

CHAPTER 26 Statistics

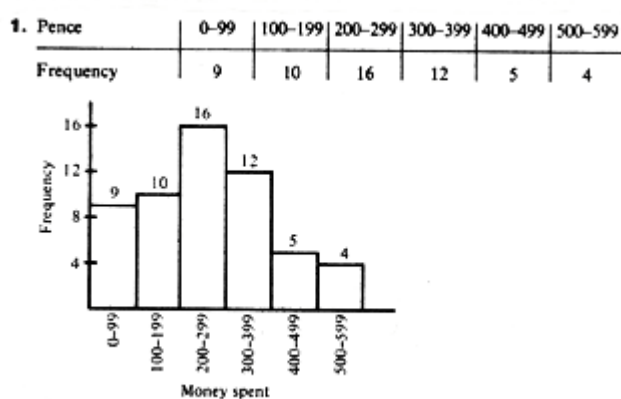
Many of the examples and questions given in this chapter involve continuous distributions. The difficulty of dealing rigorously with class boundaries at this early stage is very real. We have followed the principle of using the lowest given value as the starting point for the first group rather than going half a unit below (and above at the top limit). So an age group in which ages from 5 to 9 were given would be $5 \leq n < 10$. This presupposes that all the data given (or collected) is rounded *down* to the nearest whole unit below the measured value. We have avoided using $4.5 \leq n < 9.5$ on the grounds that it is difficult for 3rd year pupils to understand.

This has a knock-on effect when making calculations from the table. In particular the maximum range is affected, but as this can only be an estimate in any case, we regard the method given here to be satisfactory at this stage.

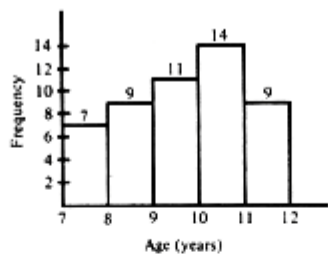
In the answers where bar charts are given, the scales that we have used are roughly half those that the children should use.

Exercise 26a (p. 438)

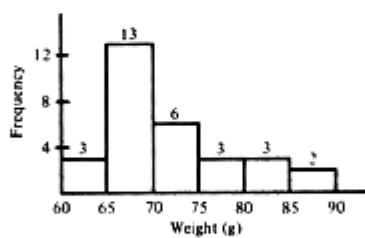
Revises the work on bar charts and frequency tables in Books 1A and 2A.



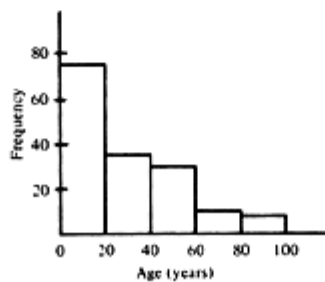
2. Age (n years)	$7 \leq n < 8$	$8 \leq n < 9$	$9 \leq n < 10$	$10 \leq n < 11$	$11 \leq n < 12$
Frequency	7	9	11	14	9



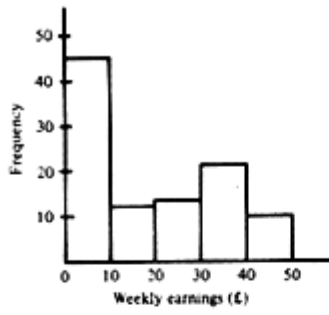
3. Weight (w grams)	$60 \leq w < 65$	$65 \leq w < 70$	$70 \leq w < 75$	$75 \leq w < 80$	$80 \leq w < 85$	$85 \leq w < 90$
Frequency	3	13	6	3	3	2



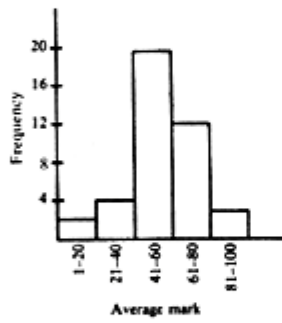
EXERCISE 26b 1.
(p. 440)



2.



3.

