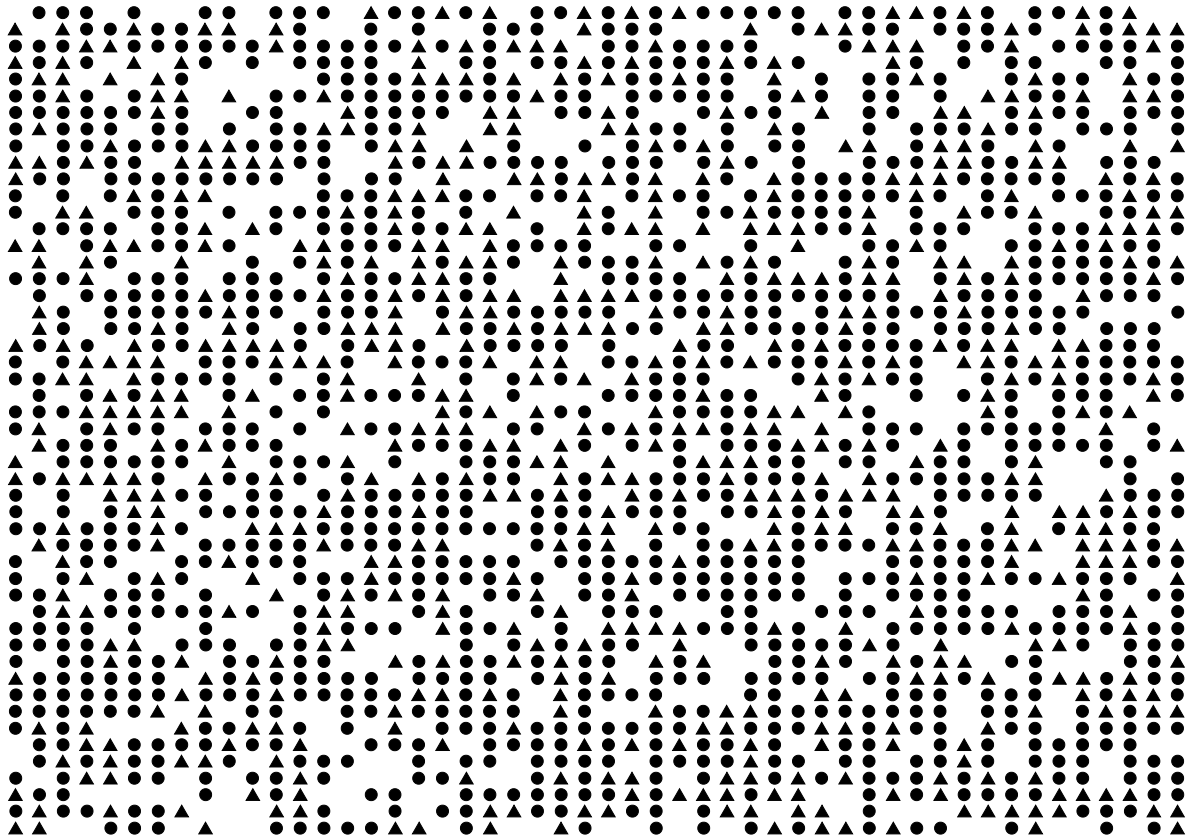
Counting Trees



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

Follow-up task for students

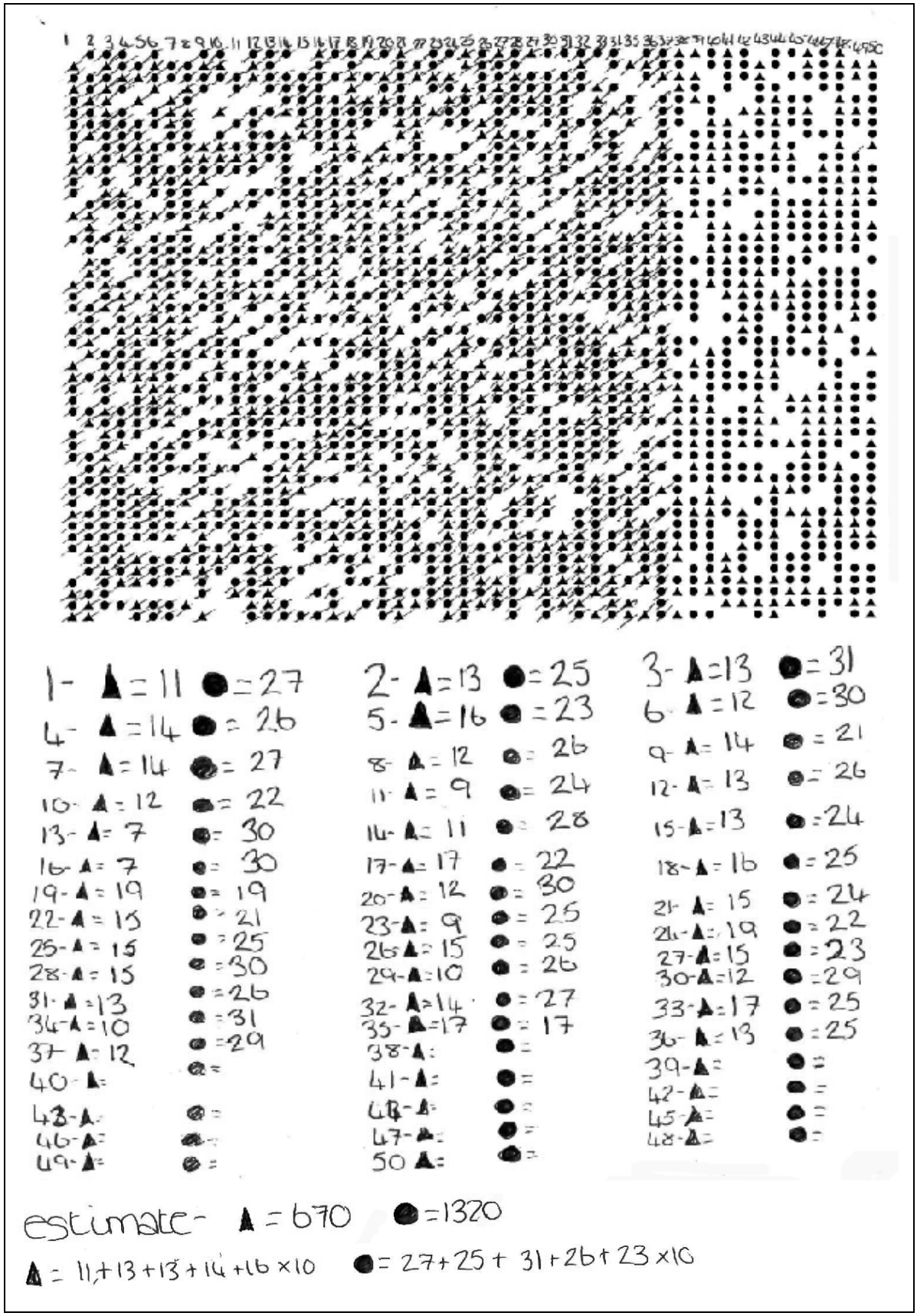
Look carefully at the following extracts of work from other students. Imagine you are their teacher. Go through each piece of work and write comments on each one.

