**Chapter 7: Charts and Graphics in Excel**

**🎯 Objective:**

To help learners visually analyze and present data using different types of Excel charts.

**Charts to Cover:**

1. Column Chart
2. Bar Chart
3. Line Chart
4. Pie Chart
5. Area Chart
6. Scatter Chart

**📋 Sample Dataset for Exercises**

| **Product** | **Category** | **January** | **February** | **March** | **Total Sales** |
| --- | --- | --- | --- | --- | --- |
| Ball Pen | Stationery | 400 | 450 | 350 | 1200 |
| Notebook | Stationery | 700 | 800 | 500 | 2000 |
| USB Cable | Electronics | 500 | 600 | 400 | 1500 |
| Flash Drive | Electronics | 600 | 700 | 500 | 1800 |
| Stapler | Office Tools | 300 | 350 | 250 | 900 |

**📊 1. Column Chart – Compare Product Sales**

**✅ Goal:**

Visualize total sales per product.

**🛠 Steps:**

1. Select the **Product** and **Total Sales** columns.
2. Go to **Insert → Column or Bar Chart → Clustered Column**.
3. Rename the chart title to **"Total Sales per Product"**.
4. Add **data labels** for better readability.

📌 **Best for**: Comparing quantities across categories.

**📊 2. Bar Chart – Horizontal Comparison**

**✅ Goal:**

Same as column chart, but horizontal layout.

**🛠 Steps:**

1. Select the **Product** and **Total Sales** columns.
2. Go to **Insert → Column or Bar Chart → Clustered Bar**.
3. Title: **"Horizontal Sales Comparison"**.
4. Customize bar colors or font for clarity.

📌 **Best for**: When category names are long or when horizontal space is preferable.

**📈 3. Line Chart – Show Trends Over Time**

**✅ Goal:**

Track monthly sales trends for each product.

**🛠 Steps:**

1. Select data from **A1:D6** (Product + Jan–Mar).
2. Go to **Insert → Line or Area Chart → Line with Markers**.
3. Title it **"Monthly Sales Trends"**.
4. Make sure each product has a unique line with a legend.

📌 **Best for**: Showing patterns and trends across time.

**🥧 4. Pie Chart – Visualize Category Share**

**✅ Goal:**

Show how much each category contributes to total sales.

**🛠 Steps:**

1. First, calculate total sales per category:
   * **Stationery:** =SUMIF(B2:B6,"Stationery",F2:F6)
   * **Electronics:** =SUMIF(B2:B6,"Electronics",F2:F6)
   * **Office Tools:** =SUMIF(B2:B6,"Office Tools",F2:F6)
2. Enter the values in a new table like this:

| **Category** | **Total Sales** |
| --- | --- |
| Stationery | 3200 |
| Electronics | 3300 |
| Office Tools | 900 |

1. Select the new table.
2. Go to **Insert → Pie Chart → 2-D Pie**.
3. Add **data labels** with percentages.
4. Title it **"Sales Share by Category"**.

📌 **Best for**: Proportional comparisons.

**📈 5. Area Chart – Cumulative Trends**

**✅ Goal:**

Emphasize the total area under the trend over time.

**🛠 Steps:**

1. Select data from **A1:D6** (Product + Jan–Mar).
2. Go to **Insert → Area Chart → Stacked Area**.
3. Title it **"Cumulative Monthly Sales"**.
4. Customize colors for clarity.

📌 **Best for**: Showing quantity over time with a cumulative visual.

**📉 6. Scatter Plot – Compare Two Numeric Variables**

**✅ Goal:**

Compare price vs stock level (use hypothetical data):

| **Product** | **Price** | **Stock** |
| --- | --- | --- |
| Ball Pen | 25 | 100 |
| Notebook | 120 | 45 |
| USB Cable | 300 | 25 |
| Flash Drive | 700 | 15 |
| Stapler | 150 | 5 |

**🛠 Steps:**

1. Select **Price and Stock** columns.
2. Go to **Insert → Scatter Chart → Scatter with only Markers**.
3. Title: **"Price vs Stock Level"**.
4. Label axes: **X = Price**, **Y = Stock**.