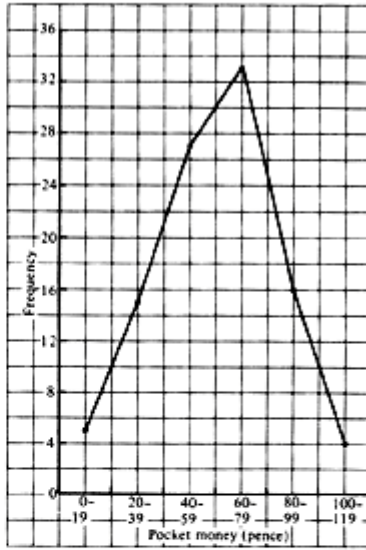
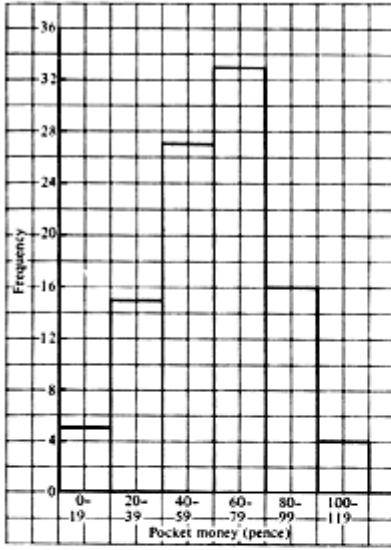


4. Time (t minutes)	$0 \leq t < 10$	$10 \leq t < 20$	$20 \leq t < 30$	$30 \leq t < 40$	$40 \leq t < 50$	$50 \leq t < 60$
Frequency	8	16	13	9	2	2

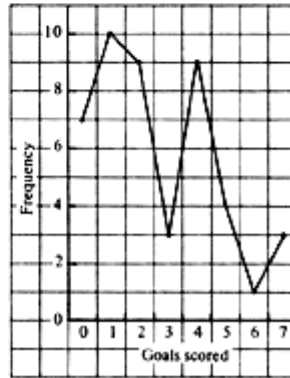
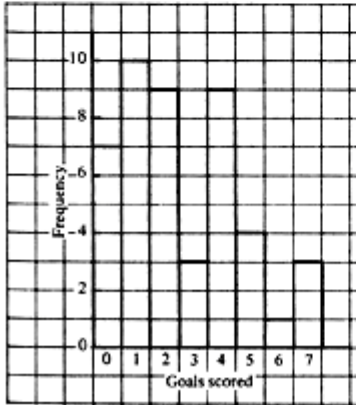
5. No. of hours spent (n hours)	$0 \leq n < 1$	$1 \leq n < 2$	$2 \leq n < 3$	$3 \leq n < 4$	$4 \leq n < 5$
Frequency	2	12	8	6	2

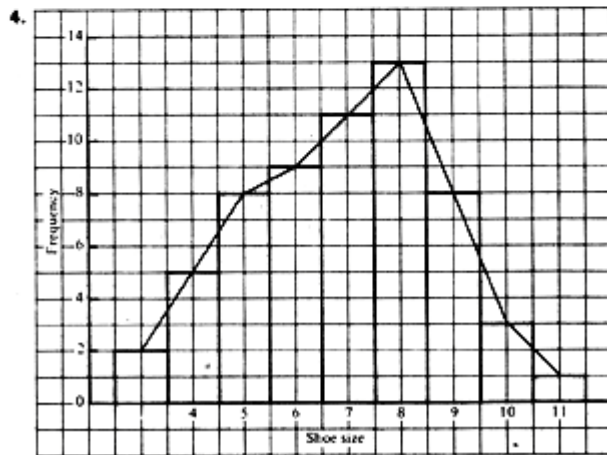
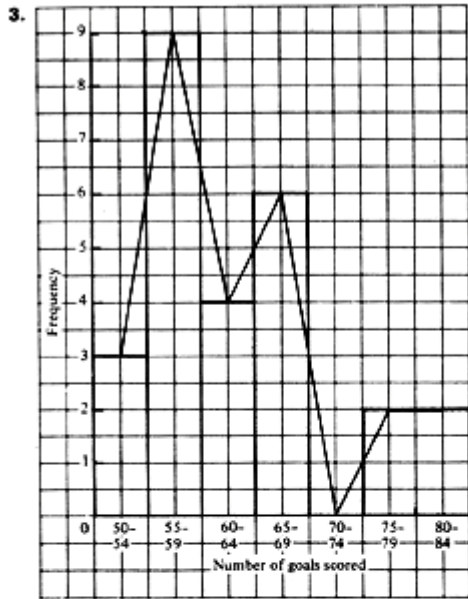
EXERCISE 26c
(p. 443)

