Introduction to Lookup Functions

Objective:

To understand how to search for specific data in large datasets using Vertical (VLOOKUP) and Horizontal (HLOOKUP) searches.

What is a Lookup Function?

Imagine you have a student ID number, and you want to find the student's name from a list of 1,000 students. You don't want to search manually.

- **The Computer's Job:** You give Excel a "Lookup Value" (the ID), and it searches the table to return the "Result Value" (the Name).
- **Two Types:**
  - **VLOOKUP:** Searches **Vertical** columns (Top to Bottom).
  - **HLOOKUP:** Searches **Horizontal** rows (Left to Right).

VLOOKUP (Vertical Lookup)

Understanding VLOOKUP

This is the most common function because most data is arranged in columns.

- **Definition:** Searches for a value in the **first column** of a table and returns a value in the same row from a specified column.
- **The "V":** Stands for **Vertical**.

The Syntax (Formula)

```
=VLOOKUP(lookup_value, table_array, col_index_num, [range_lookup])
```

- **Lookup_value:** *What* you are looking for (e.g., Student ID "101").
- **Table_array:** *Where* the data is (e.g., Range A2:C10).
- **Col_index_num:** *Which column* contains the answer (e.g., Column 2 for Name).
- **Range_lookup:** *Accuracy* (0 for Exact Match, 1 for Approximate).

VLOOKUP Practical Example

Step-by-Step Example

Scenario: finding the **Marks** for a student named "Ali".

- **Table:** Names are in Column A (Col 1), Marks are in Column B (Col 2).

The Formula:

```
=VLOOKUP("Ali", A2:B10, 2, 0)
```

1 "Ali": Look for this name.

2 A2:B10: Look inside this table.

3 2: The answer is in the **2nd column**.

4 0: Find an **Exact Match** (don't guess).

HLOOKUP (Horizontal Lookup)

Understanding HLOOKUP

This is used when data headers are in rows instead of columns (like a timeline or calendar).

- **Definition:** Searches for a value in the **top row** of a table and returns a value in the same column from a specified row.
- **The "H":** Stands for **Horizontal**.

The Syntax (Formula)

```
=HLOOKUP(lookup_value, table_array, row_index_num, [range_lookup])
```

- **Difference:** Instead of col_index_num (Column Number), we use row_index_num (Row Number).

Key Differences & Common Errors

VLOOKUP vs. HLOOKUP

Feature	VLOOKUP	HLOOKUP
Full Name	Vertical Lookup	Horizontal Lookup
Search Direction	Top to Bottom (Columns)	Left to Right (Rows)
Index Used	Column Number	Row Number
Common Use	Student Lists, Price Lists	Timelines, Schedules

8. Common Exam Errors

- **#N/A Error:** The value was not found (e.g., Student ID does not exist).
- **#REF! Error:** You asked for a column/row number that doesn't exist (e.g., asking for Column 5 in a table with only 3 columns).

Conclusion and Review Questions

The "Range_Lookup" Argument

- **FALSE (0): Exact Match.** Used for unique IDs, Names, Passport Numbers. (Most common in exams).
- **TRUE (1): Approximate Match.** Used for ranges like Grading (0-39 = Fail, 40-49 = D).

Review Questions (FBISE Style)

Q1: What does the 'V' in VLOOKUP stand for?

It stands for Vertical.

Q2: Which argument in VLOOKUP determines if we want an exact match?

The last argument, range_lookup. We set it to 0 or FALSE for an exact match.

Q3: When would you use HLOOKUP instead of VLOOKUP?

You use HLOOKUP when the data is arranged horizontally, with headers in the first row rather than the first column.