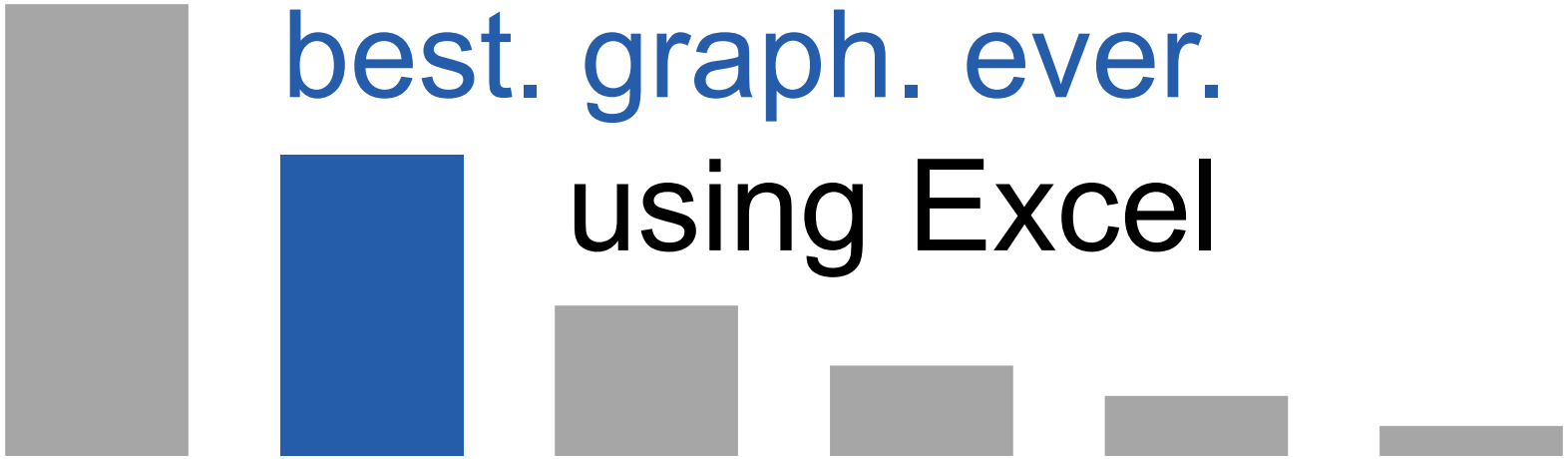
How to create the best. graph. ever. using Excel

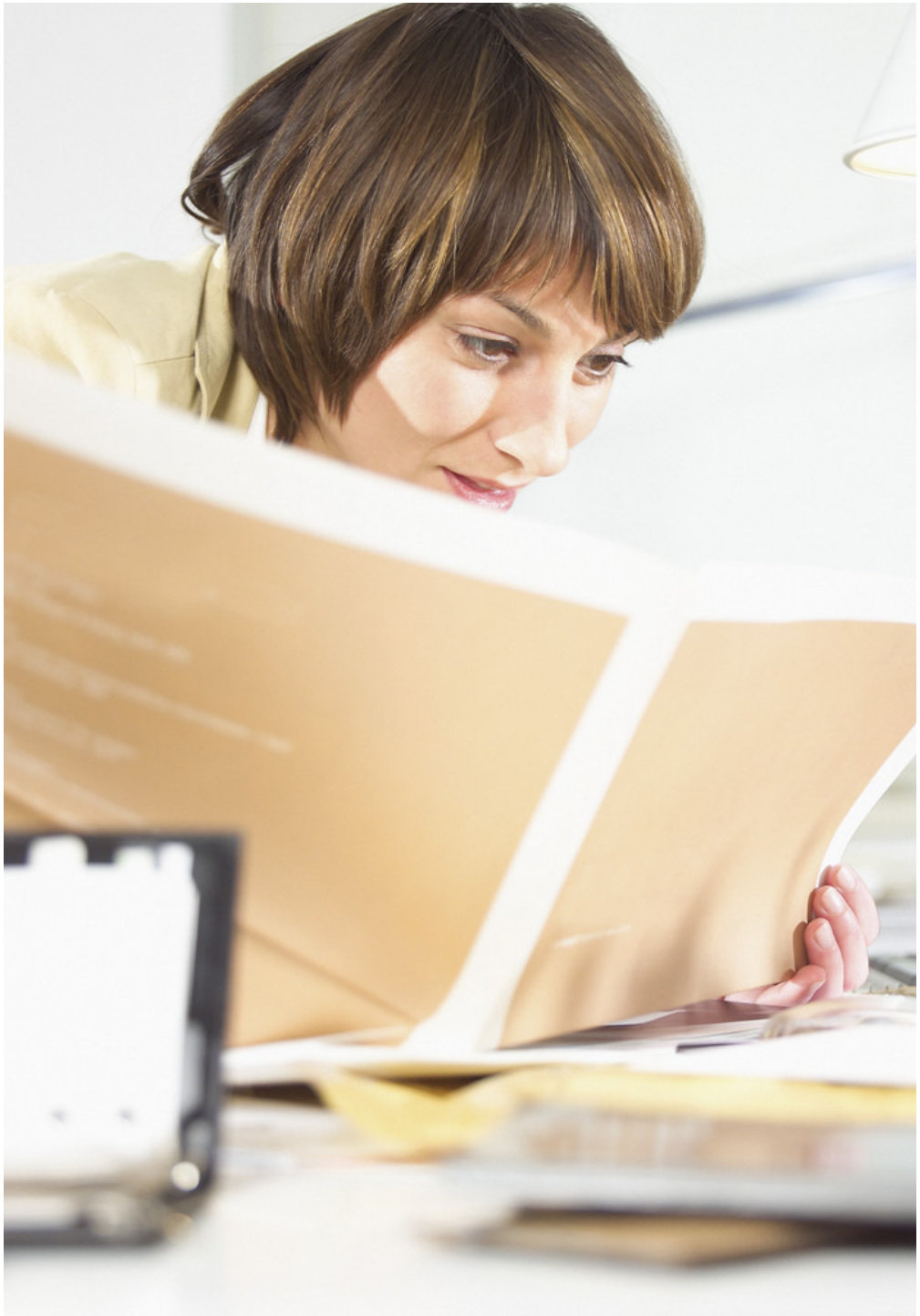


Angie Ficek, MPH
Program Evaluator
Professional Data Analysts, Inc.

March 22, 2013

PDA
www.PDAstats.com

You want your graphs to be **easy** for your reader to understand…



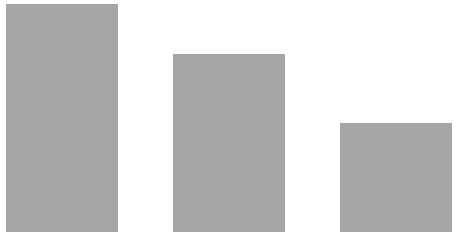
… so that they are more likely to **use** the data.

This can be done with Excel.

Five rules to follow.

1 2 3 4 5

Use the right type of graph or table.



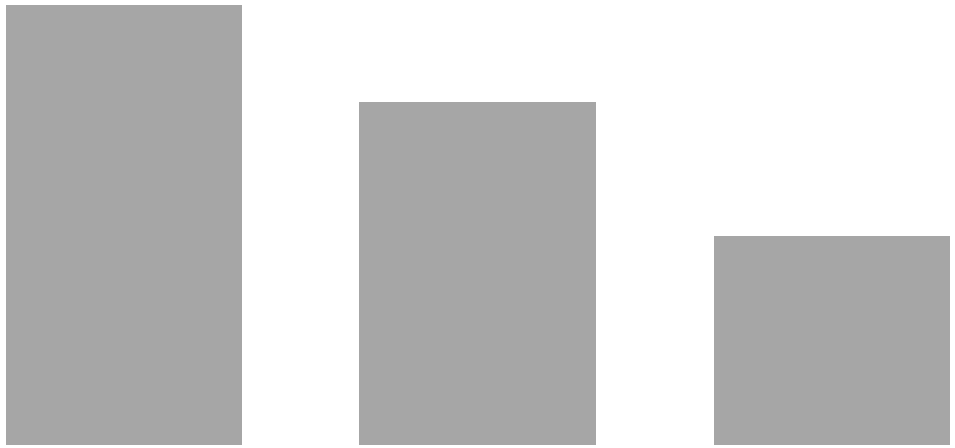
VS.

Coalition	Adults	Youth
Coalition A	1,064	335
Coalition B	778	269
Coalition C	844	52
Total	2,686	656

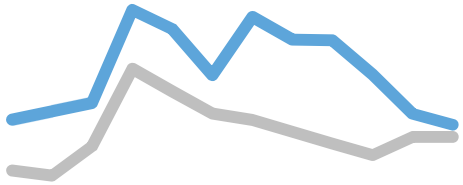
Choose a **table** if you want to be able to look up a particular value.

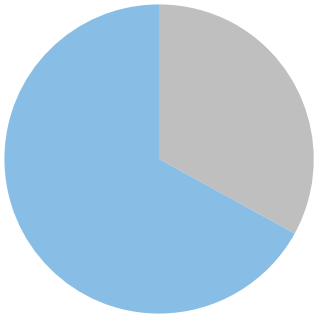
Coalition	Adults	Youth
Coalition A	1,064	335
Coalition B	778	269
Coalition C	844	52
Total	2,686	656

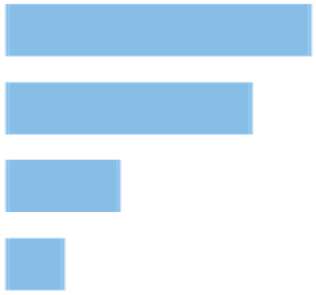
Choose a **graph** if you want to look at the data as a whole to see trends or patterns.

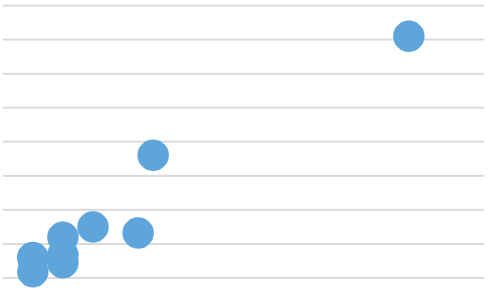


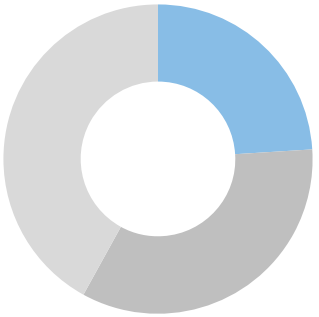
Which **graph** to choose?



