Plotting Two Data Sets with One Common Axis but Two Uncommon Axes

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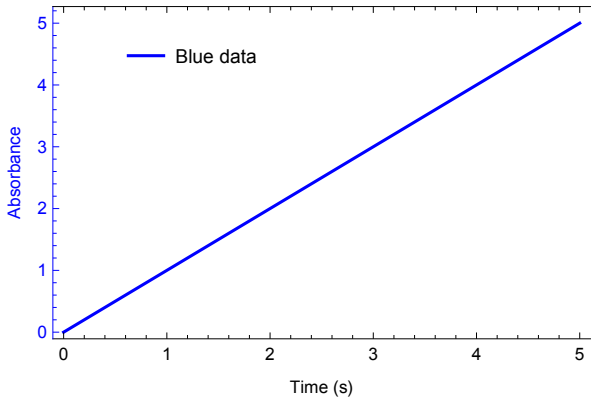
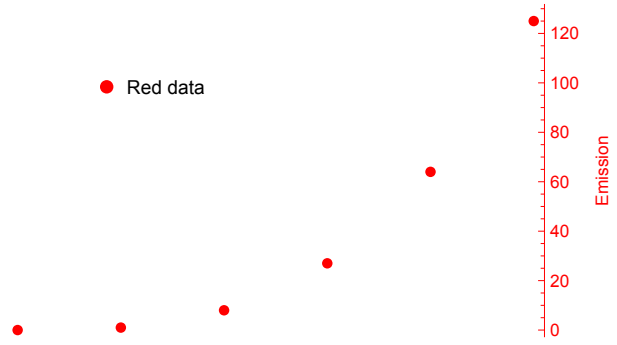
Plotting two data sets with common x-axis but two uncommon y-axes using the following syntax: ->{bottom,left, top, right} for any of the “Frame” commands.
The Overlay[ ] command is used to overlay the plots (similar to Show[ ] command).

In[317]:=
```
Clear[data1, data2, plot1, plot2]
(*Data Sets*)
data1 = {{0, 0}, {1, 1}, {2, 2}, {3, 3}, {4, 4}, {5, 5}};
data2 = {{0, 0}, {1, 1}, {2, 8}, {3, 27}, {4, 64}, {5, 125}};

(*Data plots*)
(*Showing axes: x1, x2, y1, not y2*)
plot1 = ListLinePlot[data1, PlotStyle → Blue, Frame → {True, True, True, False},
  FrameStyle → {Automatic, Blue, Automatic, Automatic},
  FrameLabel → {{"Absorbance",}, {"Time (s)",}},
  PlotLegends → Placed[LineLegend[{"Blue data"}, Background → White], {0.26, 0.85}],
  ImagePadding → 40] (*Plot data as a line with right y-axis and title;
Note that the framelabel form is FrameLabel→{{left,right},{bottom,top}}*)

(*Showing axes: not x1, not y1, not x1, y2*)
plot2 = ListPlot[data2, PlotStyle → Red, Axes → False,
  Frame → {False, False, False, True}, FrameTicks → {None, None, None, All},
  FrameStyle → {Automatic, Automatic, Automatic, Red},
  FrameLabel → {{, "Emission"}, {"Time (s)",}},
  PlotLegends → Placed[PointLegend[{"Red data"}, Background → White], {0.27, 0.75}],
  ImagePadding → 40](*Plot data as data points with left y-axis and title;
Note that the framelabel form is FrameLabel→{{left,right},{bottom,top}}*)

(*Combining plots*)
Overlay[{plot1, plot2}]
```

