

## CASE STUDY: Global Warming - the forest from the trees

### 4. Different ways of presenting the same data.

Table 2 lists the mean maximum and mean minimum temperature for each year from 1940 to 2008 at Canberra airport, calculated from the monthly statistics of the maximum temperature and minimum temperature measured by thermometer each day. The values are drawn from the Australian Bureau of Meteorology's climate data online monthly statistics and have not been subject to quality control adjustments (*BOM, 2009 b*).

**Table 2: Canberra temperature data (1940-2008); unadjusted annual means calculated from the recorded raw monthly maximums and the raw monthly minimums (*BOM, 2009 b*).**

The mean maximum temperature and mean minimum temperature (in degrees Celsius) for each year from 1940 to 2008 for Canberra Airport Met Station (World Meteorological Organisation station number = 94926) Location: -35.3049, 149.2014.											
Year	Max	Min	Year	Max	Min	Year	Max	Min	Year	Max	Min
1940	20.9	6.2	1960	18.7	5.8	1980	21.0	7.1	2000	19.8	6.9
1941	19.7	5.6	1961	19.4	5.9	1981	19.9	7.7	2001	20.7	6.6
1942	19.8	7.2	1962	18.9	5.6	1982	21.2	6.5	2002	21.0	6.7
1943	18.1	6.9	1963	19.2	6.4	1983	19.4	7.7	2003	20.3	7.4
1944	20.4	6.5	1964	18.9	6.1	1984	18.8	5.7	2004	21.1	7.0
1945	19.4	7.1	1965	20.2	5.7	1985	19.6	6.2	2005	21.0	7.3
1946	19.7	6.9	1966	18.7	5.9	1986	19.4	6.2	2006	21.8	7.0
1947	19.6	6.7	1967	20.2	6.1	1987	20.0	6.1	2007	21.2	8.3
1948	18.6	5.4	1968	19.7	6.8	1988	20.1	7.6	2008	20.4	7.1
1949	18.7	5.4	1969	19.2	6.3	1989	18.9	7.2			
1950	19.0	6.8	1970	18.7	5.8	1990	19.7	7.3			
1951	19.5	5.6	1971	19.1	5.7	1991	20.3	7.2			
1952	18.7	6.4	1972	20.1	5.6	1992	18.4	6.5			
1953	19.3	5.2	1973	19.9	7.7	1993	19.6	6.6			
1954	19.7	5.7	1974	18.7	6.5	1994	20.4	6.0			
1955	18.7	6.4	1975	19.4	6.8	1995	19.0	6.9			
1956	17.9	5.8	1976	19.0	6.1	1996	19.1	6.2			
1957	20.4	4.6	1977	20.0	6.3	1997	21.0	6.5			
1958	19.1	6.8	1978	19.0	6.8	1998	20.5	7.5			
1959	19.5	6.3	1979	20.5	6.6	1999	19.9	6.5			

When presented in this way it is not easy to see the forest for the trees; the mind gets swamped in the detail and finds it hard to detect any overall trends or changes. The human mind is better able to grasp a graphical presentation.

A graph is a portrait of the data; not one iota of the information need be lost, yet our focus shifts to the image as a whole not to each individual pixel (unless we so choose). The 'rules' for creating a graph are similar to those for painting a portrait – truthfulness of content, balance of composition, use of space, and stand-alone titles and labelling.

#### ACTIVITY: Graphing the Canberra airport temperature data

Using the data presented in the table above, graph the trend in maximum and minimum temperatures at Canberra airport over the last 68 years. You may choose to print a copy of the graph template presented **on the next page** to do this. Alternatively, you may choose to use a computer to prepare the graph using Microsoft Excel<sub>(R)</sub> or some other graph-making software (an Excel<sub>(R)</sub> file of the above data and is available for down-loading from [http://www.blueplanet.nsw.edu.au/templates/blue\\_content.aspx?pageID=542](http://www.blueplanet.nsw.edu.au/templates/blue_content.aspx?pageID=542) ) which contains all the Excel<sub>(R)</sub> files used in this case Study).



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## 4(a) Template for graphing Canberra airport temperature data

Canberra airport raw unadjusted temperature data (1940-2008)

Year	Max	Min	Year	Max	Min	Year	Max	Min	Year	Max	Min	Year	Max	Min	Year	Max	Min	Year	Max	Min
1940	20.9	6.2	1950	19.0	6.8	1960	18.7	5.8	1970	18.7	5.8	1980	21.0	7.1	1990	19.7	7.3	2000	19.8	6.9
1941	19.7	5.6	1951	19.5	5.6	1961	19.4	5.9	1971	19.1	5.7	1981	19.9	7.7	1991	20.3	7.2	2001	20.7	6.6
1942	19.8	7.2	1952	18.7	6.4	1962	18.9	5.6	1972	20.1	5.6	1982	21.2	6.5	1992	18.4	6.5	2002	21.0	6.7
1943	18.1	6.9	1953	19.3	5.2	1963	19.2	6.4	1973	19.9	7.7	1983	19.4	7.7	1993	19.6	6.6	2003	20.3	7.4
1944	20.4	6.5	1954	19.7	5.7	1964	18.9	6.1	1974	18.7	6.5	1984	18.8	5.7	1994	20.4	6.0	2004	21.1	7.0
1945	19.4	7.1	1955	18.7	6.4	1965	20.2	5.7	1975	19.4	6.8	1985	19.6	6.2	1995	19.0	6.9	2005	21.0	7.3
1946	19.7	6.9	1956	17.9	5.8	1966	18.7	5.9	1976	19.0	6.1	1986	19.4	6.2	1996	19.1	6.2	2006	21.8	7.0
1947	19.6	6.7	1957	20.4	4.6	1967	20.2	6.1	1977	20.0	6.3	1987	20.0	6.1	1997	21.0	6.5	2007	21.2	8.3
1948	18.6	5.4	1958	19.1	6.8	1968	19.7	6.8	1978	19.0	6.8	1988	20.1	7.6	1998	20.5	7.5	2008	20.4	7.1
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