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Term 3 Training

Course: Design & Technology

Target Grades: Grade 5

Academic Year: 2017/2018

Data Handling



Before we start

- Make sure to have Microsoft Excel installed on your laptop
- If not: You can access this by downloading the Office package via SharePoint using your log in details



Learning Outcomes




- Explain data and data types
- Identify what Data handling is?
- Explore how to collect data manually
- Demonstrate how to use Excel proficiently to log data and create graphical displays
- Explore creative ways to collect data within the classroom using mini projects and activities



Data types

- What is data?
- What types of data do we use?



Data Type	Data Examples
Text	Gibran Iffat or Ministry of Education, Dubai,
Number (integer)	23 or 1,000
Date	02/12/17 or 02/12/2017
Time	3.30pm or 15:30
True/False (boolean)	True or False
Graphical	  



Activity

- Write down examples of **text** data
- Write down examples of **number** data
- Write down examples of **date** data



Data Handling

- What is data handling?
- Why is logging this important?
- What ways can we record and log this data?



Data Handling

- Data handling is the recording or gathering of information and then storing or presenting it in a way which is meaningful to others.
- Logging data is an important way of ensuring recorded data is stored and displayed in a way that is accessible to its audience.
- We can collect data through surveys, questionnaires or using devices that can record different data (Thermometer, Accelerometer)
- We can log it using charts/graphs in Microsoft Excel the information easy to view for all



Data Collection

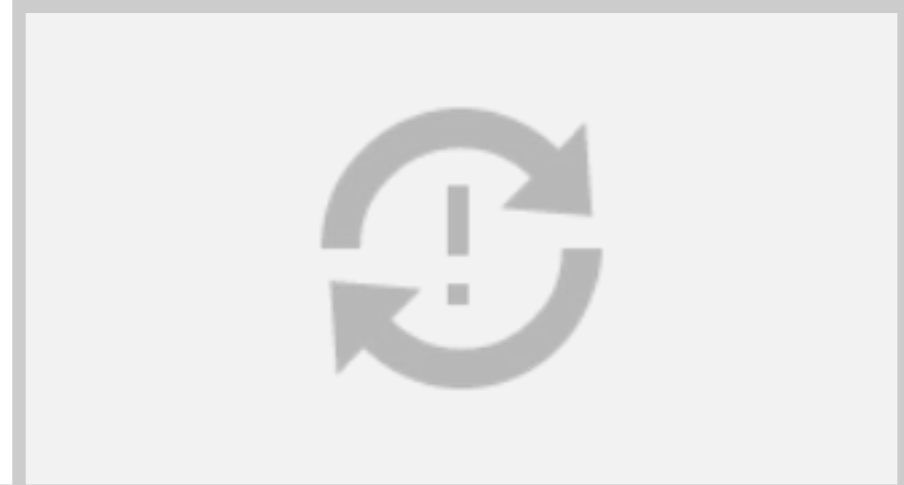
- Data collection is the method used to gather data before it can be displayed in a way that is easy to understand.
- There are many data collection methods some are listed below;
- Some **Manual** methods;
 - Counting (eg. Number of pupils in the class)
 - Measuring (eg. Height of each pupil in the class)
 - Asking questions
- Some **Electronic** methods;
 - Online forms (eg. Registration form for an email account)
 - Sensors (eg. electronically collect and store temperature over time)
 - Research (eg. Gathering information available online)





Displaying Data

- The most common way to display data is via charts/graphs





Creating charts/graphs

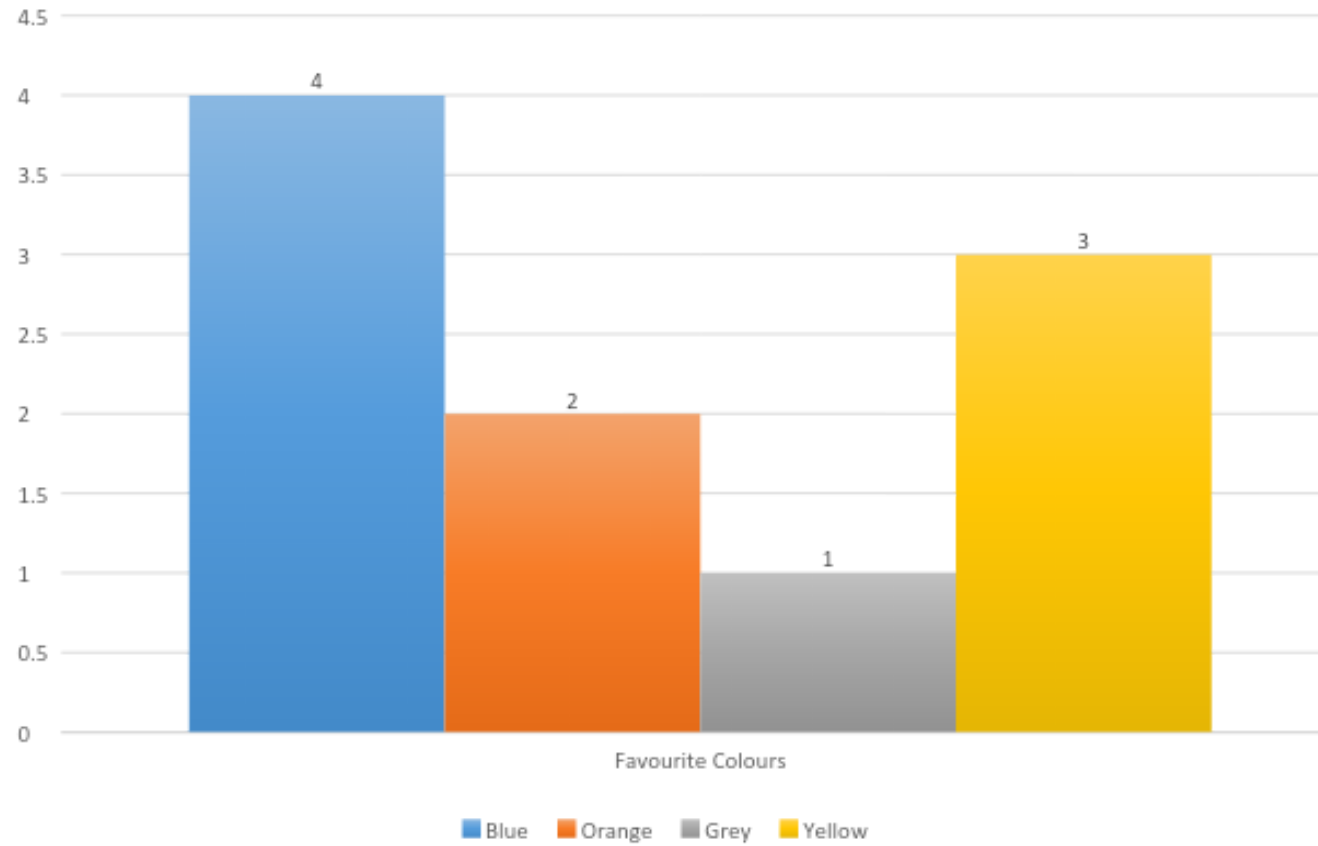
- In your groups use 3 simple questions and sketch 3 different types of graph to display the recorded data.