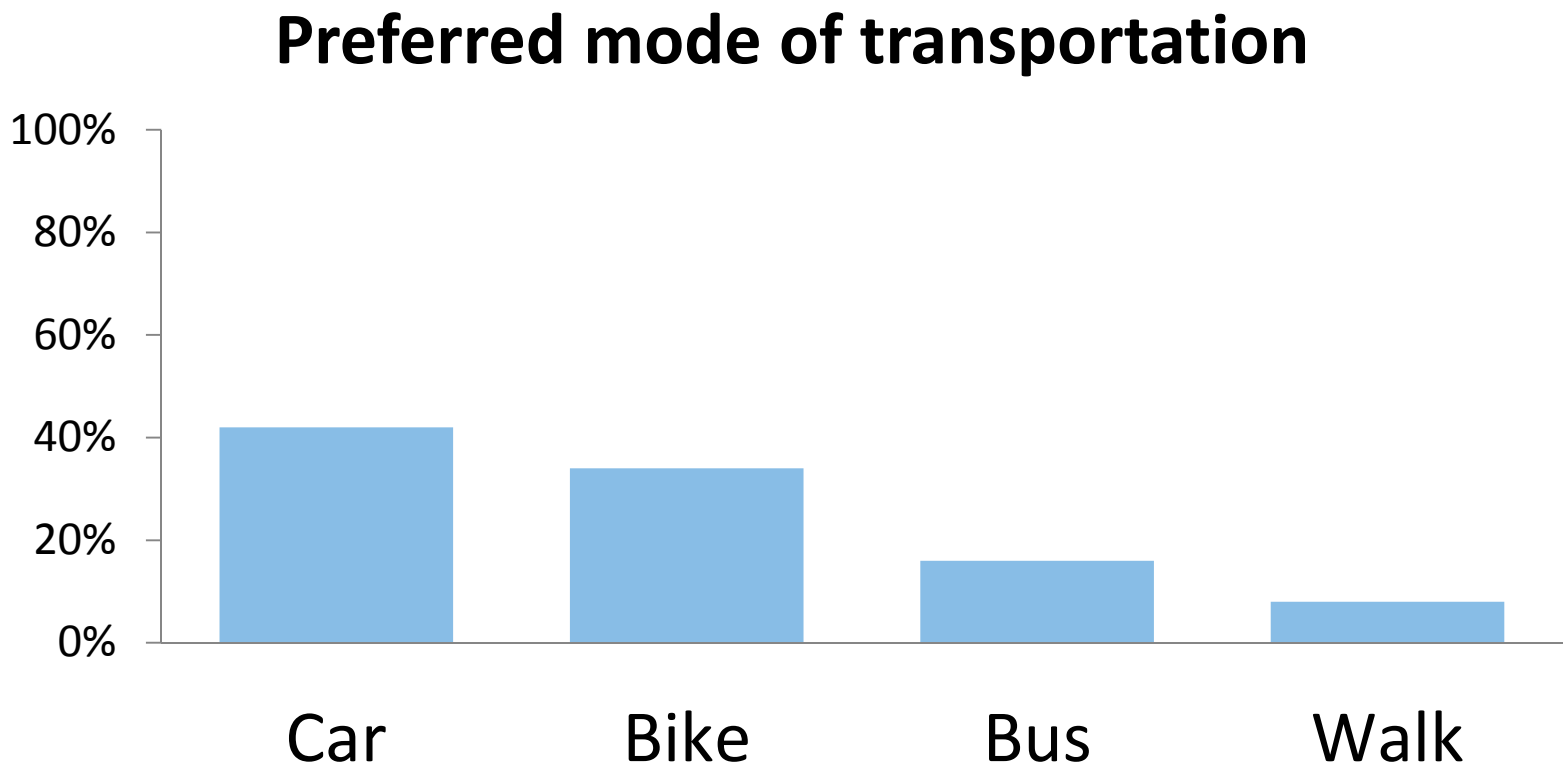




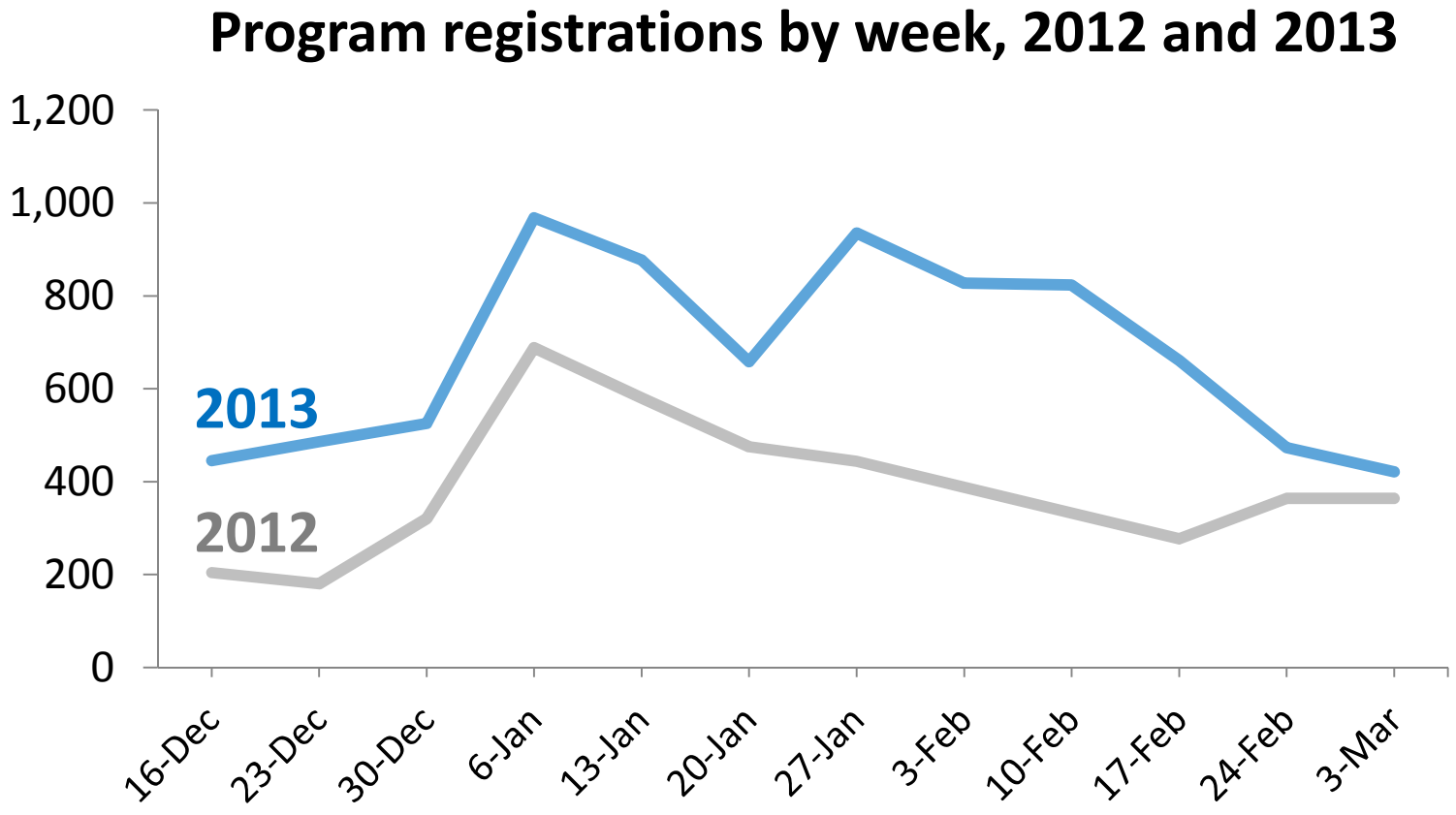




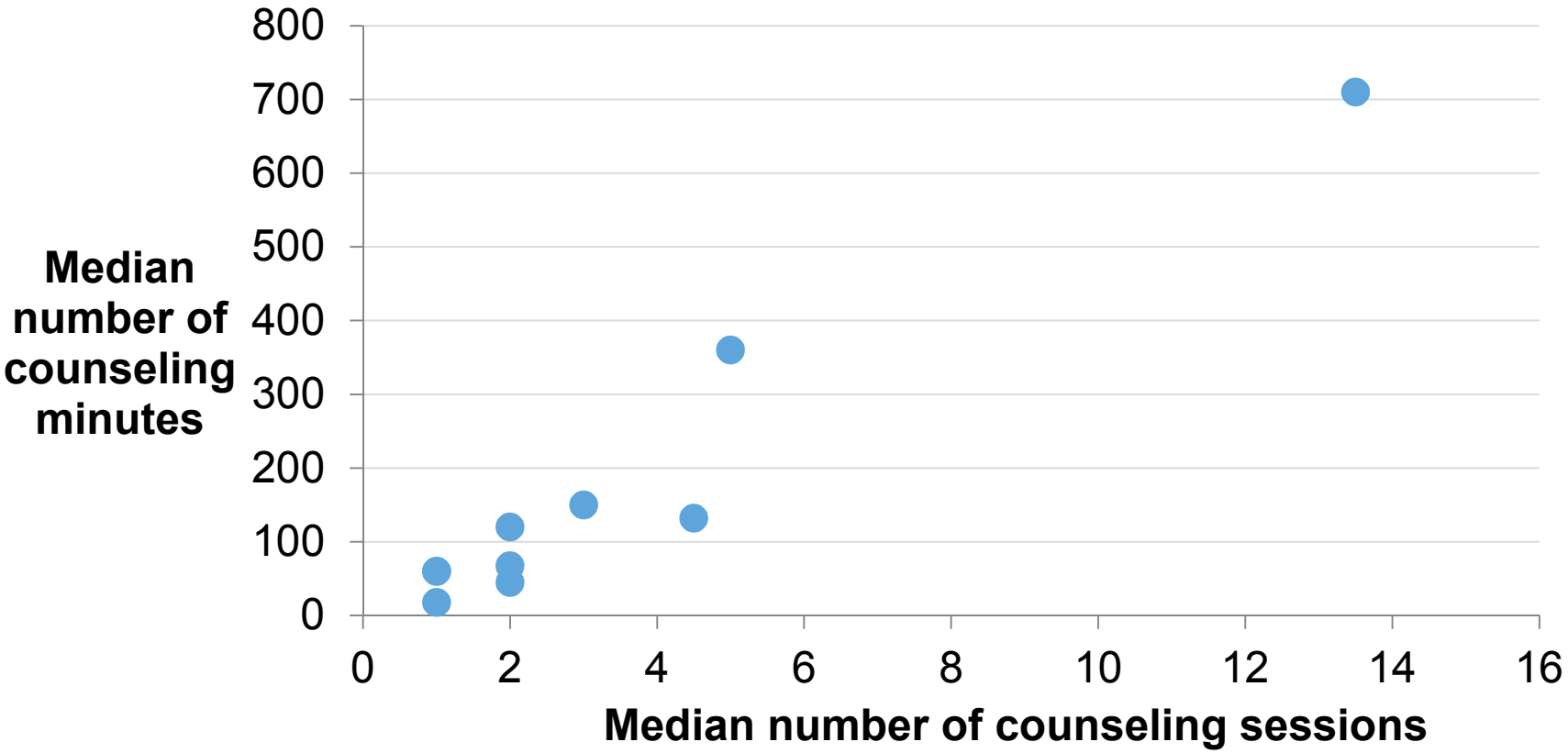
A **bar graph** is a common way to show a comparison, ranking, or part-to-whole relationship.



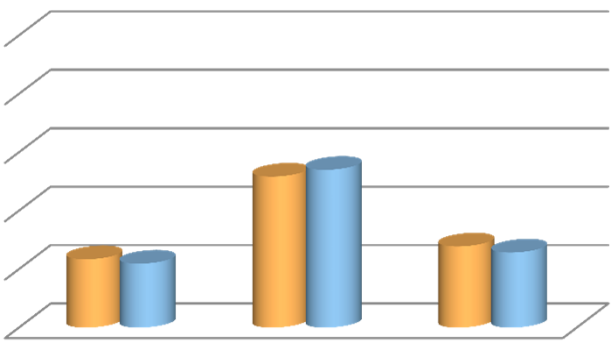
A **line graph** is often used to show a trend over time.

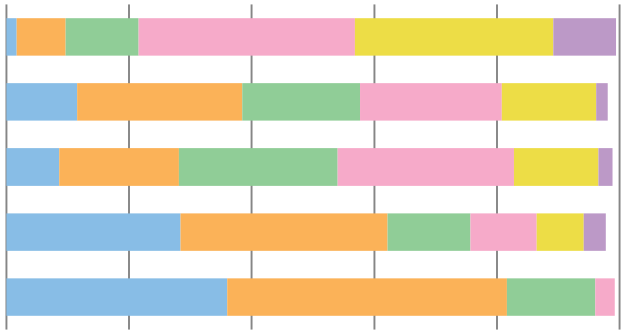


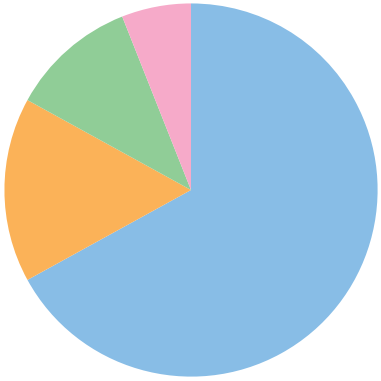
A **scatter plot** is often used to show the relationship between 2 quantitative variables.

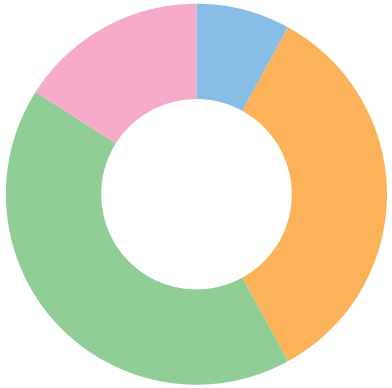


Graphs to avoid.

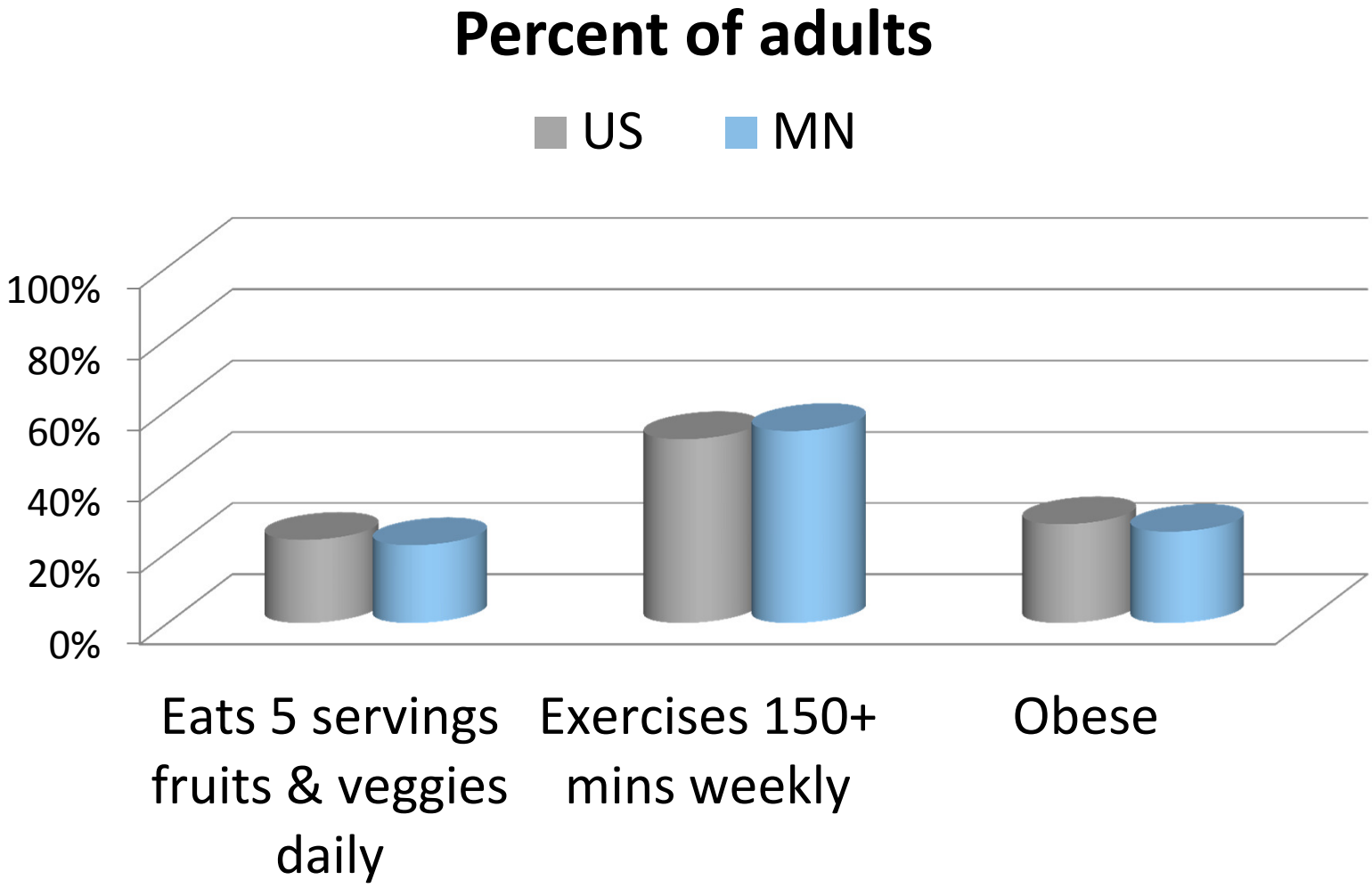




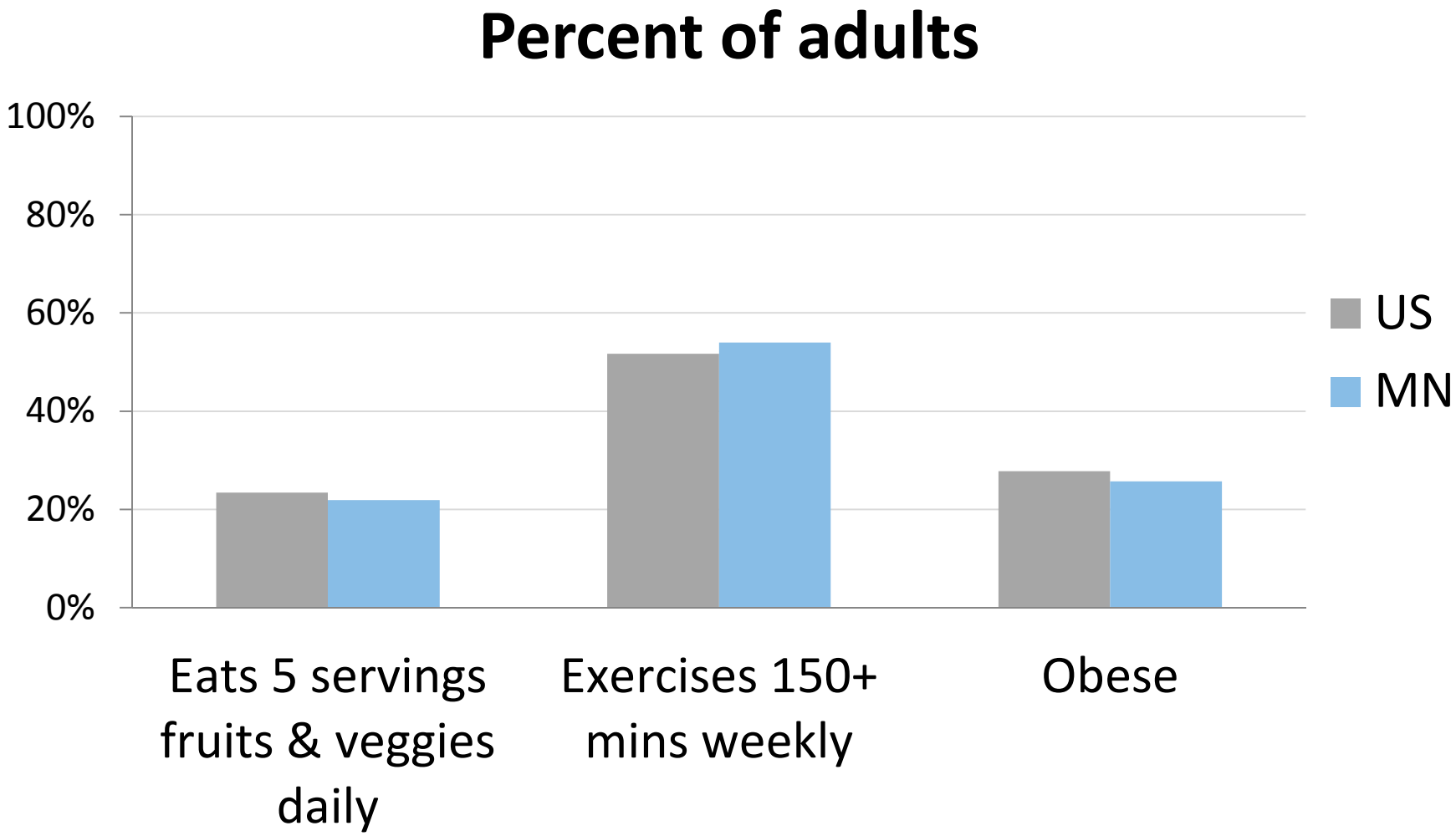




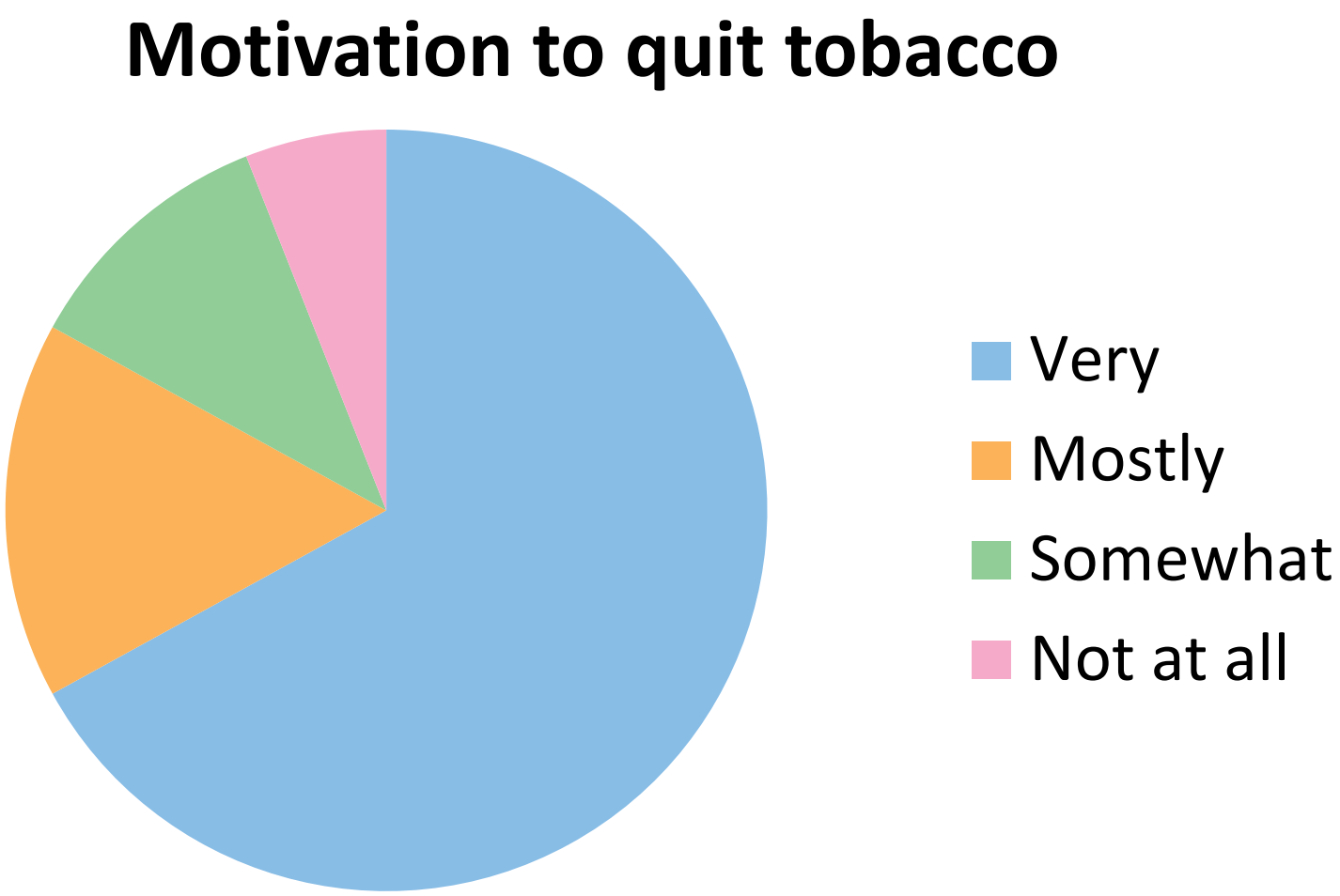
✗ 3-D anything.


