Lesson 5: Data Modeling Basics

1. What is a primary key in a table?

A primary key is a unique identifier for each record in a table. It ensures that each row can be uniquely identified.

2. Name the two types of table relationships in Power BI.

One-to-many and many-to-many relationships.

3. How do you create a relationship between two tables in Power BI?

Go to the 'Model' view, drag a field from one table to the matching field in another table.

4. What is a 'star schema'?

A star schema is a data model with a central fact table linked to multiple dimension tables.

5. Which table is typically the fact table in a sales dataset?

The Sales table is typically the fact table.

6. Link Sales.csv to Customers.csv using CustomerID (one-to-many).

Ensure CustomerID is the primary key in Customers and a foreign key in Sales, then create a one-to-many relationship.

7. Why is ProductID in Sales.csv a foreign key?

Because it references the ProductID in the Products table, connecting sales data to product details.

8. Fix a relationship error where ProductID has mismatched data types.

Ensure both fields have the same data type, e.g., change text to whole number.

9. Explain why a star schema improves performance.

Because it simplifies queries and reduces data redundancy by organizing data into fact and dimension tables.

*10. Add a new column TotalSales in Sales (Quantity * Price from Products).*

Create a calculated column or measure using DAX: TotalSales = Sales[Quantity] * RELATED(Products[Price])

11. Optimize a model with circular relationships—how would you resolve it?

Remove or redesign the relationships, or use DAX functions instead of direct relationships.

12. Create a role-playing dimension for OrderDate and ShipDate.

Duplicate the Date table and create separate relationships to OrderDate and ShipDate.

13. Handle a many-to-many relationship between Customers and Products.

Use a bridge table or the new many-to-many relationship feature in Power BI.

14. Use bidirectional filtering sparingly—when is it appropriate?

Only when both tables need to filter each other for accurate reporting, like in many-to-many scenarios.

15. Write DAX to enforce referential integrity if a CustomerID is deleted.

Use IF(NOT(ISBLANK(Customer[CustomerID])), expression, BLANK()) or use LOOKUPVALUE with error handling.