

Premier League Goals

Teacher Notes

Introduction

This activity asks students to examine data and make predictions based on what they observe. Data from the English Premier League and Scottish Premier League are available in two separate TI-Nspire documents. In each case there are sets of data from successive football seasons.

For each league and each season the number of goals and the resulting scorelines were collected from www.statbunker.com. It is important to note that here a scoreline of "1-0" could mean either a home or an away win, including both 1-0 and 0-1

The aim of the activity is for students to see a link between these two different but related data sets (goals scored and scorelines) for each season. They could also compare the data for the English and Scottish Leagues. The data are presented in a table and as a bar or pie chart. In these Teacher Notes, data from the English Premier League are used.

There is an extension activity that allows students to generate their own data for goals and scorelines using a short program called *shoot*.

Resources

Students will need a copy of either the TI-Nspire document entitled either EPLGoals.tns or SPLGoals.tns, for England or Scotland respectively, transferred onto their handhelds. Students may also want to write down their calculations and reflections on paper.

Skills required

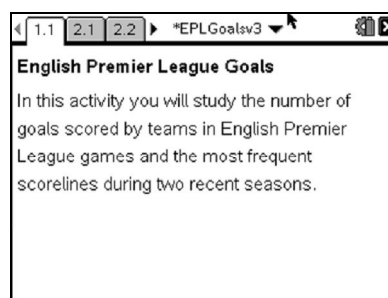
To move between pages on a TI-Nspire handheld.

To answer (open response and multiple choice) questions on a TI-Nspire handheld.

The activity

Student instructions and questions

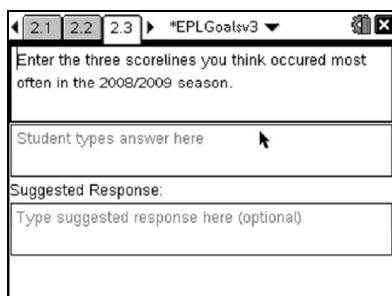
Student instructions are included in the TI-Nspire document. Students also have the opportunity to answer some questions about the presented data.



1.1 2.1 2.2 *EPLGoalsv3

English Premier League Goals

In this activity you will study the number of goals scored by teams in English Premier League games and the most frequent scorelines during two recent seasons.



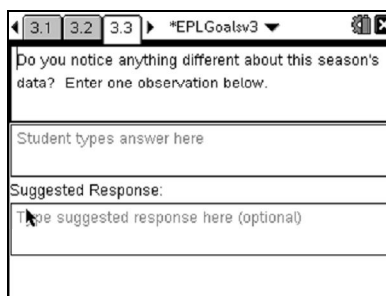
2.1 2.2 2.3 *EPLGoalsv3

Enter the three scorelines you think occurred most often in the 2008/2009 season.

Student types answer here

Suggested Response:

Type suggested response here (optional)



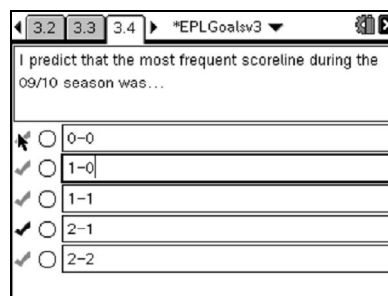
3.1 3.2 3.3 *EPLGoalsv3

Do you notice anything different about this season's data? Enter one observation below.

Student types answer here

Suggested Response:

Type suggested response here (optional)



3.2 3.3 3.4 *EPLGoalsv3

I predict that the most frequent scoreline during the 09/10 season was...

0-0

1-0

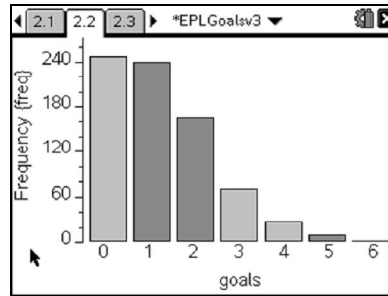
1-1

2-1

2-2

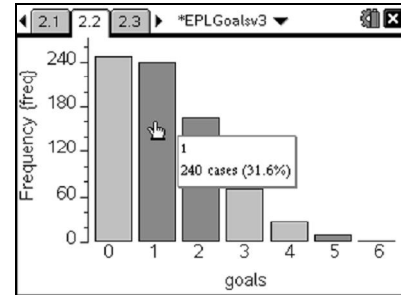
The data

goals	freq
0	247
1	240
2	165
3	71
4	27

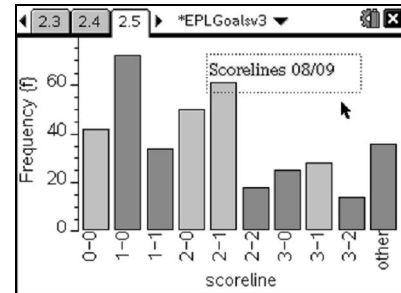


All data in Problem 2 are for season 2008/2009.

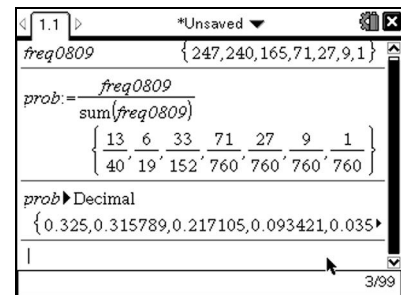
Students will see the goals presented in a spreadsheet and as a bar chart. They should be encouraged to see the connection between these representations by moving their cursor over areas of the frequency plot.



