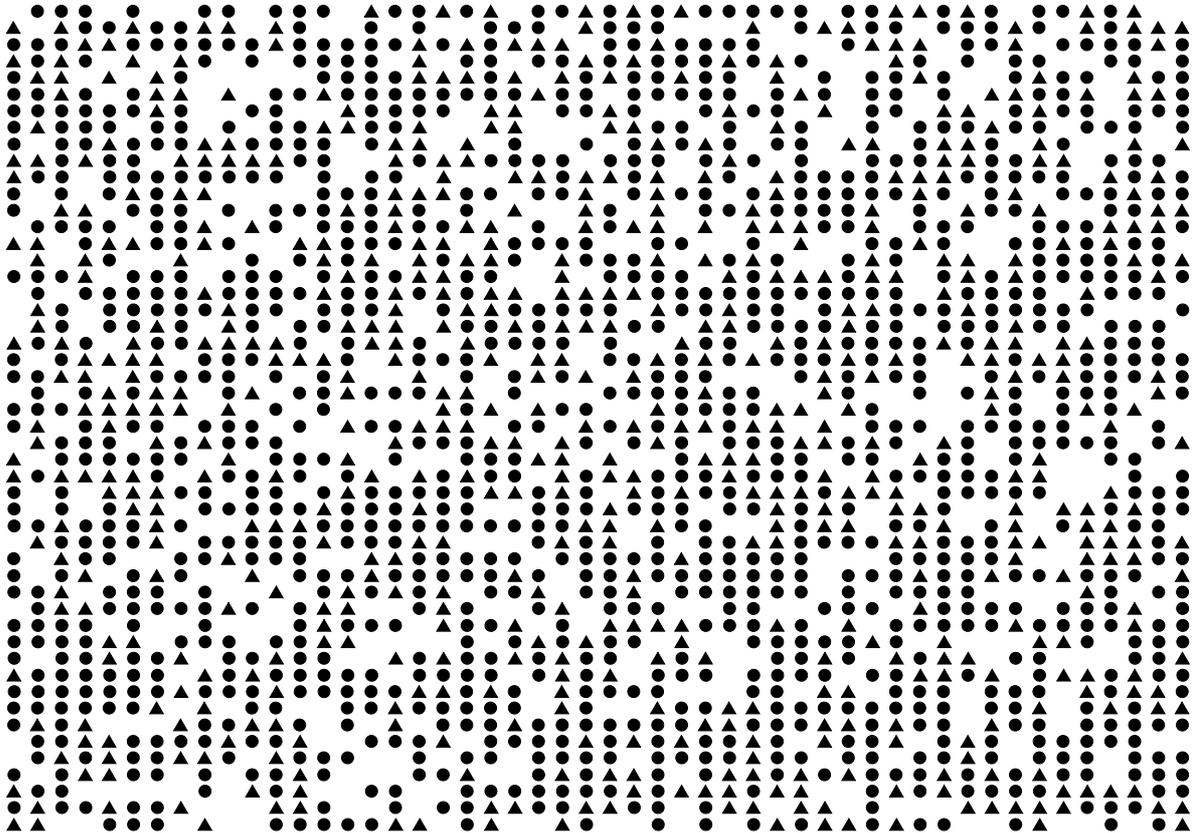


## 2 Three assessment tasks and four sample responses on each

### Counting Trees



This diagram shows some trees in a plantation.

The circles ● show old trees and the triangles ▲ show young trees.

Tom wants to know how many trees there are of each type, but says it would take too long counting them all, one-by-one.

1. What method could he use to estimate the number of trees of each type?  
Explain your method fully.
2. On your worksheet, use your method to estimate the number of:
  - (a) Old trees
  - (b) Young trees

Sample response: Laura

① You could multiply the number of trees in the length by the number of trees in the width and then half your answer.

② a. Old trees - 644  
Young trees - 644

width - 33  
length - 39.