📌 **Best for**: Identifying relationships or outliers between two continuous variables.

**Quick Summary Table**

| **Chart Type** | **Best For** |
| --- | --- |
| Column | Comparing totals across categories |
| Bar | Comparing with long category names |
| Line | Showing trends over time |
| Pie | Showing parts of a whole |
| Area | Visualizing cumulative values |
| Scatter | Showing relationships between values |

**Chapter 8: Sparklines and Data Bars**

**🎯 Objective:**

* Understand how to use **Sparklines** and **Data Bars** to add visual context to data without taking up much space.

**📌 Key Concepts**

**✅ Sparklines**

* **Definition:** Miniature charts displayed within a single cell.
* **Types:** Line, Column, Win/Loss.
* **Use Case:** Show trends in a compact form next to data rows.

**✅ Data Bars**

* **Definition:** Bars displayed directly inside cells that reflect value magnitude.
* **Use Case:** Compare numbers at a glance without leaving the spreadsheet.

**🗃️ Sample Dataset**

| **Product** | **Jan** | **Feb** | **Mar** | **Trend (Sparkline)** | **Total Sales** |
| --- | --- | --- | --- | --- | --- |
| Ball Pen | 400 | 450 | 350 |  | =SUM(B2:D2) |
| Notebook | 700 | 800 | 500 |  | =SUM(B3:D3) |
| USB Cable | 500 | 600 | 400 |  | =SUM(B4:D4) |
| Flash Drive | 600 | 700 | 500 |  | =SUM(B5:D5) |
| Stapler | 300 | 350 | 250 |  | =SUM(B6:D6) |

**Exercise 1: Insert Sparklines**

**📍Steps:**

1. Select **cells E2:E6** for placing sparklines.
2. Go to **Insert → Sparklines → Line**.
3. In the dialog box:
   * Data Range: **B2:D6**
   * Location Range: **E2:E6**
4. Click **OK**.
5. (Optional) Format:
   * Use **Marker** options for highest/lowest points.
   * Change color under **Sparkline Tools → Design**.

✅ Result: You'll see a mini trend chart in each row, showing sales movement over the months.

**Exercise 2: Apply Data Bars**

**📍Steps:**

1. Select the **Total Sales column (F2:F6)**.
2. Go to **Home → Conditional Formatting → Data Bars**.
3. Choose a gradient fill or solid color.

✅ Result: Cells now have bars representing sales volume relative to each other.

**📊 Chapter 9: PivotTables and PivotCharts**

**🎯 Objective:**

* Learn to summarize, group, and analyze large datasets using PivotTables.
* Use PivotCharts and Slicers for interactive visual insights.

**📌 Key Concepts**

**✅ PivotTable**

* A powerful summary table that aggregates and groups data.
* Allows drag-and-drop to rearrange data without altering the original.

**✅ PivotChart**

* A chart directly linked to a PivotTable.
* Updates automatically with PivotTable changes.

**✅ Slicer**

* A visual filter for PivotTables and PivotCharts.
* Makes filtering intuitive and quick.

**🗃️ Sample Dataset**

| **Order ID** | **Product** | **Category** | **Region** | **Sales** |
| --- | --- | --- | --- | --- |
| 1001 | Ball Pen | Stationery | Nairobi | 400 |
| 1002 | Notebook | Stationery | Mombasa | 700 |
| 1003 | USB Cable | Electronics | Nairobi | 500 |
| 1004 | Flash Drive | Electronics | Kisumu | 600 |
| 1005 | Stapler | Office Tools | Mombasa | 300 |
| 1006 | Flash Drive | Electronics | Nairobi | 650 |
| 1007 | Notebook | Stationery | Kisumu | 800 |

**Exercise 1: Create PivotTable by Region**

**📍Steps:**

1. Select your data range (A1:E8).
2. Go to **Insert → PivotTable**.
3. Place the PivotTable in a **new worksheet**.
4. In the PivotTable Fields pane:
   * Drag **Region** to **Rows**.
   * Drag **Sales** to **Values** (auto-summarized as SUM).
5. Rename the PivotTable as **"Sales by Region"**.

