Worksheet answers

1. Use the learning object, *Cyclones*, to count the number of cyclones in each temperature band. Add totals to Table 1.

SEA SURFACE TEMPERATURE	NUMBER OF CYCLONES ORIGINATING IN EACH TIME PERIOD					
	1985	1990	1995	2000	2005	2010
26 °C or below	*0*	*0*	*0*	*0*	*0*	*0*
27 °C	*0*	*3*	*0*	*2*	*0*	*0*
28 °C	*7*	*4*	*0*	*4*	*1*	*2*
29 °C	*7*	*1*	*1*	*3*	*4*	*3*
30 °C or above	*0*	*2*	*3*	*0*	*3*	*1*

Table 1: sea surface temperature and frequency of cyclones

2. What observations can you make about sea surface temperature and cyclone formation?

   No cyclones formed where sea surface temperature was 26 °C or below. Most cyclones formed in waters between 28 °C and 29 °C. Some cyclones formed in the water that was 30 °C or above.

3. Now use the learning object to count the number of cyclones in each latitude band. Add totals to Table 2. Move your mouse over each cyclone to get precise coordinates.

LATITUDE (DEGREES SOUTH)	NUMBER OF CYCLONES ORIGINATING IN EACH TIME PERIOD					
	1985	1990	1995	2000	2005	2010
0 (Equator)–5	*0*	*0*	*0*	*0*	*0*	*0*
5–10	*4*	*0*	*0*	*1*	*1*	*1*
10–15	*6*	*7*	*3*	*5*	*6*	*4*
15–20	*4*	*3*	*1*	*3*	*1*	*1*
20–25	*0*	*0*	*0*	*0*	*0*	*0*

Table 2: latitude and frequency of cyclones

4. What observations can you make about latitude and cyclone formation?

   No cyclones formed between the Equator and latitude 5° S. Most cyclones formed between latitude 10° and 20° S. No cyclones formed below latitude 20° S.

5. Use your answers to questions 2 and 4, and the fact sheet, *How* do *cyclones work?*, to describe environmental conditions required for a cyclone to form?

   Minimum conditions for cyclones to form are: moist air; sea surface temperature greater than 26 °C; a low pressure system and rotating air currents. These conditions occur between latitude 10° and 20° South.

6. In 1985, cyclones Frank and Gertie began over land. Predict what climate conditions may have been present for this to occur.

   For cyclones Frank and Gertie to form there would have been moist air, land surface temperature above 26 °C, a low pressure system and rotating air currents below latitude 5° S.

7. Is there any pattern between where a cyclone originates and its maximum severity (roll over points to learn more about individual cyclones)?

   This data set shows no pattern between where a cyclone originates and its maximum severity.

8. Does the map sequence show any pattern of change in sea surface temperatures off the coast of Western Australia?

   The maps show an overall tendency for the zones of higher sea surface temperature to move southwards. Although there is some fluctuation in this motion of warmer SST the area of 29 °C and 30 °C zones are clearly increasing in size and moving southwards by 2010 compared to 1985.

9. Scientists have predicted a rise in sea surface temperatures. What impact might this have on future cyclone frequency and severity?

   If sea surface temperatures rise, and all other conditions are met, then you would expect to see more cyclones affecting the Western Australian coastline as warmer waters would extend further down the coast. It is difficult to predict how severity may change as there is no clear pattern in this data set.

10. What other information might you need to be more confident in your answer to question 9?

    It would be useful to look at more data and perhaps look at cyclone tracks to find out if there are patterns within them. For example, most cyclones begin as a tropical low and progress to category 1, 2 etc. Is there any pattern where progressions occur?