SS2 Computer Studies: Practical Lessons on Pivot Tables and Advanced Excel Formulas

Practical 1: Creating a PivotTable in Microsoft Excel

What is a PivotTable?

A PivotTable is an Excel tool used to summarise, organise, count, and analyse large amounts of data without changing the original data.

For example, a school can use a PivotTable to find the average score for each class or count how many students passed an examination.

Activity A: Enter the data

Open Microsoft Excel and enter the following information, starting from cell A1.

School Examination Results

Student	Class	Subject	Score
Ada	SS1A	Mathematics	78
Musa	SS1A	Mathematics	65
Grace	SS1B	Mathematics	85
David	SS1B	Mathematics	60
Ada	SS1A	English	72
Musa	SS1A	English	55
Grace	SS1B	English	90
David	SS1B	English	68

Step 1: Enter the column headings in row 1: `Student`, `Class`, `Subject`, `Score`.

Step 2: Enter all eight records underneath the headings.

Step 3: Save the workbook as `SS1_Examination_Results.xlsx`.

Important: Do not leave blank rows or columns inside the data. Each column should have a heading.

Activity B: Insert a PivotTable

Step 4: Click any cell inside the data.

Step 5: Select Insert → PivotTable.

Step 6: Check that Excel has selected the full data range, including the headings.

Step 7: Select New Worksheet, then click OK.

Excel will create a blank PivotTable area and display the PivotTable Fields panel.

Activity C: Calculate the average score for each class

Step 8: In the PivotTable Fields panel, drag:

- `Class` into the Rows area.
- `Score` into the Values area.

Step 9: Excel may display the sum of scores. To calculate the average instead:

1. Click the drop-down arrow beside the score field in the Values area.
2. Select Value Field Settings.
3. Choose Average.
4. Click OK.

Your PivotTable should show the following result:

Class	Average score
SS1A	67.5
SS1B	75.75

What have we learnt? A PivotTable can calculate averages for different groups without requiring students to write separate formulas for each class.

Activity D: Compare performance by subject

Step 10: Drag `Subject` into the Columns area.
Keep `Class` in Rows and `Score` in Values, with the summary set to Average.
The PivotTable should now look like this:

Class	English average	Mathematics average
SS1A	63.5	71.5
SS1B	79	72.5

This allows a teacher to compare class performance across subjects.

Activity E: Count students by class

Step 11: Remove `Subject` from Columns if you want a simpler summary.
Step 12: Drag `Student` into Values.
Step 13: Open Value Field Settings and choose Count.
The result should show:

Class	Number of records
SS1A	4
SS1B	4

There are four records per class because each student has two subject records.

Expected result: Students should be able to create a PivotTable, group data by class, calculate averages and count records.

Practical 2: Advanced Formulas in Microsoft Excel

An Excel formula is an instruction used to calculate, compare or analyse data in a worksheet.
For this lesson, students will use examination scores to calculate totals, averages, grades, pass or fail status, and class summaries.

Activity A: Prepare the worksheet

Open a new Excel worksheet and enter the following data from cell A1.

Student	Class	Maths	English	Science
Ada	SS1A	78	72	80
Musa	SS1A	45	55	50
Grace	SS1B	85	90	88
David	SS1B	30	68	42
Joy	SS1A	62	70	65

Add three more headings:

- F1: `Total`
- G1: `Average`
- H1: `Grade`

The worksheet will now have eight columns, from A to H.

Formula 1: SUM — Calculate the total score

The `SUM` function adds numbers together.
Step 1: Click cell F2.
Step 2: Type:

```
=SUM(C2:E2)
```

Step 3: Press Enter.
Ada's total should be 230.
Step 4: Click F2 again. Drag the small square at the bottom-right corner of the cell down to F6 to calculate the other students' totals.
Expected results:

Student	Total
Ada	230
Musa	150
Grace	263
David	140
Joy	197

Formula 2: AVERAGE — Calculate the average score

The `AVERAGE` function calculates the mean of a group of numbers.
Step 1: Click G2.
Step 2: Type:

```
=AVERAGE(C2:E2)
```

Step 3: Press Enter.
Ada's average is approximately 76.67.
Step 4: Drag the fill handle from G2 down to G6.
Students should now see each student's average across the three subjects.

Formula 3: IF — Determine whether a student passed

The `IF` function tests a condition and returns one result if it is true and another if it is false.
For this exercise, use 50 as the pass mark for the average.
Step 1: Click a new cell, I1, and type `Status`.

Step 2: Click I2 and enter:

```
=IF(G2>=50,"PASS","FAIL")
```

Step 3: Press Enter.

Ada's status will be `PASS`.

Step 4: Copy the formula down to I6.

Students whose averages are below 50 will receive `FAIL`.

Formula 4: Nested IF — Assign grades

A nested IF formula places one `IF` function inside another to test several conditions.

Use the following grading scale for this classroom exercise:

Average score	Grade
70 and above	A
60–69.99	B
50–59.99	C
Below 50	F

Step 1: Click H2.

Step 2: Enter this formula:

```
=IF(G2>=70,"A",IF(G2>=60,"B",IF(G2>=50,"C","F")))
```

Step 3: Press Enter, then copy the formula down to H6.

Expected results:

Student	Average	Grade
Ada	76.67	A
Musa	50.00	C
Grace	87.67	A
David	46.67	F
Joy	65.67	B

This formula checks the conditions from highest to lowest. These grade boundaries are examples for practice; schools should use their approved grading scale for actual results.

Formula 5: COUNTIF — Count students who passed

The `COUNTIF` function counts the number of cells that meet a specified condition.

Suppose the teacher wants to count how many students passed.

Step 1: Click K1 and type `Number Passed`.

Step 2: Click K2 and enter:

```
=COUNTIF(I2:I6,"PASS")
```

Step 3: Press Enter.

Expected answer: `4`

Four students have an average of 50 or above.

To count students who failed, use:

```
=COUNTIF(I2:I6,"FAIL")
```

Expected answer: `1`.

Formula 6: SUMIF — Add scores for a particular class

The `SUMIF` function adds values only when they meet a specified condition.

Suppose the teacher wants to calculate the total Mathematics score for SS1A.

Step 1: Click K4 and type `SS1A Maths Total`.

Step 2: Click K5 and enter:

```
=SUMIF(B2:B6,"SS1A",C2:C6)
```

Step 3: Press Enter.

Expected answer: `185`

Excel adds 78, 45 and 62 because those students belong to SS1A.