1.

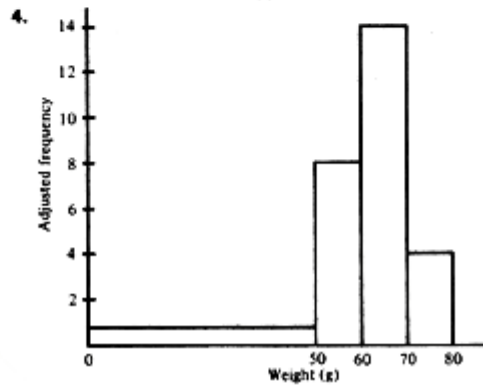
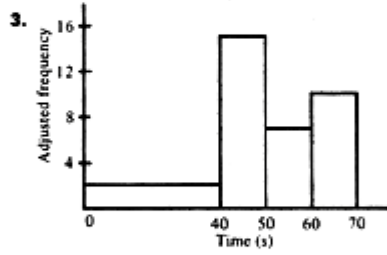
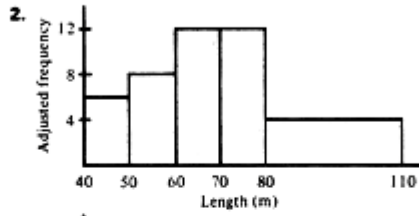
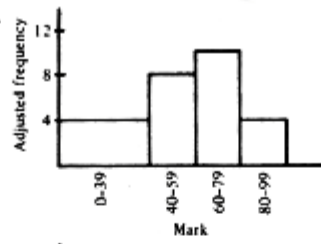


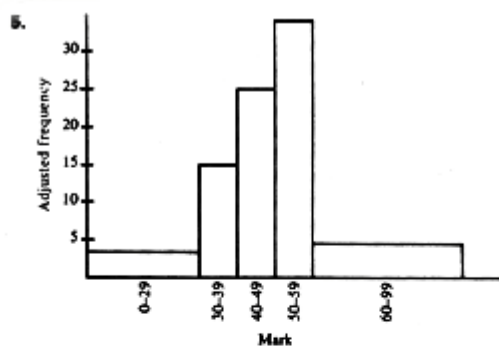
2.





EXERCISE 26d 1.
(p. 445)





6. Weight (w kg)	$0 \leq w < 10$	$10 \leq w < 20$	$20 \leq w < 30$	$30 \leq w < 50$
Frequency	5	10	15	8

7. Age (n yrs)	$0 \leq n < 3$	$3 \leq n < 4$	$4 \leq n < 5$
Frequency	15	15	18

8. Time (t mins)	$0 \leq t < 5$	$5 \leq t < 15$	$15 \leq t < 20$	$20 \leq t < 25$
Frequency	10	18	11	6

9. Height (h cm)	$10 \leq h < 30$	$30 \leq h < 40$	$40 \leq h < 50$	$50 \leq h < 60$
Frequency	14	11	16	8

Exercise 26e (p. 451)

Revises work on mean, median and mode in Book 2A. Some problems ask for reasons for choosing one or other of these measures and pupils find this surprisingly difficult. As part of their general education, it is worth spending a lot of time discussing the interpretation of statistical measures.

The formula for the median, i.e the $\frac{n+1}{2}$ th value, can be deduced from a few examples.