Percent of adults
US
MN
100%
80%
60%
40%
20%
0%
Eats 5 servings fruits & veggies daily
Exercises 150+ mins weekly
Obese

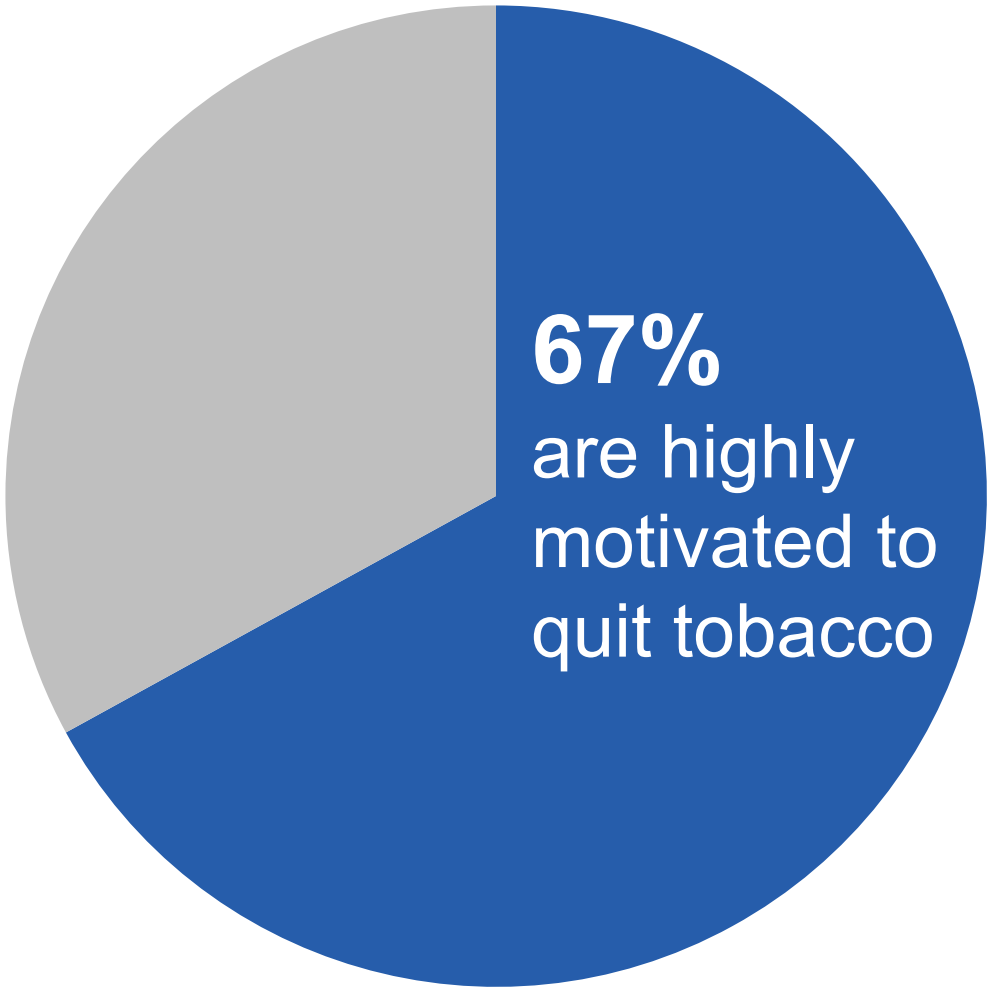
✓ Easier to compare in 2-D.



✗ Pie charts.



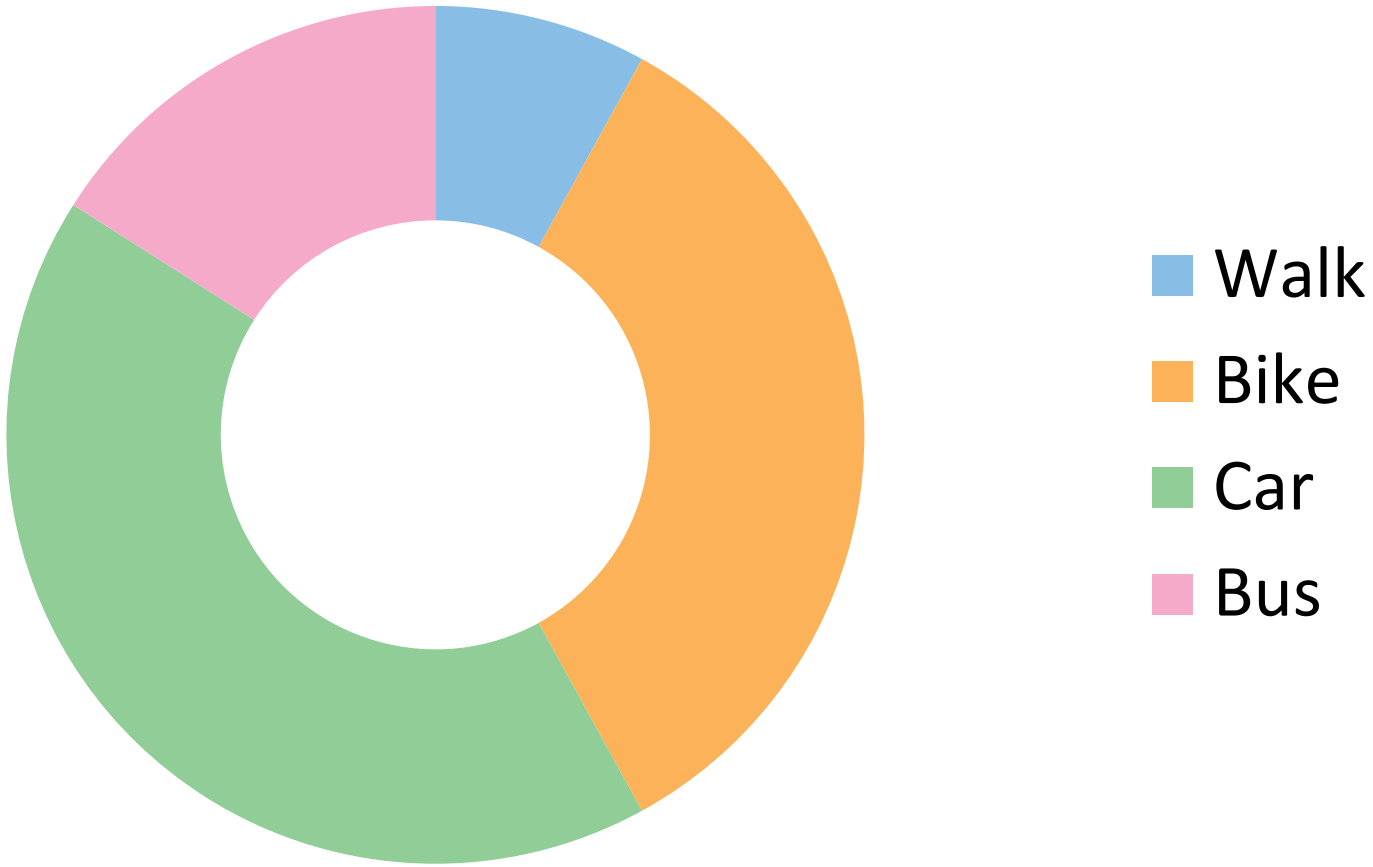
✓ Better use of a pie chart.



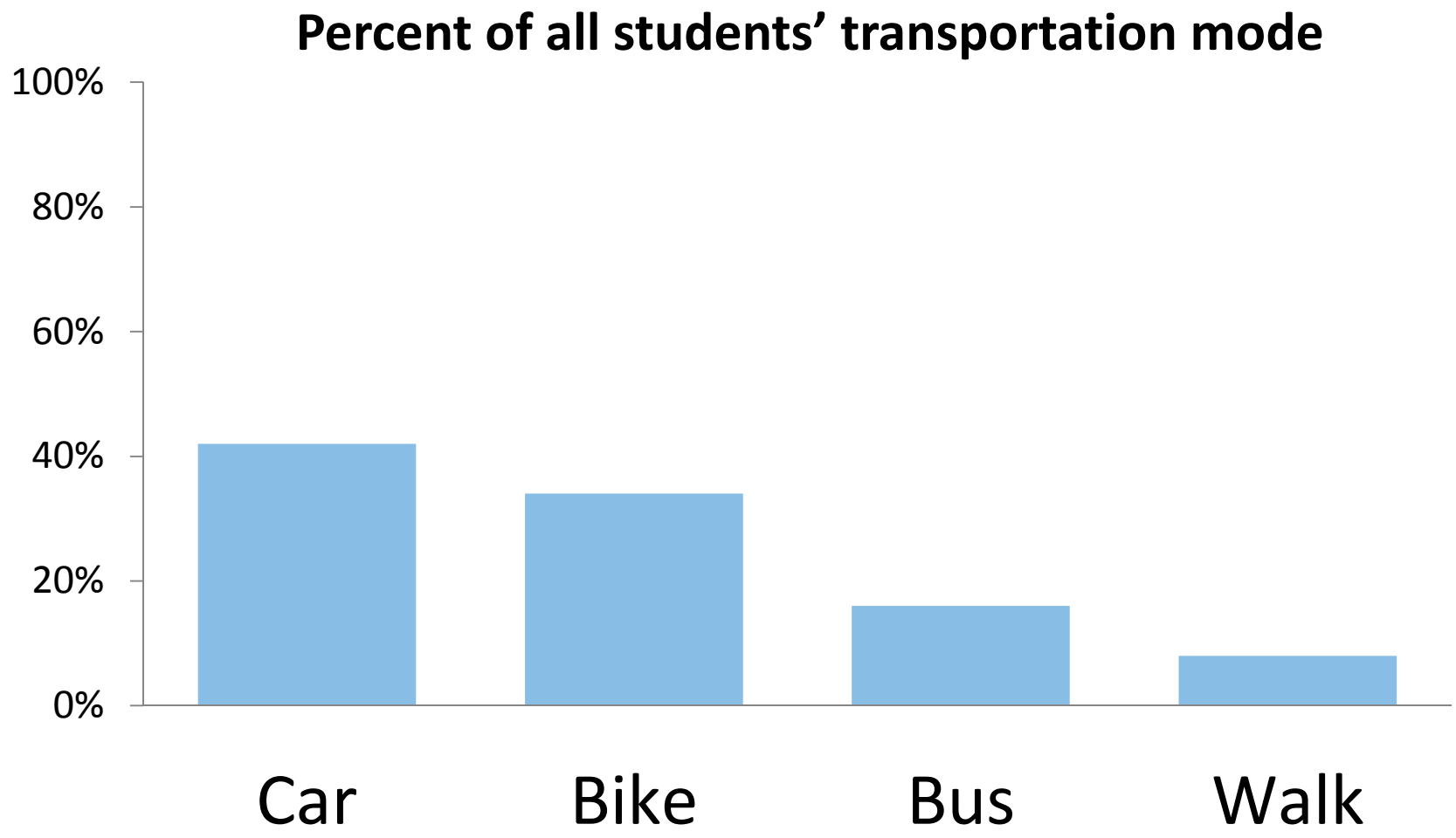
✓ Displaying one piece of information.

67% of participants are highly motivated to quit tobacco

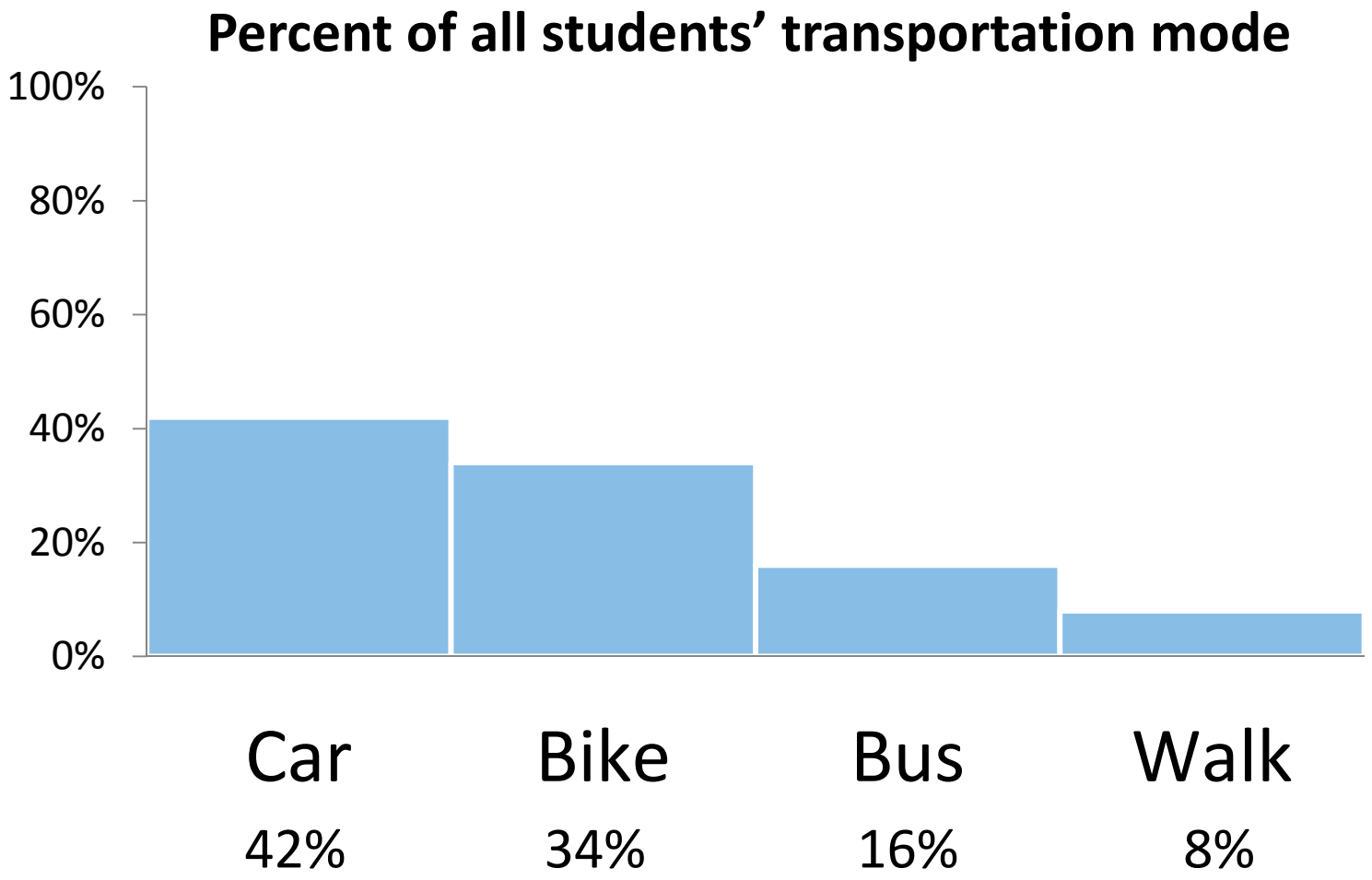
✗ Donuts.


