Which bus?

Purpose

The purpose of this activity is to engage students in using positional language and a simple scale to describe a path that will solve a problem.

Achievement Objectives

GM1-3: Give and follow instructions for movement that involve distances, directions, and half or quarter turns.

AO elaboration and other teaching resources GM1-4: Describe their position relative to a person or object. AO elaboration and other teaching resources Open configuration options

Description of Mathematics

In readiness for this problem, the students should have familiarity with each of the following components of mathematics. The problem may be solved with different combinations of these components.

- Follow instructions to arrive at a specified position
- Give instructions to describe a specified position
- Use positional language
- Follow instructions to trace a specified path
- Give instructions to trace a specified path

This activity may be carried out with guidance, or by allowing the student to follow their own chain of reasoning. The approach should be chosen in sympathy with students' skills and depth of understanding. The most likely form of feedback/evidence from the student in this activity is via discussion.

Activity

Charlie catches the bus home from school. He takes the blue route.

It takes a long time because he counts nine stops before he gets off.

Charlie wonders if he could get home faster if he takes two buses.

Look at the map showing the bus routes and roads and describe how Charlie could have a shorter trip home.



The visual approach

The student is able to give instructions for a path that will move an object between specified positions.

Prompts from the teacher could be:

- 1. Where is Charlie's school?
- 2. Where is Charlie's house relative to the school?
- 3. What is the bus route that Charlie takes when he is on the blue bus?
- 4. Is there another way that Charlie could take the bus(es) home?
- 5. Give a suggestion for Charlie to get home by a shorter route. Describe this route.



- T: This looks like a shorter trip. What bus would Charlie be taking?
- S: Well, he has to take two buses but it would be a shorter distance. He goes on the red one for three stops.
- T: Is that three counting this one? (Teacher points to the school bus stop)
- S: Oh yeah. That's like where he gets on ... um, so ... yeah he goes for two stops. There's like get on the bus, turn the corner and go past a stop and turn the corner the same way and then turn the other way and get off at the next stop. Then he has to get on the blue bus. He goes past a stop, around the corner and he gets off at the next stop.

The conceptual approach

The student is able to give accurate instructions for a path that will move an object between specified positions.

Prompts from the teacher could be:

- 1. Where is Charlie's house relative to the school?
- 2. What is the bus route that Charlie takes when he is on the blue bus?
- 3. Is there another way that Charlie could take the bus(es) home?
- 4. Give a suggestion for Charlie to get home by a shorter route. Describe this route.



- S: I think he should just walk home. It doesn't look that far and it would save lots of money.
- T: That's a good suggestion. There might be a reason that Charlie needs to take the bus sometimes. It might be raining. The road might be busy with no footpath. It might be a lot further than it looks.
- S: He might have a broken leg and it's too far to hop with crutches.
- T: Yes. So if he has to take the bus, is there a shorter journey?
- S: Well, he is going to end up going kind of in a circle. He goes on the blue one and mostly turns left so ends up going around in a big loop. But with straight sides not round ones. He could go on the red one which turns in a smaller loop but goes off in the wrong way.
- T: Can he take the red bus from school and still get home by bus?
- S: Yes. If he gets off here (points to the shared bus stop) then catches the blue one. Oh, but even though he doesn't go as far that's a silly idea.
- T: Why?
- S: Well, it's the bus he would have been on anyway if he took that one from school and now he has to pay for another bus and had to wait out in the rain with his broken leg, so he should have just taken the blue one in the first place.