Terry Rosen Consultant LLC.

Training Plan Documents Guide for Creating Pareto Charts

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Clarification:

Script - All Parts contains all the scripts in order, including A/V and Live narrative (NSL).

For production purposes, the scripts were segregated into A/V and NSL groups. A/V scripts were then rendered as rolling credits for production. NSL scripts were recorded live as video demonstrations.

Slight audio and video improvements were conducted in Post.

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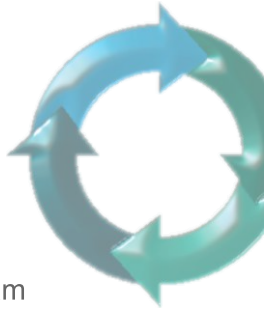
Terry Rosen Consultant LLC.

Six Sigma K12 Lesson Planner Template	
Item Name	**Content**
Unit Title:	**Creating Pareto Charts**
Major Learnings:	Various spreadsheet skill development, application of the Combo Chart, history of Pareto, origin of the 80/20 rule.
Relevance:	Pareto Charts are widely used in business and elsewhere. They provide a method of analysis that can aid us in prioritizing decisions. They are not complicated to create. The history of Pareto charts is interesting.
Purpose:	Students of this course can explore the methods of creating a Pareto Chart, (with Google Sheets). Once they create their first chart they can copy it and use it again with new data.
Activity Description:	Students will use the instructional video to create a Pareto Chart step-by-step. They will also have opportunities to increase their skills in spreadsheets.
Assessment methods:	Knowledge Checks - This course does not provide a grade or certificate. The knowledge checks may help students to identify areas of potential improvement. Each of five sections has two questions, for a total of ten questions. A summary of scores appears at the end.
Web components:	This course is available online. It collects no personal data. The course can be easily altered to function in an LMS system. Much of the content exists on a web server out side the course itself.
Writing log?	n/a - Notetaking may be valuable for some, but not required.
Lesson Description:	The student starts the course in a browser and navigates through slides explaining the details. The student should also have another browser TAB open with a blank spreadsheet to work with. As the lessons progress, students can pause or go back to complete each step. There is no time limit. The video will demonstrate every step clearly. Students can follow along, pausing as needed to complete every step. There are five sections, each with its own knowledge check. No grade or certificate is provided. Final scores may reveal opportunities for improvement.
Time required:	The time required will vary for each student for various reasons. Students will have varying skills with spreadsheets and there are optional portions of the course that can be skipped. A beginner may spend up to an hour completing all the content.
Examples:	The course is presented in a series of screen videos demonstrating each step. Voice content supports the steps. Currently there is no closed captioning.
Resources:	To complete the course, the user will need a browser and access to a spreadsheet program. The course is demonstrated with Google Sheets but could be completed in Excel or other Spreadsheet programs. The final two-part chart is easily available in Google and Microsoft spreadsheets. The final part can be created in other programs, but extra steps are required.
Web resources:	This is one location of the course. http://tragicrhapsody.com/Pareto/Pareto-Captivate-Alpha/
Homework:	The course example is based on a fictitious chocolate company. To avoid confusion, it's recommended that the first run through of creating a chart be completed using this data on screen. Users may want to develop their own data set before or during the course and use that data to create their chart.
Self-evaluation:	Each section provides two questions for students to self-check for their understanding. The final score page will show them how much improvement they might gain by doing the course again.



Training Plan - Creating Pareto Diagrams

Introduction: Welcome to Creating Pareto Diagrams

Learning Objectives: To become aware of the history and application of the Pareto diagram and to be able to create a Pareto chart from relevant data.

General topic description: Creating a Pareto Chart in a spreadsheet.

After this lesson, you will be able to:

- 1 - Arrange data in a chart format in a spreadsheet
- 2 - Sort the data from largest to smallest
- 3 - Automatically calculate the percentage values of categories in units and percents
- 4 - Create a combo chart (Pareto chart) and adjust the right-hand side to fit

Key Points: You should be able to follow directions as they appear in the videos. You should be able to pause/reverse the video as needed to complete the work. You should be able to access the optional content as desired to gain further depth of understanding of the topic. You should be able to create a chart of your own using your own data.

Primary Lesson Features:

- 1 - Knowledge is provided via spoken narrator video.
- 2 - Knowledge is gained through listening to the narrator and watching the screen.
- 3 - Expertise is acquired by applying the steps from the video into your spreadsheet file.
- 4 - Optional knowledge can be gained by visiting the optional content sections.
- 5 - There are no grades or certificates. Scores reveal areas of potential improvement.

Script:

The scripts for this course are lengthy and detailed. Scripts are used for both narration in live recordings and narration of steps required in the demonstration videos.

Detailed scripts can be found in the extended script document, the A/V scripts for teleprompter use, and the Narrative Sheet Live components that accompany the demonstration videos.

Knowledge Check:

Quiz #1 (1,2)

Which of these is NOT a reason to use a Pareto Chart?

1. To learn to create a data chart on paper.
2. To reduce the time we waste on things that are less important.
3. To help us focus on what is really important.
4. To prioritize our focus.

Which is NOT a reason to use the data in the video?

1. The numbers don't really matter in this process; only the labels do.
2. It will help you check that your work is correct as you learn.
3. Seeing the changes on the chart step by step will help you know if you're on track.
4. You'll be able to interpret better what is happening to the numbers and labels on the chart.

Quiz#2 (3,4)

In which direction should you select the data so the sort works just right?

1. Top right to bottom left.
2. Top left to bottom right.
3. Bottom left to top right.
4. Bottom right to top left.

When the sort is completed, what will happen to the chart?

1. The item with the largest number will be on top.
2. The item with the largest number will be on the bottom.
3. The labels for the items will be in alphabetical order from top to bottom.
4. The labels for the items will be in alphabetical order from bottom to top.

Quiz #3 Questions (5,6)

Why do we need to know the total of the data from our item list?

1. Each item in the list is divided by the total so we can see what percentage each item is.
2. We can compare this total to the total from the previous Pareto Chart.
3. We don't actually need the total. We put it there for accounting style.
4. We use the total to learn how the SUM() function works.

How do we label the PERCENT column?

1. With a percent symbol '%'.
2. We leave it blank because it's obvious.
3. With a 'P'. Just one letter because that column is so narrow.
4. We type 'Percent'.

Quiz #4 Questions (7,8)

What column is the 'Cumulative %' column in this tutorial? (As seen in this video)

1. E
2. C
3. D
4. F

What is the cumulative value for ‘Mr. Lorentz’ in cell E10?

1. 0.920…
2. 0.957…
3. 0.997…
4. 1

Quiz #5 Questions (9,10)

How do the two kinds of graph data differ?

1. The blue bars measure the quantity of the data items. The red line shows the cumulative percentage of the value, beginning with the largest and adding one item for each step.
2. The blue bars show less important information, and the red line shows more important information.
3. The blue bars show incidents of defects. The red line shows that defects are being reduced.
4. The bars are the Pareto diagram. The red line was added later by Ishikawa and is, therefore, an Ishikawa Diagram.

Why does the red line start above the left blue bar?

1. The top of the blue bar, and the bottom left point of the red line, are the same value. The blue measures the quantities individually, while the red measures them gradually added together.
2. If the red line was shown lower, it would overlap the blue bar and be difficult to see.
3. The red line has to start there so that the top of the red line reaches the 100% mark.
4. Actually, it can start from the top of any blue bar.

