

The `scaletextbullet` package

Resize the `\textbullet` without changing its vertical center

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1 Loading the package

```
\NeedsTeXFormat{LaTeX2e}[2023-11-01]
\ProvidesExplPackage{scaletextbullet}{2025-11-05}{2.0.4}
  {Resize the \noexpand\textbullet without changing its vertical center.}

\msg_new:nnn { scaletextbullet } { l3kernel }
{
  The~ scaletextbullet~ package~ could~ not~ load. \\
  This~ package~ requires~
  L3~ programming~ layer~ version~ 2023-11-01~ or~ later.
}
\IfExplAtLeastTF { 2023-11-01 } { }
  { \msg_critical:nn { scaletextbullet } { l3kernel } }
```

2 Some variables

```
\fp_new:N \l__scaletextbullet_factor_fp
\fp_set:Nn \l__scaletextbullet_factor_fp { 0.4 }
\int_new:N \l__scaletextbullet_count_int
\fp_new:N \l__scaletextbullet_scale_fp
\box_new:N \l__scaletextbullet_textbullet_box

% Used only to speed up floating point computations.
\fp_const:Nn \c__scaletextbullet_count_two_fp { 0.7071 0678 1186 5475 }
\fp_const:Nn \c__scaletextbullet_count_three_fp { 0.5773 5026 9189 6258 }
\fp_const:Nn \c__scaletextbullet_count_four_fp { 0.5 }
```

3 Some functions

```
% Lowers the \textbullet to the baseline, scales it by a factor of #2, and
% then raises it back to the vertical center.
% I have referenced code by the user egreg:
% https://tex.stackexchange.com/questions/620507
% the bottom and center of \textbullet
\dim_new:N \l__scaletextbullet_bottom_dim
\dim_new:N \l__scaletextbullet_center_dim
\cs_new_protected:Npn \__scaletextbullet_box_scale:Nn #1#2
```

```

{
  \mode_leave_vertical:
  \hbox_set:Nn #1 { \textbullet }
  \dim_set:Nn \l__scaletextbullet_bottom_dim
  {
    \box_ht:N #1 -
    \fp_to_dim:n
    { \l__scaletextbullet_factor_fp * \dim_to_fp:n { \box_wd:N #1 } }
  }
  \dim_set:Nn \l__scaletextbullet_center_dim
  { ( \box_ht:N #1 + \l__scaletextbullet_bottom_dim ) / 2 }
  \hbox_set:Nn #1
  {
    \box_move_down:nn { \l__scaletextbullet_bottom_dim } { \box_use:N #1 }
  }
  \box_scale:Nnn #1 {#2} {#2}
  \hbox_set:Nn #1
  {
    \box_move_up:nn { \l__scaletextbullet_center_dim - \box_ht:N #1 / 2 }
    { \box_use:N #1 }
  }
}

\cs_new:Npn \__scaletextbullet_box_if_zero:NTF #1
{
  \bool_lazy_or:nnTF
  { \dim_compare_p:nNn { \box_wd:N #1 } = \c_zero_dim }
  { \dim_compare_p:nNn { \box_ht_plus_dp:N #1 } = \c_zero_dim }
}

```

4 Document commands

```

\NewDocumentCommand \settextbulletfactor { m }
{
  \mode_if_math:TF
  {
    \msg_error:nnn { scaletextbullet } { math-mode-invalid }
    { settextbulletfactor }
  }
  { \__scaletextbullet_set_factor:n {#1} }
}

\cs_new_protected:Npn \__scaletextbullet_set_factor:n #1
{
  \fp_set:Nn \l__scaletextbullet_factor_fp {#1}
  \fp_compare:nF { \c_zero_fp < \l__scaletextbullet_factor_fp <= \c_one_fp }
  { \msg_error:nn { scaletextbullet } { factor-invalid } }
}

```

```

\NewDocumentCommand \scaletextbullet { m }
{
  \mode_if_math:TF
  {
    \msg_error:nnn { scaletextbullet } { math-mode-invalid }
    { scaletextbullet }
  }
  { \__scaletextbullet_scale_textbullet:n {#1} }
}

\cs_new_protected:Npn \__scaletextbullet_scale_textbullet:n #1
{
  \fp_set:Nn \l__scaletextbullet_scale_fp {#1}
  \fp_compare:nNnTF \l__scaletextbullet_scale_fp < \c_zero_fp
  { \msg_error:nn { scaletextbullet } { scale-invalid } }
  {
    \__scaletextbullet_box_scale:Nn \l__scaletextbullet_textbullet_box
    { \l__scaletextbullet_scale_fp }
    \__scaletextbullet_box_if_zero:NnTF \l__scaletextbullet_textbullet_box
    { \msg_warning:nn { scaletextbullet } { scale-zero } }
    { \box_use:N \l__scaletextbullet_textbullet_box }
  }
}

\NewDocumentCommand \scaletextbullets { o m }
{
  \mode_if_math:TF
  {
    \msg_error:nnn { scaletextbullet } { math-mode-invalid }
    { scaletextbullets }
  }
  {
    \IfNoValueTF {#1}
    { \__scaletextbullet_scale_textbullets:n {#2} }
    { \__scaletextbullet_scale_textbullets:nn {#1} {#2} }
  }
}

\cs_new_protected:Npn \__scaletextbullet_scale_textbullets:n #1
{
  \int_set:Nn \l__scaletextbullet_count_int {#1}
  \int_compare:nNnTF \l__scaletextbullet_count_int > 0
  {
    \int_case:nnF { \l__scaletextbullet_count_int }
    {
      { 1 } { \fp_set_eq:NN \l__scaletextbullet_scale_fp \c_one_fp }
      { 2 }
    }
    {
      \fp_set_eq:NN \l__scaletextbullet_scale_fp
      \c__scaletextbullet_count_two_fp
    }
  }
}

