

Calling Plans: The Case of Nick Bannister
(Part 3—Selecting and Sequencing)

Armed with the data that he had collected while he monitored his students' work, Nick was now ready to make decisions about the discussion. He knew from the outset of the lesson that he would need to have a table, graph, and equation available to meet his lesson goals (lines 3–11 in part 1), so the real questions were, which table, graph, and equation, and in what order should they be presented? As Nick now indicated in the third column of the chart that he had used in monitoring his students (shown in fig. 5.3), he decided to start with the tables that had been created by groups 3 and 1, move to the sketch of the graph that had been created by group 2, and conclude with the equation that had been produced by group 5.

Strategy	Who and What	Order
Table	Group 1 started with increments of 1 but then gave it up and used 20 Groups 2, 3, and 4 used increments of 10	2nd (Tamika) 1st (Devas)
Graph	Group 1 used their calculator to create a graph from their table Group 2 made a sketch of a graph but did not plot the points Group 3 and 4 each made a graph from their table	3rd (Lynette)
Equation	Group 5 made an equation and then created a graph by using 0 minutes and 100 minutes Group 6 started with the equation and used it to create a table of values incremented by 5	4th (Tony)
Other	Group 3 had trouble understanding the context of the problem Group 4 confused the axes in their initial graph Group 6 was confused about notation and initially used 4 instead of .04	

Group 1: Tamika, Nina, Harold, Kisha

Group 2: Camilla, Jason, Lynette, Robert

Group 3: Devas, Andrea, Yolanda, Chris

Group 4: Mary, Jessica, Richard, Colin (50 minutes)

Group 5: James, Tony, Christine, Melissa

Group 6: Latasha, Derrick, Tanya, William (50 minutes)

Fig. 5.3. Nick Bannister's completed chart for monitoring students' work on the Calling Plans task

Nick decided to start the discussion by exploring whether the answer to the question, "How much time per month would you have to talk on the phone before subscribing to company A would save you money?" was 50 minutes or 51 minutes, since two groups thought the answer was 50 minutes (incorrect) and four groups thought the answer was 51 minutes (correct). He then planned to move to a discussion of tables because five of the six groups made a table, so it was the most commonly used representation. He decided to discuss a table that was incremented by 10 minutes, because using 10-minute intervals was a popular approach and the resulting table clearly showed the point of intersection, as well as a table incremented by 20 minutes, because such a table did not show the point of

intersection. This, he hoped, would launch a discussion about what we do or do not know about the functions from the table and what else we might need to do to answer the question.

240 Although several groups plotted points and connected them to make graphs, Nick decided to focus on the sketch of the graph created by group 2. And rather than have the group members explain what they had done and why, he decided that he would ask the class how group 2 knew what the graph was going to look like. This would focus students' attention on the question of how the table provides many "clues" about the graph and stimulate their thinking about how functions behave (i.e., the functions have to be linear because they have a constant rate
245 of change, they must have a point of intersection because they share a common point, and they start on the y -axis, which represents the monthly fee). By having the class consider this question, rather than listening to what group 2 did, Nick could engage more students in thinking about how they could figure it out. He then thought he would check with group 2 and see whether what the other students described captured what they actually did.

250 He decided to end with the equation produced by group 5, since it was one of only two groups that produced the equation and the only group that did not create a table of values. He wanted the class to consider why the group members used only two points in creating their graphs and whether or not this approach was valid. He also wanted students in the class to consider how the slope and y -intercept, which were key features of the equation, were salient in the tables and the graph.

260 Once Nick had decided which groups would present, he needed to figure out which student would speak on behalf of each group. Although he sometimes had the entire group make the presentation, this strategy often resulted in one student doing most of the talking and the others receding to the background. He reviewed the membership of the groups he had targeted and identified presenters who had not had a chance to share their work in the last week (shown in column 3 of his chart in fig. 5.3). The groups assumed that any member could be asked to present, so every student in the group needed to understand the work that the group
265 had produced well enough to discuss it in front of the class. Nick found that this assumption on their part also helped him to hold all students accountable for participating in the small-group discussions.