✅ Result: A table showing total sales per region.

**Exercise 2: Generate PivotChart**

**📍Steps:**

1. Click anywhere in your PivotTable.
2. Go to **PivotTable Analyze → PivotChart**.
3. Choose **Column Chart**.
4. Click **OK**.
5. Rename chart to **"Sales Distribution by Region"**.

✅ Result: Visual representation of the PivotTable summary.

**Exercise 3: Filter with Slicers**

**📍Steps:**

1. Click inside the PivotTable.
2. Go to **PivotTable Analyze → Insert Slicer**.
3. Select **Category** and **Region** as slicers.
4. Click **OK**.
5. Use slicers to dynamically filter both the PivotTable and PivotChart.

✅ Result: Interactive filtering with clickable buttons (e.g., only show “Stationery”).

**Chapter 10: Data Cleaning in Excel**

**🎯 Objective:**

Equip learners with the tools to clean and prepare raw data for analysis by:

* Removing duplicates
* Eliminating blank rows
* Fixing text inconsistencies
* Converting data formats
* Handling missing values

**📌 Common Data Cleaning Techniques**

| **Technique** | **Purpose** |
| --- | --- |
| Remove Duplicates | Eliminate repeated entries |
| Delete Blank Rows | Remove empty data rows that break analysis |
| TRIM() | Remove leading/trailing/multiple spaces |
| PROPER() | Capitalize names properly (e.g., *john doe* → *John Doe*) |
| Convert Text to Numbers | Ensure numeric fields are not mistakenly stored as text |
| IF(ISBLANK()) | Handle missing values with default replacements |

**Sample Dataset**

Enter the following data into **A1:C9**:

| **Name** | **Age** | **Score** |
| --- | --- | --- |
| John Doe | 24 | 88 |
| mary ann |  | 73 |
| John Doe | 24 | 88 |
| Alice | 22 |  |
| brian otieno | 25 | 67 |
|  |  |  |
| CAROL OTlENO | 23 | 91 |
| Daniel | 21 | 55 |
|  |  |  |

**Exercise 1: Remove Duplicates**

**✅ Goal:**

Remove repeated rows based on identical values in all columns.

**📍Steps:**

1. Select your dataset (A1:C9).
2. Go to **Data** tab → Click **Remove Duplicates**.
3. In the dialog box, ensure all three columns are selected.
4. Click **OK**.

✅ Result: Duplicate entry of *John Doe* will be removed.

**Exercise 2: Delete Blank Rows**

**✅ Goal:**

Remove entirely empty rows that interrupt data structure.

**📍Steps:**

1. Select the data range.
2. Press **F5** → Click **Special** → Choose **Blanks** → Click **OK**.
3. Right-click one of the selected rows → Click **Delete** → Choose **Entire Row**.

✅ Result: Row 6 (completely blank) is deleted.

**🧪 Exercise 3: Use TRIM() and PROPER()**

**✅ Goal:**

Standardize spacing and name formatting.

**📍Steps:**

1. In column D, type:  
   =PROPER(TRIM(A2))
2. Drag down the formula.
3. Copy and **Paste as Values** over Column A if needed.

✅ Result:

* " brian otieno " → "Brian Otieno"
* "CAROL OTlENO" → "Carol Otleno"

**Exercise 4: Fill Blanks with Default using IF(ISBLANK())**

**✅ Goal:**

Handle missing data in **Age** and **Score** columns with defaults.

**📍Steps:**

1. In a new column (e.g., Age Cleaned), type:  
   =IF(ISBLANK(B2), 0, B2)
2. For Score:  
   =IF(ISBLANK(C2), "Missing", C2)
3. Drag both formulas down.

✅ Result:

* Missing Ages are replaced with 0.
* Missing Scores show "Missing" (or use a number like -1 if preferred for calculations).

**Summary Table**

| **Function/Tool** | **Use Case** |
| --- | --- |
| Remove Duplicates | Eliminate duplicate records |
| Go To Special → Blanks | Find and remove empty rows |
| TRIM() | Remove extra spaces |
| PROPER() | Fix name capitalization |
| IF(ISBLANK()) | Replace or flag missing data |