

SCRABBLE STATS

Lesson 1: Scrabble Values

Australian Curriculum: Mathematics (Year 6)

ACMNA131: Make connections between equivalent fractions, decimals and percentages.

ACMSP146: Compare observed frequencies across experiments with expected frequencies.

ACMSP147: Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables.

Lesson abstract

Students collect data about letter frequency in newspapers and use this data to propose new letter point values for Scrabble.

Mathematical purpose (for students)

We will update Scrabble for the 21st century.

Mathematical purpose (for teachers)

To calculate relative frequency and use data to construct arguments.

Suggested presentation Two lessons of one hour each.

Vocabulary encountered Lesson materials

- | | |
|-------------|--|
| • frequency | • 1a Scrabble Values PowerPoint (for display) |
| • relative | • 1b Letter Frequency Graph Spreadsheet |
| frequency | • Student Sheet - Letter Frequency |
| | • 2-3 newspapers |

We value your feedback after this lesson via our website.

Introduction

Introduce the context of Scrabble and show slide 2 of PowerPoint *1a Scrabble Values*, which displays the point value assigned to each letter of the alphabet in Scrabble. Prompt: *what do you notice about these point values? What do you wonder?* Discuss.

Explain that the inventor of Scrabble, Alfred Butts, chose the value of each letter by reviewing newspapers and other sources of text. He calculated the frequency of each letter. Letters that were used the most were worth fewer points, and letters used rarely were worth more points. He did this in the 1930s. Ask the students to consider: *do you think letter frequencies might have changed in the last ninety years? How and why?*

Exploration

Students each take a section of newspaper and a copy of [Student Sheet - Letter Frequency](#). The newspaper section can be a paragraph, article, or entire page as appropriate. Students count how often each letter of the alphabet is used, fill in the letter frequency table and calculate the relative frequency of each letter.

Teacher notes

- Focus students on finding systematic and efficient strategies to collect data.
- Gallery walks to share strategies on data collection may be useful.

Pool all students' data to form a class frequency table and graph. *1b Letter Frequency Graph* can be used for this.

Set students (in pairs) to determine a set of point values for the alphabet based on the class frequency graph. They can use the Scrabble point value summary table on slide 3, but note they should not feel obliged to maintain the same letter distributions.

Once they have determined a new set of point values, they should identify a word that has a high value in their updated Scrabble and a low value in Classic Scrabble, and vice versa.

Students present their updated set of point values to the class, using the data to justify their conclusions. They show their identified high scoring/low scoring words and explain why the value of these words are different.

Reflection

Explain that Words With Friends is a game similar to Scrabble, released eighty years later in 2009. It has some differences from Scrabble, including a different set of point values and a different letter distribution. Show slide 4 which compares the letter and point distribution of Scrabble and Words with Friends. Ask: *Are your point values more like Classic Scrabble or Words With Friends? Why might this be?*

Ask students: *is this activity a maths lesson, or an English lesson?* This is a good opportunity to discuss numeracy and its relevance to daily life. Discuss:

- *What makes this an English lesson?*
 - The focus on text, the exploration of letter frequency
- *What makes this a maths lesson?*
 - Making decisions based on letter frequency

Letter	Number of uses	Relative Frequency
A		
B		
C		
D		
E		
F		
G		
H		
I		
J		
K		
L		
M		
N		
O		
P		
Q		
R		
S		
T		
U		
V		
W		
X		
Y		
Z		
Totals		