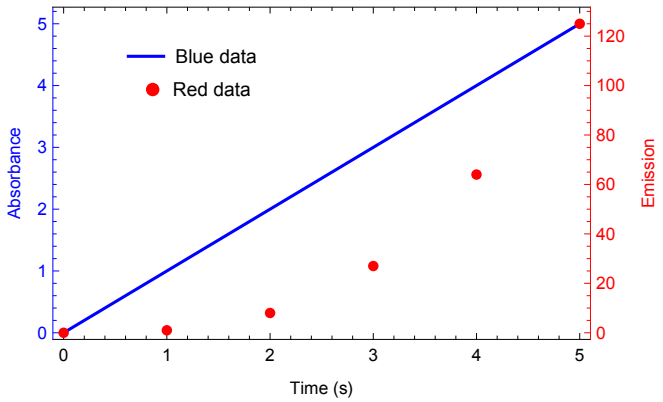
Out[320]=



Out[321]=



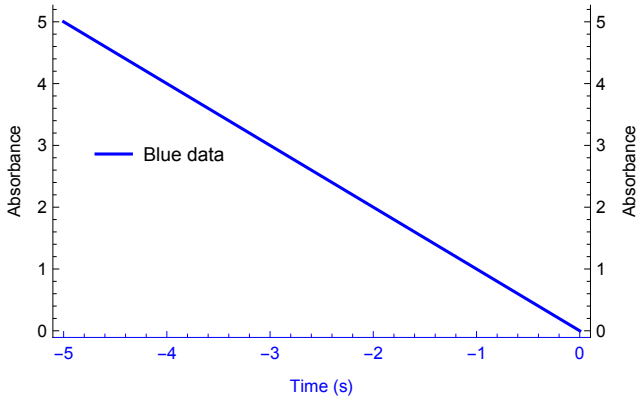
Out[322]=



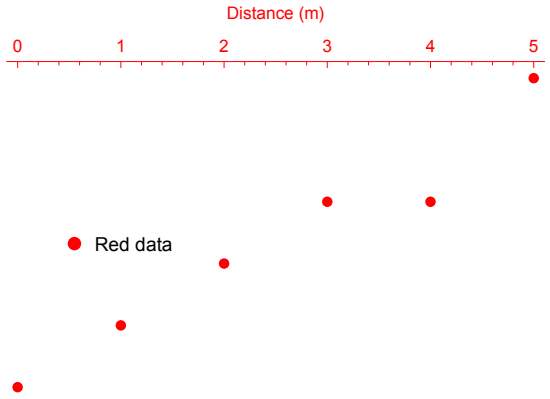
Plotting data with a common Y-axis but two uncommon X-axes using the following syntax: ->{bottom,left, top, right} for any of the “Frame” commands.
The Overlay[ ] command is used to overlay the plots (similar to Show[ ] command).

In[323]:=
```
Clear[data1, data2, plot1, plot2]
(*Data Sets*)
data1 = {{0, 0}, {-1, 1}, {-2, 2}, {-3, 3}, {-4, 4}, {-5, 5}};
data2 = {{0, 0}, {1, 1}, {2, 2}, {3, 3}, {4, 3}, {5, 5}};

(*Data plots*)
(*Showing axes: x1, y1, not x2 & y2*)
plot1 = ListLinePlot[data1, PlotStyle → Blue, Frame → {True, True, False, True},
  FrameStyle → {Blue, Automatic, Automatic, Automatic},
  FrameTicks → {All, All, None, All},
  FrameLabel → {{"Absorbance", "Absorbance"}, {"Time (s)",}},
  PlotLegends → Placed[LineLegend[{"Blue data"}, Background → White], {0.2, 0.55}],
  ImagePadding → 40] (*Plot data as a line with right y-axis and title;
Note that the framelabel form is FrameLabel→{{left,right},{bottom,top}}*)

(*Showing axes: not x1, not y1, x2 & not y2*)
plot2 = ListPlot[data2, PlotStyle → Red, Axes → False,
  Frame → {False, False, True, False}, FrameTicks → {None, None, All, None},
  FrameStyle → {Automatic, Automatic, Red, Automatic},
  FrameLabel → {{, }, {, "Distance (m)"}},
  PlotLegends → Placed[PointLegend[{"Red data"}, Background → White], {0.21, 0.45}],
  ImagePadding → 40](*Plot data as data points with left y-axis and title;
Note that the framelabel form is FrameLabel→{{left,right},{bottom,top}}*)

(*Combining plots*)Overlay[{plot1, plot2}]
```

