7.2. *t* test (Student's *t* test) for unmatched samples

EXAMPLE 7.2. The evolution of *Littorina littoralis* at Porthcawl, 2002

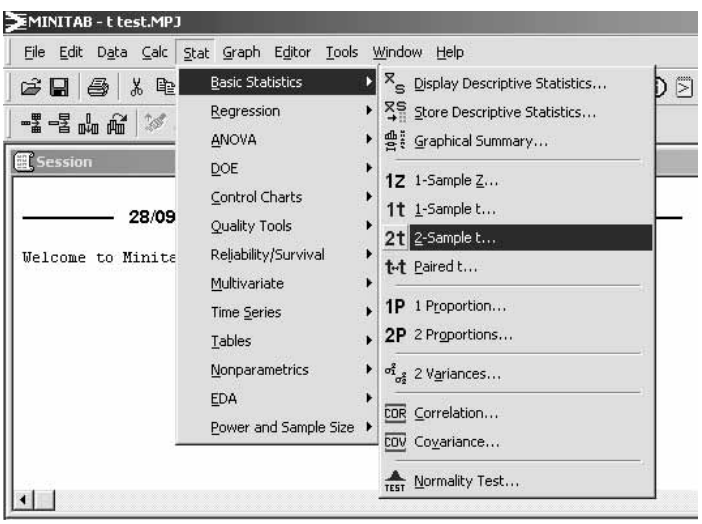
BOX 7.3. How to carry out a *t* test for unmatched data

Step 1. Enter your data into the worksheet part of the Minitab display, using sensible headings for the columns.

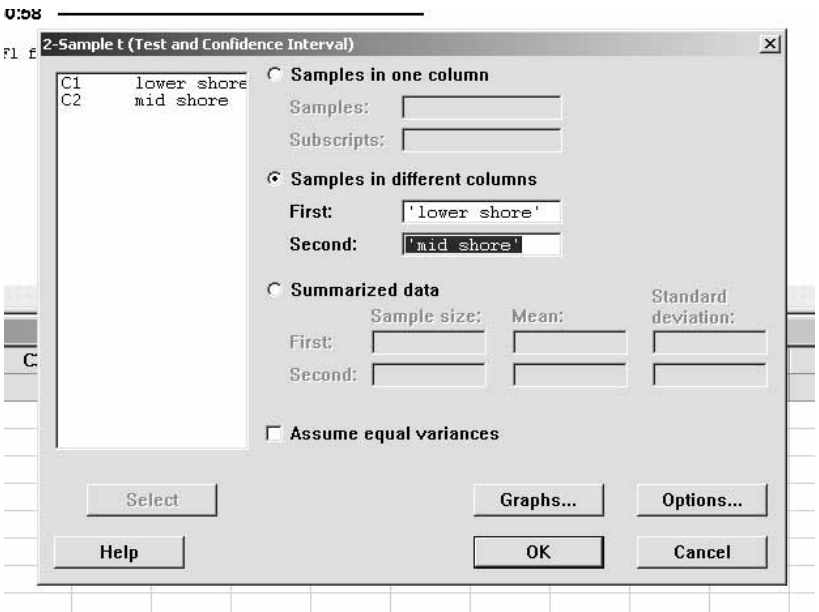
Worksheet 1 ***

↓	C1	C2	C
	lower shore	mid shore	
1	5.5	3.3	
2	8.4	6.3	
3	5.0	6.1	
4	5.0	8.0	
5	5.6	13.5	
6	4.8	5.3	
7	8.4	6.7	
8	4.0	6.7	
9	5.0	5.7	
10	6.2	4.2	

Step 2. Perform the test. Go to 'Stat', 'Basic Statistics', '2-Sample t'.



Click on the radio button 'Samples in two different columns'. Click in the window for the first column, click on the column heading in the left-hand window, and click on 'Select' to transfer it across. Repeat for the second column.



Click on 'OK'. The results of the test will appear in the 'Session' window.

Two-Sample T-Test and CI: lower shore, mid shore

```
Two-sample T for lower shore vs mid shore

                N     Mean     StDev     SE Mean
lower shore    13     5.89      1.42        0.39
mid shore      13     6.56      2.41        0.67

Difference = mu (lower shore) - mu (mid shore)
Estimate for difference: -0.669231
95% CI for difference: (-2.294114, 0.955652)
T-Test of difference = 0 (vs not =): T-Value = -0.86
P-Value = 0.399 DF = 19
```

Step 3. Decide what the results mean

The value of t is given as -0.86, but we should ignore the minus sign. (If we had done the test with the two variables interchanged, we would have got a positive result of the same magnitude.)

The p value is 0.399, which is much greater than 0.05. Therefore the data do not support the conclusion that there is a significant difference between the two samples.