the user's choice
518 \renewcommand{\GP@patternsizel}{\GPOpt@patternsizel}
519 \fi
520
521 %% Now that everything has been set up, we can finally define the
522 %% patterns with the correct lengths.
523 \GP@declarehexpat
524 \GP@declaretripat
525 \GP@declareisopat
526 \GP@declarelightconepat
527 \GP@declaredotpat
528
529 %% Set the background color.
530 \AtBeginDocument{\pagecolor{bgcolor}}
531 %% Actually hook it in!
532 \AddEverypageHook{%

```

```
533 \GP@patterncode%  
534 }  
535  
536 \endinput
```

Change History

v1.0.0
General: Converted to DTX file 1