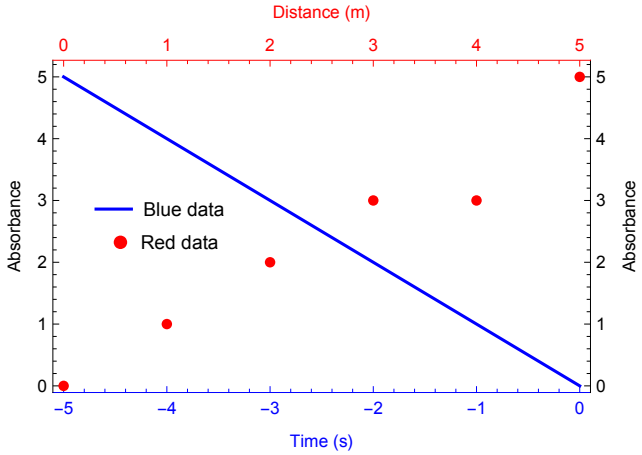
Out[326]=



Out[327]=



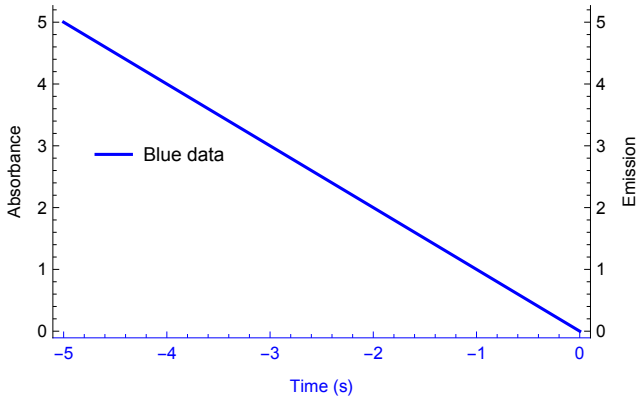
Out[328]=



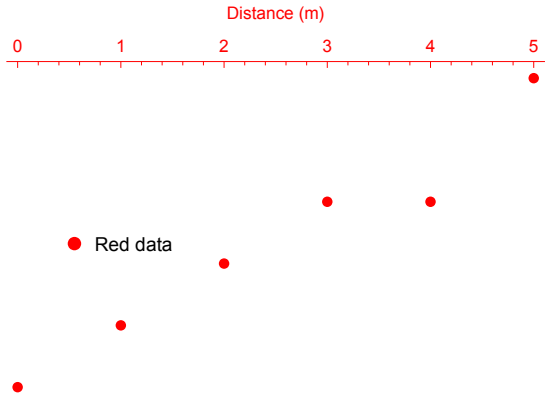
Plotting data with a common Y-axis but two uncommon X-axes using slightly different syntax as above. This is done using the following syntax:
->{{left,right}, {bottom,top} for any of the “Frame” commands.
The Overlay[ ] command is used to overlay the plots (similar to Show[ ] command).