Storyboard Template Gagne Style

Title: Creating Pareto Charts	
Goal Summary: After this training learners will know the origin of the Pareto chart, how it relates to the 80/20 rule, be able to organize data into a spreadsheet, sort that data from highest to lowest, utilize various methods in Google Sheets, select the chart they need, ** understand how to use the chart to establish priorities, and be able to format the chart to the proper modern standard. The learner will also have the opportunity to explore the content in more depth by accessing optional content and/or exploring the extended content referenced at the end of the course.	
Client:	The course is available for free via LinkedIn
Contact:	n/a
Project Manager: **Team Members:**	The entirety of the course was produced by Terry Rosen for Terry Rosen Consultant © 2025
Project Scope Elements:	**Project Objectives:** The desired outcomes **Deliverables:** The results that the project will produce **Tasks and Activities:** The specific work required **Exclusions:** What is explicitly not part of the project **Constraints:** Restrictions that may impact the project **Assumptions:** Things that are true and necessary for project planning
Project Scope Details:	**Project Objectives:** Learners will be able to create Pareto charts to facilitate prioritization for work projects **Deliverables:** Learners will create charts in Google Sheets using the DATA provided in the lesson. **Tasks and Activities:** Learners will follow each step in the tutorial. Learners may also access optional content during the course. This content will include specific methods commonly used in Sheets but may be unknown to the learner. Learners will complete five units, and each unit will include two self-assessment tasks in order to gauge skill acquisition. These assessments can be taken again to reach better mastery. **Exclusions:** The course is intended for learners that already have a basic understanding of Google Sheets. The course is not intended to introduce the fundamentals of Google Sheets. **Constraints:** A computer will be needed to complete the course, and users will need to have a Google email account in order to duplicate the lessons. Learners will have various levels of skill when taking the course and therefore may require different amounts of time to complete the content. **Assumptions:** Learners should already have a working knowledge of spreadsheets and specific knowledge of Google Sheets.

Part I

GET ATTENTION **Present something engaging and relevant Present an engaging video or animation** **Incorporate something interactive**
Introduce myself on video to what's coming including optional content. Describe what a Pareto diagram is. Remind learners that they can provide suggestions for the course.

LEARNING OBJECTIVES **State up front what the learners will be learning Present them in conversational language** **If possible, spike interest by mentioning optional content for those who wish to go further**
Learners will understand the origin of the Pareto chart and how it was used. Learners will access optional content to discover that no one knows for sure who first created the Pareto charts.

STIMULATE RECALL **To ease into new learning, connect new information to existing experience** **Ask the audience if they already know X Ask at three different levels to engage all levels**
Describe the value of prioritizing what we do and why we do it. Refer to Spreadsheets and the fact that they can make charts.

PRESENT THE CONTENT **Deliver 1 to 3 chunks of content Include personal experience when possible** **Include clear examples Provide various modalities and senses**
Describe in general the steps required to complete the Pareto chart. Refer to my experience creating a speed chart.

PROVIDE GUIDANCE **Mnemonics Flashcards for vocabulary Journaling Other resources** **Recommended tools and habits**
Mention that the learner will complete steps, step by step, and the content can be paused for learners with less expertise. Explain the value of using the data as presented in the tutorial.

OPPORTUNITY TO PRACTICE **Processes especially require practice to reinforce the learning Multiple-choice Surveys** **Simulations Gamification Interactives Order of operations puzzles**
Learners have an opportunity to access optional content. This segment includes the history of the Pareto chart and the fact that no one knows for sure who created the first chart

PROVIDE FEEDBACK

Kaizen Provide details about why a quiz answer is incorrect Ask 'How can you improve?'
Ask 'Would you like help improving this?' Eliminate negativity from your feedback

This course does not provide reflection on wrong answers. But it does provide unlimited retries for the questions.

ASSESS PERFORMANCE

Do NOT use true/false or multiple-choice tests, unless they can be retaken to mastery
Gamification can reinforce processes Provide explicit suggestions for improving skills

In each section, there are two knowledge checks. Most of the questions are multiple-choice with four possible answers. Learners can retake the knowledge checks as needed.

ENHANCE TRANSFER AND RETENTION

A business card with basic nomenclature as a reference Create an online variable interactive
A motion video of a live experience will have more impact than an illustration or photo

The use of video demonstration of the Sheets will make the experience easy to follow and concrete.

Part 2

GET ATTENTION

Present something engaging and relevant Present an engaging video or animation
Incorporate something interactive

Review the essentials from Unit 1 - relate them to the upcoming content
Continue the video demonstration sequence. Describe the need for data with a short summary of the needs. Explain our sample data will involve cases of chocolates.

LEARNING OBJECTIVES

State up front what the learners will be learning Present them in conversational language
If possible, spike interest by mentioning optional content for those who wish to go further

Present the first chart visual, and describe the content as the exemplar. Explain the labels in order.

STIMULATE RECALL

To ease into new learning, connect new information to existing experience
Ask the audience if they already know X Ask at three different levels to engage all levels

Explain why the chart does not start in cell A1. Please set up your labels and data the same way I have it. This will reduce mistakes by making your first chart less complicated. Experts can ignore this requirement.

PRESENT THE CONTENT

Deliver 1 to 3 chunks of content Include personal experience when possible
Include clear examples Provide various modalities and senses

Demonstrate where to insert the data in the sheet as seen in the video.
Demonstrate how to sort the data from largest to smallest.

PROVIDE GUIDANCE

Mnemonics Flashcards for vocabulary Journaling Other resources
Recommended tools and habits

Explain that future charts will not necessarily need to be created from scratch. The Chocolate chart can be copied. The labels and data can then be switched, and more data lines can be inserted into the new chart. This is true of many charts in Spreadsheets.

OPPORTUNITY TO PRACTICE

Processes especially require practice to reinforce the learning Multiple-choice Surveys
Simulations Gamification Interactives Order of operations puzzles

Learners should be following along as they watch the demonstration. Or, they have watched it once, then watched it again to create the work content.

PROVIDE FEEDBACK

Kaizen Provide details about why a quiz answer is incorrect Ask 'How can you improve?'
Ask 'Would you like help improving this?' Eliminate negativity from your feedback

This course does not provide reflection on wrong answers. But it does provide unlimited retries for the questions.

ASSESS PERFORMANCE

Do NOT use true/false or multiple-choice tests, unless they can be retaken to mastery
Gamification can reinforce processes Provide explicit suggestions for improving skills

In each section, there are two knowledge checks. Most of the questions are multiple-choice with four possible answers. Learners can retake the knowledge checks as needed.

ENHANCE TRANSFER AND RETENTION

A business card with basic nomenclature as a reference Create an online variable interactive
A motion video of a live experience will have more impact than an illustration or photo

The spoken word in conjunction with the video tutorial facilitates multiple modalities of learning. The occasional live video of me talking connects me to the voice, and the voice to the demonstration. The inclusion of optional content provides learners a way to increase the depth of knowledge without undue complexity to reinforce the concepts included.
Optional 1: compares the Pareto Principle described for the first time by Dr. Juran. Explain why we don't know who created the first chart. Then provide examples of the 80/20 rule.

Part 3

GET ATTENTION **Present something engaging and relevant Present an engaging video or animation** **Incorporate something interactive**
Review the essentials from unit 2 - relate them to the upcoming content Continue the video demonstration sequence.

