

### 3 Improving pupils' responses through questioning

#### Counting Trees

**Sample response: Laura**

Laura attempts to estimate the number of old and new trees by multiplying the number along each side of the whole diagram and then halving. She does not account for gaps nor does she realise that there are an unequal number of trees of each kind.

*What questions could you ask Laura that would help her improve her response?*

**Sample response: Jenny**

Jenny realises that sampling is needed, but she multiplies the number of young trees and old trees in the left hand column by the number of trees in the bottom row. She ignores the columns with no trees in the bottom row, so her method underestimates the total number of trees. She does, however, take account of the different numbers of old and new trees.

*What questions could you ask Jenny that would help her improve her response?*

**Sample response: Woody**

Woody uses a sample of two columns and counts the number of old and young trees. He then multiplies by 25 (half of 50 columns) to find an estimate of the total number.

*What questions could you ask Woody that would help him improve his response?*

**Sample response: Amber**

Amber chooses a representative sample and carries through her work to get a reasonable answer. She correctly uses proportional reasoning. She checks her work as she goes along by counting the gaps in the trees. Her work is clear and easy to follow.

*What questions could you ask Amber that would help her improve her response?*

## Security Camera

### **Sample response: Max**

Max realises that F and H cannot be seen, but incorrectly thinks that E cannot be seen. He does not show any work to justify his thinking and his further statements are incorrect.

Laura attempts to estimate the number of old and new trees by multiplying the number along each side of the whole diagram and then halving. She does not account for gaps nor does she realise that there are an unequal number of trees of each kind.

*What questions could you ask Max that would help him improve his response?*

### **Sample response: Ellie**

Ellie does not show any sightlines to justify her answers. However, she correctly states that F and H cannot be seen and that 3 squares cannot be seen. However, she may be thinking of whole squares rather than areas,. Her justification for the 15% is incomplete and poorly explained. She seems to have some understanding that 5% is one twentieth and 10% is one tenth.

*What questions could you ask Ellie that would help her improve her response?*

### **Sample response: Simon**

Simon correctly states that F and H cannot be seen and that 3 squares = 15% of the area cannot be seen. However, it is possible that he thinks that 3 whole squares are hidden from the camera. He investigates the best place for the camera, and shows that the centre of a side is good but he does not investigate further. No calculations are shown.

*What questions could you ask Simon that would help him improve his response?*

### **Sample response: Rhianna**

Rhianna correctly shows that F and H cannot be seen and that 3 squares = 15% of the area cannot be seen. She investigates the best place for the camera, and shows that the centre of a side is good. Rhianna clearly shows diagrams with sightlines and calculations that justify her findings.

*What questions could you ask Rhianna that would help her improve her response?*

## Cats and Kittens

### **Sample response: Alice**

Alice chose to represent the task using a timeline. She has only considered the number of kittens from the original cat. The computation required is accurate.

*What questions could you ask Alice that would help her improve her response?*

### **Sample response: Ben**

Ben has decided to draw a 'cat tree', and tries to control for time (with some errors). The communication is reasonably clear, allowing the reader to follow the argument, but the value of 9846 is not explained and does not follow from the reasoning, since, again, only the kittens from the original cat are considered. The number of kittens per litter is made explicit.

*What questions could you ask Ben that would help him improve his response?*

### **Sample response: Wayne**

Woody appears to favour a minimalist approach! He starts with what would be a time consuming pictorial representation which he then abandons in favour of a numerical representation.

*What questions could you ask Wayne that would help him improve his response?*

### **Sample response: Sally and Janet**

Sally and Janet used a spreadsheet to control for both time and multiplication and their method is clear and effective.

*What questions could you ask Sally and Janet that would help them improve their response?*