In[352]:=
```
Clear[data1, data2, plot1, plot2]
(*Data Sets*)
data1 = {{0, 0}, {-1, 1}, {-2, 2}, {-3, 3}, {-4, 4}, {-5, 5}};
data2 = {{0, 0}, {1, 1}, {2, 2}, {3, 3}, {4, 3}, {5, 5}};

(*Data plots*)
(*All frame commands: {{left,right},{bottom,top}}*)
plot1 = ListLinePlot[data1, PlotStyle → Blue,
  Frame → {{True, True}, {True, False}}, FrameTicks → {{All, All}, {All, None}},
  FrameLabel → {{"Absorbance", "Emission"}, {"Time (s)", "Distance (m)"}},
  FrameStyle → {{Automatic, Automatic}, {Blue, Automatic}},
  PlotLegends → Placed[LineLegend[{"Blue data"}, Background → White], {0.20, 0.55}],
  ImagePadding → 40] (*Plot data as a line with right y-axis and title;
Note that the framelabel form is FrameLabel→
 {{left,right},{bottom,top}} and Frame→{{left,right},{bottom,top}} *)
plot2 = ListPlot[data2, PlotStyle → Red, Axes → False,
  Frame → {{False, False}, {False, True}}, FrameTicks → {{None, None}, {None, All}},
  FrameLabel → {{"Absorbance", "Emission"}, {"Time (s)", "Distance (m)"}},
  FrameStyle → {{Automatic, Automatic}, {Automatic, Red}},
  FrameLabel → {{, }, {, "Distance (m)"}},
  PlotLegends → Placed[PointLegend[{"Red data"}, Background → White], {0.21, 0.45}],
  ImagePadding → 40](*Plot data as data points with left y-axis and title;
Note that the framelabel form is FrameLabel→{{left,right},{bottom,top}}*)

(*Combining plots*)
Overlay[{plot1, plot2}]
```