LEARNING OBJECTIVES **State up front what the learners will be learning Present them in conversational language** **If possible, spike interest by mentioning optional content for those who wish to go further**
Learners will discover and apply methods for calculating the SUM (total), referencing cells by letter/number, the use of the tilde button to examine functions, and how to reformat number values to best suit the needs of the chart.

STIMULATE RECALL **To ease into new learning, connect new information to existing experience** **Ask the audience if they already know X Ask at three different levels to engage all levels**
Explain how the collection of data, and then sorting it, facilitates the next steps in creating the chart.

PRESENT THE CONTENT **Deliver 1 to 3 chunks of content Include personal experience when possible** **Include clear examples Provide various modalities and senses**
Explain the following steps one at a time: The label for total, and calculate the sum of all items. Explain the new column values by referring to the cells required. Demonstrate how to complete the cell values one at a time. (There is a way to do this all at once, but the course is created with a beginner in mind.) Optional content 1: How the tilde button works to shift between function view and normal view. Also learn about the value of switching back and forth. Optional content 2: How to format the cells to 2 decimal points of accuracy. This makes the number values easier to see and eliminates rounding. This also presents the possibility for custom number formatting.

PROVIDE GUIDANCE **Mnemonics Flashcards for vocabulary Journaling Other resources** **Recommended tools and habits**
Encourage learners to use the tilde key to examine what is happening with the data, and where it's going. In the intro video describe the Optional Content options to generate interest.

OPPORTUNITY TO PRACTICE

Processes especially require practice to reinforce the learning **Multiple-choice Surveys** **Simulations** **Gamification** **Interactives** **Order of operations puzzles**

Remind learners that when they're done with the simulation data they can go back and review any time they like. Suggest they start a new chart as soon as possible with their own data. Then continue the demonstration tutorial.

PROVIDE FEEDBACK

Kaizen **Provide details about why a quiz answer is incorrect** **Ask 'How can you improve?'** **Ask 'Would you like help improving this?'** **Eliminate negativity from your feedback**

This course does not provide reflection on wrong answers. But it does provide unlimited retries for the questions. The suggestions button provides learners the opportunity to connect online if they have questions.

ASSESS PERFORMANCE

Do NOT use true/false or multiple-choice tests, unless they can be retaken to mastery **Gamification can reinforce processes** **Provide explicit suggestions for improving skills**

In each section, there are two knowledge checks. Most of the questions are multiple-choice with four possible answers. Learners can retake the knowledge checks as needed.

ENHANCE TRANSFER AND RETENTION

A business card with basic nomenclature as a reference **Create an online variable interactive** **A motion video of a live experience will have more impact than an illustration or photo**

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Part 4

GET ATTENTION

Present something engaging and relevant **Present an engaging video or animation** **Incorporate something interactive**

Review the essentials from unit 3 - relate them to the upcoming content
Continue the video demonstration sequence.
Explain that this part is challenging, and they're getting close to finishing.

LEARNING OBJECTIVES

State up front what the learners will be learning Present them in conversational language
If possible, spike interest by mentioning optional content for those who wish to go further

Students will practice using cell references to complete the functions needed. Learners will then find out how to reformat the numeric data. Next, the learners will learn how to hide a column, but will not yet know why.
The optional content will be a lesson for beginners on how to find the function they need.

STIMULATE RECALL

To ease into new learning, connect new information to existing experience
Ask the audience if they already know X Ask at three different levels to engage all levels

Remind learners that they have completed the source data and are now learning how to accumulate the data.

PRESENT THE CONTENT

Deliver 1 to 3 chunks of content Include personal experience when possible
Include clear examples Provide various modalities and senses

Remind learners that they've completed inputting the data and sorting the data.
Demonstrate how to add the total box. Continue demonstrating how to accumulate data from the top down. Then demonstrate how to convert the quantity values to percents.
The last step is to format the percents into a style that is useful.
The optional content presents a short lesson on how to find functions. Use the MEAN function, and possibly the STDEV (standard deviation).

PROVIDE GUIDANCE

Mnemonics Flashcards for vocabulary Journaling Other resources
Recommended tools and habits

Remind learners they can play the video again and pause it as needed to make sure they're completing the steps as designed. Provide a reminder that the column that is hidden MUST be hidden for the results to be accurate in the last section. Explain how to Unhide a column.

OPPORTUNITY TO PRACTICE

Processes especially require practice to reinforce the learning Multiple-choice Surveys
Simulations Gamification Interactives Order of operations puzzles

As learners follow the steps on the screen they are practicing what they'll need to do with their own data. The knowledge checks allow students to answer the questions without risk. At this point they should be exploring the questions with near-zero anxiety over testing.

PROVIDE FEEDBACK
Kaizen Provide details about why a quiz answer is incorrect Ask 'How can you improve?' Ask 'Would you like help improving this?' Eliminate negativity from your feedback
This course does not provide reflection on wrong answers. But it does provide unlimited retries for the questions.

ASSESS PERFORMANCE
Do NOT use true/false or multiple-choice tests, unless they can be retaken to mastery Gamification can reinforce processes Provide explicit suggestions for improving skills
In each section, there are two knowledge checks. Most of the questions are multiple-choice with four possible answers. Learners can retake the knowledge checks as needed.

ENHANCE TRANSFER AND RETENTION
A business card with basic nomenclature as a reference Create an online variable interactive A motion video of a live experience will have more impact than an illustration or photo
The spoken word in conjunction with the video tutorial facilitates multiple modalities of learning. The occasional live video of me talking connects me to the voice, and the voice to the demonstration. The inclusion of optional content provides learners a way to increase the depth of knowledge without undue complexity to reinforce the concepts included.

Part 5

GET ATTENTION
Present something engaging and relevant Present an engaging video or animation Incorporate something interactive
Review the essentials from unit 4 - relate them to the upcoming content Continue the video demonstration sequence Prepare the learner for completion of the chart

LEARNING OBJECTIVES
State up front what the learners will be learning Present them in conversational language If possible, spike interest by mentioning optional content for those who wish to go further
The learner will discover with precision how to select the data for the chart to make the chart as easy as possible. They then will see a chart appear. Learners will be able to distinguish between a bar or combo chart, and to select the combo chart if needed. Learners will be able to connect the data to the chart visually. Learners will be able to detect a red line across the bottom. Learners may choose to watch the content diving deeper into the chart selection process. Finally, learners will discover the process needed to shift the red line to the the top of the left-most blue bar. Learners will come to understand that shifting the red bar this way is the ideal version of the chart.

STIMULATE RECALL

To ease into new learning, connect new information to existing experience
Ask the audience if they already know X Ask at three different levels to engage all levels

Explain that the time for the chart has arrived. Prepare them for steps that may seem difficult for some and remind them they can stop at any time or go back. Explain that the data part of the task is complete. Anticipate with them that the chart is ready to be made. Display the exemplar image from earlier in the course to remind them what the goal is.

PRESENT THE CONTENT

Deliver 1 to 3 chunks of content Include personal experience when possible
Include clear examples Provide various modalities and senses

Display the exemplar image from earlier in the course to remind them what the goal is. Carefully explain how to shift the redline above the left-most blue bar. Continue explaining how to align the red bar so that each additional bar, if stacked on top of each other, represents the height of the next red line data point. Distinguish the left-side data as numeric from the right-side access which is percents. Reinforce that the percents now correlate exactly with the numeric counts. Explain that THIS is the way the chart is supposed to look.

PROVIDE GUIDANCE

Mnemonics Flashcards for vocabulary Journaling Other resources
Recommended tools and habits

Provide guidance for what to do if the chart that appears is incorrect. For beginners, provide a bit more content re. Chart selection, but do not dive too deep so learners can focus on the current task at hand.