$33 \times 39 = 1287$   
 $1287 \div 2 = 643.5 = 644$

Sample response: Jenny

1. there are 38 trees in each column  
there are around 11 young trees  
and around 27 old ones  
33 trees in each row so

$11 \times 33 = 363$   
 $27 \times 33 = \frac{891}{1254}$

2.  
a.  $11 \times 33 = 363 = \text{new trees.}$   
b.  $27 \times 33 = 891 = \text{old trees.}$

Sample response: Woody

2 columns has 21 young trees  
55 old trees

50 columns is approx  
 $50 \div 2 = 25$   
 $25 \times 21 =$  amount of young trees  $= 525$   
 $25 \times 55 =$  amount of old trees  $= 1,375$   
 rounded up

young 530  
old 1,380

Sample response: Amber

Counting trees

- If Tom draws a 10x10 square round some trees and counts how many old and new there are. There are 50 rows and 50 columns altogether so he must multiply by 25. He could do this a few times to check and then take the average.
- |           |               |            |  |
|-----------|---------------|------------|--|
| 53 old    | $\times 25 =$ | 1325 old   |  |
| 28 new    | $\times 25 =$ | 700 new    |  |
| 19 spaces | $\times 25 =$ | 475 spaces |  |
| 100       |               | 2500       |  |

$1325 + 1200 \div 2 = 1262.5$   
 $700 + 875 \div 2 = 787.5$

check

48 old	$\times 25 =$	1200 old	So about 1263 old trees and 788 new trees
35 new	$\times 25 =$	875 new	
17 spaces	$\times 25 =$	425 spaces	
100		2500	

## Security Camera

A shop owner wants to prevent shoplifting.

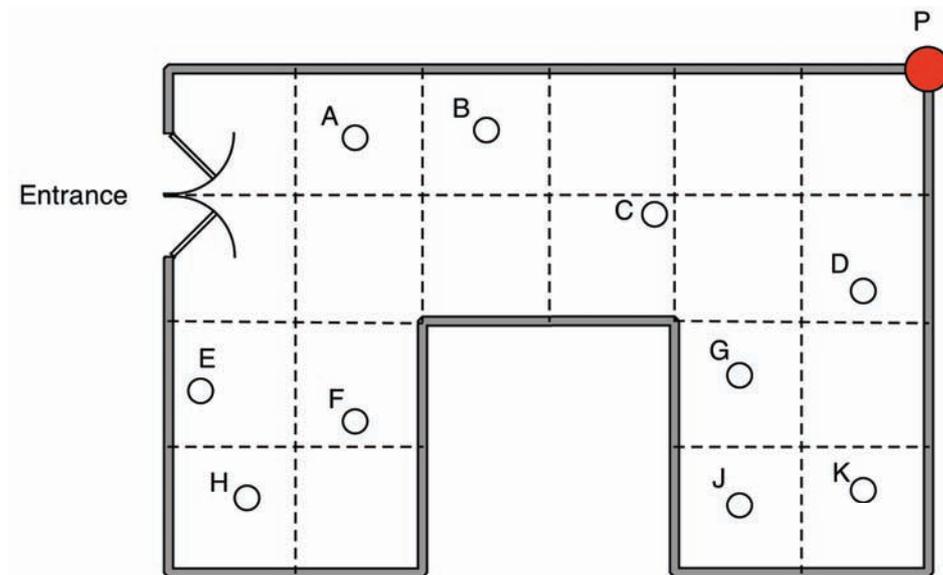
He decides to install a security camera on the ceiling of his shop.

The camera can turn right round through  $360^\circ$ .

The shop owner places the camera at point P, in the corner of the shop.

The plan below shows ten people are standing in the shop.

*Plan view of the shop*



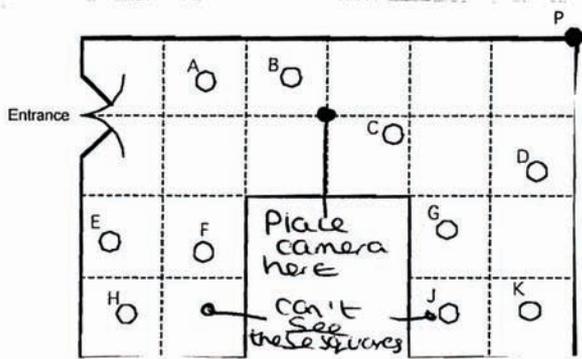
1. Which people cannot be seen by the camera at P?
2. The shopkeeper says that "15% of the shop is hidden from the camera"  
Show clearly that he is right.
3. (a) Show the best place for the camera, so that it can see as much of the shop as possible.  
(b) Explain how you know that this is the best place for the camera.

