

7.SP.4: Worksheet

Solutions

Use the following information to answer problems 1-10. Twenty words were randomly selected from a fourth-grade science textbook. The following list shows the number of letters in each of the twenty words.

2, 4, 6, 5, 6, 3, 5, 4, 8, 7, 5, 4, 1, 2, 4, 1, 5, 3, 4, 2

Twenty words were also randomly selected from a seventh-grade science textbook. The following list shows the number of letters in each of the twenty words.

3, 4, 9, 7, 5, 12, 5, 3, 4, 8, 4, 3, 9, 6, 7, 1, 5, 6, 8, 4

1. What is the mean word length of words in the sample from the fourth-grade textbook? **4.05 letters**
2. What is the mean word length of words in the sample from the seventh-grade textbook? **5.65 letters**
3. What is the mean absolute deviation length of words in the sample from the fourth-grade textbook? **1.46 letters**
4. What is the mean absolute deviation length of words in the sample from the seventh-grade textbook? **2.12 letters**
5. How much greater is the mean word length in the sample from the seventh-grade textbook than the mean word length in the sample from the fourth-grade textbook? **1.60 letters**
6. How do the word lengths compare between the seventh-grade textbook and the fourth-grade textbook? **The words are, on average, between 1 to 2 letters longer than the words in the fourth-grade textbook.**
7. What conclusions can we draw about the mean word length of all seventh-grade science textbooks, compared to all fourth-grade science textbooks? **We can't draw any conclusions about *all* the textbooks. Our random samples**
- are from the words inside a single textbook, instead of randomly sampling all the textbooks of each grade.
8. What can we say about the variability in the length of words in the seventh-grade textbook compared to the fourth-grade textbook? **The mean absolute deviation is larger in the seventh-grade textbook, so the words tend vary more in length compared to the words in the fourth-grade textbook.**
9. Suppose the words in each sample were instead selected by finding the twenty longest words on the first page of each book. Could we calculate the difference between the mean word lengths in each sample? Why or why not? **Yes. We would still have two samples of twenty words each, so we could still count the letters in each word, calculate the mean word length of each sample, and then subtract the means.**
10. Suppose the words in each sample were selected instead by finding the twenty longest words on the first page of each book. Could we estimate the difference between the mean word lengths in each book? **No. Since the words in each sample were not randomly chosen, the samples are not likely to be representative of the length of the words in each book.**