OPPORTUNITY TO PRACTICE

Processes especially require practice to reinforce the learning Multiple-choice Surveys
Simulations Gamification Interactives Order of operations puzzles

The two knowledge checks will help learners grasp the exact nature of what is shown. Slowly demonstrating the steps needed in the video will best prepare learners to duplicate what they have seen.

PROVIDE FEEDBACK

Kaizen Provide details about why a quiz answer is incorrect Ask 'How can you improve?'
Ask 'Would you like help improving this?' Eliminate negativity from your feedback

This course does not provide reflection on wrong answers. But it does provide unlimited retries for the questions.

ASSESS PERFORMANCE

Do NOT use true/false or multiple-choice tests, unless they can be retaken to mastery
Gamification can reinforce processes **Provide explicit suggestions for improving skills**

In each section, there are two knowledge checks. Most of the questions are multiple-choice with four possible answers. Learners can retake the knowledge checks as needed.
After the fifth unit's knowledge checks a screen will appear with the overall totals for the content of the course. Suggest that those who desire to improve can easily do the course again to gain more mastery. Outline the extended content from the final slide for those with a higher level of interest.

Thank participants for doing the course and remind them of the opportunity to provide feedback online.

ENHANCE TRANSFER AND RETENTION

A business card with basic nomenclature as a reference **Create an online variable interactive**
A motion video of a live experience will have more impact than an illustration or photo

The spoken word in conjunction with the video tutorial facilitates multiple modalities of learning. The occasional live video of me talking connects me to the voice, and the voice to the demonstration. The inclusion of optional content provides learners a way to increase the depth of knowledge without undue complexity to reinforce the concepts included.

All Parts

Pareto Script

V01.1-Intro

Hi, Welcome to Creating Pareto Diagrams. I'm Terry Rosen, teacher of 26 years and Certified Quality Engineer. I'll be showing you step-by-step how to create a Pareto diagram in Google Sheets. Almost exactly the same process will work in Excel. I'll also be explaining a bit of the history as we go. You'll see a button in each section labeled 'Optional'. Click these if you're interested in learning a bit more.

As you move through the content you'll be presented with quiz questions. This training is not meant to provide you with a grade. In fact, the assessed grade at the end will reflect pass/fail information and no percentages. There's a rationale for never doing letter or percent grades. The short version is, if you only needed an 80% to pass, it'd be better to eliminate the 20% of the questions that didn't matter, and grade pass/fail.

Use the grading in each section to gauge your own success. If you want to work toward better mastery, I encourage you to review this content and try again. You'll also see a suggestions button. Use this to help me improve the content of the course. Typically, like anyone else, I'll make a spelling or grammar error. Click the suggestion button to inform me which page or section the error occurred on, and what kind of error it was. You can also add whatever suggestions you like, and over time I'll implement them. If you prefer, you can connect with me directly via email at Terry Rosen Consultant @ gmail. Com.

Alright, let's get to it.

V.1.1-Part I: What's a Pareto Diagram

We all prioritize things in our lives. Everyone has created a to-do list at some point. In my own life, I've created a list and then circled the three most important or urgent items to make sure I did those first. Once they were done I'd prioritize the next three, and so on, and it worked pretty well.

Prioritizing helps us focus on what is really important and reduces the time we waste, or at least balances what is urgent with what's important.

A Pareto diagram is just a fancy system for prioritizing.

For this course, we're going to use a Google Sheet. An Excel spreadsheet is fine, or any other sheet format. This can also be easily done on paper.

Here is the list of steps we'll use. I'll provide you video for every step.

The steps are:

Gather your data

Put the data into the sheet

Include a label for each data item

Order the data numerically from highest to lowest

Sum the numeric totals

Convert the numeric to percentages

Create an accumulating set from the data

Hide a column

Create your chart - and finesse it a bit

Interpret your results

This may seem like a lot. For a challenge years ago I managed to create a chart on video in two minutes. It took a few tries.

For a first-time Pareto chart I'd guess you'll need ten to twenty minutes, including putting the data together.

At the end of the course, I'll share a few tidbits of history around the Pareto method. Feel free to skip that, there won't be any questions on it.

I recommend using the data I provide in the course for your first try. It can get confusing, and seeing the changes from one step to the next will help you get clear on what's happening to the data as we move from step to step.

Quiz #1

Which of these is NOT a reason to use a Pareto Chart?

1. To learn to create a data chart on paper.
2. To reduce the time we waste on things that are less important.
3. To help us focus on what is really important.
4. To prioritize our focus.

Which is NOT a reason to use the data in the video?

1. Because the numbers don't really matter in this process. Only the labels do.
2. It will help you check that your work is correct as you learn.
3. Seeing the changes on the chart step by step will help you know if you're on track.
4. You'll be able to better interpret what is happening to the numbers and labels on the chart.

V.1.2

(Optional)

History of the Pareto Diagram

Who invented the Pareto chart? There's some ambiguity as to the origin, so let's take this step by step.

1. Vilfredo Pareto noticed the 80/20 nature of distribution in land ownership. But as far as anyone knows, he never created any chart format of his observation.
2. Joseph Juran is well documented as having applied the concept in quality and management. Though the novel application was his, he referred to it as the Pareto Principle. He is known to have said that he should have just called it the Juran Principle. It also seems likely that he was the first to apply the idea to a histogram. The histogram bars would display from tallest to shortest and provide possible guidance as to which problems to focus our attention on. This type would persist into the 1980's.
3. But the Pareto diagram in use today includes a bar that is above the histogram. In effect it creates a dual chart. Histogram data on the left, and cumulative data with the line above and the axis on the right. There is not yet any consensus as to the origin. It's also possible that Dr. Ishikawa may have been the first to add the line at the top, but apparently there is no documented record to establish the true origin.

V.2.1

Part II - The Data

To create a Pareto chart we first need some data. The data consists of a label, the name of what we're going to measure, and the quantity or amount of what we're measuring. For instance, if we made five different cars, and in different amounts, the first line of data might be Sports, with a value of 3,000. So, for each item you'll need a label, and a number. In the sample data we're measuring the number of cases sold for each type of chocolate we make.

V.2.2

Step 1: Gather your data - Show this title

Video of me

In this step we put our data into our Sheet. Our project here has to do with a fictional Japanese chocolate factory in the fictional Japanese City of Obi. Obi City, Japan.

Video of sheet

You can see how I've arranged my data with labels on the left and the numbers to the right. You can also see that I have labels on the top representing the content of the two columns LABELS and QTY or Quantity. I also indicate this is in the thousands of packages. For example, last month they sold 26,700 boxes of Chonky Donks.

If you're diving in with your own data be sure to put your labels on the left, and your data values to the right, lining up each number with the label you're using. You'll use this format for the data in upcoming steps.

For your custom data, do not forget to include the units at the top. Without it another user may not be able to interpret what's going on.

Pause your video so you can take a few minutes and get your data to match this set exactly.

(Pause)
FADE
UNFADE
(Unpause)

V.2.3

Step 2: Sort the data - Show this title - Video of sheet

Now you'll sort the data so it's in order from largest to smallest.

You can see I select the cell under the quantity (or QTY) box. I click and hold, the top number cell, not the word cell on the left. NOTE: we need to NOT select the category labels on the top. These do NOT need to be sorted. Then I drag my selection from top-right to the bottom-left of the chart. If you're new to Sheets this might take a few tries. We select it this way so our sort comes out just right. Sorting it another way may not get you the results you need.