- Have they chosen a sensible method?
- Are the calculations correct?
- Are the conclusions sensible?
- Is the work easy to understand?

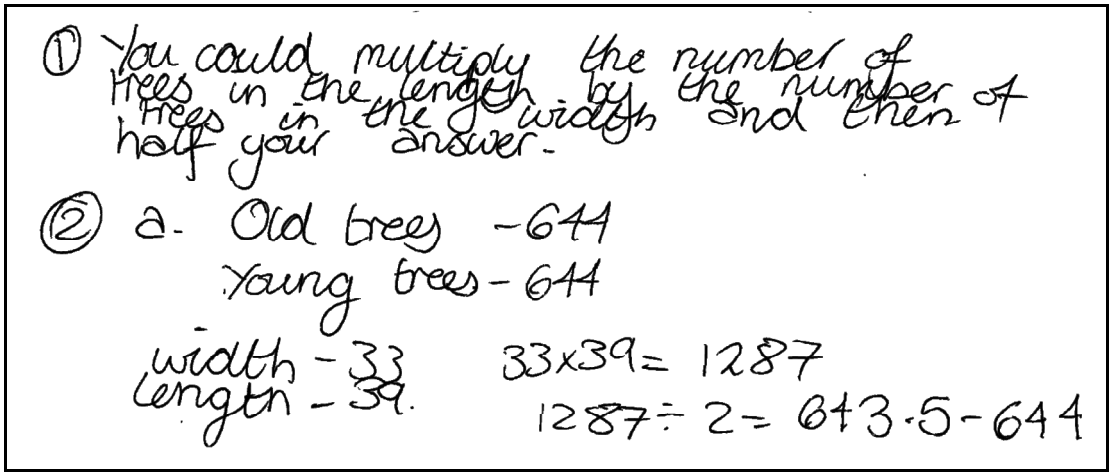
Name	Comments
Sarah	
Laura	
Jenny	
Woody	
Amber	

Now try to write out an answer that is better than all of them!