Percent of all students' transportation mode
Walk
Bike
Car
Bus

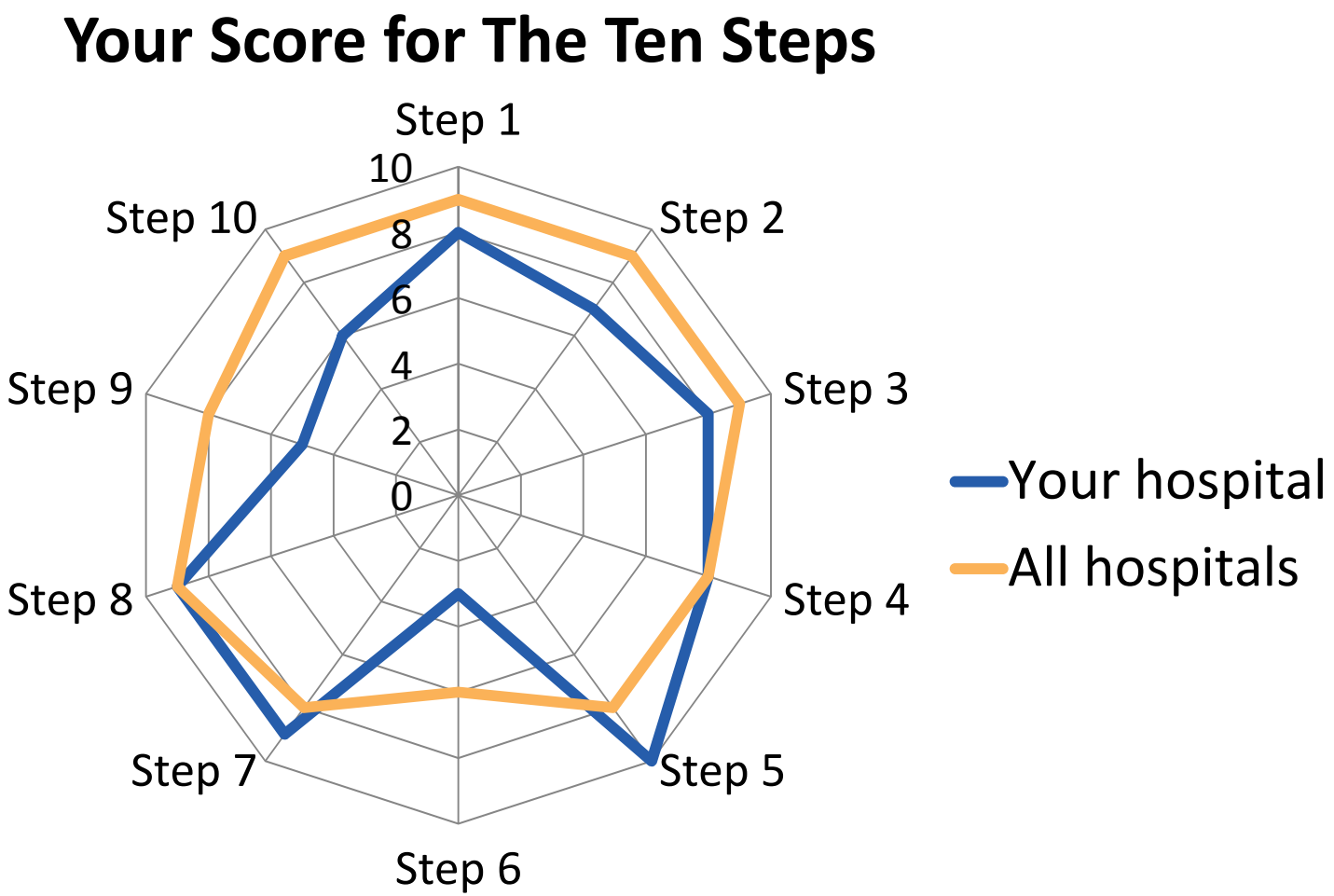
✓ Grab a bar instead of a donut.



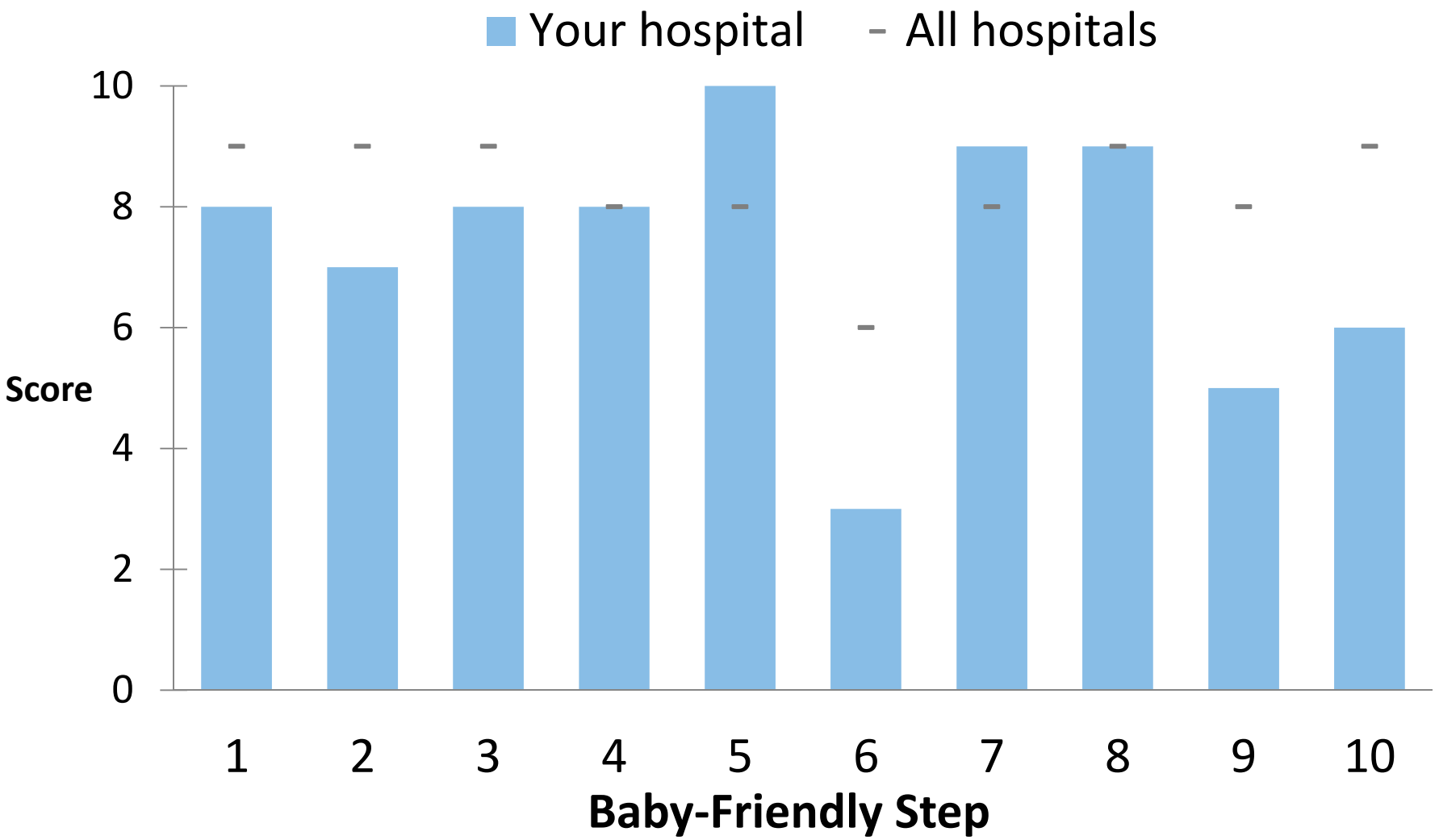
✓ Bar graph to show part-to-whole.



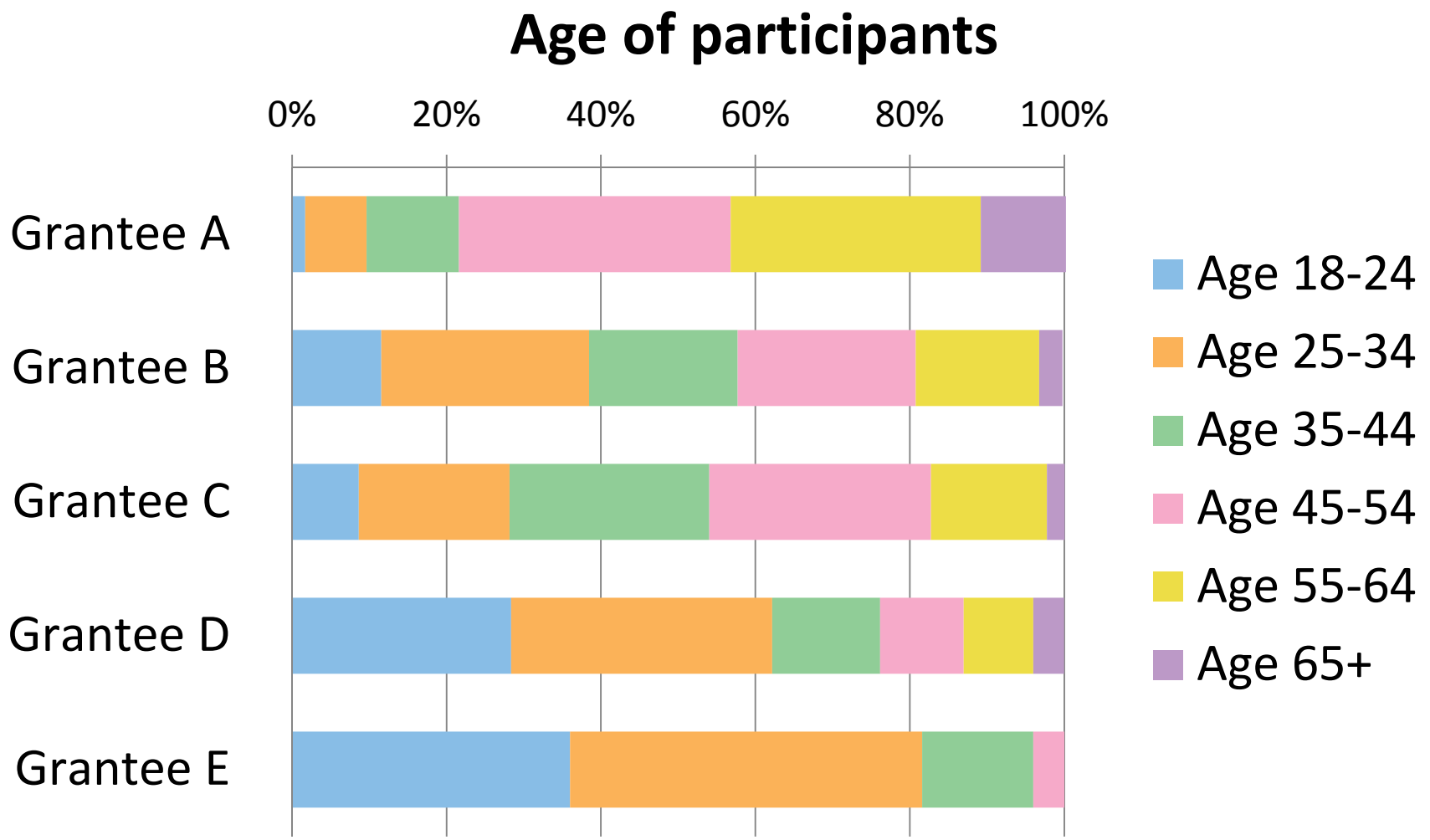
Radar charts.



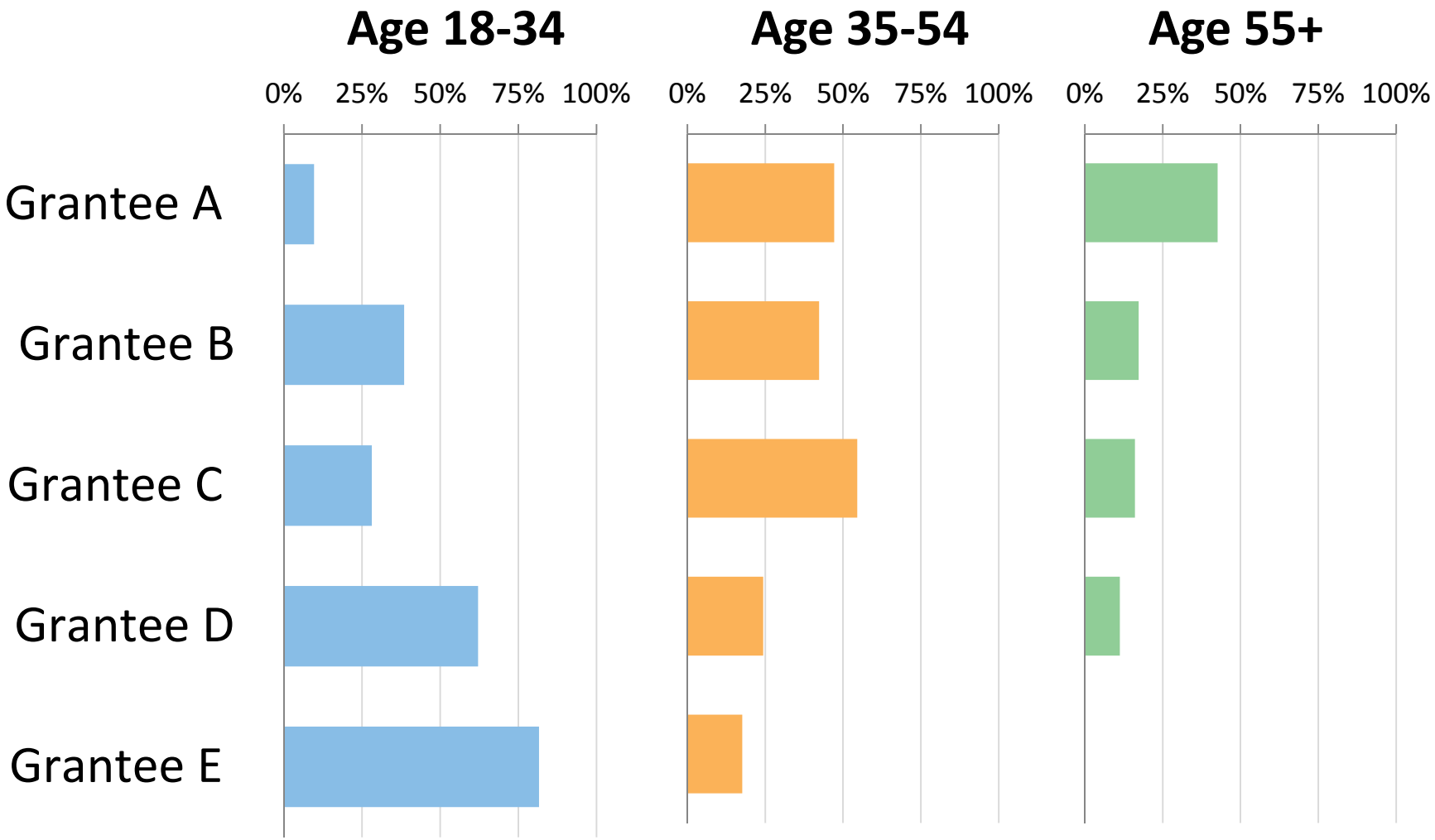
Going off the radar.



✗ Super stacked charts.



✓ Unstacked charts.



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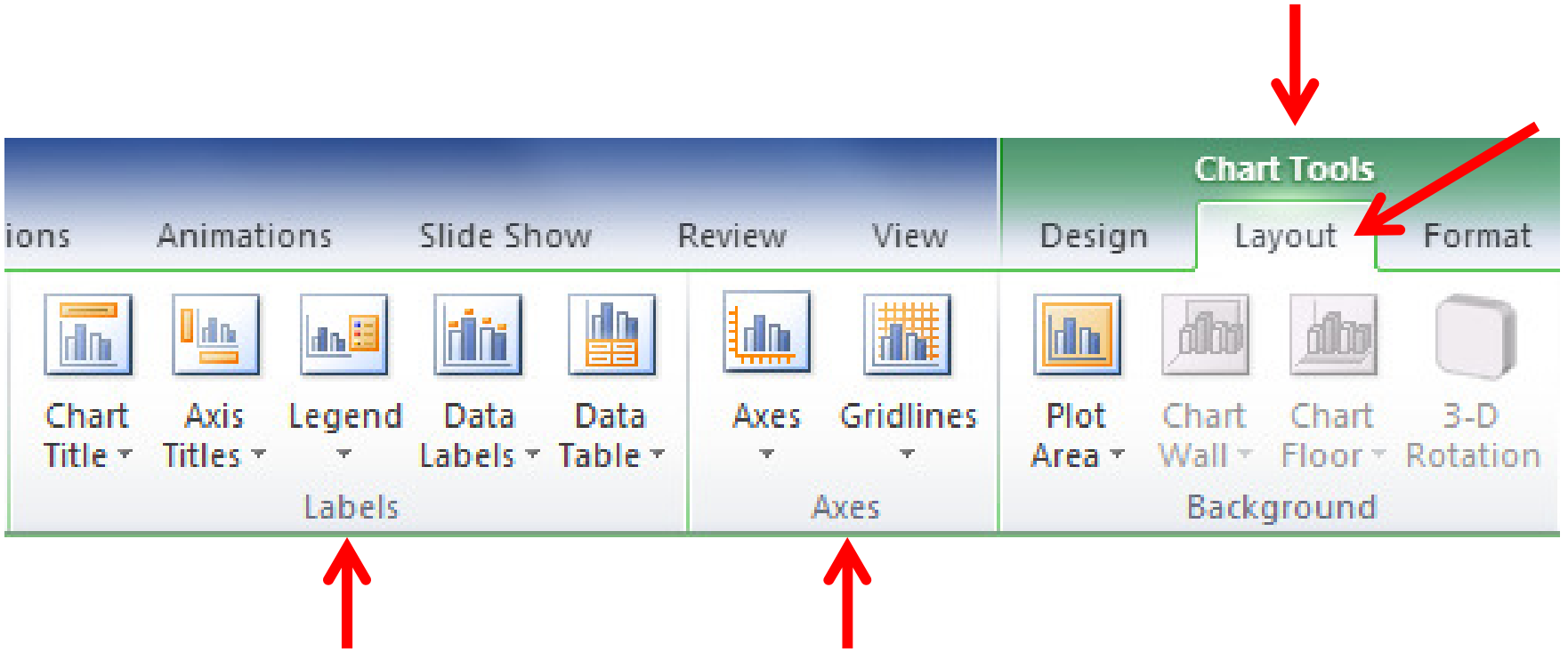
2.
3.
4.
5.