To cause the sort we click on the Data button on the tool tab at the top. Then select Sort Range (??) Column Z to A. On my chart you can see my selection started with column E then ended in column D. This shows the sort will occur from right to left. And it causes the labels to be sorted along with their numbers.

This means the sort will focus on the numbers and will NOT sort the word column in alphabetical order. Your data may be in different columns than mine, but in the video you'll see it as described.

Now Press ENTER.

You'll see the data and labels have shifted so the numbers are in order, largest to smallest. You may want to verify the labels have shifted correctly as well. Check that the labels are accurately placed next to their numbers. If they're in the wrong places now, you'll need to go back a step, and try again, to get it just right.

Quiz#2 (2-3 questions)

In which direction should you select the data so the sort works just right?

1. Top right to bottom left.
2. Top left to bottom right.
3. Bottom left to top right.
4. Bottom right to top left.

When the sort is completed what will happen to the chart?

1. The item with the largest number will be on top.
2. The item with the largest number will be on the bottom.
3. The labels for the items will be in alphabetical order from top to bottom.
4. The labels for the items will be in alphabetical order from bottom to top.

V.2.4

Optional content

The Origin of the Pareto Principle

In 1906 Vilfredo Pareto noticed that roughly 80% of the land in Italy was owned by just 20% of the people. Sometimes called the 80 20 rule, describes the idea that 80% of consequences come from 20% of the causes. Dr. Juran then applied it to factory production. When someone asked him what the method was called, without thinking he said the Pareto Principle. Later he reflected on the fact that he should have just called it the Juran Principle. After World War II it's one of the tools he shared with the Japanese, incl. Dr. Ishikawa. Juran probably added the histogram as a visual form of the idea. Ishikawa is well known for many innovations in manufacturing, but nowhere does he claim to have added the line above the bar graph. This line shows the accumulated quantity. Juran also never claimed that innovation.

Here are a few examples you might explore of the 80/20 rule:

80% of defects are created in 20% of the processes
80% of your grocery expense is caused by 20% of the items bought
80% of construction projects utilize only 20% of the tools used
80% of LinkedIn reactions come from just 20% of your followers
20% of the clothes you wear 80% of the time
20% of what we eat causes 80% of our weight gain
20% of cities have 80% of the population
20% of your inventory occupies 80% of the space

V.2.5 end clip - 2 sentences

Video of me

Hopefully that wasn't too stressful. The next steps are a bit trickier, and I've simplified each step to make the process as clear as possible.

V.3.1

Part III

You'll see in the video that I've typed **Total** under the labels column, and then aligned it to the right. In the cell to the right (E13), we Sum the column. There are various ways to do this. For clarity I'll demonstrate that functions can be typed in.

=SUM(E6:E12)

You'll see the total is 79.7. We need this total in order to calculate the percents for each type of chocolate. We also use this value later.

To convert the raw numbers to percents we need another column.
To the right of the quantity column type a percent sign.
Directly under that percent sign we will type a new formula. It's slightly different from our SUM formula.
While in cell D4 type the equal sign '=', then C4 - the location of our first number value, then the divide sign '/', and finally the cell with your total value, in this case C11. This calculation results in a value of 33%. In my chart it has many decimal places after the 33 which we can ignore, or format differently if we like.
There is a quick shortcut for the next step, but we're going to keep things simple. Just duplicate the process for each item. The second item will be typed like this '=C5/C11'. The next is '=C6/C11' and so on. You don't need to create an equation next to the TOTAL value.

Quiz #3 Questions

Why do we need to know the total of the data from our item list?

1. Each item in the list is divided by the total so we can see what percentage each item is.
2. We can compare this total to the total from the previous Pareto Chart.
3. We don't actually need the total. We put it there for accounting style.
4. We use the total to learn how the SUM() function works.

How do we label the PERCENT column?

1. With a percent symbol '%'.
2. We leave it blank because it's obvious
3. With a 'P'. Just one letter because that column is so narrow.
4. We type 'Percent'

Optional content

V.3.2

The Tilde Key

At this point you might be interested to learn about the Tilde key '~'. This key on your keyboard should be to the left of the '1' key which is directly above the 'Q' key. To use the tilde key, first press and hold the CTRL key. Then hit the tilde key.

You should see the calculated number have been replaced by the formulas that created them. Pressing the tilde key again reverts the cells back to showing just numbers, and no formulas. This can be extremely useful for verification of your formulas. In some cases it may even be easier to type all the formulas in this mode and then revert back to normal to observe the numbers created.

V.3.3

Formatting the decimal values

To format cells to your specification, you first select the cells that need the format.
For this example we will convert these long decimal numbers to just two decimal places of accuracy.
Next click the Format button above the toolbar.
Use the mouse to click the 123 Number Tab, and to the right use the mouse to click the bottom option, Custom Number Format.
We can see the 6th item down has: 0:00
Click this
You'll see the numbers have been truncated.
You may have also noticed there are many pre set versions of number formatting. It might not be obvious. But you can also craft your own format.

V.4.1

Part IV

In this next step we will create the numbers for the Cumulative Column

Our next column is called ‘Cumulative %’. Here we’ll show the gradual accumulation of the percents from the top cell (ours has 33%) to the bottom cell which will show 100%.
The first step is just like what we did in column D. In the E column, type the function ‘=C4/C11’. The result should be the same as the value in column D ‘0.335…’
The next step is different. We need to add the value from the second item to the number in the first item. So in E5 we type ‘=D4+C5’. We follow this pattern, in cell E6 type ‘=D5+C6’. In E7 type ‘=D6+C7’. Do this all the way down your list, iterating the second number incrementally instead of using the same number like we did previously.

Use the tilde key to verify your functions are aligned correctly. (add tilde button for review)

Finally, although we can see the percent values as decimals, let’s convert them to actual percent values. The first step for this is to select all the cumulative percent values by clicking and dragging. Then, with those values selected we find the FORMAT button on the toolbar at the top. Select the Number tab which brings up some more options. Move your cursor to click the Percent label. Now the values will appear as percent values. You can also use the format to remove the decimal and numbers after the decimal, but it won’t affect the value of the existing format.

We’re almost ready to create the chart. But first we need to hide the D column. The values in this column are important, so we won’t delete them. We just need to hide them so the chart automation doesn’t get confused. To hide the D column click on the cell that actually has a D in it. Use your mouse to scroll down to where you see the label ‘Hide Column’. Once you click it you’ll see that the column labels from left to right are A, B, C and then E. This verifies the D column is now hidden.

Quiz #4 Questions

What column is the ‘Cumulative %’ column in this tutorial? (As seen in this video)

1. E
2. C
3. D
4. F

What is the cumulative value for ‘Mr. Lorentz’ in cell E10?

1. 0.920…
2. 0.957…
3. 0.997…
4. 1

V.4.2

Optional content

Learning to find and use functions

For this quick example we've got a list of numbers. The top number is in cell G4. The bottom number is in cell G9.
First I'll type in the function for adding them together.
Please notice these letters do not need to be capitalized.
When I press enter, the formula is hidden, and 312 shows the total.
To verify it is a formula, hold the CTRL button down, and press the tilde button. This button is almost always the button to the left of the 1 button, The 1 that is just above Q.
Now you can view all the formulas on the page. On this page there's just this one formula.
Press CTRL tilde again to return back to the number format.