For Example:

- What Continent are you from?
- What month were you born?
- What is your favourite colour?



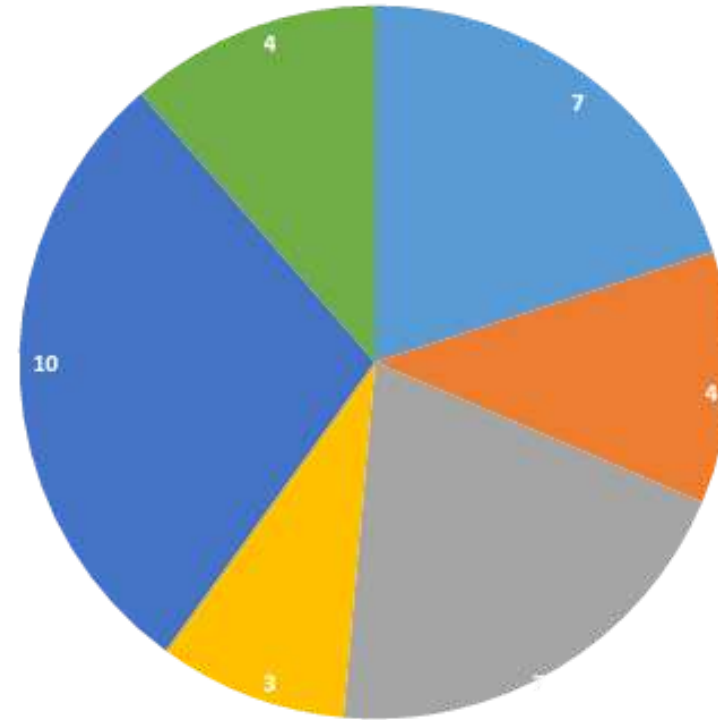
Bar Chart





Pie Chart

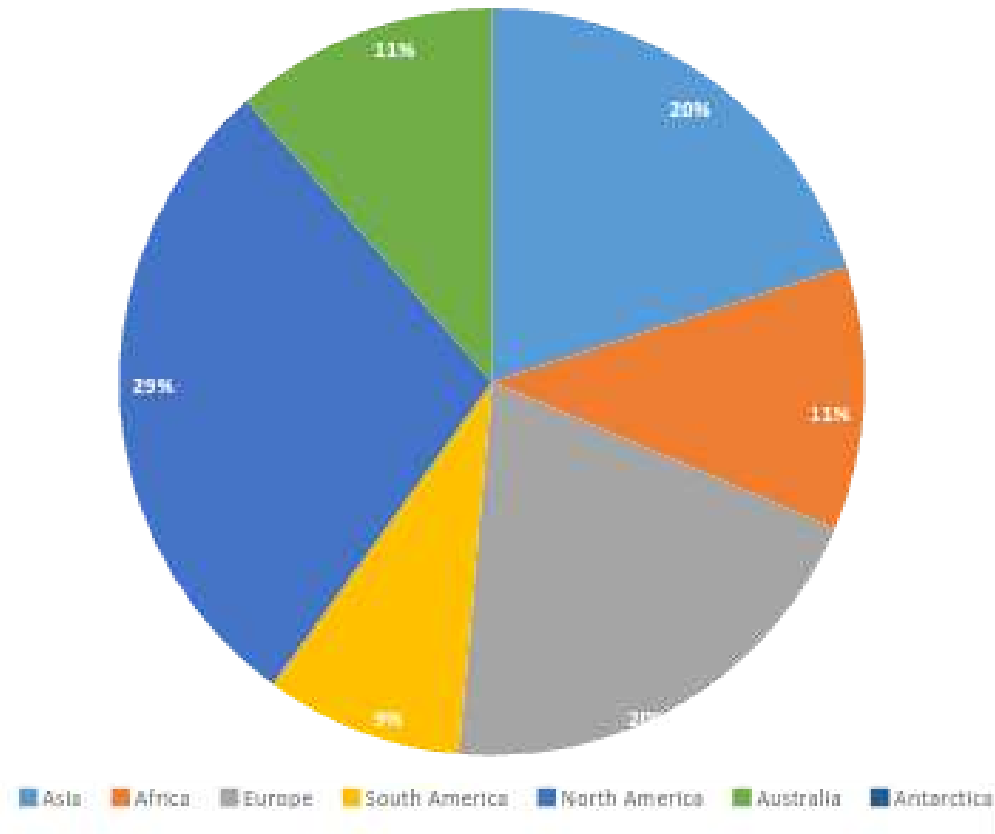
No. of People from each Continent



■ Asia ■ Africa ■ Europe ■ South America ■ North America ■ Australia ■ Antarctica