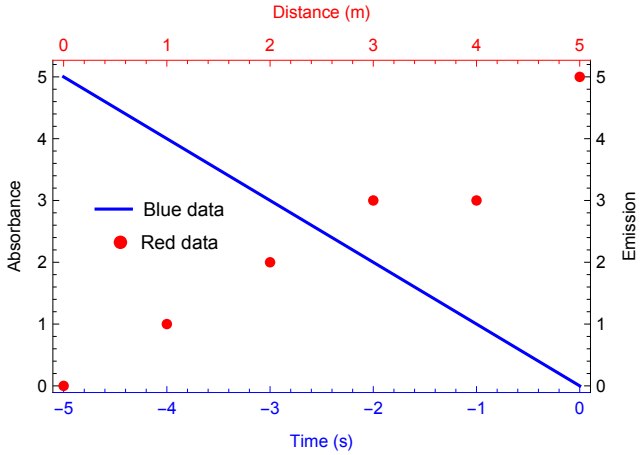
Out[355]=



Out[356]=



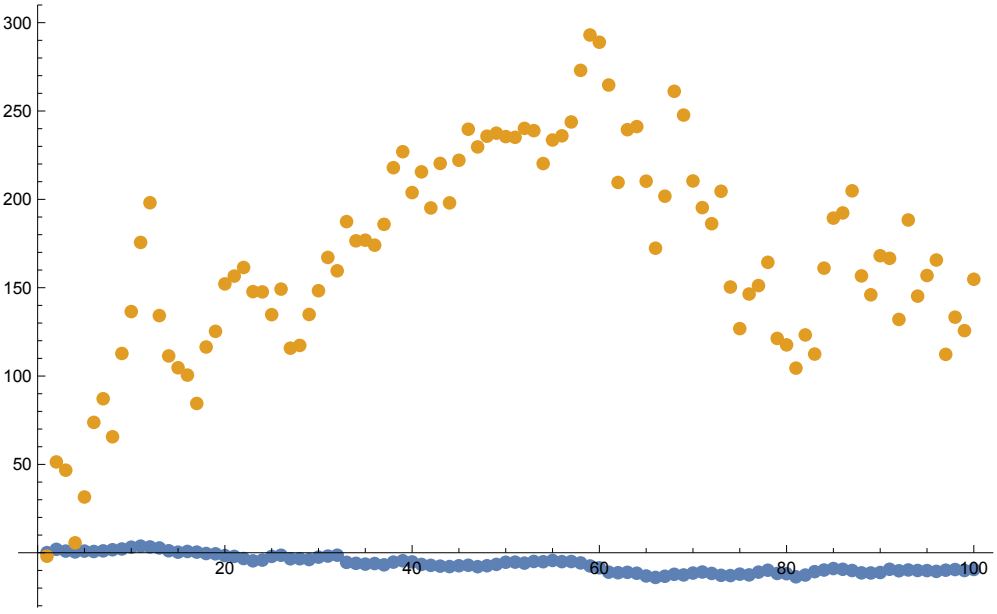
Out[357]=



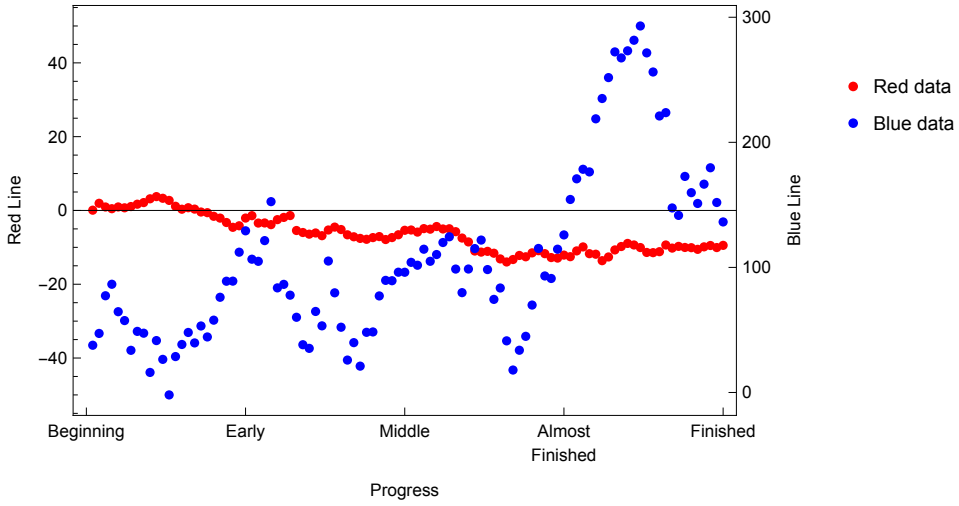
Another way to plot 2 y-axes

In[335]:=
```
(*create 2 lists*)
x1 = Accumulate[RandomVariate[NormalDistribution[0, 1], 100]];
x2 = 25 Accumulate[RandomVariate[NormalDistribution[0, 1], 100]];

ListPlot[{x1, x2}]

(*As expected, x2 goes off ListPlot's range and needs a
 different scale.This can be accomplished by rescaleing x2 and
 using FrameTics to create a rescaled axis on the right.First,
rescale x2 using the function Rescaled[]:*)
datamax = Max[x2]; datamin = Min[x2];
datarange = datamax - datamin;
plotrange = 100; plotmin = -50;
rescaled[x_] := (x - datamin) plotrange / datarange + plotmin

(*Next,create new axis labels for the right axis:*)
axeslabel[v_] := {rescaled[v], ToString[v]}
rightaxis = Table[axeslabel[v], {v, -500, 500, 100}];

(*Finally,create the new ListPlot:*)
lp = ListPlot[{x1, x3},
  FrameTicks → {{{0, "Beginning"}, {25, "Early"}, {50, "Middle"},
     {75, "Almost\nFinished"}, {100, "Finished"}}, Automatic, None, rightaxis},
  PlotStyle → {Red, Blue}, Frame → True, FrameLabel →
   {{"Red Line", "Blue Line"}, {"Progress",}}, PlotLegends →
   Placed[PointLegend[{"Red data", "Blue data"}, Background → White], {1, 0.75}]]
x3 = rescaled[#] & /@ x2;
```

Out[337]=



Out[344]=


Red Line
Blue Line
40
20
0
−20
−40
300
200
100
0
Beginning
Early
Middle
Almost Finished
Finished
Progress
Red data
Blue data