Next I'll show you again, but I'll do it with the formula list.
I deleted the total
I've selected the empty cell where the total will go
If the window toolbar space is wide enough the Sigma sign will appear (the last symbol, looks kind of like an E)
If the toolbar window is not that wide, you can click the ellipsis button ' … '
You can see the Sigma symbol right below the Elipsis, and other buttons that were hidden. Press the sigma button.
When the list appears, the very first formula you see is the SUM.
Click SUM
The cell at the bottom of your numbers now has a border around it. And the formula appears as =SUM( ), but with no numbers inside the parentheses. Sometimes the computer will guess what range you want to sum.
Using my mouse I click and drag upward to select the numbers I want to sum.
DO NOT INCLUDE THE FORMULA CELL IN YOUR SELECTION
Once they are selected, press ENTER
You'll see the total is the same as when we just typed the formula in.
Press CTRL tilde
You can see the formula is exactly the same as the one we typed in.

The formula list is extensive. I doubt you'll need formulas beyond what are in the list. However, there are some. If you ever need a specific formula for advanced mathematics or whatever reason, you can probably download what you need from Google or Excel.

V.5.1 - Intro - Live

Part V
Okay, we're beginning our last section.

Now we're ready to create the chart. Parts of this are complicated, other parts easy. We'll take it slow and you can pause whenever you need to or go back and review something if needed. Watch carefully as I select the box of data that we need for the chart. I do not select the title, and I do not include the TOTAL or the value adjacent to it.
I first click-and-hold on the word ITEM. I then drag the mouse down and to the right until the selection includes the cell that shows 100%, then release the mouse button. This is all the selected data we need. To create the chart I'll go to the INSERT tab at the top. Then select CHART.
In this demonstration, the chart that pops up is actually the Pareto chart, also referred to as a combo chart.

V.5.2

Notice the Y-axis on the left is measuring the Qty of each column(bar), and the labels at the bottom display the names of each product line. In addition you should note a red line across the bottom.

Sometimes the computer chooses a different chart. Press the simplified selection button to dive slightly deeper into chart selection.

V.5.3

Optional Content - (Video separate) - Demonstrate how to choose the chart - WRITE THIS

Explain what to do if the wrong chart appears.
What of the wrong chart type appears?

Let's say a pie chart comes up instead of the combo chart.This may mean your data selection is not quite right.
To make the style change look to the upper right corner where you see the words Chart editor. Under that you should see Chart Type, and under that a box labeled Pie Chart. Click the small arrow in this box, and float/scroll over the chart that has histogram bars and a red line. As you're pointing at it, the label Combo Chart should appear. Either way, click this, and the chart should now resemble what you see in my tutorial screen.

V.5.4

Optional Content
You may notice upon reflection that 100% is equal to 1. And before you moved the bar the left end of the red bar was at zero, and rises slightly to 1. This is because the red and blue data sets are both set to the axis on the left side. When we switch the red axis to the right, it recalculates, and matches the 100% height with the left side height of 30. Kinda cool. But not what we need.

V.5.5

To adjust the red line we need another axis. This is another Y-axis, but it appears on the right side instead of the left. The axis on the right is the cumulative percentage. Right now it doesn't appear useful at all. We need to adjust it upward so that the left end of the red line rests on, or close to, the top of the histogram bar on the left side.
First, we need to access the CUSTOMIZE tab in the top right. It's under the Chart Editor Label. Scrolling down we're looking for the setting Axis. We know we're in the right section because the dots are red and the dot label says cumulative. A bit further down we see the Axis Drop Down. Click that and you'll see it's currently set to LEFT. Select RIGHT instead.

Next take note of the total quantity of product packages in the C column. 79.9. Also notice the left side axis is formatted to the approximate height of the first bar in the histogram. (26.7, rounds up to size of 30).
What we need to do is to lift that right side axis higher, and to do that we use the accumulated total of 79.9, or rounded to 80. So, to make the alteration we double click in the number space of the left axis, and navigate over to the right side under the customize tab, and find MAX. Click in the Max box and type 80, and hit enter.
The chart format is now basically correct. You can resize the chart as needed by click-and-dragging from any corner of the chart. You could also print this chart, or take a screen shot if you need it for a report or something.

Quiz #5 Questions

How do the two kinds of graph data differ?

1. The blue bars measure the quantity of the data items. The red line shows the cumulative percentage of the value beginning with the largest and adding one item each step.
2. The blue bars show less important information, and the red line shows more important information.
3. The blue bars show incidents of defects. The red line shows that defects are being reduced.
4. The bars are the Pareto diagram. The red line was added later by Ishikawa and is therefore an Ishikawa Diagram.

Why does the red line start above the left blue bar?

1. The top of the blue bar, and the bottom left point of the red line, are the same value. The blue measures the quantities individually while the red measures them gradually added together.
2. If the red line was shown lower it would overlap the blue bar and be difficult to see.
3. The red line has to start there so the top of the red line to reach the 100% mark.
4. Actually, it can start from top of any blue bar.

V.5.6

Why use a Pareto Chart?

Conclusion video

Optional - Pareto Cautions

How powerful are these charts, and what are their weaknesses? This chart is prone to misuse by those that lack the skill to understand their limitations. The 80/20 rule is not a law, but rather a basic tool used to guide our focus, hopefully in a better or more effective direction.

It's always important to use sound reasoning when applying analysis of any kind. This chart merely counts things. It cannot make judgments. The most numerous items may not be the most costly. Or perhaps the less numerous item has a very quick fix when the largest numbered items are complex. The Pareto chart can help us focus, especially when we are not yet aware of the quantities, but it does not necessarily direct us to the best decisions.

As mentioned at the beginning, a Pareto chart can help us focus on priorities. It can show this in different ways. It's really a translation of the 80/20 rule into a visual form, and visuals are often better communicators than the written or spoken word.

I also want to thank you for trying out this course. I enjoyed creating it, and I hope you enjoyed learning about Pareto charts. And if you want to dive into Pareto even further I've included links to 4 Pareto wiki links. The last item refers to a priority matrix. This is a different kind of prioritization scheme you might find useful.

I also encourage you to provide any feedback you like. Suggestion on improving this course, and new topics for a course can both help me discern which direction to go in future course development.

V.5.7

V.5.8

To learn more I've provided four Wiki links to more information. Three relate to Pareto, and the last one is a link to the Quadrant method of prioritization.

Pareto Chart
https://en.wikipedia.org/wiki/Pareto_chart

Pareto Distribution
https://en.wikipedia.org/wiki/Pareto_distribution

Pareto Principle - 80/20 rule
https://en.wikipedia.org/wiki/Pareto_principle

Priority Matrix - Quadrant based
https://en.wikipedia.org/wiki/Priority_Matrix

Pareto Script A/V only

Pareto Script

V.0.1-Intro

Hi, Welcome to Creating Pareto Diagrams. I'm Terry Rosen, teacher of 26 years and Certified Quality Engineer. I'll be showing you step-by-step how to create a Pareto diagram in Google Sheets. Almost exactly the same process will work in Excel. I'll also be explaining a bit of the history as we go. You'll see a button in each section labeled 'Optional'. Click these if you're interested in learning a bit more.

As you move through the content you'll be presented with quiz questions. This training is not meant to provide you with a grade. In fact, the assessed grade at the end will reflect pass/fail information and no percentages. There's a rationale for never doing letter or percent grades. The short version is, if you only needed an 80% to pass, it'd be better to eliminate the 20% of the questions that didn't matter, and grade pass/fail.

