



*Ministero dell'Istruzione, dell'Università, della Ricerca
Ufficio Scolastico Regionale Per Il Lazio
Liceo Scientifico Statale
"TALETE"*

Modulo 3 MiniCLIL

Incontro 7: Data, tables, graphs

L'intervento della nostra giornata sarà mirato all'analisi dei dati e variabili derivanti dalla lettura di tabelle e grafici. La raccolta delle informazioni, accompagnata dall'uso sistematico di calcoli, analizzerà il fenomeno dell'inquinamento ambientale derivante da veicoli su strada nel Regno Unito e in un arco temporale selezionato. L'attività prende spunto dal testo *'Functional Skills Maths'* utilizzato nelle scuole superiori inglesi per gli indirizzi tecnologici.

Lezione

L'intervento odierno prenderà in considerazione l'analisi dei dati e delle variabili relativi a fenomeni complessi distribuiti su un arco temporale esteso. I fenomeni saranno analizzati in termini di calcolo matematico-funzionali e porteranno gradualmente alla costruzione analitica di un grafico che sintetizzerà in plenaria il lavoro svolto a gruppi durante la sessione

Il materiale, qui allegato, è tratto dal testo *'Functional Skills Maths' Motor Vehicle Technology Workbook, Nelson Thornes, London 2010* utilizzato negli istituti superiori inglesi per gli indirizzi tecnologico-matematici.

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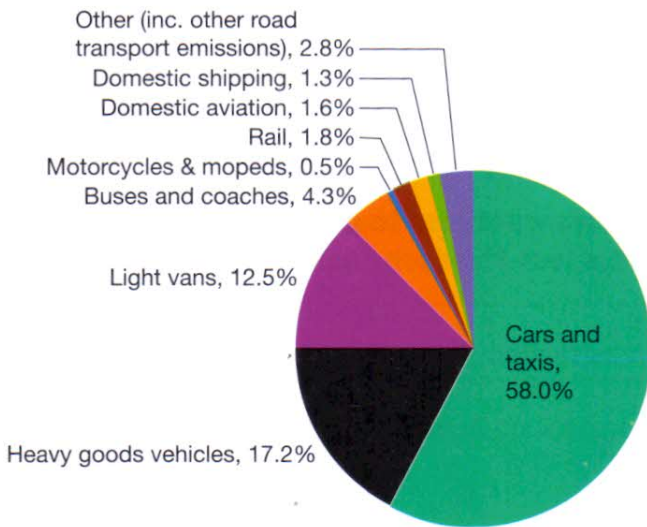
Extracting data from tables, charts and graphs

SOURCE Carbon emissions targets

The United Nations Kyoto Protocol set a target to reduce greenhouse gas emissions by 12.5% between 1990 and 2012. However, the UK government aimed for greater reductions: 22% by 2012, 28% by 2017, 34% by 2022 and 60% by 2050 (each reduction based on 1990 levels).

Sources of carbon emissions in the UK, 1990–2011 (million tonnes)									
Source	1990	1995	2000	2005	2007	2008	2009	2010	2011
Energy supplies	242	211	203	218	219	213	190	196	184
Transport	119	120	125	129	131	126	121	121	119
Business	111	104	104	94	89	87	76	76	70
Residential	79	81	87	84	78	80	75	87	67
Other	39	36	31	27	24	22	16	17	16

Domestic transport contribution to UK greenhouse gas emissions in 2009



Study the table showing sources of carbon emissions.

1 a) How many million tonnes of emissions were produced by transport in 1990?

b) In which other year did transport produce the same amount as in 1990?

c) In which year did transport produce the most emissions?

2 a) In which year did energy supplies produce the most emissions?

b) How much was produced?

c) In which year did energy supplies produce the least emissions?

d) How much was produced?