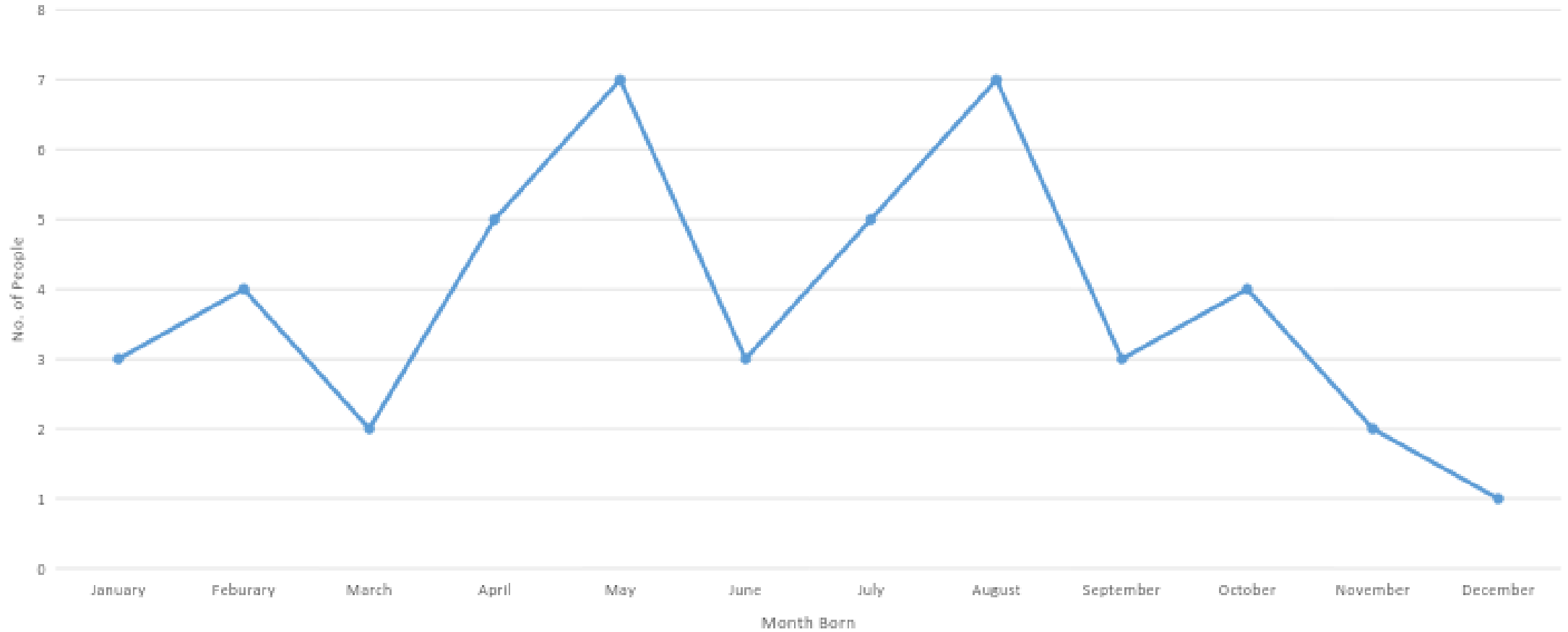


Percentage of People from each Continent





Line Graph







Creating these charts/graphs in Excel

- Open Excel



- Take 5 minutes to try create 1 of the charts you have just sketched





- Is there only one way in which charts/graphs can be made in excel?
- How did you create your first chart?
- What method do you think will work best for pupils in school?



Using Excel

The screenshot shows a Microsoft Word document with the following content:

When Microsoft excel opens you need to choose 'blank workbook' to create a new spreadsheet document;

The embedded image shows the Microsoft Excel start screen with the following elements:

- Search for online templates
- Suggested searches: Business, Personal, Financial Management, Industry, Lists, Logs, Calculator
- Blank workbook (circled in red)
- Welcome to Excel
- Get started with Formulas (New)
- Back to School Planner
- Student schedule
- Academic calendar (any year)
- Project Planner
- January Year
- Open Other Workbooks