Use the grading in each section to gauge your own success. If you want to work toward better mastery, I encourage you to review this content and try again. You'll also see a suggestions button. Use this to help me improve the content of the course. Typically, like anyone else, I'll make a spelling or grammar error. Click the suggestion button to inform me which page or section the error occurred on, and what kind of error it was. You can also add whatever suggestions you like, and over time I'll implement them. If you prefer, you can connect with me directly via email at Terry Rosen Consultant @ gmail. Com.

Alright, let's get to it.

V.1.1-Part I: What's a Pareto Diagram

We all prioritize things in our lives. Everyone has created a to-do list at some point. In my own life, I've created a list and then circled the three most important or urgent items to make sure I did those first. Once they were done I'd prioritize the next three, and so on, and it worked pretty well.

Prioritizing helps us focus on what is really important and reduces the time we waste, or at least balances what is urgent with what's important.

A Pareto diagram is just a fancy system for prioritizing.

For this course, we're going to use a Google Sheet. An Excel spreadsheet is fine, or any other sheet format. This can also be easily done on paper.

Here is the list of steps we'll use. I'll provide you video for every step.

The steps are:

Gather your data

Put the data into the sheet

Include a label for each data item

Order the data numerically from highest to lowest

Sum the numeric totals

Convert the numeric to percentages

Create an accumulating set from the data

Hide a column

Create your chart - and finesse it a bit

Interpret your results

This may seem like a lot. For a challenge years ago I managed to create a chart on video in two minutes. It took a few tries.

For a first-time Pareto chart I'd guess you'll need ten to twenty minutes, including putting the data together.

At the end of the course, I'll share a few tidbits of history around the Pareto method. Feel free to skip that, there won't be any questions on it.

I recommend using the data I provide in the course for your first try. It can get confusing, and seeing the changes from one step to the next will help you get clear on what's happening to the data as we move from step to step.

V.1.2

(Optional)

History of the Pareto Diagram

Who invented the Pareto chart? There's some ambiguity as to the origin, so let's take this step by step.

1. Vilfredo Pareto noticed the 80/20 nature of distribution in land ownership. But as far as anyone knows, he never created any chart format of his observation.
2. Joseph Juran is well documented as having applied the concept in quality and management. Though the novel application was his, he referred to it as the Pareto Principle. He is known to have said that he should have just called it the Juran Principle. It also seems likely that he was the first to apply the idea to a histogram. The histogram bars would display from tallest to shortest and provide possible guidance as to which problems to focus our attention on. This type would persist into the 1980's.
3. But the Pareto diagram in use today includes a bar that is above the histogram. In effect it creates a dual chart. Histogram data on the left, and cumulative data with the line above and the axis on the right. There is not yet any consensus as to the origin. It's also possible that Dr. Ishikawa may have been the first to add the line at the top, but apparently there is no documented record to establish the true origin.

V.2.1

Part II - The Data

To create a Pareto chart we first need some data. The data consists of a label, the name of what we're going to measure, and the quantity or amount of what we're measuring. For instance, if we made five different cars, and in different amounts, the first line of data might be Sports, with a value of 3,000. So, for each item you'll need a label, and a number. In the sample data we're measuring the number of cases sold for each type of chocolate we make.

V.2.2

Step 1: Gather your data - Show this title

Video of me

In this step we put our data into our Sheet. Our project here has to do with a fictional Japanese chocolate factory in the City of Obi.

V.2.4

Optional content

The Origin of the Pareto Principle

In 1906 Vilfredo Pareto noticed that roughly 80% of the land in Italy was owned by just 20% of the people. Sometimes called the 80 20 rule, describes the idea that 80% of consequences come from 20% of the causes. Dr. Juran then applied it to factory production. When someone asked him what the method was called, without thinking he said the Pareto Principle. Later he reflected on the fact that he should have just called it the Juran Principle. After World War II it's one of the tools he shared with the Japanese, incl. Dr. Ishikawa. Juran probably added the histogram as a visual form of the idea. Ishikawa is well known for many innovations in manufacturing, but nowhere does he claim to have added the line above the bar graph. This line shows the accumulated quantity. Juran also never claimed that innovation.

Here are a few examples you might explore of the 80/20 rule:
80% of defects are created in 20% of the processes
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80% of construction projects utilize only 20% of the tools used
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20% of cities have 80% of the population
20% of your inventory occupies 80% of the space

V.2.5 end clip - 2 sentences

Video of me

Hopefully that wasn't too stressful. The next steps are a bit trickier, and I've simplified each step to make the process as clear as possible.

V.5.6

Why use a Pareto Chart?

Conclusion video

Optional - Pareto Cautions

How powerful are these charts, and what are their weaknesses? This chart is prone to misuse by those that lack the skill to understand their limitations. The 80/20 rule is not a law, but rather a basic tool used to guide our focus, hopefully in a better or more effective direction.

It’s always important to use sound reasoning when applying analysis of any kind. This chart merely counts things. It cannot make judgments. The most numerous items may not be the most costly. Or perhaps the less numerous item has a very quick fix when the largest numbered items are complex. The Pareto chart can help us focus, especially when we are not yet aware of the quantities, but it does not necessarily direct us to the best decisions.

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I also want to thank you for trying out this course. I enjoyed creating it, and I hope you enjoyed learning about Pareto charts. And if you want to dive into Pareto even further I’ve included links to 4 Pareto wiki links. The last item refers to a priority matrix. This is a different kind of prioritization scheme you might find useful.

I also encourage you to provide any feedback you like. Suggestion on improving this course, and new topics for a course can both help me discern which direction to go in future course development.

Pareto Scripts NSL Only

Pareto Script

V.2.2

Step 1: Gather your data - Show this title

Video of sheet

You can see how I've arranged my data with labels on the left and the numbers to the right. You can also see that I have labels on the top representing the content of the two columns LABELS and QTY or Quantity. I also indicate this is in the thousands of packages. For example, last month they sold 26,700 boxes of Chonky Donks.

If you're diving in with your own data be sure to put your labels on the left, and your data values to the right, lining up each number with the label you're using. You'll use this format for the data in upcoming steps.

For your custom data, do not forget to include the units at the top. Without it another user may not be able to interpret what's going on.

Pause your video so you can take a few minutes and get your data to match this set exactly.

(Pause)
FADE
UNFADE
(Unpause)

V.2.3

Step 2: Sort the data - Show this title - Video of sheet

Now you'll sort the data so it's in order from largest to smallest.

You can see I select the cell under the quantity (or QTY) box. I click and hold, the top number cell, not the word cell on the left. NOTE: we need to NOT select the category labels on the top. These do NOT need to be sorted. Then I drag my selection from top-right to the bottom-left of the chart. If you're new to Sheets this might take a few tries. We select it this way so our sort comes out just right. Sorting it another way may not get you the results you need.

To cause the sort we click on the Data button on the tool tab at the top. Then select Sort Range (??) Column Z to A. On my chart you can see my selection started with column E then ended in column D. This shows the sort will occur from right to left. And it causes the labels to be sorted along with their numbers.

This means the sort will focus on the numbers and will NOT sort the word column in alphabetical order. Your data may be in different columns than mine, but in the video you'll see it as described.

Now Press ENTER.

You'll see the data and labels have shifted so the numbers are in order, largest to smallest. You may want to verify the labels have shifted correctly as well. Check that the labels are accurately placed next to their numbers. If they're in the wrong places now, you'll need to go back a step, and try again, to get it just right.