1 2 3 4 5

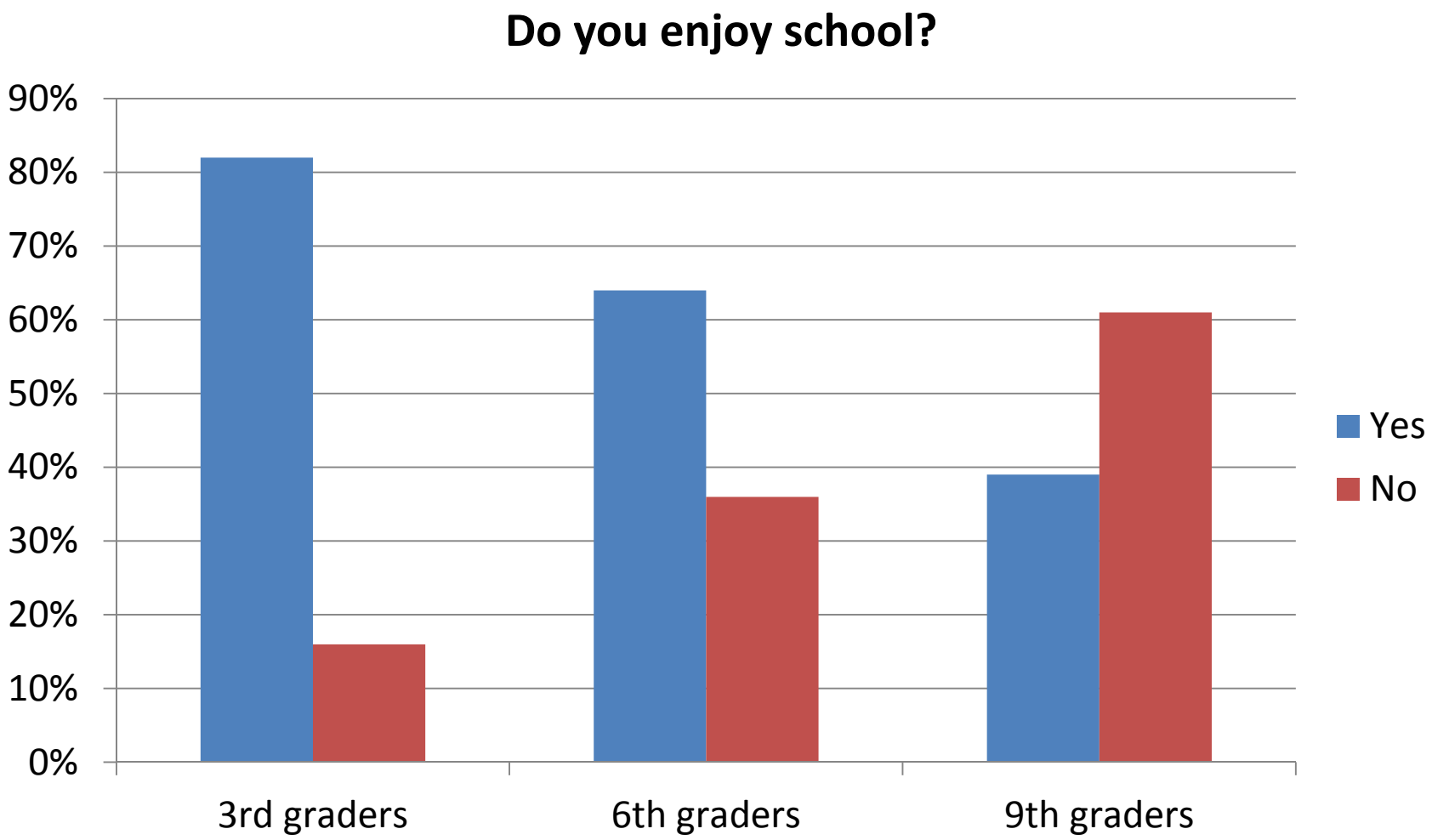
Abandon all Microsoft Office defaults.

To edit a graph (on a PC):

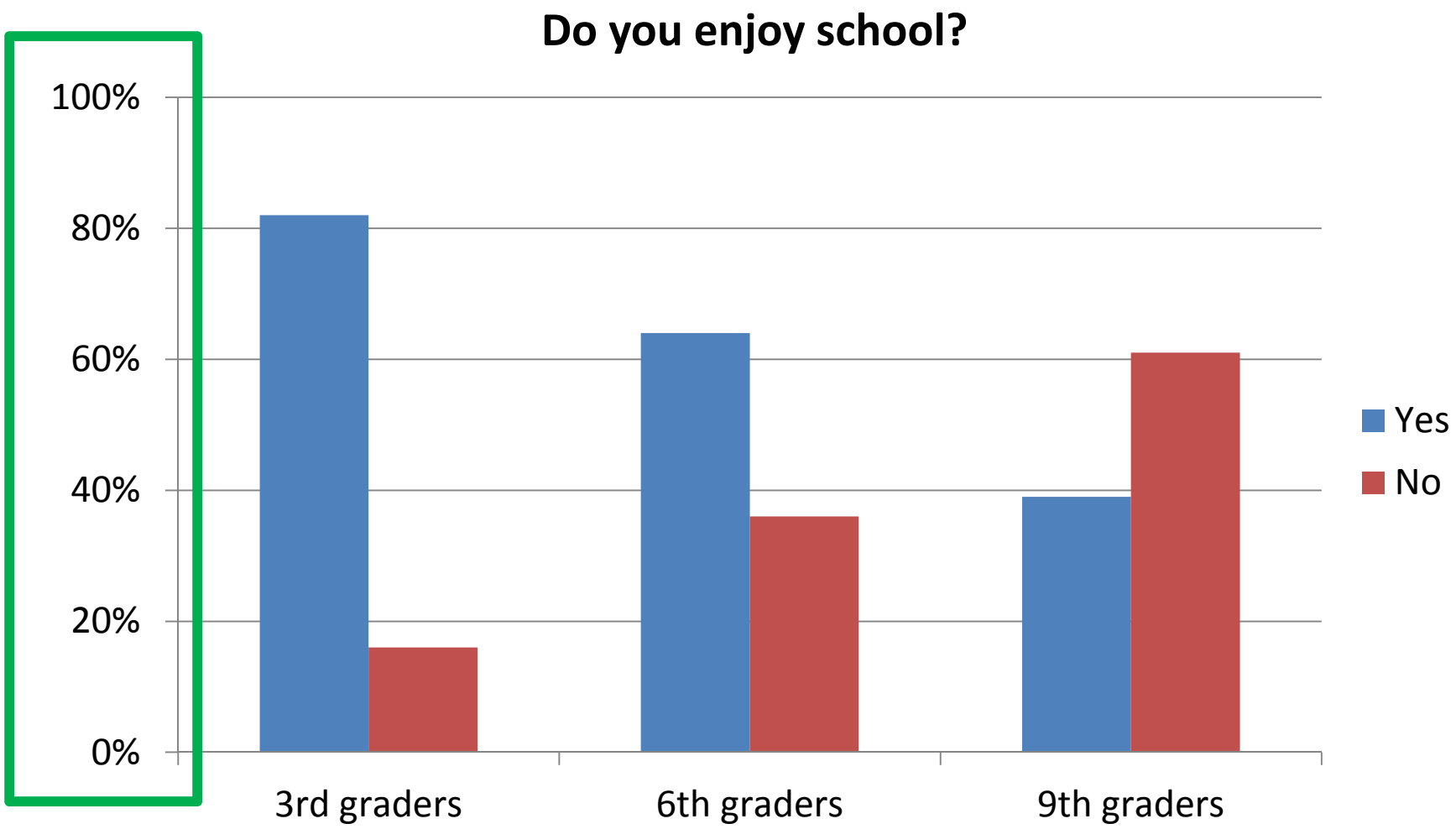
Chart Tools – Layout – Labels / Axes



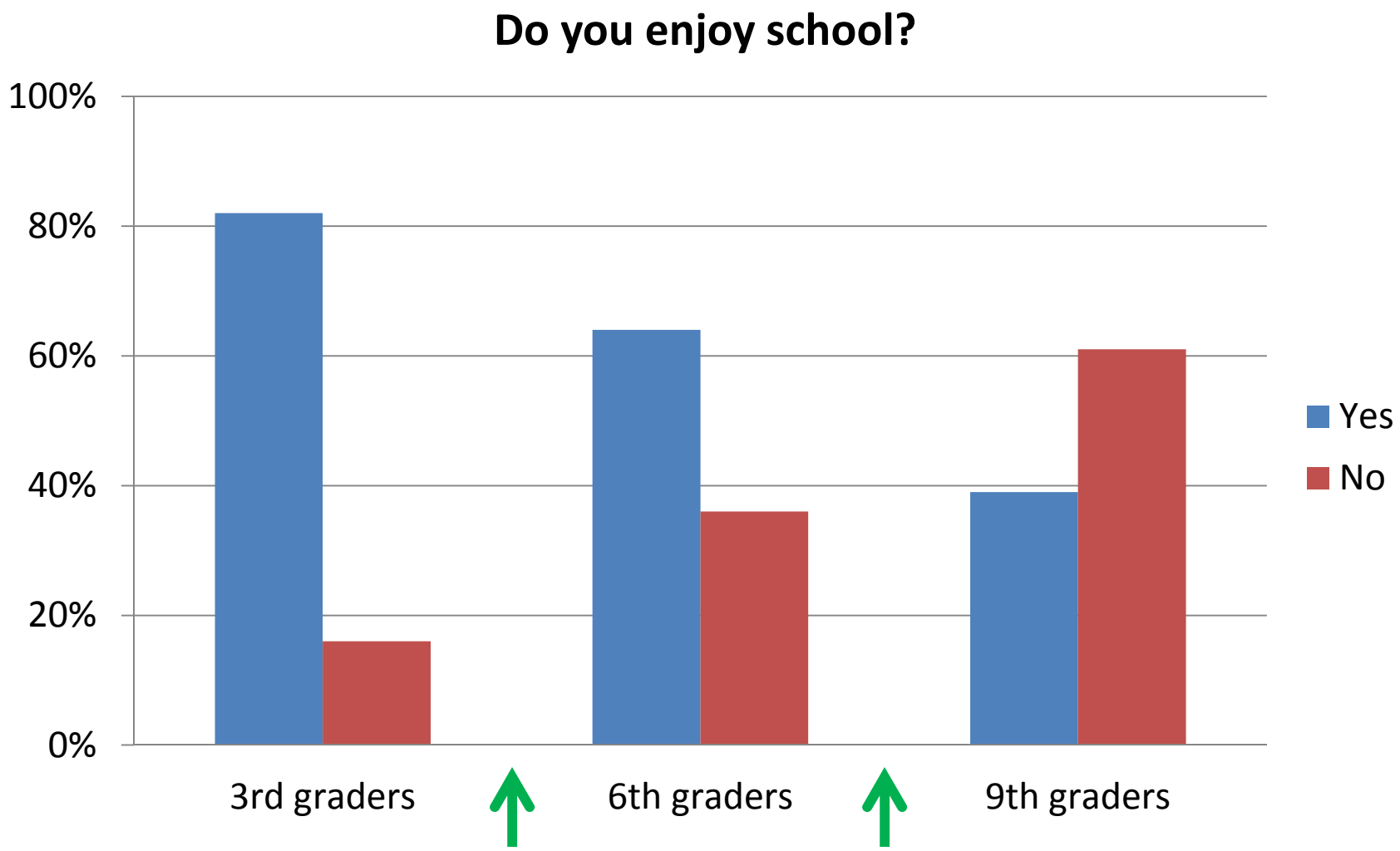
Microsoft Office Default



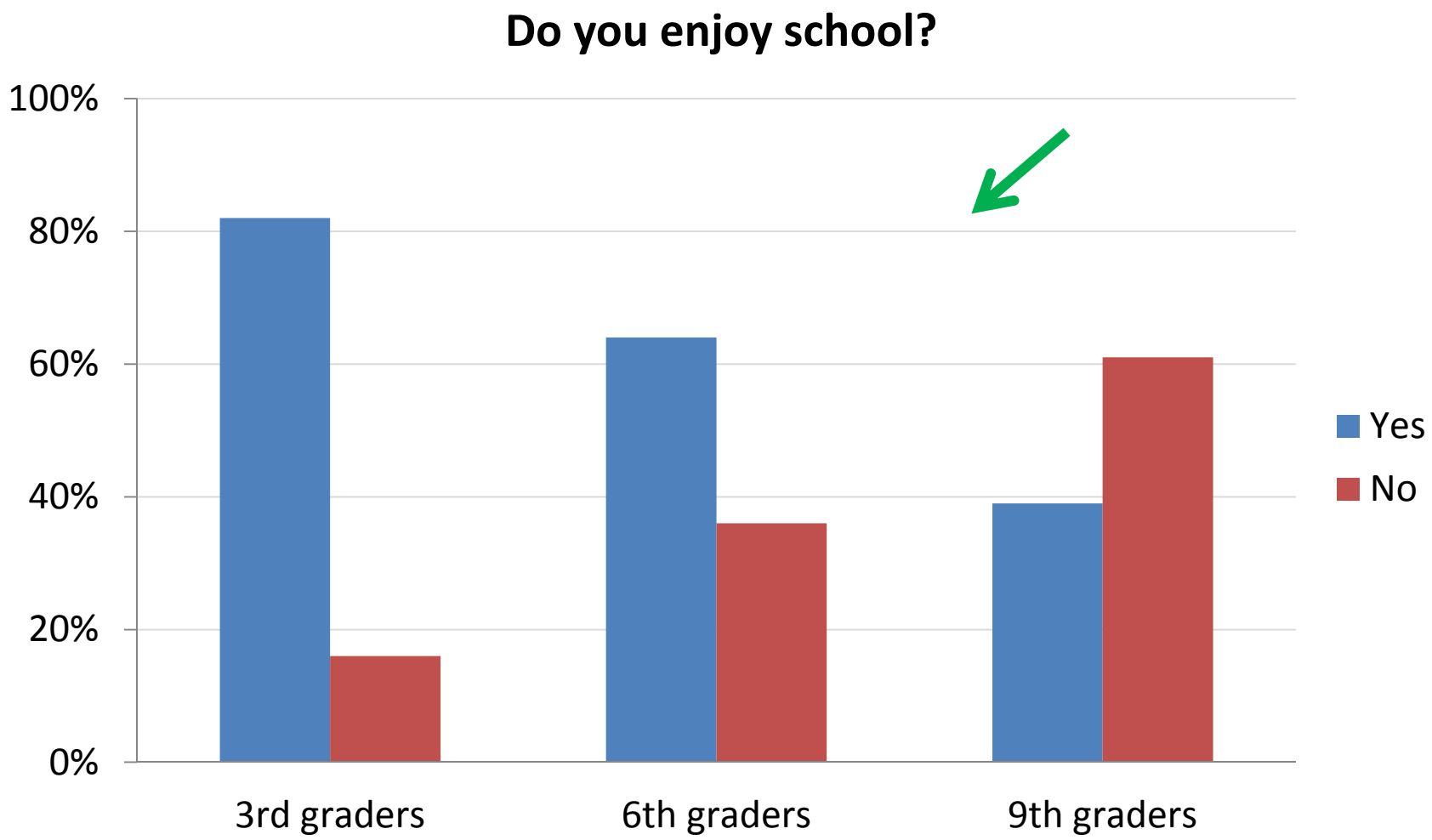
Adjust the axis.



