Odd socks

Purpose

The purpose of this activity is to engage students in identifying possible outcomes in a given situation.

Achievement Objective

S1-3: Investigate situations that involve elements of chance, acknowledging and anticipating possible outcomes.

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.

- Chance

- Identifying possible outcomes

- Describing possible outcomes in language such as 'likely, maybe, unlikely'

- Modelling a situation involving chance

This activity may be carried out with guidance, or by allowing the student to follow their own set of instructions. The approach should be chosen in sympathy with students' skills and depth of understanding.

Activity

Alice has 2 pink socks and 2 orange socks in the washing basket.

If she picks two socks out of the basket without looking will she get two the same colour?

The visual approach

The student is able to model a given situation, allowing them to anticipate and describe

possible outcomes.

Prompts from the teacher could be:

1. Use pink and orange counters to represent the socks in the basket.

2. Pick two counters out at random. Are they the same colour?

3. Replace the counters, shuffle all the counters and pick another two at random.

4. Keep a record of the colours in each pair.

5. Does she always get a pair the same colour?

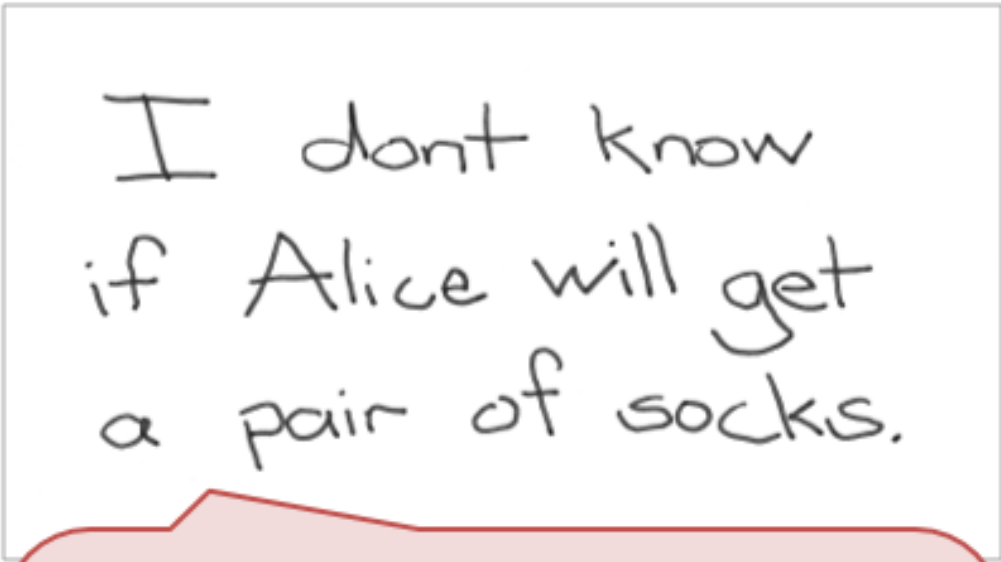6. Does she always get a pair with different colours?

S: It's never matching. No not never. It's mostly not matching.

T: So are you saying that she won't get a matching pair?

S: I put four counters in this little box. They are the colours of the socks. Then I shut my eyes, shook it up and picked out two counters without looking. I kept getting one pink but the other one is mostly turning out to be orange. So they are not matching.

T: But is it possible to pick out two pink socks?

S: Yes. I did that once. It could happen, but mostly it didn't.

T: What about two orange socks?

S: Um. I could keep trying until that happens. It should be possible. But it might take a long time before I get that.

The conceptual approach

The student is able to anticipate and describe possible outcomes in a given situation.

Prompts from the teacher could be:

1. What are the different socks that Alice could pull out first?

2. If she pulls out a pink sock first do we know whether she will pull out another pink sock next?

3. If she pulls out a orange sock first do we know whether she will pull out another orange sock next?

4. Will she always get a pair the same colour?

5. Will she always get a pair with different colour?

I dont know if Alice will get a pair of socks.

T: You have said you don't know if Alice will get a pair. What do you mean by that?

S: I thought about what you might get first and what you might get next. If she gets a pink one first she might get another pink one or she might get an orange one.

T: And what if she gets an orange one first?

S: It's the same thing she might get another orange one or she might get a pink one, so I don't know if she will get a pair or not.