

### What's the Chance of Rain?

#### Objectives

By the end of this lesson the student will:

- examine the outcomes from simple chance experiments and data on familiar events to order outcomes and events from least to most likely
- extract and interpret numerical information contained in tables, data displays and databases.

#### Extension activity objectives

By the end of this lesson the student will:

- Interpret, discuss and compare data displays and communicate information

#### Background

There are long-term events that happen year after year and affect the rainfall pattern. The Bureau of Meteorology analyses the past patterns and tries to predict the future patterns. The predictions are presented as probabilities (chances) and published to help people make informed decisions.

The three wheels (pie charts) you'll see on the website given in the Resources section below tell you what the chance of rain is during different climatic events.

An El Niño climate event is when there is a greater chance of low rainfall and a smaller chance of high rainfall. A La Niña climate event is when there is a greater chance of high rainfall and smaller chance of low rainfall.

Knowing when it is more likely to rain helps farmers to plan ahead and reduce the risk of a bad year. It helps in the planning of major outdoor events such as the Olympics and other sporting events.

#### Resources and actions

You'll need to access the content at the following internet location : [http://www.bom.gov.au/lam/Students\\_Teachers/climprob/rainprbprim.shtml](http://www.bom.gov.au/lam/Students_Teachers/climprob/rainprbprim.shtml). If the internet is not available to students, print off this lesson plan and worksheet, and have the students cut out pie charts and make tops for use in the activity. For tops you'll need toothpicks, scissors and prints of the pie charts (see worksheet).

Print off the student's worksheet and photocopy one for each student: [http://www.bom.gov.au/lam/Students\\_Teachers/climprob/ws1.htm](http://www.bom.gov.au/lam/Students_Teachers/climprob/ws1.htm).

Southern Oscillation Index (SOI) definition: <http://www.bom.gov.au/lam/climate/levelthree/analclim/soi.htm>.

Print off the SOI graph (<http://www.bom.gov.au/climate/current/soi2.shtml>) and the SOI monthly values (<http://www.bom.gov.au/climate/current/soihtm1.shtml>) for reference material. Make photocopies for students who don't have internet access.

Ask the students to carry out the activity from the worksheet then go over their results

at the end of the class.

### Solutions

1. Student's answers will vary. Some student's may not record one letter after another. To have the letters presented in one long sequence will help in getting across the fact that each spin is an independent event. Some student's may get quite a few W's in a row, which they may not have expected.
2. Student's answers will vary. The totals of all three states should add up to 100 for a quick check.
3. The scores obtained for Question 2 should show that 'Dry' has the highest score and therefore low rainfall is the most likely. 'Wet' should have the lowest score and therefore high rainfall is least likely. The student should use the results to support their answers. Some students may provide general information about El Niño to support their reason.
4. Their results should be very close and possibly the same.
5. You would start employing a drought strategy. Student's may offer some of the following responses: get another water tank and fill ahead of time. Plan to grow a crop that can tolerate dry conditions. Put in an irrigation system that is more effective.

Here is an actual plan from a farmer - monitor feed levels in pastures, check stored feed (hay and grain) for quality and amount, pregnancy test all cattle and sell the 'dries' or manage those separately, wean both sheep and cattle earlier, sell off non-breeding stock in cattle, sell culls of sheep, avoid overgrazing and maintain perennial pastures, both native and introduced.

6. The SOI graph is constantly updated. The answer will vary depending on the time the data is viewed. At the time of writing this material - the last El Niño episode had lasted for 14 months from March 1997 to April 1998.
7. The answer will vary as the SOI is updated every 3 months.
8. Student's answers will vary. The bar graph is easier to read and allows you to detect an El Niño episode much quicker than the monthly values. The monthly values give exact figures. To improve the monthly values the monthly columns could be labelled along the bottom as well as the top. Guidelines could be used on the bar graph to make it easier to associate the bar with the month.

### Time

30 minutes

### Assessment Task

Questions 2, 3 and 4.

### Support/Extension Activity

Questions 5, 6, 7 and 8 can be used for further investigation and require internet access or prints of the relevant web pages.

### Other References

Information about El Niño:

<http://www.bom.gov.au/lam/climate/levelthree/analclim/elnino.htm>