3 Find the total emissions in million tonnes produced for each of the years below.

a) 1990

b) 2000

c) 2010

d) 2011

4 Match the parts of the sentences about carbon emissions between 1990 and 2011.

a) Carbon emissions from transport have gone...
b) Other carbon emissions have gone...
c) Residential carbon emissions have gone...
d) Business carbon emissions have gone...
e) Carbon emissions from energy supplies have gone...

... up.
... up or stayed the same.
... up and down.
... down or stayed the same.
... down.

L1

Study the table showing sources of carbon emissions.

1 Find the difference between the most and least emissions produced for each source.

- a) Energy supplies
- b) Transport
- c) Business
- d) Residential
- e) Other

Study the pie chart showing the domestic transport contribution to UK greenhouse gas emissions.

2 Which of these statements are true and which are false, according to the data?

- a) Cars and taxis accounted for over $\frac{1}{2}$ of the emissions. True False
- b) Buses and coaches produced more than double the emissions from rail. True False
- c) Light vans, motorcycles and mopeds produced the same emissions as heavy goods vehicles. True False
- d) Light vans accounted for $\frac{1}{8}$ of emissions. True False
- e) Rail was the third-smallest contributor to emissions. True False
- f) Heavy goods vehicles emitted under $\frac{1}{3}$ of the emissions of cars and taxis. True False

3 Car and taxi emissions were roughly $4\frac{1}{2}$ times those produced by light vans. This could mean that there are two light vans for every nine cars or taxis.

Do you think there are two light vans for every nine cars or taxis? If not, what does this say about emissions from light vans?

Study the table showing sources of carbon emissions.

1 In which year did transport account for:

a) about $\frac{5}{1}$ of the total emissions?

b) about $\frac{4}{1}$ of the total emissions?

c) more than $\frac{4}{1}$ of the total emissions?

2 a) How many tonnes did the Kyoto target want the UK to reduce its emissions by between 1990 and 2012?

b) When was this target achieved?