Sample response: Sarah



Sample response: Laura



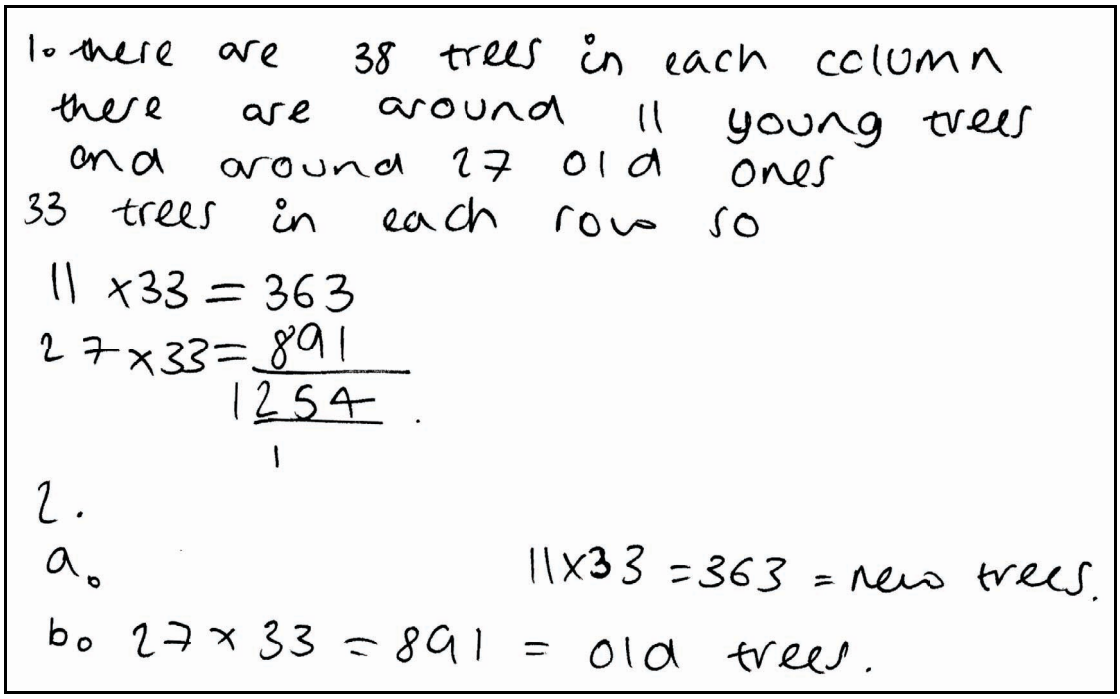
① You could multiply the number of trees in the length by the number of trees in the width and then of half your answer.

② a. Old trees - 644
Young trees - 644

width - 33
length - 39.

33 x 39 = 1287
1287 ÷ 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 x 33 = 363
27 x 33 = 891
1254
1

2.
a. 11 x 33 = 363 = new trees.
b. 27 x 33 = 891 = old trees.

Sample response: Woody

2 columns has 21 young trees
55 old

50 columns is approx
50 ÷ 2 = 25
25 × 21 = amount of young trees = 525
25 × 55 = amount of old trees = 1,375
rounded up

young 530
old 1,380

Sample response: Amber

Counting trees

1. 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.

2.

53 old	x 25	= 1325	old
28 new	x 25	= 700	new
19 spaces	x 25	= 475	spaces
100		2500	

1325 + 1200 ÷ 2 = 1262.5
700 + 875 ÷ 2 = 787.5

Check

48 old	x 25	= 1200	old
35 new	x 25	= 875	new
17 spaces	x 25	= 425	spaces
100		2500	

So about 1263 old trees and 788 new trees

Progression in key processes

	Representing	Analysing	Interpreting and evaluating	Communicating and reflecting
PROGRESSION	Chooses a method, but this may not involve sampling. E.g. Counts all trees or multiplies the number of trees in a row by the number in a column.	Follows chosen method, possibly making errors. E.g. Does not account for different numbers of old and young trees or that there are gaps.	Estimates number of new and old trees, but answer given is unreasonable due to method and errors.	Communicates work adequately but with omissions.
	Chooses a sampling method but this is unrepresentative or too small. E.g. tries to count the trees in first row and multiplies by the number of rows.	Follows chosen method, mostly accurately. E.g. May not account for different numbers of old and young trees or that there are gaps.	Estimates number of new and old trees, but answer given is unreasonable due mainly to the method.	Communicates reasoning and results adequately, but with omissions.
	Chooses a reasonable sampling method.	Follows chosen method, mostly accurately.	Estimates a reasonable number of old and new trees in the plantation. The reasonableness of the estimate is not checked. E.g. by repeating with a different sample.	Explains what they are doing but explanation may lack detail.
	Chooses an appropriate sampling technique.	Follows chosen method accurately. Uses a proportional argument correctly.	Deduces a reasonable number of old and new trees in the plantation. There is some evidence of checking the estimate. E.g. Considers a different sampling method.	Communicates reasoning clearly and fully.