The students should answer the question on page 2.3 and compare their prediction with the actual scorelines as displayed on page 2.5. Are they surprised by the scorelines? They might have expected, for example, 0-0 to have occurred more frequently than 1-0, so it will be worth discussing with them why this is not the case. You could perhaps compare the situation with throwing two dice where there are two equally likely ways of producing a “scoreline” of 1-0 and only one equally likely way of producing 1-1. Here the numbers of goals scored are not equally likely but the same principle applies.

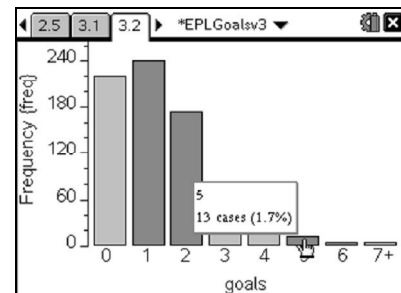


Probabilities can be calculated using TI-Nspire as shown here. For example, in the 08/09 season, the probability of a team scoring 0 goals was 247 (the frequency during 08/09) out of 760 (twice number of games played). Insert a Calculator page, (press / ~ 1) if you would like the students to perform some of these calculations. The analysis assumes that in any match the numbers of goals scored by the two teams are mutually exclusive events.

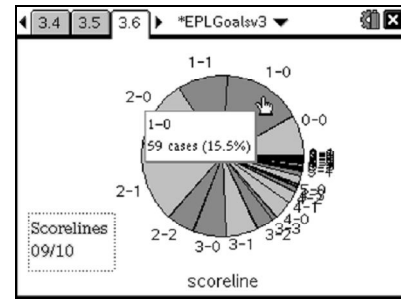


Similar goals and scoreline data for season 2009/2010 are presented in Problem 3.

goals	freq
0	221
1	240
2	174
3	74
4	29



After answering the questions on pages 3.3 and 3.4 the scorelines data is presented for season 2009/2010. In this case a pie chart is shown. Discuss with the students the different representation. The view can be changed to a bar chart by pressing \square 1 8 . Here the less common scorelines have not been collected together.



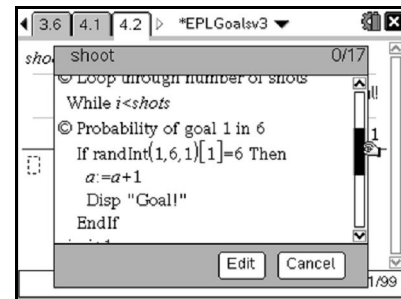
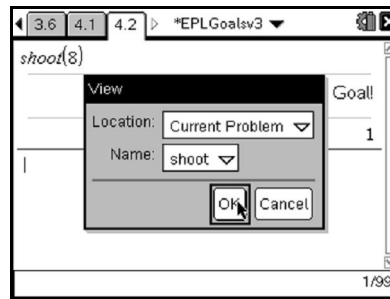
Extension activity: Shoot!

On average, in the English and Scottish Premier Leagues, for every shot taken, 1 in 6 results in a goal. The average number of shots taken in a match by a Premier League team is 8. Each shot has a 1 in 6 chance of “hitting the back of the net”.

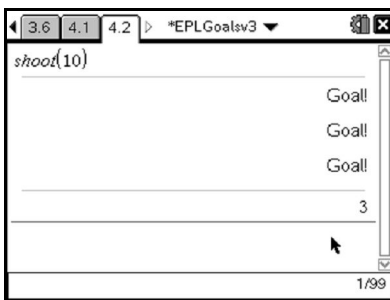
The *shoot(x)* command simulates this using a random number generator. For example, *shoot(8)*, produces a result when 8 shots have been taken . The command was defined using the function editor within the Calculator application. When on page 4.2 you can see the definition by pressing \square 9 1 4 and choosing *shoot*.

You can view (and choose to edit) the shoot command by pressing \square 9 4 2 and choosing *shoot*.

Help is available at <http://education.ti.com/guides>

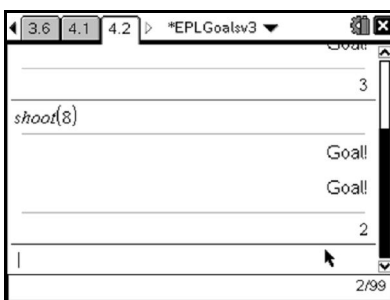
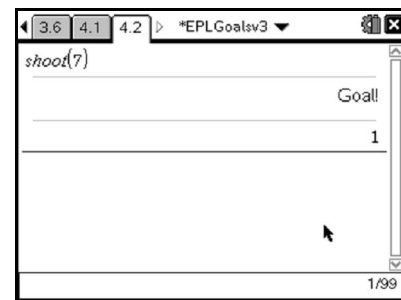


Get students to collect their own data on goal and scorelines data by playing against their classmates. Remind them that some teams might be more attacking than others and therefore make more shots on goal than the average. Other teams might be more defensive. For example:



Arsenal vs. Wigan Athletic

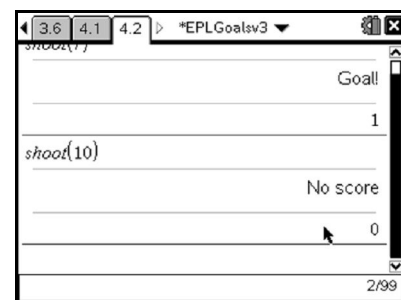
Scoreline: 3-1



Sunderland vs. Blackpool

Scoreline: 2-0

Sunderland win despite taking fewer shots!



A new command could be created to output complete scorelines, allowing students to work on this part of the activity individually. If you would be interested in this please email c-rath@ti.com.