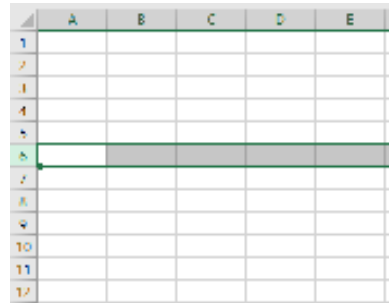
Page 13 of 25 1616 words

1:23 PM 3/6/2018

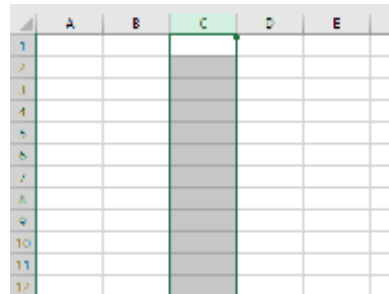


- Pupils will have to understand the basic layout of Excel

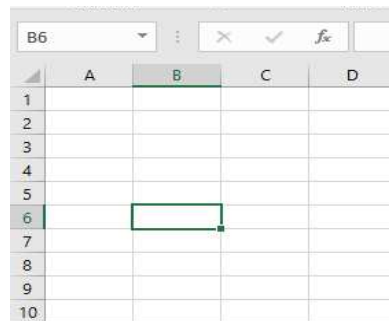
- Rows



- Columns



- Cells





Rows

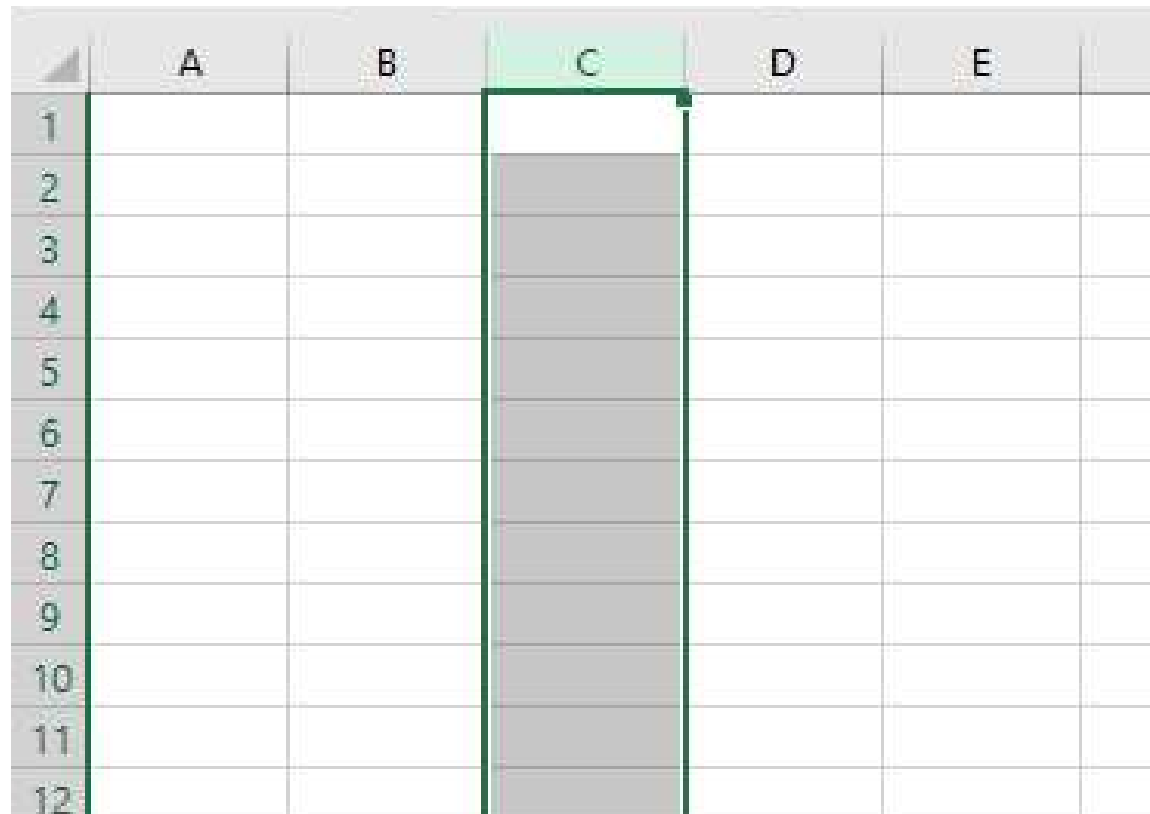
- The rows are numbered and are horizontal (across the screen). Below row 6 is selected;

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					



Columns

- The columns use letters and are vertical (down the screen). Below column C is selected;



The image shows a portion of an Excel spreadsheet. The columns are labeled A, B, C, D, and E. The rows are numbered 1 through 12. Column C is selected, indicated by a green background and a dark green border. The cells in column C from row 2 to row 12 are shaded grey, suggesting they are part of a selection or a specific data set.

	A	B	C	D	E
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					



- Cells are used to store data like **text** or **numbers**. We refer to Cells by their column and row number. Below Cell B6 is selected;

A screenshot of an Excel spreadsheet interface. The formula bar at the top shows 'B6'. The spreadsheet grid has columns labeled A, B, C, and D, and rows labeled 1 through 10. Cell B6 is highlighted with a green border, indicating it is the active cell. The grid is otherwise empty.

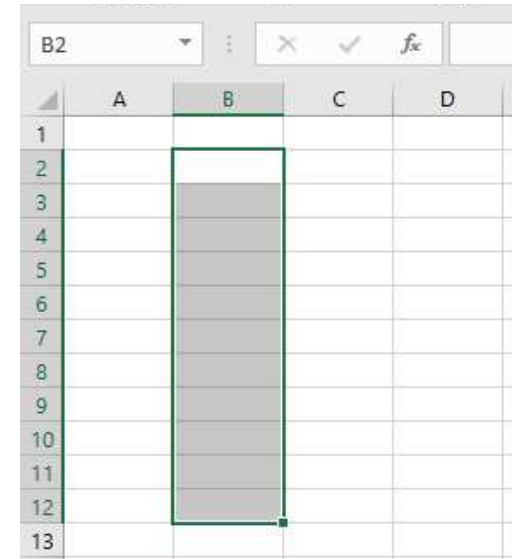
	A	B	C	D
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				