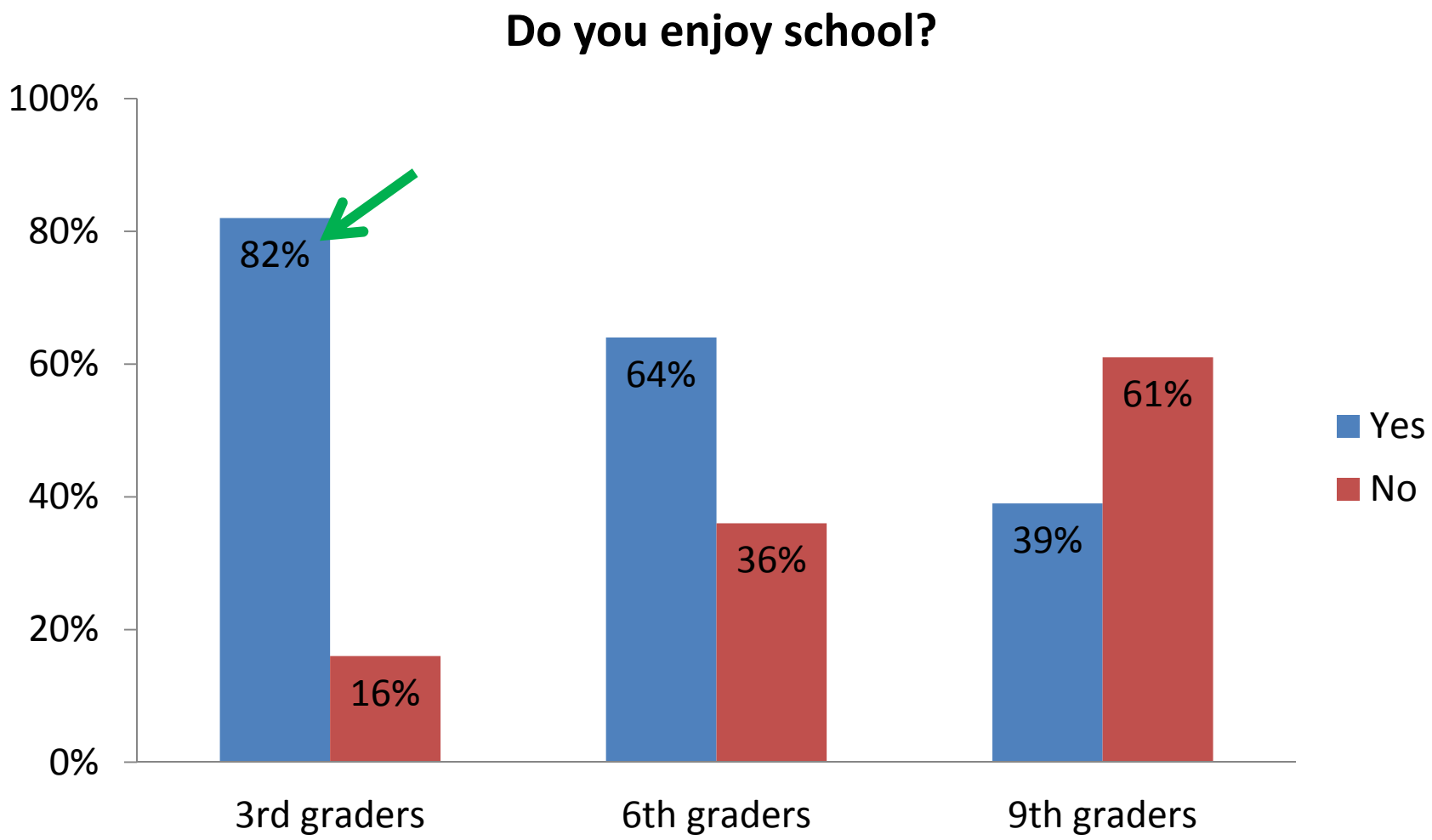
Delete unnecessary tick marks.



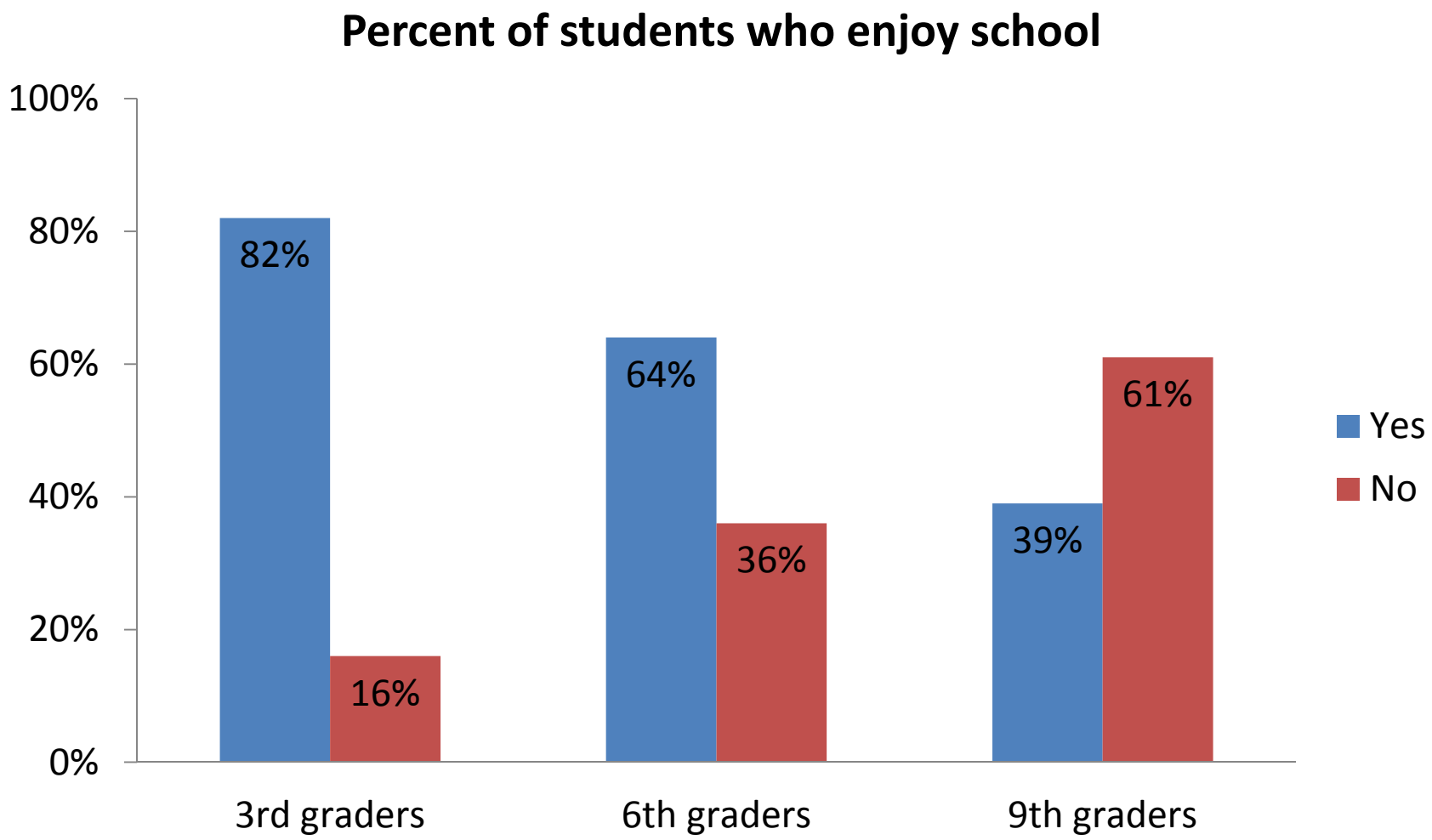
Lighten the gridlines or…



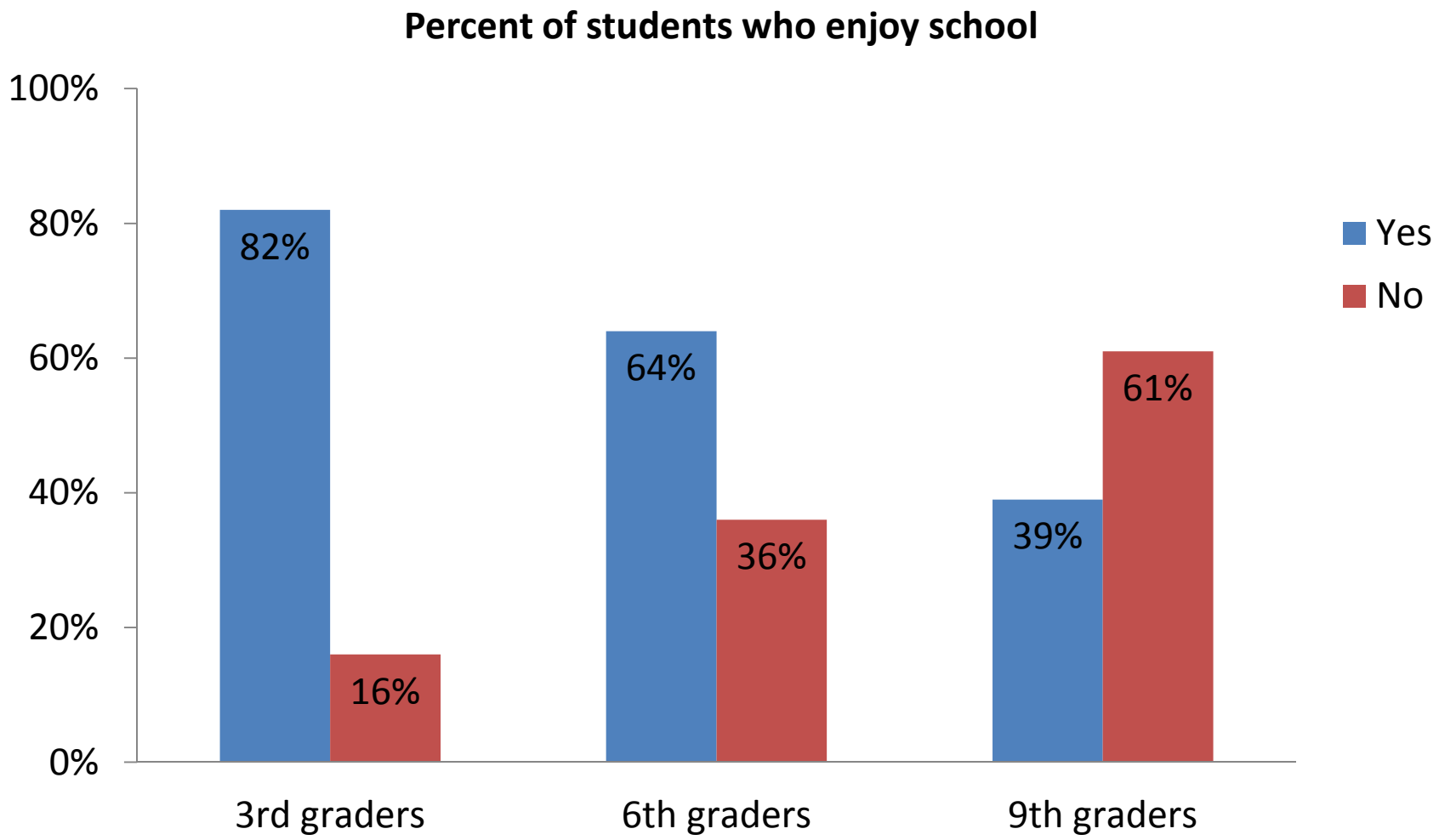
…delete them & add data labels.



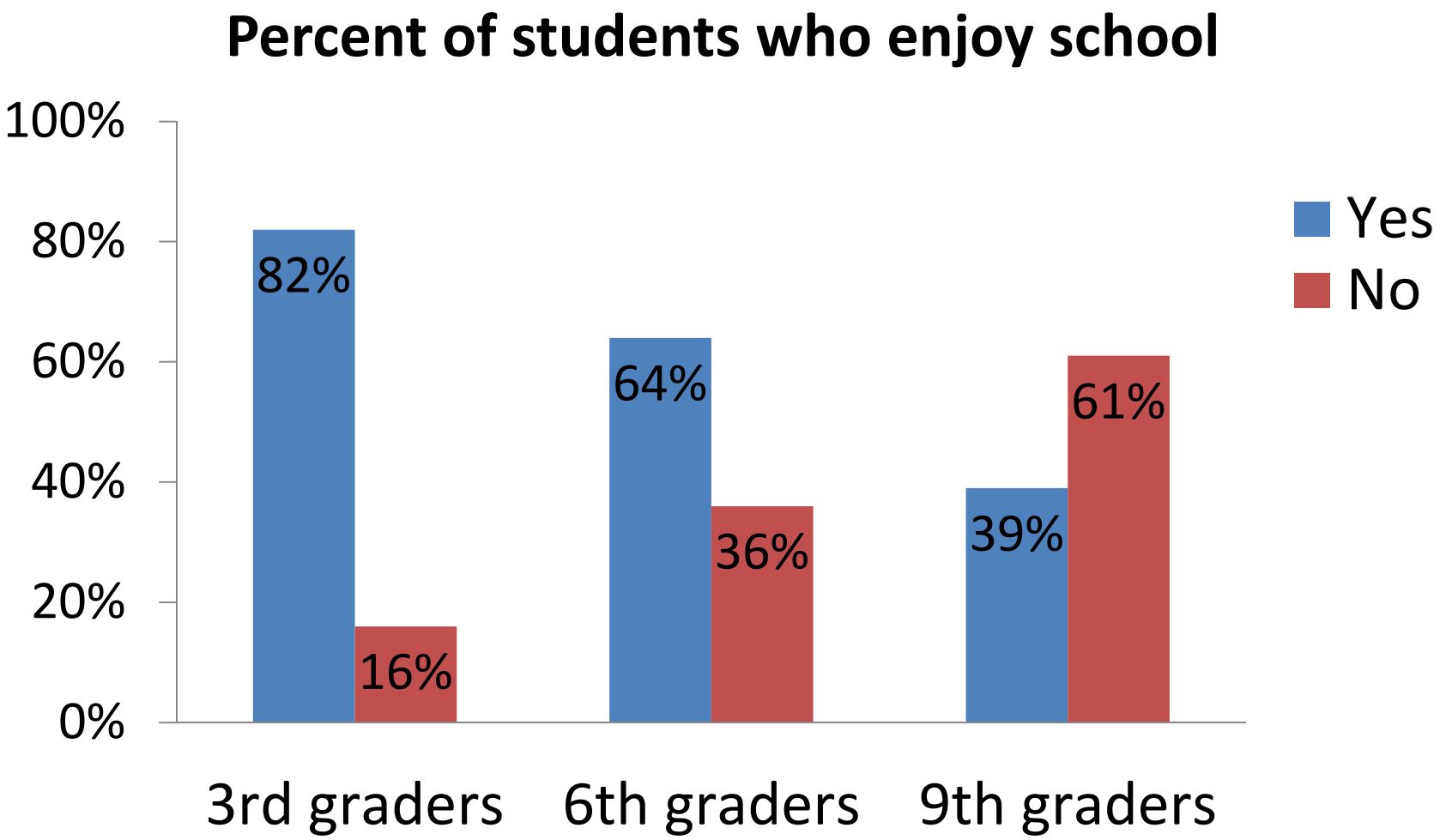
Titles


Percent of students who enjoy school
100%
80%
60%
40%
20%
0%
82%
16%
64%
36%
39%
61%
3rd graders
6th graders
9th graders
Yes
No

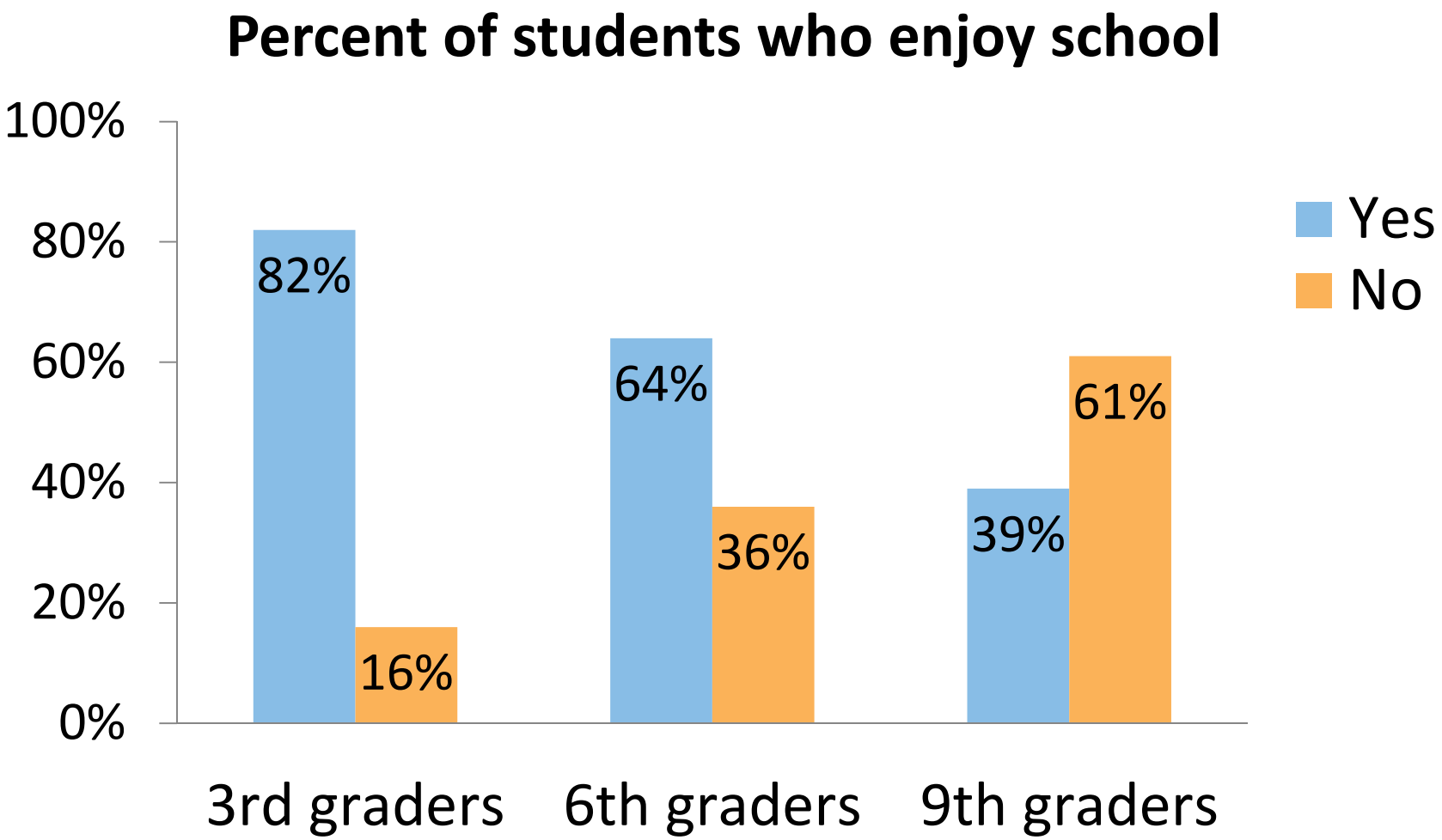
Position the legend.



