**1. What is Power Query?**

* A data connection technology built into Excel (2016+).
* Available under **Data > Get & Transform**.
* Used for:
  + Connecting to various data sources (Excel, CSV, web, SQL).
  + Cleaning and transforming data.
  + Automating repetitive data preparation steps.

**2. Where to Find It?**

* Excel 2016 and later:  
  **Data > Get & Transform Data** group
* Older Excel (2010, 2013):  
  Install as a free add-in from Microsoft.

**3. Supported Data Sources**

* Excel workbooks
* CSV / Text files
* Web pages
* SharePoint folders
* SQL Server / MySQL / Oracle
* Power BI Datasets
* APIs (via Web connector)

**4. Power Query Editor Interface**

When you click *"Transform Data"*, the **Power Query Editor** opens with:

* **Ribbon**: Contains transformation commands
* **Queries Pane**: Shows all imported queries
* **Applied Steps Pane**: Lists every transformation step
* **Preview Window**: Displays data preview

**5. Common Data Transformations**

Here are some practical tasks you can perform in Power Query:

| **Transformation** | **Where to Find It / Action** |
| --- | --- |
| Remove Columns | Home > Remove Columns |
| Filter Rows | Click dropdown in column header |
| Change Data Type | Right-click column > Change Type |
| Split Column | Transform > Split Column (by delimiter/number) |
| Merge Columns | Transform > Merge Columns |
| Group By | Transform > Group By (e.g., total sales per region) |
| Pivot/Unpivot Columns | Transform > Pivot or Unpivot |
| Replace Values | Transform > Replace Values |
| Append Queries | Combine rows (like UNION) |
| Merge Queries | Combine columns (like VLOOKUP or JOIN) |

**6. Creating Custom Columns**

* Use **Add Column > Custom Column** to write formulas using **M language** (Power Query language).

Example:

= [Quantity] \* [Unit Price]

**7. Automation Features**

* **All steps are recorded** in the Applied Steps pane.
* Re-use and refresh data with one click (**Refresh All**).
* Works with dynamic data (e.g., files from a folder).

**8. Load Options**

After applying your transformations, click:

* **Close & Load**: Load to new worksheet
* **Close & Load To…**: Choose to load to table, PivotTable, data model, or just create a connection.

**9. Power Query vs Traditional Excel**

| **Task** | **Excel (Manual)** | **Power Query (Automated)** |
| --- | --- | --- |
| Combine multiple files | Manually copy-paste | Folder connector |
| Clean raw data | Use formulas (e.g., TRIM) | Trim step in transformation |
| Refresh with new data | Manual update | One-click refresh |
| Error handling | Use IFERROR() | Built-in error management |

**10. Example: Clean and Prepare Sales Data**

**Goal**: Import sales data from CSV, clean it, and load to PivotTable.

**Steps:**

1. **Data > Get Data > From File > From Text/CSV**
2. Load your file, click **Transform**.
3. Remove unnecessary columns.
4. Filter out null or unwanted rows.
5. Add a new column for Total = Quantity \* Price.
6. Rename columns.
7. Close & Load to a new worksheet.
8. Build PivotTable from the cleaned data.

**Pro Tips**

* Use **Column Profiling** to understand your data.
* Document your steps using **step renaming**.
* Combine queries with **Merge** (like VLOOKUP).
* Schedule **data refresh** if connected to external sources.

**Project Title: Consolidate Monthly Sales Reports**

**Objective**

You have monthly sales reports stored as CSV files in a folder. Your task is to:

* Combine all files
* Clean and transform the data
* Add a calculated column for Total Sales
* Load the cleaned data into a table or PivotTable for analysis

**Project Setup**

**Sample Folder Structure**

Put these files in one folder (e.g., C:\SalesReports\):

* Sales\_Jan.csv
* Sales\_Feb.csv
* Sales\_Mar.csv

Each file contains the same columns:

Date, Region, Product, Quantity, UnitPrice

**Step-by-Step Power Query Process**

**Step 1: Import All Files from Folder**

1. Open **Excel**
2. Go to **Data > Get Data > From File > From Folder**
3. Browse to the folder containing the sales CSVs
4. Click **OK**, then click **Transform Data**

**Step 2: Combine Files**

1. In the Power Query preview, click **Combine > Combine & Transform Data**
2. Power Query auto-generates a query and shows a combined table
3. Click **OK** to load it into the Power Query Editor

**Step 3: Clean the Data**

1. **Remove unwanted columns** (if any)
2. Ensure data types:
   * Date → *Date*
   * Quantity & UnitPrice → *Decimal Number*
3. Rename columns if needed

**Step 4: Add a New Column for Total Sales**

1. Go to **Add Column > Custom Column**
2. Enter this formula:

= [Quantity] \* [UnitPrice]

1. Name the column: Total Sales
2. Click **OK**

**Step 5: Rename the Query**

1. In the Query pane, right-click the query name (e.g., "Transform File") → Rename to CombinedSales

**Step 6: Load the Data**

1. Click **Close & Load**
2. Choose:
   * **Load to Table** → For flat table view
   * **Load to PivotTable** → To analyze with charts/slicers

**Bonus: Create PivotTable Analysis**

If you load to PivotTable:

1. Add Region to Rows
2. Add Product to Columns
3. Add Total Sales to Values
4. Add Date to Filters

**Step 7: Refresh with New Files**

Whenever you add a new CSV file (e.g., Sales\_Apr.csv) to the folder:

* Right-click anywhere in the loaded data
* Select **Refresh**
* Power Query will automatically import the new data!

**Skills Practiced**

* Folder connector
* File combining automation
* Data cleaning & type conversion
* Custom column creation
* Reusable ETL pipeline in Excel