3 Calculate the total emission targets set by the UK government for:

a) 2012

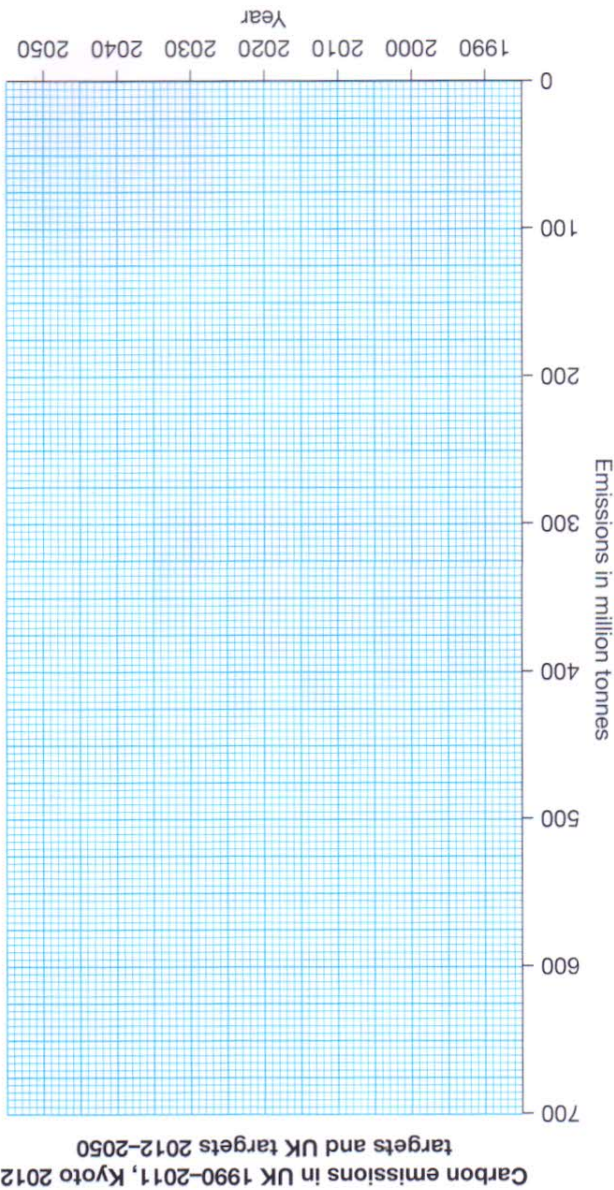
b) 2017

c) 2022

d) 2050

4 Draw line graphs on the grid on the right to show UK emissions from 1990 to 2011, UK targets between 1990 and 2050 and the Kyoto reduction target for 2012.

5 Do you think the UK will meet the targets for 2017, 2022 and 2050? Explain.



Carbon emissions in UK 1990-2011, Kyoto 2012 targets and UK targets 2012-2050

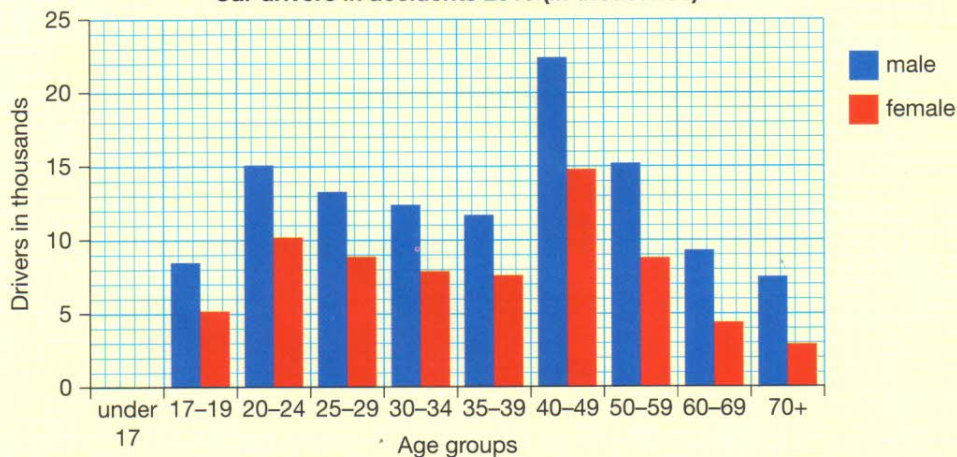
Extracting data from tables, charts and graphs

SOURCE Accidents on roads

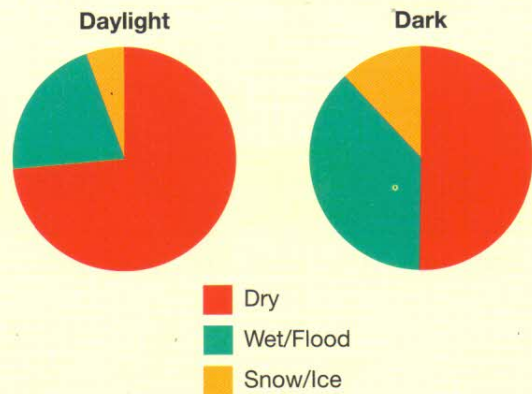
Each year in the UK, accidents involving motor vehicles cause thousands of injuries and claim too many lives. Every driver should be aware of driving conditions and their potential to contribute to accidents.

Vehicles involved in accidents with casualties						
	2005	2006	2007	2008	2009	2010
Pedal cycles	12039	16611	16607	16797	17599	17811
Motorcycles	25870	24323	24381	22427	21590	19534
Cars	281810	267991	255891	236923	227244	212685
Bus/coach	9988	9133	8559	8375	7831	7462
Light goods vehicles	16078	15593	14620	13621	13214	12866
Heavy goods vehicles	12120	11336	10688	9040	7487	7615

Car drivers in accidents 2010 (in thousands)



Driving conditions when accidents took place



Study the bar chart showing car drivers in accidents.