```

```

    }
    { 3 }
    {
        \fp_set_eq:NN \l__scaletextbullet_scale_fp
        \c__scaletextbullet_count_three_fp
    }
    { 4 }
    {
        \fp_set_eq:NN \l__scaletextbullet_scale_fp
        \c__scaletextbullet_count_four_fp
    }
}
{
    \fp_set:Nn \l__scaletextbullet_scale_fp
    { \int_use:N \l__scaletextbullet_count_int ^ -0.5 }
}
\__scaletextbullet_box_scale:Nn \l__scaletextbullet_textbullet_box
{ \l__scaletextbullet_scale_fp }
\prg_replicate:nn { \l__scaletextbullet_count_int }
{ \box_use:N \l__scaletextbullet_textbullet_box }
}
{
    \int_if_zero:nTF { \l__scaletextbullet_count_int }
    { \msg_warning:nn { scaletextbullet } { count-zero } }
    { \msg_error:nn { scaletextbullet } { count-invalid } }
}
}
\cs_new_protected:Npn \__scaletextbullet_scale_textbullets:nn #1#2
{
    \fp_set:Nn \l__scaletextbullet_scale_fp {#1}
    \int_set:Nn \l__scaletextbullet_count_int {#2}
    \fp_compare:nNnTF \l__scaletextbullet_scale_fp < \c_zero_fp
    { \msg_error:nn { scaletextbullet } { scale-invalid } }
    {
        \int_compare:nNnTF \l__scaletextbullet_count_int > 0
        {
            \__scaletextbullet_box_scale:Nn \l__scaletextbullet_textbullet_box
            { \l__scaletextbullet_scale_fp }
            \__scaletextbullet_box_if_zero:NnTF
            \l__scaletextbullet_textbullet_box
            { \msg_warning:nn { scaletextbullet } { scale-zero } }
            {
                \prg_replicate:nn { \l__scaletextbullet_count_int }
                { \box_use:N \l__scaletextbullet_textbullet_box }
            }
        }
    }
    {
        \int_if_zero:nTF { \l__scaletextbullet_count_int }
        { \msg_warning:nn { scaletextbullet } { count-zero } }
    }
}

```

```

        { \msg_error:nn { scaletextbullet } { count-invalid } }
      }
    }
  }

\NewDocumentCommand \scaletextbulletdebug { }
{
  \mode_if_math:TF
  {
    \msg_error:nnn { scaletextbullet } { math-mode-invalid }
    { scaletextbulletdebug }
  }
  { \__scaletextbullet_debug: }
}

% I have referenced code by the user egreg:
% https://tex.stackexchange.com/questions/620507
\cs_new_protected:Npn \__scaletextbullet_debug:
{
  \int_step_inline:nn { 15 }
  {
    \fp_set:Nn \l__scaletextbullet_scale_fp { ##1 ^ -0.5 }
    \__scaletextbullet_box_scale:Nn \l__scaletextbullet_textbullet_box
    { \l__scaletextbullet_scale_fp }
    \box_use:N \l__scaletextbullet_textbullet_box
  }
  \,
  \group_begin:
  \setlength \fboxrule { 0.1pt }
  \setlength \fboxsep { 0pt }
  \framebox
  [
    \fp_to_dim:n
    { \l__scaletextbullet_factor_fp * \dim_to_fp:n { \width } }
  ]
  { \textbullet }
  \group_end:
}

```

5 Messages

```

\msg_new:nnn { scaletextbullet } { math-mode-invalid }
{ '\iow_char:N \ \ #1'~ invalid~ in~ math~ mode~ \msg_line_context:. }
\msg_new:nnn { scaletextbullet } { factor-invalid }
{
  Invalid~ \iow_char:N \ \ textbullet~ factor~
  '\fp_to_tl:N \l__scaletextbullet_factor_fp'~ \msg_line_context:.
}

```

```

\msg_new:nnn { scaletextbullet } { scale-invalid }
{
  Invalid~ scale~ factor~ '\fp_to_tl:N \l__scaletextbullet_scale_fp'~
  \msg_line_context:.
}
\msg_new:nnn { scaletextbullet } { count-invalid }
{
  Invalid~ number~ of~ \iow_char:N \\ textbullet~ s~
  '\int_use:N \l__scaletextbullet_count_int'~ \msg_line_context:.
}
\msg_new:nnn { scaletextbullet } { scale-zero }
{
  The~ new~ \iow_char:N \\ textbullet~ would~ have~ zero~ dimensions~
  \msg_line_context:.
}
\msg_new:nnn { scaletextbullet } { count-zero }
{ No~ \iow_char:N \\ textbullet~ s~ were~ printed~ \msg_line_context:. }

```