Font type / size.



Color.

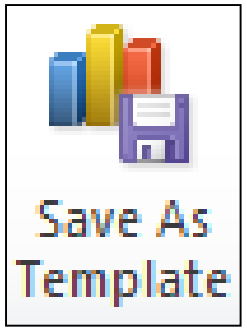

Percent of students who enjoy school
100%
80%
60%
40%
20%
0%
82%
16%
64%
36%
39%
61%
Yes
No
3rd graders
6th graders
9th graders

Save it as a template!

Chart Tools menu

↳ Design tab

↳ Save as Template



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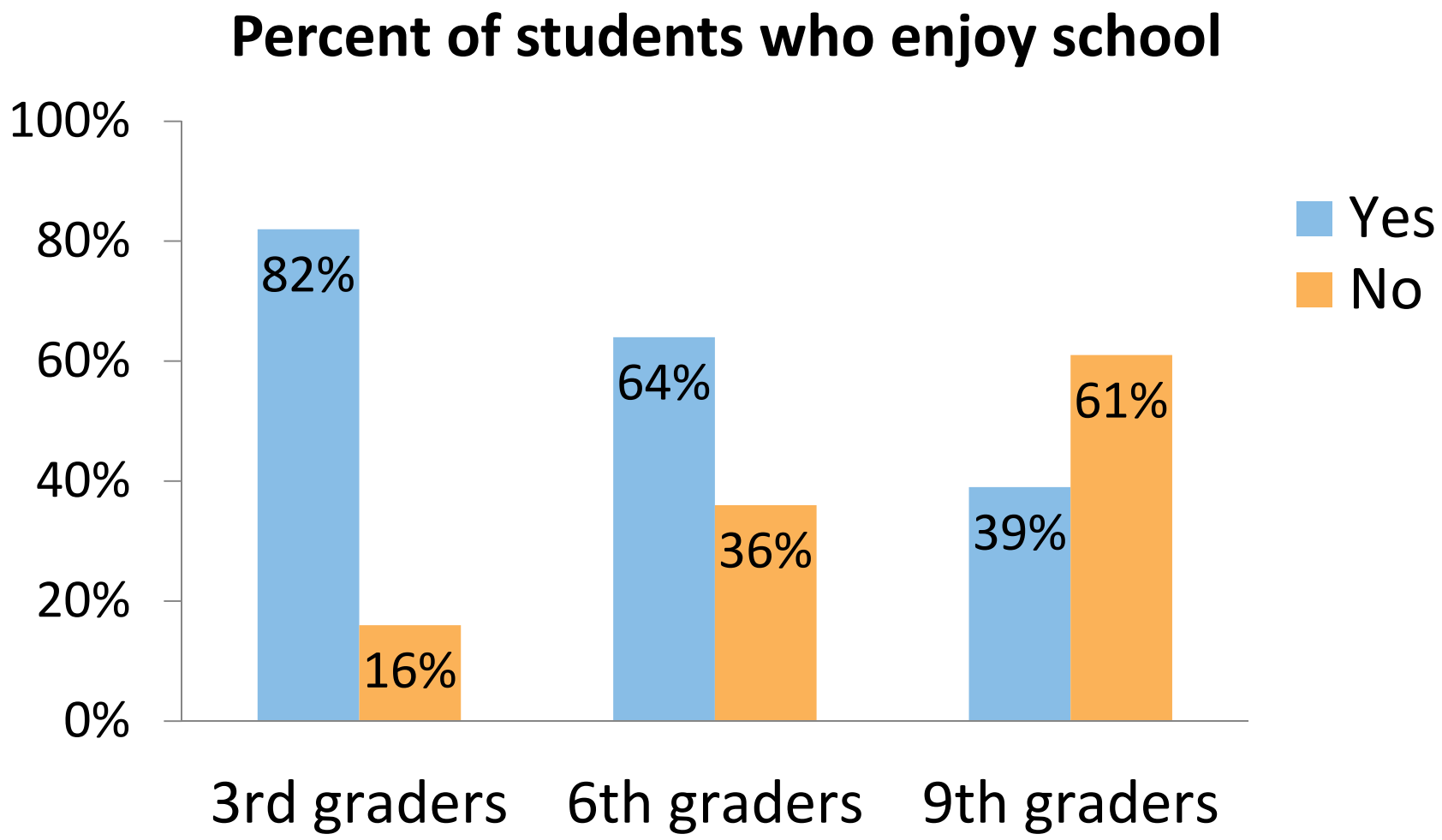
1 2 3 4 5

Focus the message.


Percent of students who enjoy school
100%
80%
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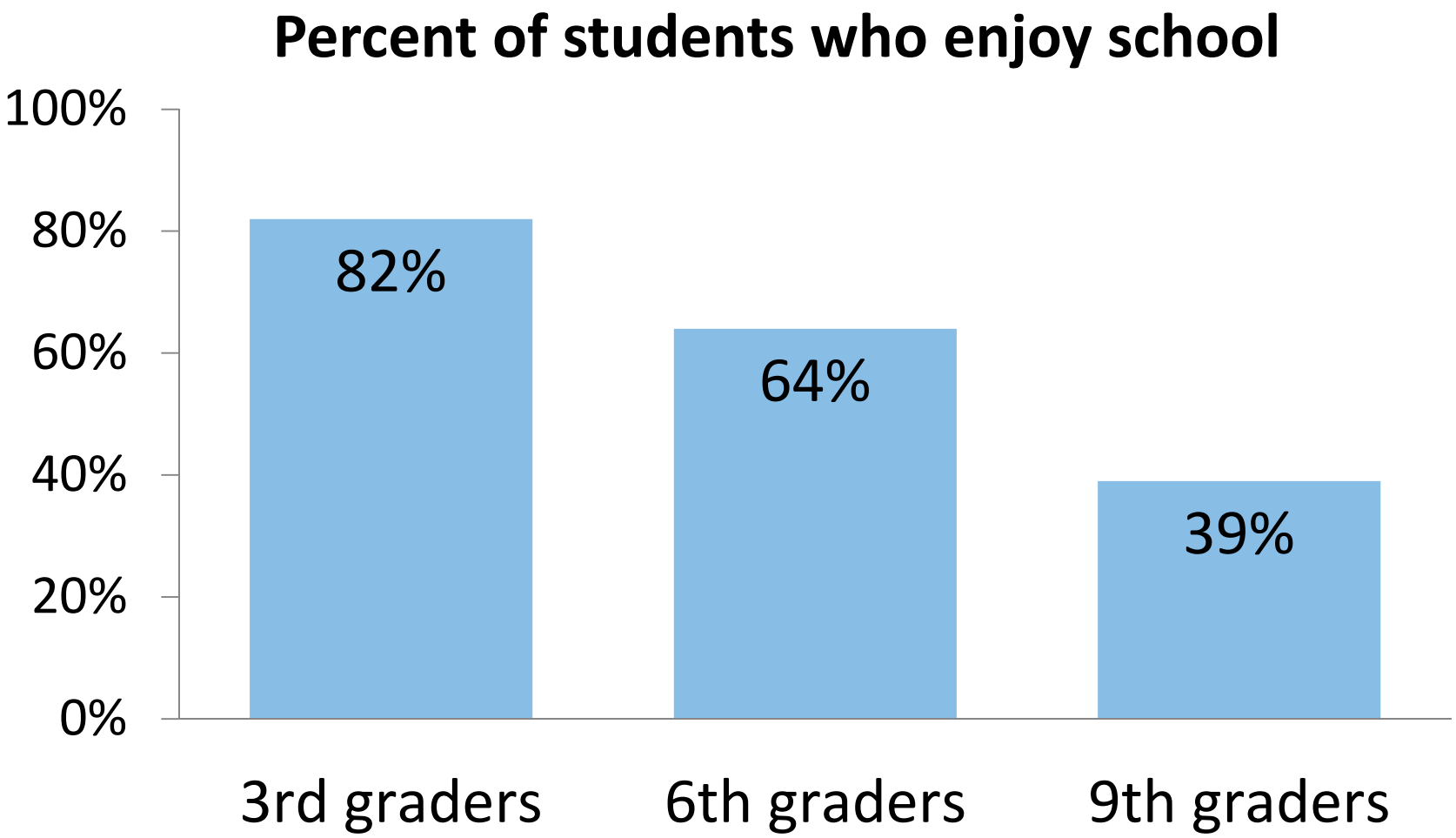
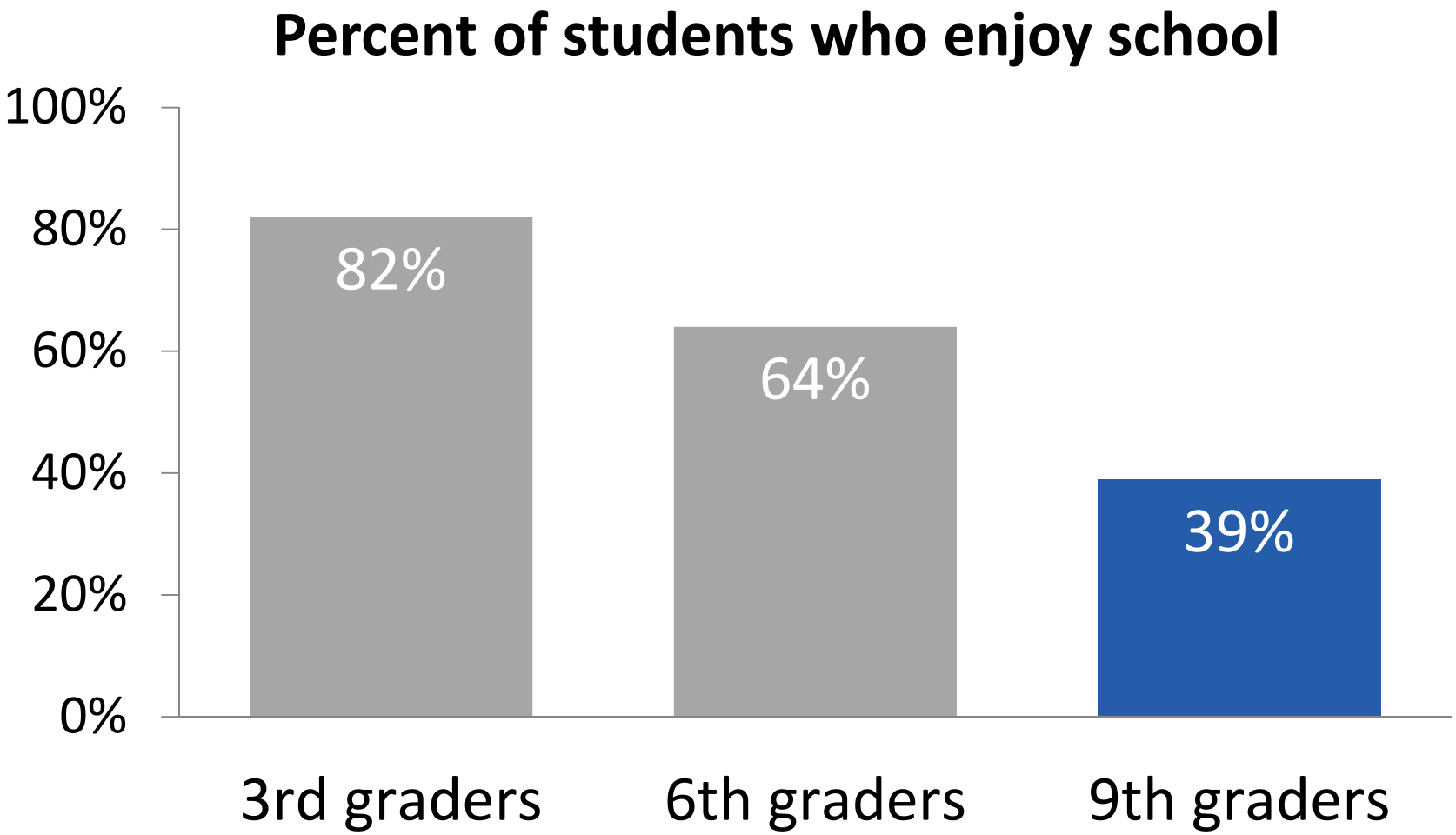
40%
20%
0%
82%
16%
64%
36%
39%
61%
3rd graders
6th graders
9th graders
Yes
No

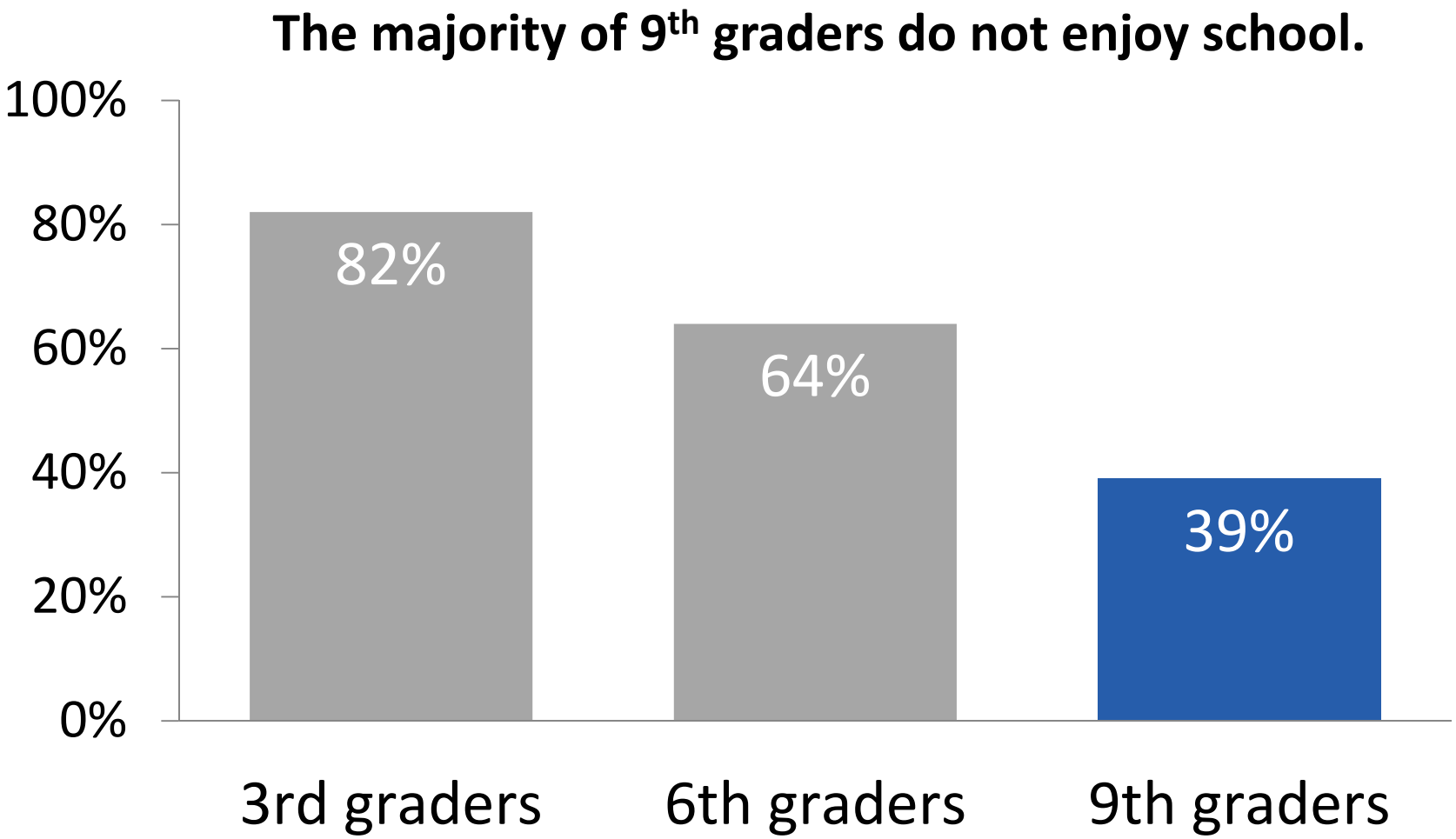
Focus the data.



Focus the message.



Focus the message even more.



What about **tables**?

Number of participants

Coalition	Adults	Youth
Coalition A	1,064	335
Coalition B	778	269
Coalition C	844	52
Total	2,686	656

Microsoft Office default

Number of participants

Coalition	Adults	Youth
Coalition A	1,064	335
Coalition B	778	269
Coalition C	844	52
Total	2,686	656

Nix the colorful shading.

Number of participants

Coalition	Adults	Youth
Coalition A	1,064	335
Coalition B	778	269
Coalition C	844	52
Total	2,686	656

Use minimal borders.

Number of participants

Coalition	Adults	Youth
Coalition A	1,064	335
Coalition B	778	269
Coalition C	844	52
Total	2,686	656

Use proper alignment.

Number of participants

Coalition	Adults	Youth
Coalition A	1,064	335
Coalition B	778	269
Coalition C	844	52
Total	2,686	656

Adjust row and column width and height.

Number of participants

Coalition	Adults	Youth
Coalition A	1,064	335
Coalition B	778	269
Coalition C	844	52
Total	2,686	656

Focus the message.