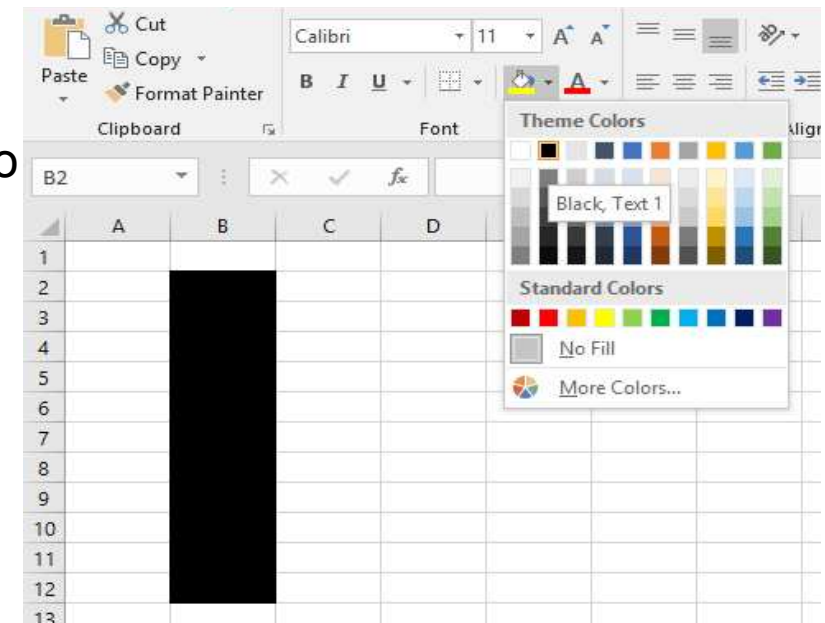
Activity

Shading rows and columns

- Starting with a blank spreadsheet document click, hold and drag from B2 to B12 to select a range of cells as shown below;

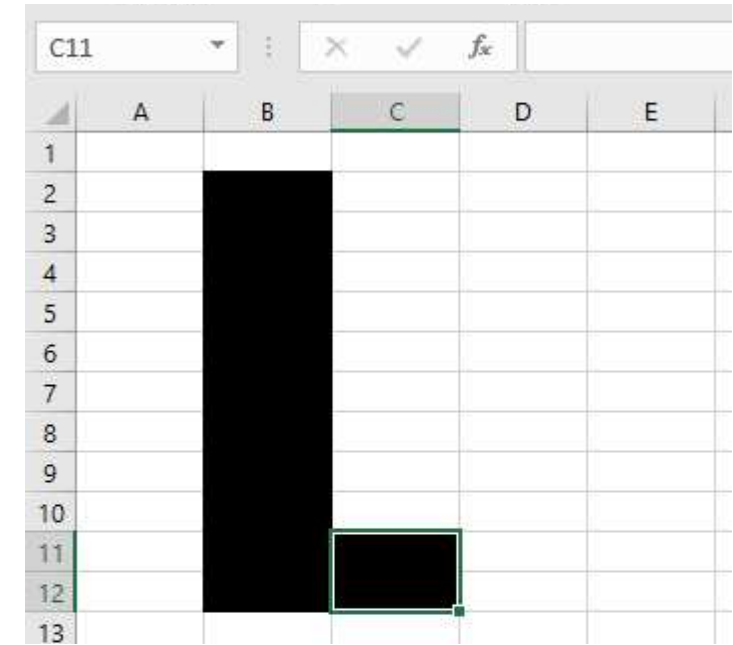


- With the cells selected. Use the fill colour tool from the menu to set the colour to Black;





- Now select cells C11 to C12 and use the fill colour tool to set the colour to Black
- Now select cells **D2** to **D12** and use the fill colour tool to set the colour to Black.
- Now you know how to use fill colour set the following cells;



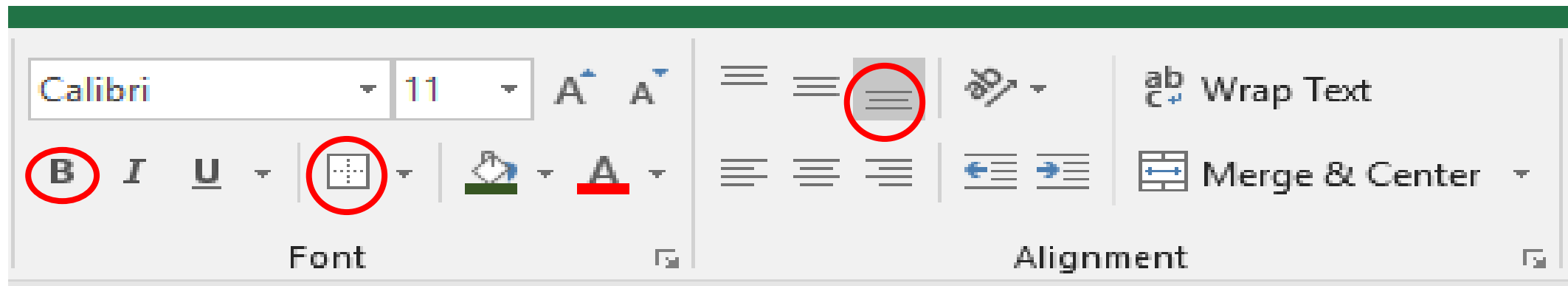
Cells	Fill Colour
F2 to F12	Red
G2 to G4	Red
G7 to G8	Red
H2 to H12	Red
J2 to J12	Green
K2 to L4	Green
K6 to L8	Green
K11 to L12	Green



- Keep inputting text and numbers until you have inputted all the data collected from the group of trainers

	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2	Class Name/Number:	5, 3											
3													
4		January	February	March	April	May	June	July	August	September	October	November	December
5	Birthdays in Each Month	4	2	6	9	3	0	4	1	2	0	1	2

- Use formatting tools like **Bold**, **Alignment** and **Borders** to improve the layout of your data. Tools shown below;

