Y9 Lesson 3 Activities

Temperature Prediction:
Below is a table of midday temperature readings at 10 sites in the UK and the distance south of each observation site relative to site 1.

Site	1	2	3	4	5	6	7	8	9	10
Distance South /km	0	50	160	180	250	290	350	370	460	510
Temperature /degC	15.4	16.1	16.4	16.8	17.5	17.5	17.9	18.0	18.6	18.7

1) Produce a scatter plot of Temperature (vertical axis) against Distance South (horizontal axis) remembering to use suitable scales.
   a) Add a point to the scatter plot at (262km, 17.3degC), this is the mean distance south and mean temperature.
   b) Add a straight best fit line to this scatter plot passing through the point (262km, 17.3degC)

2) Now we wish to define the best fit line as a *mathematical model*; suppose **y = Temperature** and **x = Distance South** are related by the equation **y = mx + c** for the expected values.
   a) From the scatter plot in question 2 determine the approximate value of **c**.
   b) Using this value of **c** and the information that the point (262km, 17.3degC) lies on this line calculate the value of **m** to 3 significant figures.

3) Using the equation in question 2:
   a) Calculate, to 3 s.f., the expected temperature of a site 600km south of site 1.
   b) Calculate, to 3 s.f., the expected distance south of site 1 where the temperature is 22degC.
   c) Why is the model unlikely to be reliable for large values of **x**?

Forecast Verification:
1) Complete the table of observed and forecast temperatures in degrees Celsius for 13:00 each day you have data for:

	Monday	Tuesday	Wednesday	Thursday	Friday
Observed Temperature (T1)					
Forecast Temperature (T2)					
Observed – Forecast Temperature (T1 – T2)					

2) Produce a bar graph displaying the **Observed – Forecast Temperature** on the vertical axis and the day on the horizontal axis.

3) Complete a similar table for observed and forecast wind direction; you may need to convert the wind direction from the 16-point compass scale to °.

4) Produce a bar graph displaying the **Observed – Forecast Wind Direction** on the vertical axis and the day on the horizontal axis.

5) Are any trends apparent in these bar graphs and what do they suggest about the accuracy of the 5-day forecast?