Case Study: The task below was used by a group of teachers from 5th class, 6th class and First Year to help them learn about how their students think. They were particularly interested in whether the students' solution strategies were based on additive thinking or multiplicative thinking. The wording of the task was adapted to suit the students.

Task

The First Year students in Scoil Mhuire are going on an outdoor adventure trip. Each student can choose an activity. The table shows the student's choices.

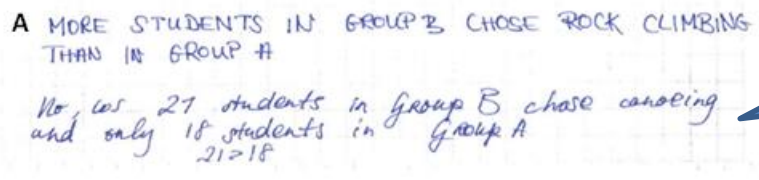
	Rock Climbing	Canoeing	Archery	Zip lining
Group A	15	18	24	18
Group B	19	21	38	22

a) What can you say about the choices of Group A and Group B students?
b) The First Year Year Head said that canoeing was more popular with Group A students than Group B students. Do you agree with the Year Head's statement? Use as much mathematics as you can to support your answer

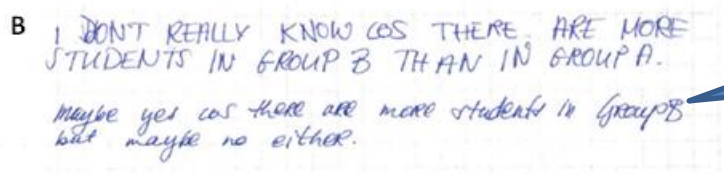
Problem solving reminder: If you are going to use this task remember, answers are important but what is more important is the mathematics students can learn from engaging in the task.

Samples of student solutions

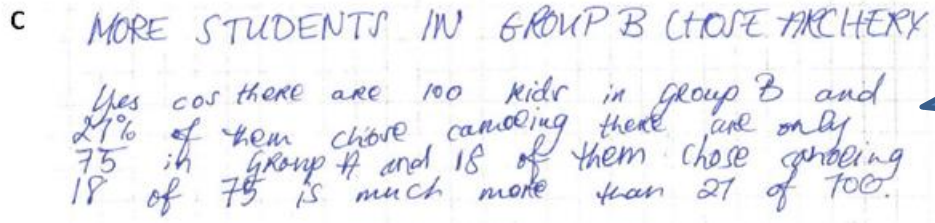
The solution strategies were classified into 3 groups and the samples labelled A, B and C are typical of the solutions in each category.



Solutions in this category rely on the relative magnitude of the numbers alone. There does not seem to be any awareness of the relevance of proportion.



Solutions in this category made at least one observation which recognises the difference in total numbers.



Solutions in this category displayed evidence of the awareness of proportion in the situation.

A: Evidence of additive thinking.

B: Evidence of moving towards multiplicative thinking.

C: Evidence of multiplicative thinking.

Although more First Year solutions were categorised as C, and so more of these students were thinking multiplicatively since they could sense the relevance of proportion in the situation. There was still a significant majority whose answers relied on the relative magnitude of the numbers alone, they were probably not aware of the relevance of proportion and were working additively. There was some 5th and 6th class solutions categorised as C but the majority of solutions from these students were classified A or B, these students are still thinking additively.