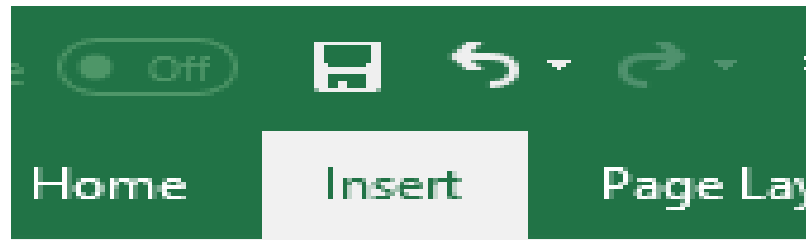




- To create a bar chart, select all the cells as shown:

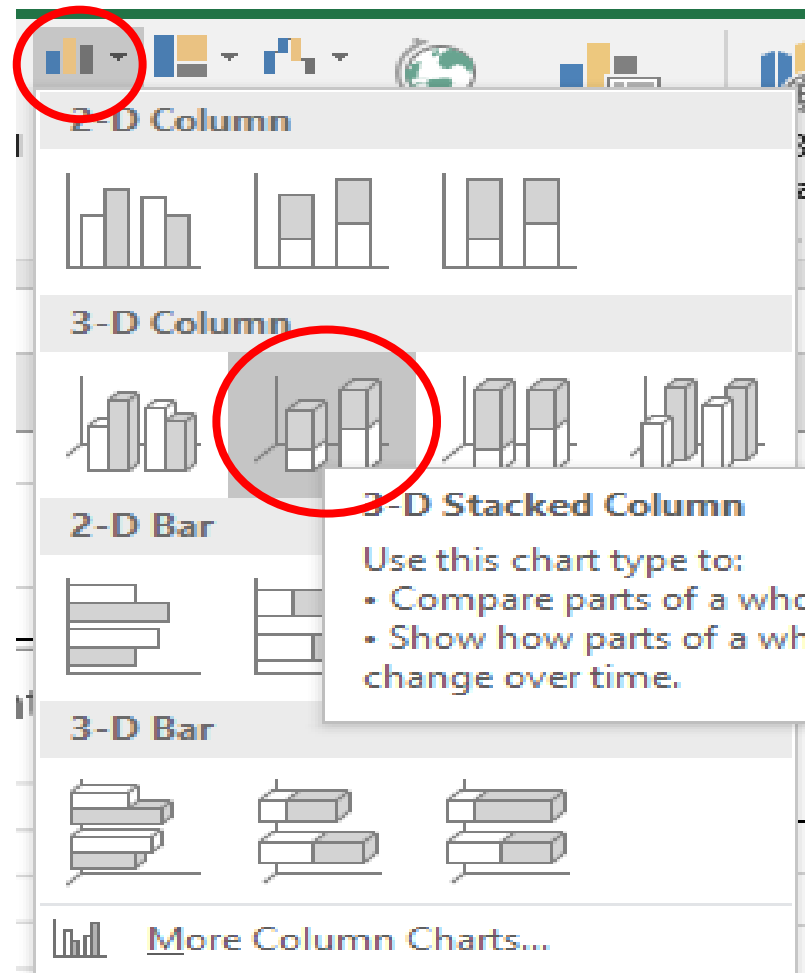
	A	B	C	D	E	F	G	H	I	J	K	L	M
1													
2	Class Name/Number:	5, 3											
3													
4		January	February	March	April	May	June	July	August	September	October	November	December
5	Birthdays in Each Month	4	2	6	9	3	0	4	1	2	0	1	2
6													
7													

- Select the insert tab:





- You can select the type of Bar chart you want to use here; For this example select '3-D stacked column'





Finished Bar Chart





Measurement

- What is measurement?
- What kind of measurement standard is used in UAE?





- The units for measurement used in the UAE is metric. The metric system works with 'millimetres' (mm), 'centimetres' (cm), 'metres' (m) and 'kilometres' (km) to measure distance, height, length or width.



- As part of Unit 2, pupils will be required to take measurements using tools such as tape and ruler.
- Firstly pupils must understand the basics of measurement and the units they will use to record this data.



Activity

- Measure the height of each person in your group
- Record this data manually first
- Enter this data into Excel to create a chart

- Please ensure that pupils understand how to record the length, height and width of an object



Project

- The aim of this project is to be hands on and incorporate a range of skills that involve STEAM education.
- The pupils will be able to get creative in designing and making their balloon powered vehicles
- They will then run a series of tests that will allow them to record the data (distance moved) from a starting line, and finally create the charts to display this in excel
- Watch the following video and then use the materials provided to create balloon powered vehicles in your groups
- <https://youtu.be/-OENIttg1dU>



- Once you have created the balloon powered vehicle, make a starting line by placing some tape to the floor.
- Then test out the vehicles and record the length for each go.
- Record the highest distance travelled to the nearest CM and create a bar chart in Excel to display the data.



Temperature and Humidity

- In Unit 3, pupils will use weather apps to record data over 5 days and finally create a line graph to display this data from 3 cities across the world.
- One will be their home: (example: Ajman) and any other 2 cities in the world, preferably from a different climate or continent
- First pupils will have to learn about the basics of temperature and humidity and why they effect weather.



- What is temperature?



- What is humidity?





Line Graphs

- A line graph, or a line chart, is a type of chart used to display the value of something over time. For example, how many laptops were sold in a month for a store.



What can you describe about the information in this chart?



Collecting data for Temperature and Humidity

- Use the <http://www.uaeweather.ae/> website to record the temperature and relative humidity of 3 places in the World over 5 days.



