The task used in this illustration was part of an investigation into reading behaviour in a year 5–6 class. The teacher scheduled a 30-minute silent reading time after lunch each day. When the class repeatedly struggled to settle, one boy asked: “Why do we have silent reading anyway?” The teacher opened a discussion of this question, seeing the potential for a statistical investigation.

The task relates to achievement objectives for Statistics from the mathematics and statistics learning area in *The New Zealand Curriculum*.

**Silent Reading**

Identify and investigate a question that will help us understand more about silent reading in our class.

Some features of students’ work used to make judgments in relation to the mathematics standards are described below.
Silent Reading 1 of 2

**New Zealand Curriculum: Level 3**

In solving problems and modelling situations, students will:

**Statistics**
- conduct investigations using the statistical enquiry cycle:
  - gathering, sorting, and displaying multivariate category and whole-number data and simple time-series data to answer questions
  - identifying patterns and trends in context, within and between data sets
  - communicating findings, using data displays (statistical investigation)

**Mathematics Standard: By the end of year 5**

**Statistics**
- investigate summary and comparison questions by using the statistical enquiry cycle:
  - gather, display, and identify patterns in category and whole-number data
  - interpret results in context

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Ben’s group of 3 came up with the following idea for an investigation:
- Do the students in our class like reading?
- Do girls like reading more than boys?

The teacher asked Ben: “How will you collect data to answer your questions? What will your investigation do to help us understand silent reading better?”

Ben and his group had generated a hypothesis to investigate, using a comparative question.

Ben’s group prepared a simple set of instructions for students to gather data.

1. Divide your sticky in half.
2. On one side, write whether you’re a girl or a boy.
3. On the other side, say if you like reading or not.

Ben and his group chose a suitable format that asked each student in the class (N = 24, 10 boys and 14 girls) to respond on a sticky note.
**Discussion**

This task provides some of the evidence needed to show that Ben is achieving at early curriculum level 3 and the year 5 standard in Statistics. He has demonstrated that he is able to investigate a comparison question by gathering and displaying category data and interpreting the results to reach a conclusion.
Jade’s group of four decided to investigate the “calming effect” of silent reading. They linked this to their last term’s work on heart rates and fitness. They knew if a person is calm and relaxed, they would have a lower heart rate than when they are physically active.

We are going to take our pulse rates and then see if silent reading can calm you down after play.

The teacher asked when and how they would take pulse rates. How would they know whether the reading was having an effect? The teacher suggested that collecting more data (including during silent reading) might give a clearer picture. She wanted to see if the group could collect and display simple time-series data as they were confident with category data.

Jade and her group had developed a comparative question (reviewing data before and after an event). With support, they expanded their investigation to collect their pulse rates every 10 minutes from the end of the lunch bell to the end of silent reading (1.20 to 2.00 p.m.).

Jade created a recording sheet that would enable her to easily transfer the data to a spreadsheet.

<table>
<thead>
<tr>
<th></th>
<th>1.20</th>
<th>1.30</th>
<th>1.40</th>
<th>1.50</th>
<th>2.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Jade</td>
<td>112</td>
<td>100</td>
<td>96</td>
<td>104</td>
</tr>
<tr>
<td>B</td>
<td>Talia</td>
<td>120</td>
<td>100</td>
<td>72</td>
<td>88</td>
</tr>
<tr>
<td>C</td>
<td>Kyle</td>
<td>136</td>
<td>124</td>
<td>100</td>
<td>120</td>
</tr>
<tr>
<td>D</td>
<td>Hunter</td>
<td>148</td>
<td>100</td>
<td>100</td>
<td>96</td>
</tr>
</tbody>
</table>

We know how to take our pulse. We count the beats for 15 seconds, then times by 4 to work out the beats in 1 minute. So we will do it when the bell rings and again at the end of silent reading. If our pulse rate goes down when we read, we will know we are calmer. If it goes up, it will mean reading is like running around outside at playtime.

BY THE END OF YEAR 6

ILLUSTRATING THE MATHEMATICS STANDARD

New Zealand Curriculum: Level 3

In solving problems and modelling situations, students will:

Statistics
- conduct investigations using the statistical enquiry cycle:
  - gathering, sorting, and displaying multivariate category and whole-number data to answer questions
  - identifying patterns and trends in context, within and between data sets
  - communicating findings, using data displays (statistical investigation)
- evaluate the effectiveness of different displays in representing the findings of a statistical investigation ... [statistical literacy]

Mathematics Standard: By the end of year 6

Statistics
- investigate summary and comparison questions by using the statistical enquiry cycle:
  - gather or access multivariate category and whole-number data
  - sort data into categories or intervals, display it in different ways, and identify patterns
  - interpret results in context, accepting that samples vary
Discussion

This task provides some of the evidence needed to show that Jade is achieving at curriculum level 3 and the year 6 standard in Statistics. She has demonstrated that she is able to gather whole-number data and to sort it into intervals. She was able to choose an appropriate way to display the results and to identify a pattern within them. Jade recognised that the sample may have influenced the results and that her group would need to expand the sample to get a true picture of pulse rates during silent reading.