1. *What is the graph type and its purpose?*

*A* ***scatter plot*** *is a graphical representation that shows the relationship between two variables. It displays individual data points on a two-dimensional plane, where:****One variable*** *is plotted along the* ***x-axis*** *(horizontal axis).****The other variable*** *is plotted along the* ***y-axis*** *(vertical axis)*

1. *How can you spot trends or outliers?*

*If a value in a dataset is deviating from a consistent pattern it’s a n outlier.A* ***trend*** *is a consistent pattern in the data points that shows how the two variables are related.*

1. *Why is it important to label axes correctly and consider adding trend lines? How do these elements improve the chart’s clarity?*
   * 1. *Proper* ***axis labeling*** *and* ***adding trend lines*** *are essential elements for creating clear, interpretable scatter plots.*
     2. *1.* ***Direction of the Relationship:Positive correlation Negative correlation****:* ***positive correlation*** *occurs when two variables move in the* ***same direction****—as one variable increases, the other also*
2. *What are the key best practices for using this graph?*

*Ensure both axes are clearly labeled with the* ***variable names*** *and* ***units of measurement***

*Make sure the data set is large enough to provide visualization for clustering or outliers.*

1. *An example demonstrating its use.*

*Analyzing the relationship between* ***hours studied*** *and* ***test scores*** *for a group of students.*

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| **Activity Directions** |

1. **1 min - Move** into breakout rooms and open the resource links for your group.
2. **12 min - Refer** to the resources provided and take notes using the guiding questions to prepare to present to the rest of the class. Prepare a 2 minute presentation using the following guiding questions
   1. *What is the graph type and its purpose?*
   2. *What are the key best practices for using this graph?*
   3. *An example demonstrating its use.*
   4. *Answer any additional questions assigned to your group if they differ from the above.*

**Graphical Distributions of Data Distribution - Activity Instructions**

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| **Instructions for Each Group** |

1. **Group 1: Histograms** 
   1. Resources : [StatQuest: Histograms, Clearly Explained](https://youtu.be/qBigTkBLU6g?list=PLblh5JKOoLUK0FLuzwntyYI10UQFUhsY9&t=33) and [How to create a histogram | Data and statistics | 6th grade | Khan Academy](https://www.youtube.com/watch?v=gSEYtAjuZ-Y&t=399s)
   2. *What is a histogram, and how does it make hidden measurements visible?*
   3. *What are some best practices for making a clear and useful histogram?*
   4. *How does changing the bin width affect what you see in a histogram?*
2. **Group 2: Line Graphs**
   1. Resources: Cisco Network Academy - Data Analytics Essentials - Module 5.2.3 - Line Chart and [Reading line graphs | Applying mathematical reasoning | Pre-Algebra | Khan Academy](https://www.youtube.com/watch?v=36v2EXZRzUE&t=43s)
   2. *What makes line charts effective for showing trends over time?*
   3. *How do they help Data Analysts track changes in data?*
   4. *Can you think of situations where line charts would be useful?*
3. **Group 3: Bar Charts or Column Charts**
   1. Resources: Cisco Network Academy - Data Analytics Essentials - Module 5.2.3 - Bar Chart and Column Chart and [Reading bar graphs | Applying mathematical reasoning | Pre-Algebra | Khan Academy](https://www.youtube.com/watch?v=kiQ6MUQZHSs)
   2. *What are the key differences between bar and column charts? How does their orientation affect data presentation?*
   3. *Why is it important to label axes and start the axis at zero? How does this ensure an accurate representation of data?*
4. **Group 4: Pie Charts** 
   1. Resources: Cisco Network Academy - Data Analytics Essentials - Module 5.2.3 - Pie Chart and [Reading pie graphs (circle graphs) | Applying mathematical reasoning | Pre-Algebra | Khan Academy](https://www.youtube.com/watch?v=4JqH55rLGKY)
   2. *When are pie charts useful for showing data?*
   3. *What should you keep in mind to make sure they’re easy to understand?*
5. **Group 5: Box Plots** 
   1. Resources: [Parts of a Box and Whisker Plot (Box Plot) | Math with Mr. J](https://www.youtube.com/watch?v=E7ewAxluyt0&list=PLiT3pCvK_cfUXde5to-AogFyemIAmAhWY&index=2)
   2. *What key parts make up a box plot, and what do they tell us about the data?*
   3. *Why are the median, quartiles, and outliers important in a box plot?*
   4. *How do they help in understanding data spread?*
6. **Group 6: Scatter Plots** 
   1. Resources: Cisco Network Academy - Data Analytics Essentials - Module 5.2.3 - Scatter Plot and [How To Construct A Scatter Plot Graph - What Is A Scatter Plot Graph](https://www.youtube.com/watch?v=1ZAxR2KgM0g&t=11s)
   2. *What do scatter plots show about the relationship between two variables?*

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| **Video Credits** |

* [StatQuest: Histograms, Clearly Explained](https://youtu.be/qBigTkBLU6g?list=PLblh5JKOoLUK0FLuzwntyYI10UQFUhsY9&t=33)  
  Credit: @statquest. (2017, September 25).StatQuest: Histograms, Clearly Explained [Video]. YouTube. <https://youtu.be/qBigTkBLU6g?list=PLblh5JKOoLUK0FLuzwntyYI10UQFUhsY9&t=33>
* [How to create a histogram | Data and statistics | 6th grade | Khan Academy](https://youtu.be/gSEYtAjuZ-Y?t=2)
  + Credit: Khan Academy. (2015, February 5). How to create a histogram | Data and statistics | 6th grade | Khan Academy [Video]. YouTube. <https://youtu.be/gSEYtAjuZ-Y?t=2>
* [Reading line graphs | Applying mathematical reasoning | Pre-Algebra | Khan Academy](https://youtu.be/36v2EXZRzUE?t=2)
  + Credit: Khan Academy. (2011, November 15).Reading line graphs | Applying mathematical reasoning | Pre-Algebra | Khan Academy [Video]. YouTube. <https://youtu.be/36v2EXZRzUE?t=2>
* [Reading bar graphs | Applying mathematical reasoning | Pre-Algebra | Khan Academy](https://www.youtube.com/watch?v=kiQ6MUQZHSs)
  + Credit: Khan Academy. (2011, November 15).Reading bar graphs | Applying mathematical reasoning | Pre-Algebra | Khan Academy [Video]. YouTube. <https://www.youtube.com/watch?v=kiQ6MUQZHSs>
* [Parts of a Box and Whisker Plot (Box Plot) | Math with Mr. J](https://www.youtube.com/watch?v=E7ewAxluyt0&list=PLiT3pCvK_cfUXde5to-AogFyemIAmAhWY&index=2)
  + Credit: Math with Mr.J. (2023, March 14).Parts of a Box and Whisker Plot (Box Plot) | Math with Mr. J [Video]. YouTube. <https://youtu.be/36v2EXZRzUE?t=2>
* [How To Construct A Scatter Plot Graph - What Is A Scatter Plot Graph](https://youtu.be/1ZAxR2KgM0g)
  + Credit: Whats Up Dude. (2020, August 12). How To Construct A Scatter Plot Graph - What Is A Scatter Plot Graph [Video]. YouTube. <https://youtu.be/1ZAxR2KgM0g>