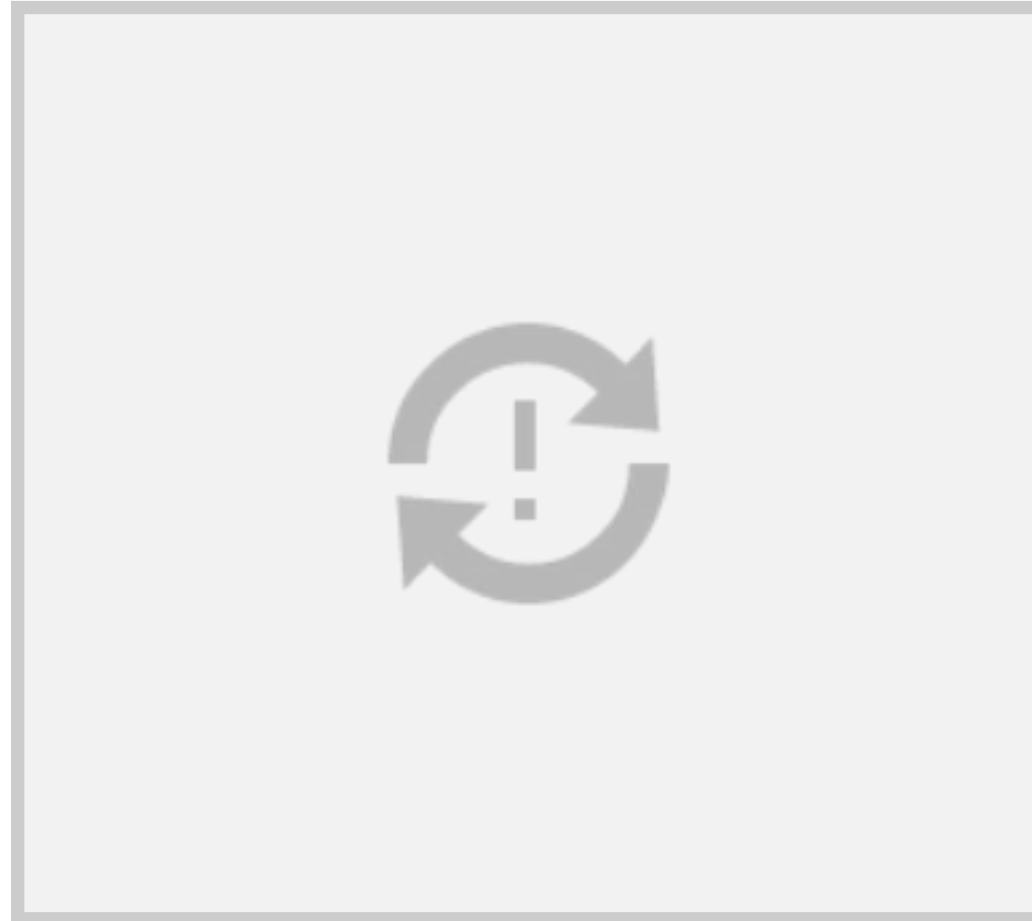


- Here you can encourage pupils to collect the data over 5 days for Homework and record it manually in their books
- If they do not have access to internet daily to do this, the data can be taken from the 5 day forecast
- Pupils can record the data into the table in their book before eventually creating the Line graph in excel

Day:	City 1: _____	Temperature °C	Relative Humidity %
Sunday			
Monday			
Tuesday			
Wednesday			
Thursday			



- Step 1: Insert the data you have collected over the past 5 days for temperature



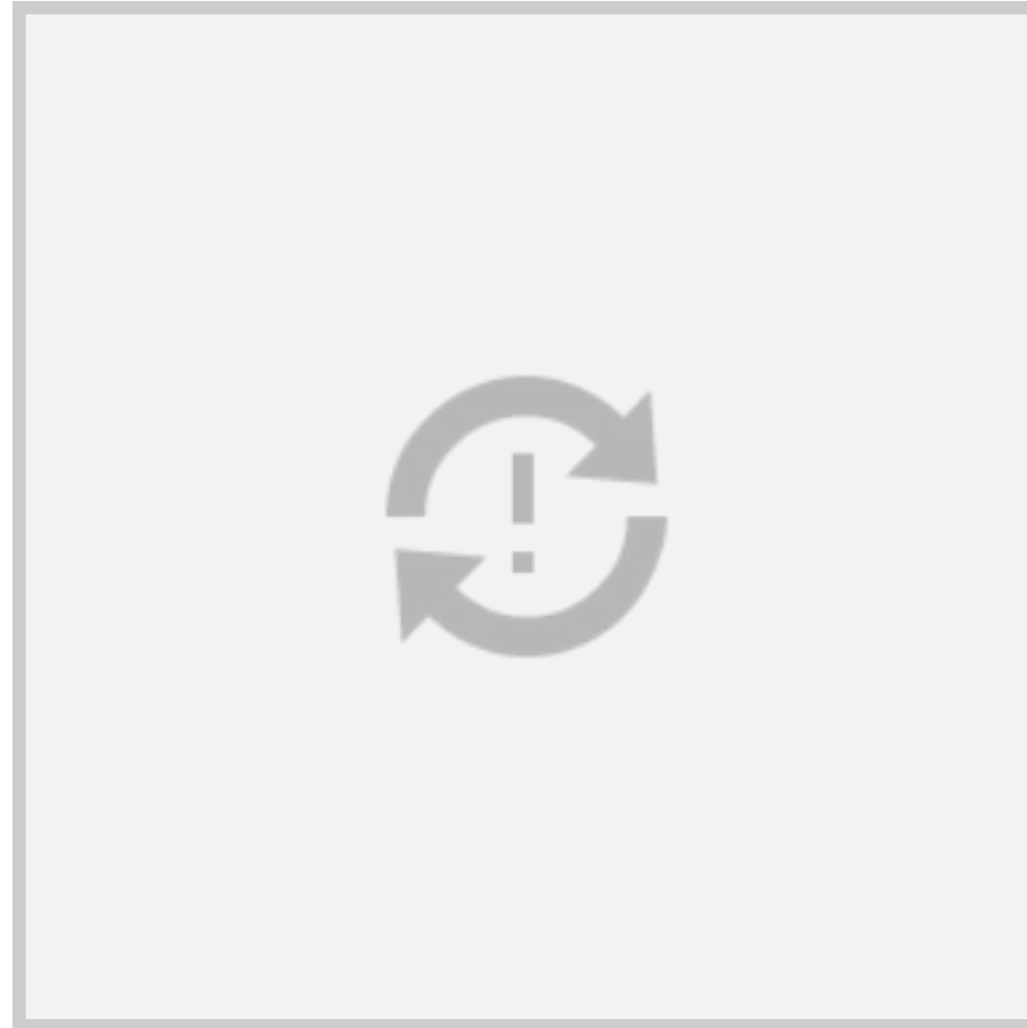


- This data can be taken from the 5 day forecast as seen below: However encourage pupils to take the temperature and humidity daily as it will be more accurate