Range is introduced but need not be overemphasised as it is not of any great use in practice.

	Mean	Mode	Median	Range
1.	4.43	2	4	7
2.	9.67	10	9	9
3.	14.1	12, 13, 14	13.5	7
4.	1.84	1.6	1.65	3.7
5.	3.75	4	4	3
6.	8.42	7	8	7
7.	0.725	0.8	0.75	0.4
8.	1.54	1.3, 1.8	1.5	0.7
9.	Mean 119.2, median 124			
10.	Mean £7150, mode £5000, median £5000			
11.	Mean 180p, mode 200p, median 175p			
12.	Mean £21.23, median £18.10			
13.	17y, 5 m; 43y, 9 m			
14.	2			

Exercise 26f (p. 453)

	<i>Mode</i>	<i>Range</i>
1.	7	13
2.	1	6
3.	5	5

Exercise 26g (p. 455)

1. 4.28 2. 3.64 3. 1.57 4. 120, 2.14

Exercise 26h (p. 456)

1. 5 2. (a) 5 (b) $3\frac{1}{2}$ (c) $1\frac{1}{2}$

Exercise 26i (p. 457)

	<i>Modal group</i>	<i>Range</i>
1.	$5 \leq t < 10$	20
2.	$28 \leq n < 38$	50
3.	36 – 40	24

Exercise 26j (p. 458)

1. 4.2
2. 7.6cm
3. $50\frac{1}{2}$ p
4.

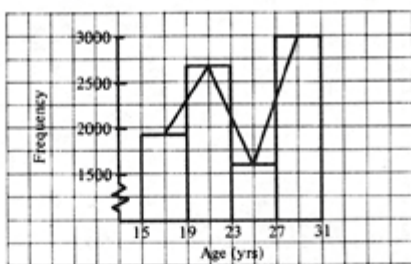
Number of defective screws per box	0–2	3–5	6–8	9–11	3.1
Frequency	10	7	2	1	

5. 160.4cm

Exercise 6k (p.460)

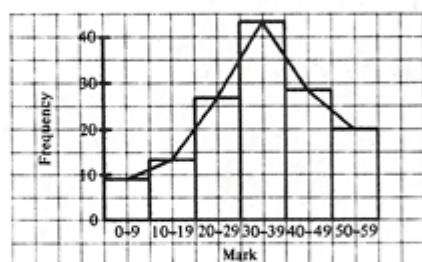
1. 2 2. $8\frac{1}{2}$ 3. 62

EXERCISE 261 1. (a)
(p. 460)



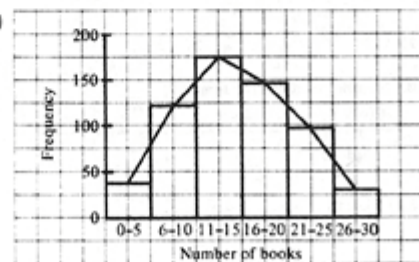
- b) 27-31 c) 16 d) 23-27

2. (a)



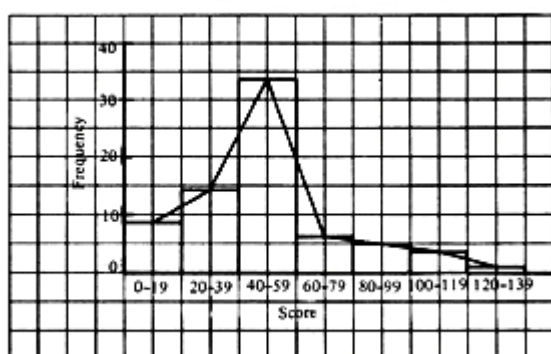
- b) 11-15 c) 30 d) 11-15

3. (a)



- b) 30-39 c) 59 d) 30-39

4. (a)



- b) 40-59 c) 139 d) 40-59

5. 45-59; 100; 52

6. (a) 75p; 75p (b) 90.2p

7. 21.5

8. 53.5

9. 106.7, 107cm

10.