1 What is the value of each division on the vertical axis?

2 a) Which colour on the chart represents male drivers?

b) Which colour on the chart represents female drivers?

3 Which age group, for each gender, has the most accidents?

a) Male drivers b) Female drivers

4 Which drivers had fewer accidents in each age group - male or female?

5 Estimate the number of accidents for each set of drivers below.

a) Male 20-24 e) Female 20-24

b) Male 25-29 f) Female 25-29

c) Male 30-34 g) Female 30-34

d) Male 35-39 h) Female 35-39

6 Use your answers to question 5 to estimate the number of accidents for each of these groups.

a) Male drivers 20-29 c) Female drivers 20-29

b) Male drivers 30-39 d) Female drivers 30-39

7 Under 17s have very few accidents. Does this mean they are the best drivers? Explain.

8 Car insurance is higher for younger drivers. Do you think this is fair? Explain.

L1

Study the table showing vehicles involved in accidents with casualties.

1 Which of these options are true and which are false, according to the data?

Between 2005 and 2010 accidents with casualties reduced each year for:

- | | | |
|-------------------------|-------------------------------|--------------------------------|
| a) pedal cycles | True <input type="checkbox"/> | False <input type="checkbox"/> |
| b) motorcycles | True <input type="checkbox"/> | False <input type="checkbox"/> |
| c) cars | True <input type="checkbox"/> | False <input type="checkbox"/> |
| d) light goods vehicles | True <input type="checkbox"/> | False <input type="checkbox"/> |
- 2 Altogether how many accidents involved casualties in 2005?

3 How many fewer accidents were there in 2010?

Study the bar chart showing car drivers in accidents.

4 Estimate the difference in accident numbers between male and female drivers:

- | | | | |
|---------------|----------------------|---------------|----------------------|
| a) aged 17-19 | <input type="text"/> | c) aged 30-39 | <input type="text"/> |
| b) aged 20-29 | <input type="text"/> | d) aged 40-49 | <input type="text"/> |

5 Jasmin says women are better drivers than men. Is she right? Explain.

Study the pie charts.

6 Estimate the percentage of accidents in daylight that can be attributed to:

- | | |
|------------------------------|----------------------|
| a) wet or flooded conditions | <input type="text"/> |
| b) snow or ice | <input type="text"/> |

7 Estimate the percentage of accidents in the dark that can be attributed to:

- | | |
|------------------------------|----------------------|
| a) wet or flooded conditions | <input type="text"/> |
| b) snow or ice | <input type="text"/> |

8 Estimate the percentage of accidents that happen in dry conditions:

- | | |
|----------------|----------------------|
| a) in daylight | <input type="text"/> |
| b) in darkness | <input type="text"/> |

1 For each type of vehicle, find the percentage increase/decrease in accidents with casualties between 2005 and 2010.

- a) Pedal cycles
- b) Motorcycles
- c) Cars
- d) Buses/coaches
- e) Light goods vehicles
- f) Heavy goods vehicles

2 Estimate the fraction of accidents female drivers were involved in compared to men, in these age groups.

- a) Aged 20-24
- b) Aged 25-29
- c) Aged 60-69
- d) Over 70

3 Raman says the chart showing car drivers in accidents is misleading. Why is this?

4 Find the average number of accidents for each year of age within the age groups for male drivers between 17 and 49.

5 If all accidents in 2010 had happened in daylight, how many could have been attributed to:

- a) wet or flooded conditions?
- b) snow or ice?

6 If all accidents in 2010 had happened in darkness, how many could have been attributed to:

- a) wet or flooded conditions?
- b) snow or ice?

7 Write recommendations for learner drivers to go with the pie charts.

Nelson Thornes



Veronica Thomas

Deborah Holder

Motor Vehicle Technology Workbook



ENTRY 3 -
LEVEL 2

Functional Skills Maths

In Context