- Step 2: Select all the data:





- Step 3: The select 'insert' and select 'line chart' from the chart section:





- Step 4: You can now select the type of 'line chart' you want: For this example 'Line with Markers' is used.





- You can then change the 'chart title' to suit the data you are displaying



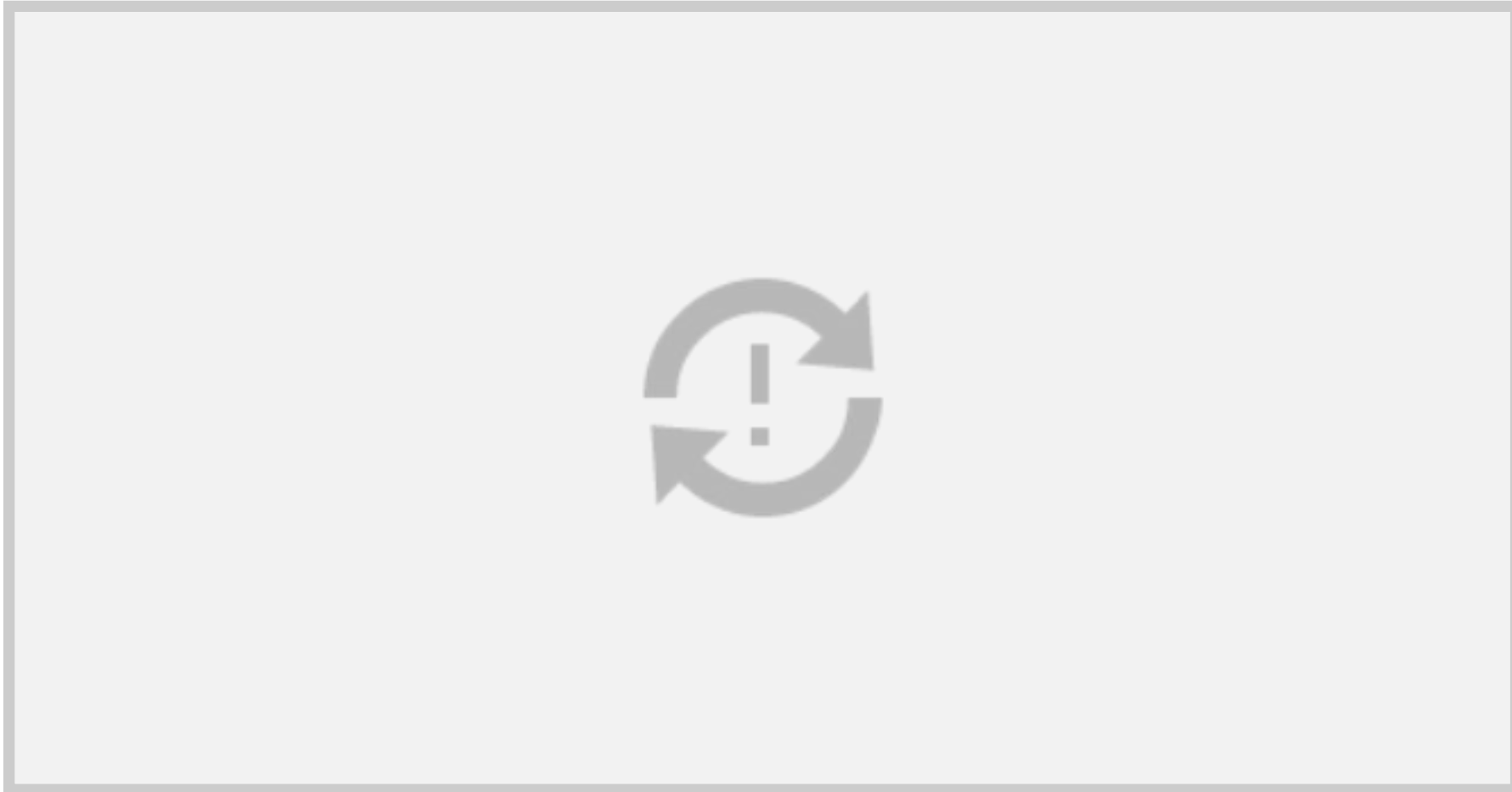


- Then select the 'quick layout' tab:





- Here you can change the style of the 'line graph'. Select 'Layout 1' for a chart with an 'axis title':





- Change the 'axis title' to suit the unit of measurement:





- Use the same steps to change the data to match 'Relative Humidity' and 'Save as'.





- **Extension:**
- The same process can be used to collect all types of data:
- You can record the 'data' and use it to create graphs/charts in Excel.
- Feel free to explore with different units of 'data' and create new types of graphs/charts in Excel.
- This will only be required if pupils finish all activities already provided in Unit 3, it might work well for pupils who are at a higher level of differentiation



UNITED ARAB EMIRATES
MINISTRY OF EDUCATION

Learning and Development Department

Any Questions?