V.3.1

Part III

You'll see in the video that I've typed **Total** under the labels column, and then aligned it to the right. In the cell to the right (E13), we Sum the column. There are various ways to do this. For clarity I'll demonstrate that functions can be typed in.

=SUM(E6:E12)

You'll see the total is 79.7. We need this total in order to calculate the percents for each type of chocolate. We also use this value later.

To convert the raw numbers to percents we need another column.
To the right of the quantity column type a percent sign.
Directly under that percent sign we will type a new formula. It's slightly different from our SUM formula.
While in cell F6 type the equal sign '=', then E6 - the location of our first number value, then the divide sign '/', and finally the cell with your total value, in this case E13. This calculation results in a value of .34. In my chart it has many decimal places after the 34 which we can ignore, or format differently if we like.
There is a quick shortcut for the next step, but we're going to keep things simple. Just duplicate the process for each item. The second item will be typed like this '=E7/E13'. The next is '=E8/E13' and so on. You don't need to create an equation next to the TOTAL value.

V.3.2

Optional content

The Tilde Key

At this point you might be interested to learn about the Tilde key '~'. This key on your keyboard should be to the left of the '1' key which is directly above the 'Q' key. To use the tilde key, first press and hold the CTRL key. Then hit the tilde key.

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V.4.1

Part IV

In this next step we will create the numbers for the Cumulative Column

Our next column is called 'Cumulative %'. Here we'll show the gradual accumulation of the percents from the top cell (ours has 33%) to the bottom cell which will show 100%.
The first step is just like what we did in column F. In the G column, in G6, type the function '=F6'. The result should be the same as the value in column F '0.335…'
The next step is different. We need to add the value from the second item to the number in the first item. So in G7 we type '=G6+F7'. We follow this pattern, in cell G8 type '=G7+F8'. In G9 type '=F8+E9'. Do this all the way down your list, iterating the second number incrementally instead of using the same number like we did previously.

Use the tilde key to verify your functions are aligned correctly. (add tilde button for review)

Finally, although we can see the percent values as decimals, let's convert them to actual percent values. The first step for this is to select all the cumulative percent values by clicking and dragging. Then, with those values selected we find the FORMAT button on the toolbar at the top. Select the Number tab which brings up some more options. Move your cursor to click the Percent label. Now the values will appear as percent values. You can also use the format to remove the decimal and numbers after the decimal, but it won't affect the value of the existing format.

We're almost ready to create the chart. But first we need to hide the F column. The values in this column are important, so we won't delete them. We just need to hide them so the chart automation doesn't get confused. To hide the F column click on the cell that actually has a F in it. Use your mouse to scroll down to where you see the label 'Hide Column'. Once you click it you'll see that the column labels from left to right are A, B, C,D,E and then G. This verifies the F column is now hidden.

V.4.2

Optional content

Learning to find and use functions

For this quick example we've got a list of numbers. The top number is in cell E6. The bottom number is in cell E12.
First I'll type in the function for adding them together. =SUM(E6:E12)
Please notice these letters do not need to be capitalized.
When I press enter, the formula is hidden, and E13 shows the total.
To verify it is a formula, hold the CTRL button down, and press the tilde button. This button is almost always the button to the left of the 1 button, The 1 that is just above Q.
Now you can view all the formulas on the page. On this page there's just this one formula.
Press CTRL tilde again to return back to the number format.

Next I'll show you again, but I'll do it with the formula list.
I deleted the total
I've selected the empty cell where the total will go
If the window toolbar space is wide enough the Sigma sign will appear (the last symbol, looks kind of like an E)
If the toolbar window is not that wide, you can click the ellipsis button ' … '
You can see the Sigma symbol right below the Ellipsis, and other buttons that were hidden. Press the sigma button.
When the list appears, the very first formula you see is the SUM.
Click SUM
The cell at the bottom of your numbers now has a border around it. And the formula appears as =SUM( ), but with no numbers inside the parentheses. Sometimes the computer will guess what range you want to sum.
Using my mouse I click and drag upward to select the numbers I want to sum.
DO NOT INCLUDE THE FORMULA CELL IN YOUR SELECTION
Once they are selected, press ENTER
You'll see the total is the same as when we just typed the formula in.
Press CTRL tilde
You can see the formula is exactly the same as the one we typed in.

The formula list is extensive. I doubt you'll need formulas beyond what are in the list. However, there are some. If you ever need a specific formula for advanced mathematics or whatever reason, you can probably download what you need from Google or Excel.

V.5.1 - Intro - Live

Part V
Okay, we're beginning our last section.

Now we're ready to create the chart. Parts of this are complicated, other parts easy. We'll take it slow and you can pause whenever you need to or go back and review something if needed. Watch carefully as I select the box of data that we need for the chart. I do not select the title, and I do not include the TOTAL or the value adjacent to it.
I first click-and-hold on the word ITEM. I then drag the mouse down and to the right until the selection includes the cell that shows 100%, then release the mouse button. This is all the selected data we need. To create the chart I'll go to the INSERT tab at the top. Then select CHART.
In this demonstration, the chart that pops up is actually the Pareto chart, also referred to as a combo chart.

V.5.2

Notice the Y-axis on the left is measuring the Qty of each column(bar), and the labels at the bottom display the names of each product line. In addition you should note a red line across the bottom.

Sometimes the computer chooses a different chart. Press the simplified selection button to dive slightly deeper into chart selection.

V.5.3

Optional Content - (Video separate) - Demonstrate how to choose the chart - WRITE THIS

Explain what to do if the wrong chart appears.
What of the wrong chart type appears?

Let's say a pie chart comes up instead of the combo chart.This may mean your data selection is not quite right.
To make the style change look to the upper right corner where you see the words Chart editor. Under that you should see Chart Type, and under that a box labeled Pie Chart. Click the small arrow in this box, and float/scroll over the chart that has histogram bars and a red line. As you're pointing at it, the label Combo Chart should appear. Either way, click this, and the chart should now resemble what you see in my tutorial screen.

V.5.4

Optional Content
You may notice upon reflection that 100% is equal to 1. And before you moved the bar the left end of the red bar was at zero, and rises slightly to 1. This is because the red and blue data sets are both set to the axis on the left side. When we switch the red axis to the right, it recalculates, and matches the 100% height with the left side height of 30. Kinda cool. But not what we need.

V.5.5

To adjust the red line we need another axis. This is another Y-axis, but it appears on the right side instead of the left. The axis on the right is the cumulative percentage. Right now it doesn't appear useful at all. We need to adjust it upward so that the left end of the red line rests on, or close to, the top of the histogram bar on the left side.
First, we need to access the CUSTOMIZE tab in the top right. It's under the Chart Editor Label. Scrolling down we're looking for the setting Axis. We know we're in the right section because the dots are red and the dot label says cumulative. A bit further down we see the Axis Drop Down. Click that and you'll see it's currently set to LEFT. Select RIGHT instead.

Next take note of the total quantity of product packages in the C column. 79.9. Also notice the left side axis is formatted to the approximate height of the first bar in the histogram. (26.7, rounds up to size of 30).
What we need to do is to lift that right side axis higher, and to do that we use the accumulated total of 79.9, or rounded to 80. So, to make the alteration we double click in the number space of the left axis, and navigate over to the right side under the customize tab, and find MAX. Click in the Max box and type 80, and hit enter.
The chart format is now basically correct. You can resize the chart as needed by click-and-dragging from any corner of the chart. You could also print this chart, or take a screenshot if you need it for a report or something.