Number of participants

Coalition	Adults	Youth
Coalition A	1,064	335
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Total	2,686	656

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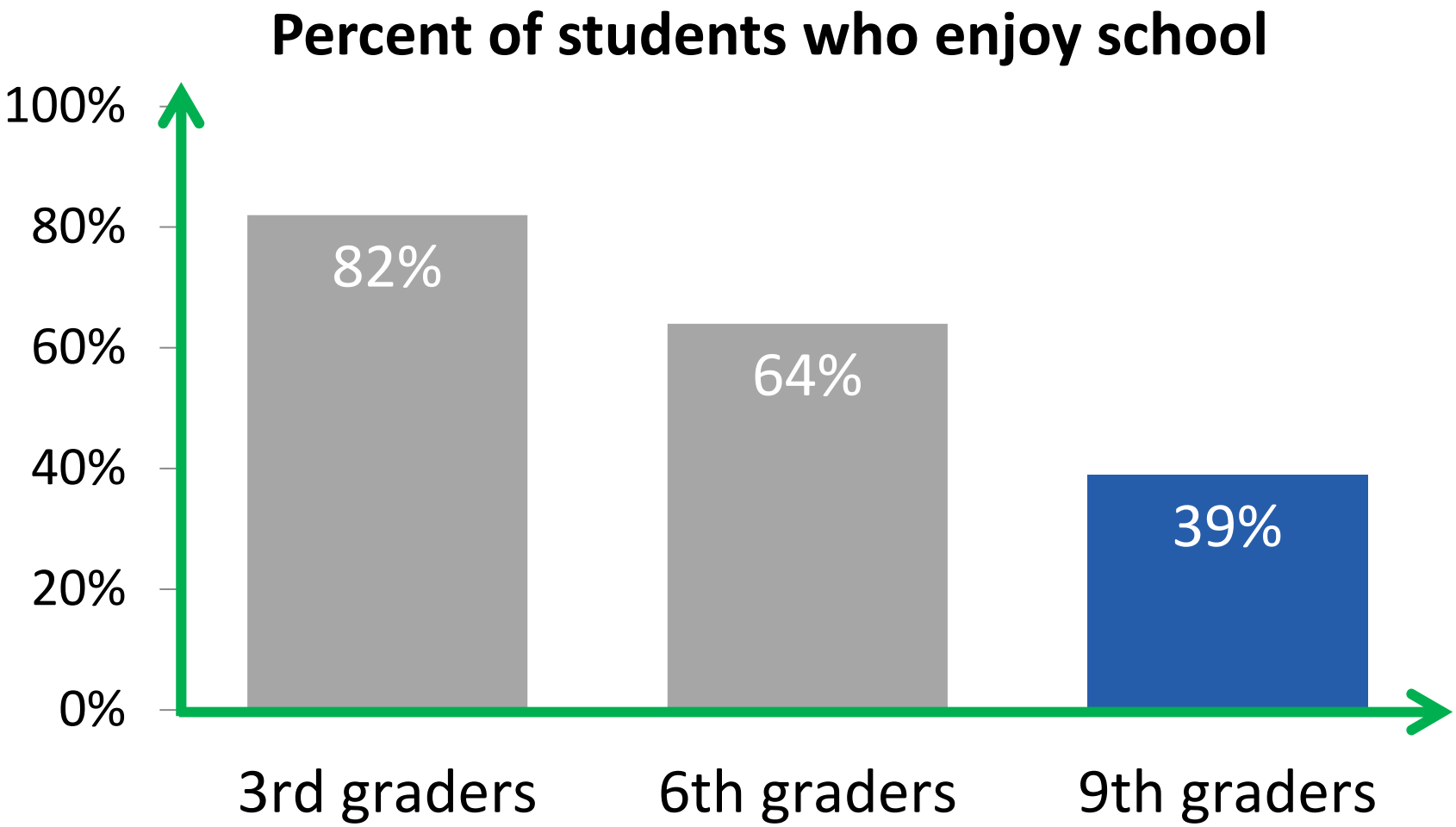
4.
5.

1 2 3 4 5

Display the graph properly
in your report.

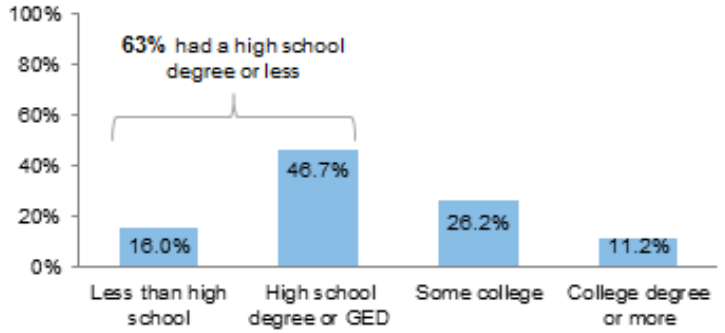
Size 2:1


Percent of students who enjoy school
100%
80%
60%
40%
20%
0%
82%
64%
39%
3rd graders
6th graders
9th graders

Avoid borders around the graph.

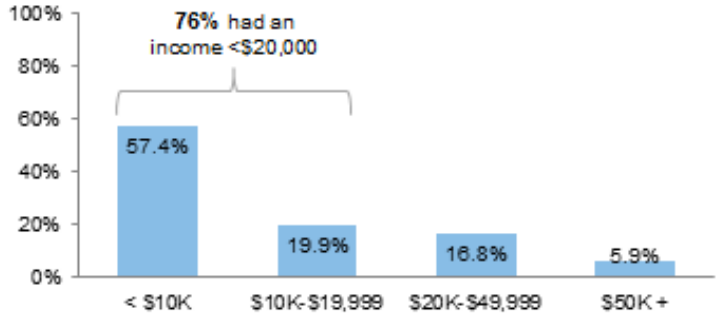
Nearly two-thirds (63%) of intensive participants had a high school degree or less (Figure 10). More than one-half (57%) had an income of less than $10,000 (Figure 11). Both of these proportions are higher than that of the quitline, indicating that the Cessation Grants are serving disparate populations that may not be as well served by the quitline.

Figure 10. Intensive participants' education level (N=2,520)



Missing = 258

Figure 11. Intensive participants' income level (N=2,376)



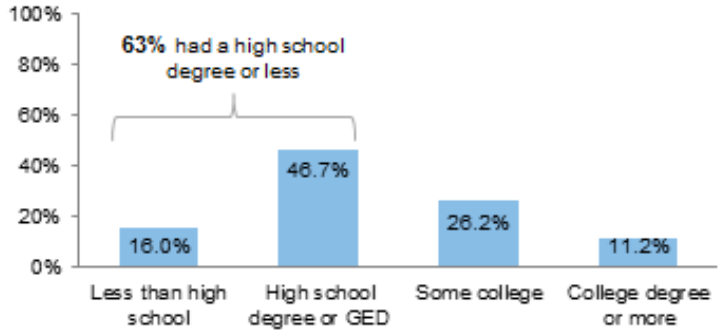
Missing = 402

Finally, **17% of female participants indicated that they were currently pregnant,** amounting to 7% of all intensive interventions. It is a success that the Cessation Grants are serving such a large proportion of participants for whom cessation will have benefits for both them and their infant. Of the 197 female participants who were pregnant, 78% were served by two particular grantees. These two programs focus heavily on serving this population.

Align graphs with the text.

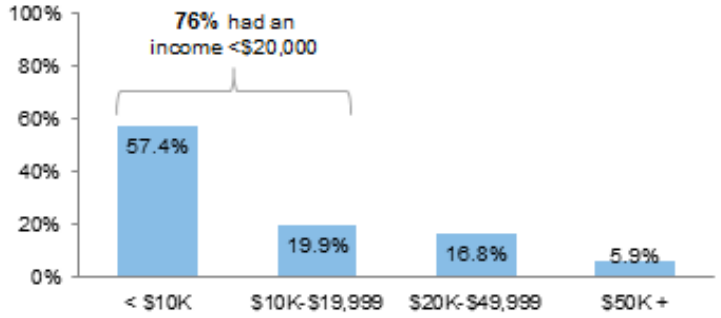
Nearly two-thirds (63%) of intensive participants had a high school degree or less (Figure 10). More than one-half (57%) had an income of less than $10,000 (Figure 11). Both of these proportions are higher than that of the quitline, indicating that the Cessation Grants are serving disparate populations that may not be as well served by the quitline.

Figure 10. Intensive participants' education level (N=2,520)



Missing = 258

Figure 11. Intensive participants' income level (N=2,376)



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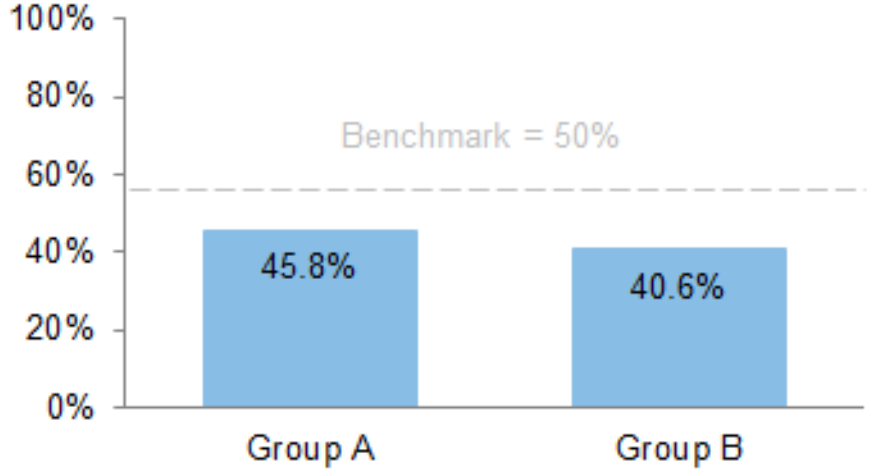
Finally, **17% of female participants indicated that they were currently pregnant,** amounting to 7% of all intensive interventions. It is a success that the Cessation Grants are serving such a large proportion of participants for whom cessation will have benefits for both them and their infant. Of the 197 female participants who were pregnant, 78% were served by two particular grantees. These two programs focus heavily on serving this population.

Wrap smaller graphs around text.

Figure 2 displays response rates for Group A and Group B. While the 41% response rate for Group A is below the 50% benchmark, the 46% response rate among Group B comes close to the minimum threshold. PDA considers these response rates to be a success given the disparate populations served by the programs. Nevertheless, to further address this issue a response bias analysis is described at the end of the section.

Figure 2. Response rate by intervention type



Other factors that can bias results are reasons that callers were not reached. Common reasons are that a surveyor was unable to reach a participant after 15 attempts, the phone number was disconnected or not in service, and the phone number was incorrect (Figure 3). This suggests participants are not reached for reasons out of the survey vendor's control. Further, the survey vendor is able to obtain data from almost all the participants that it reaches.

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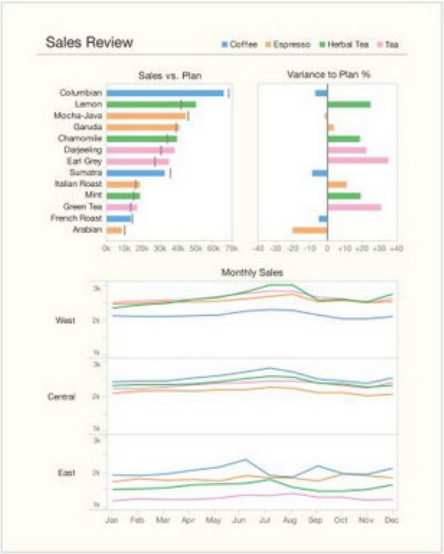

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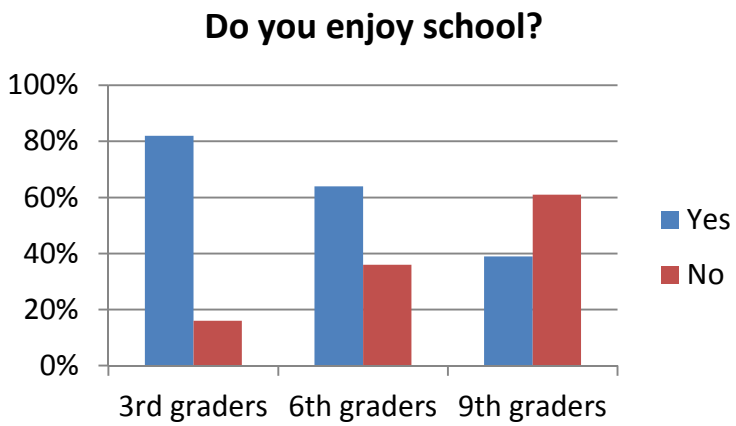

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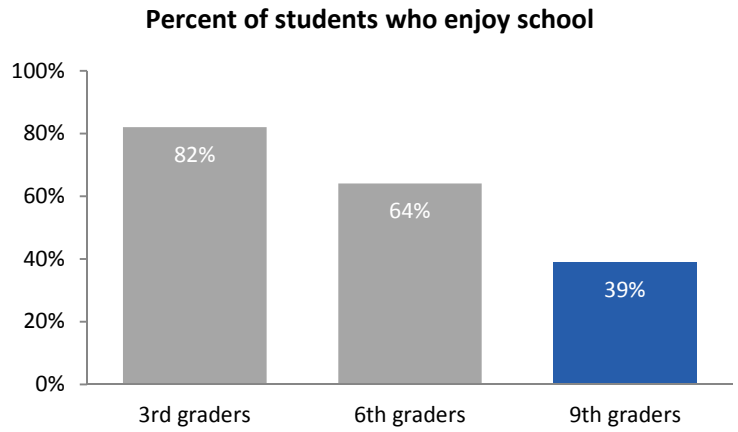

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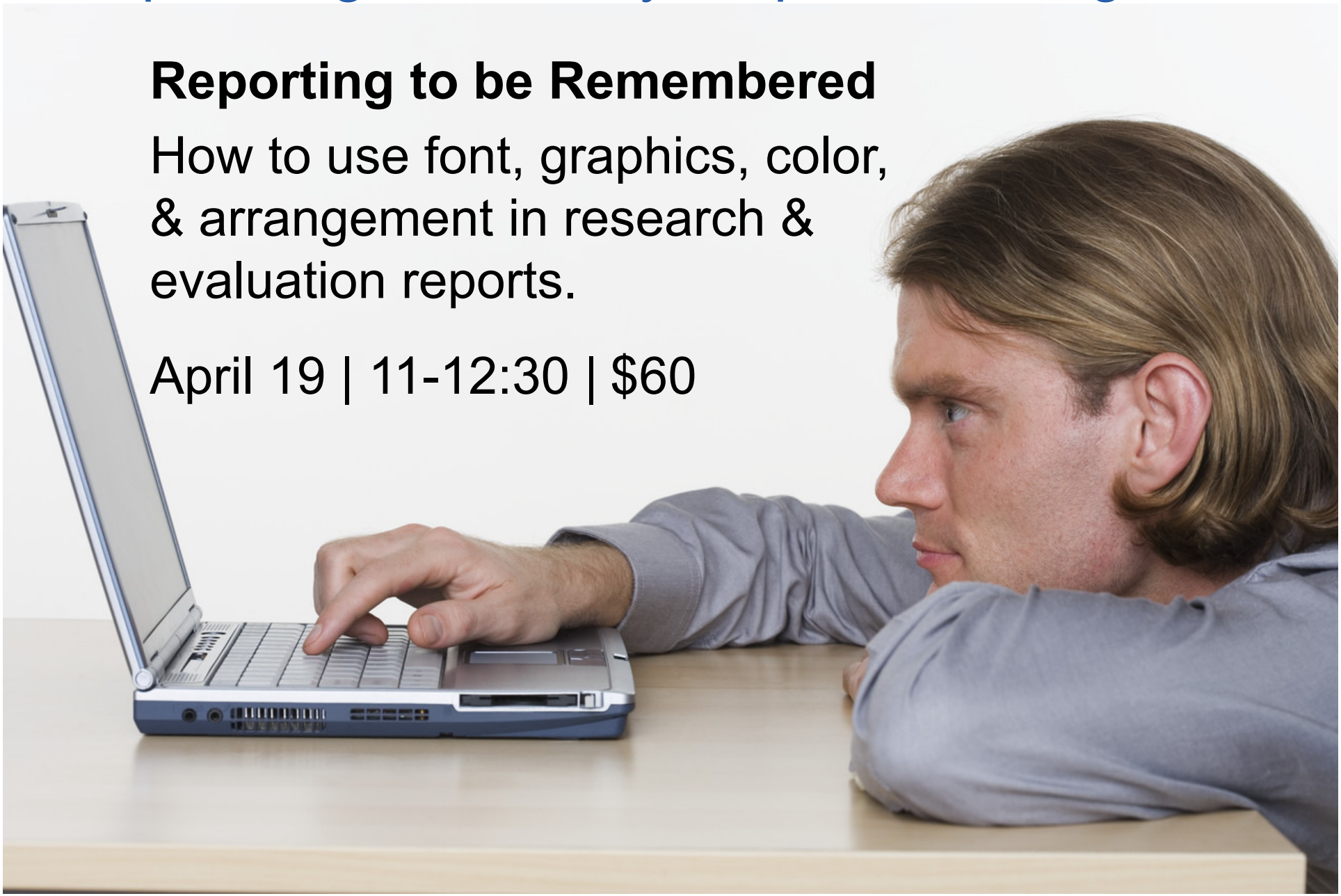

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