Sample response: Max

1. E, F and H cannot be seen by the camera.  
 2.  
 3a. The exact middle of the shop would be the place where it could see the most amount of people.  
 3b. Because the middle of the shop will grant the camera a larger vision of the shop.

Sample response: Ellie

1. F + H  
 2. This is true because if there are 20 squared areas to make up the shop and 3 cannot be seen by the camera then that means the 3 squared areas would have to equal 15%. They do because if <sup>15%</sup> of the room = 100% then to get from 10 to 100 you divide by 10 and if you get 5 to 100 you divide by 2 and then by 10. add them together and you'll get 15%.  
 3a/b. I think the best place for the camera is in the centre of the room because it only can't see two squares.



Sample response: Simon

1. F+H

2. because 3 squares are hidden from the camera  
1 square is 5% so 3 squares are 15%

3. *a* Here is the best place  
↳ it can see all the cars almost everywhere

Sample response: Rhianna

1. He cannot see F + H.

2. There are 20 squares. 3 squares are hidden from the camera.  
Each square represents 5%.  
 $3 \times 5\% = 15\%$   
This proves 15% of the shop is hidden

3. *a*)  $\bullet = R$   
My camera 5% is hidden on one half.  
5% is hidden on the other half.  
This way only 10% is hidden + that space could be used for a till/trolleys.

*B*) I know this is the best place because it has a full view of all around the shop it can go

## Cats and kittens

Here is a poster published by an organisation that looks after stray cats.

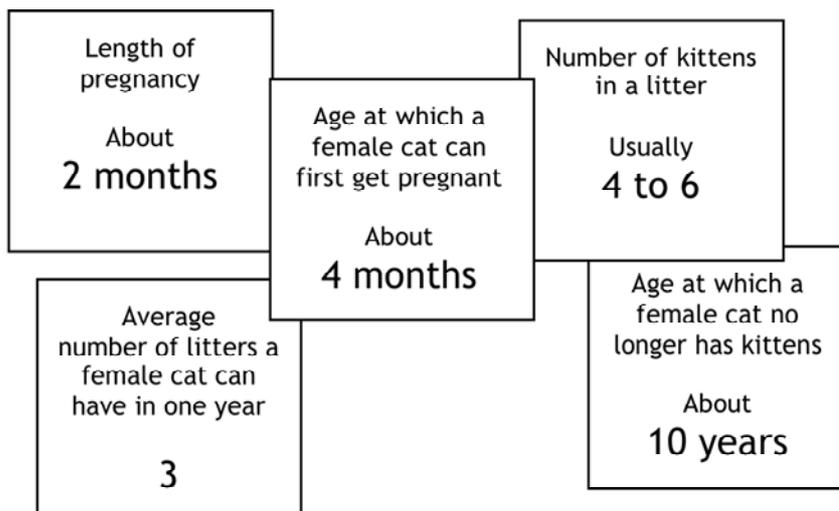


*Cats can't add but they do multiply!*

In just 18 months, this female cat can have 2000 descendants.

Make sure your cat cannot have kittens.

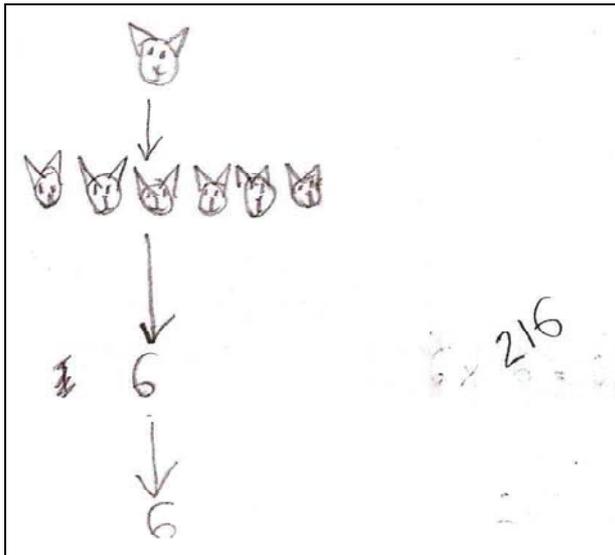
Work out whether this number of descendants is realistic. Here are some facts that you will need:



*Sample response: Alice*



Sample response: Wayne



Sample response: Sally and Janet

Two pupils worked on this task, discussing and sharing their methods. They used a spreadsheet.

