Measurement

SPMG Book 7

6 £6766

Avonside Country Park 68

1 (a) Bristle Worm 4 cm and 9 mm *or* 49 mm
(b) Stickleback 8 cm and 7 mm *or* 87 mm
(c) Newt Tadpole 6 cm and 1 mm *or* 61 mm
(d) Blackfly Larva 1 cm and 7 mm *or* 17 mm
(e) Screech Beetle 8 mm

2 (a) 72 mm (b) 111 mm (c) 140 mm (d) 55 mm (e) 300 mm

3 Bristle Worm 4·9 cm Stickleback 8·7 cm
Newt Tadpole 6·1 cm Blackfly Larva 1·7 cm
Screech Beetle 0·8 cm

4 Practical work

69 Boats

1 (a) 4·4 cm, true length 44 cm (b) 6·8 cm, true length 54·4 cm
(c) 3·7 cm, true length 74 cm (d) 6 cm, true length 72 cm
2·3 cm, true height 27·6 cm

2 26·7 m

3 (a) 2·6 m (b) 5·04 m
(c) 9·8 m (d) 10·8 m

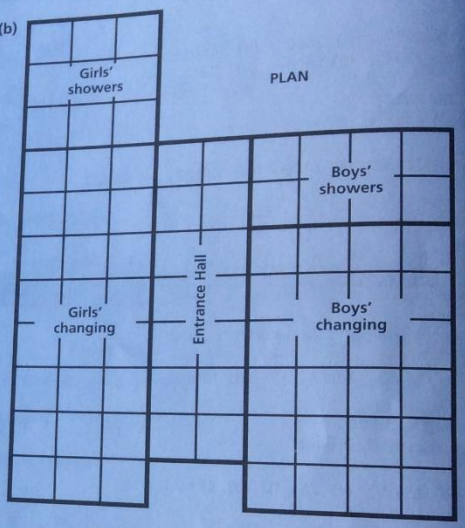
70 Sports Centre

1 (a) Redwood 8 cm European Larch 10 cm
English Yew 2 cm Monkey Puzzle 5 cm
(b) Practical work

2 (a)

	Length	Breadth
Girls' Changing	8 cm	3 cm
Entrance Hall	7 cm	2 cm
Girls' Showers	3 cm	3 cm
Boys' Changing	6 cm	4 cm
Boys' Showers	2 cm	4 cm

(b)



Around Avonside 71

1 (a) 2·8 m (b) 14 m (c) 16 m 40 cm (d) 7·6 m

2 (a) 150 m (b) 280 m (c) 40 m

3 (a) 12 cm (b) 12·4 cm (c) 17 cm

72 Builder's yard

1 (a) 1 kg 750 g (b) 3 kg 450 g (c) 2 kg 850 g (d) 1 kg 75 g

2 (a) 1320 g (b) 2405 g (c) 1020 g (d) 3005

3 (a) 50 kg (b) 145 kg (c) 343·75 kg (d) 537·5 kg

4 Answers depend on the child's weight.

5 (a) 50 kg (b) 136·5 kg (c) 300 kg
(d) 115 kg (e) 796·25 kg (f) 562·5 kg

6 (a) 226·25 kg (b) 641·1 kg (c) 936·25 kg

73 Just weight

1 (a) 8 tonnes 750 kg (b) 4 tonnes
(c) 1 tonne 60 kg (d) 10 tonnes 500 kg

2 (a) 3000 kg (b) 10 000 kg (c) 4500 kg
(d) 25 000 kg (e) 3455 kg (f) 6080 kg
(g) 2650 kg (h) 4005 kg (i) 1010 kg

3 (a) 11 tonnes (b) 8 tonnes 500 kg
(c) 2 tonnes 50 kg (d) 1 tonne 700 kg

4 26·35 tonnes

5 (a) 1 tonne 175 kg (b) 1 tonne 987 kg

6 27 Wendys weigh 999 kg. 1 kg less than a tonne.

7 1 000 000 cubes weigh 1 tonne.

74 What's its weight?

1 (a) letter 60g (b) lorry 10 tonnes (c) baby 3 kg
(d) chocolates 500 g (e) man 70 kg (f) labrador dog 30 kg
(g) Jumbo jet 350 tonnes

2 Practical work

3 (c) and (d)

4, 5 Practical work

75 Creative Studio

1 (a) 8 squares
(b) 4 rows
(c) 32 square centimetres
(d) Multiply the number of squares in a row by the number of rows.

2

Label	length in cm	breadth in cm	area in cm^2
disc	3	3	9
tape	6	2	12
video	5	4	20

3 (a) 28 cm^2 (b) 27 cm^2 (c) 12 cm^2 (d) 75 cm^2 (e) 240 cm^2

76 Creative Studio – *continued*

1 (a) 20 cm^2 (b) 28 cm^2

2 Children should sketch each diagram.
(a) 40 cm^2 (b) 48 cm^2 (c) 60 cm^2
(d) 58 cm^2 (e) 51 cm^2 (f) 33 cm^2

77 Flags, banners and mobiles

1 (a) 16 cm^2 (b) $10\frac{1}{2}$ cm^2 (c) $12\frac{1}{2}$ cm^2
(d) 25 cm^2 (e) 9 cm^2 (f) 18 cm^2
(g) 20 m^2 (h) 14 m^2 (i) 20 m^2

2 (a) 13 m^2 (b) 18 m^2

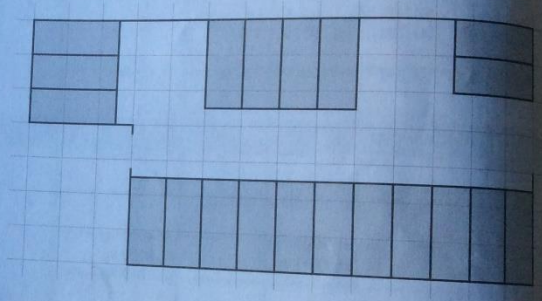
78 Creative Studio extension

1 Practical work

2 (a), (b), (c) Practical work

3 About 10 m^2. You have to leave space for doors opening.

4 Here is one arrangement. Other arrangements are possible.

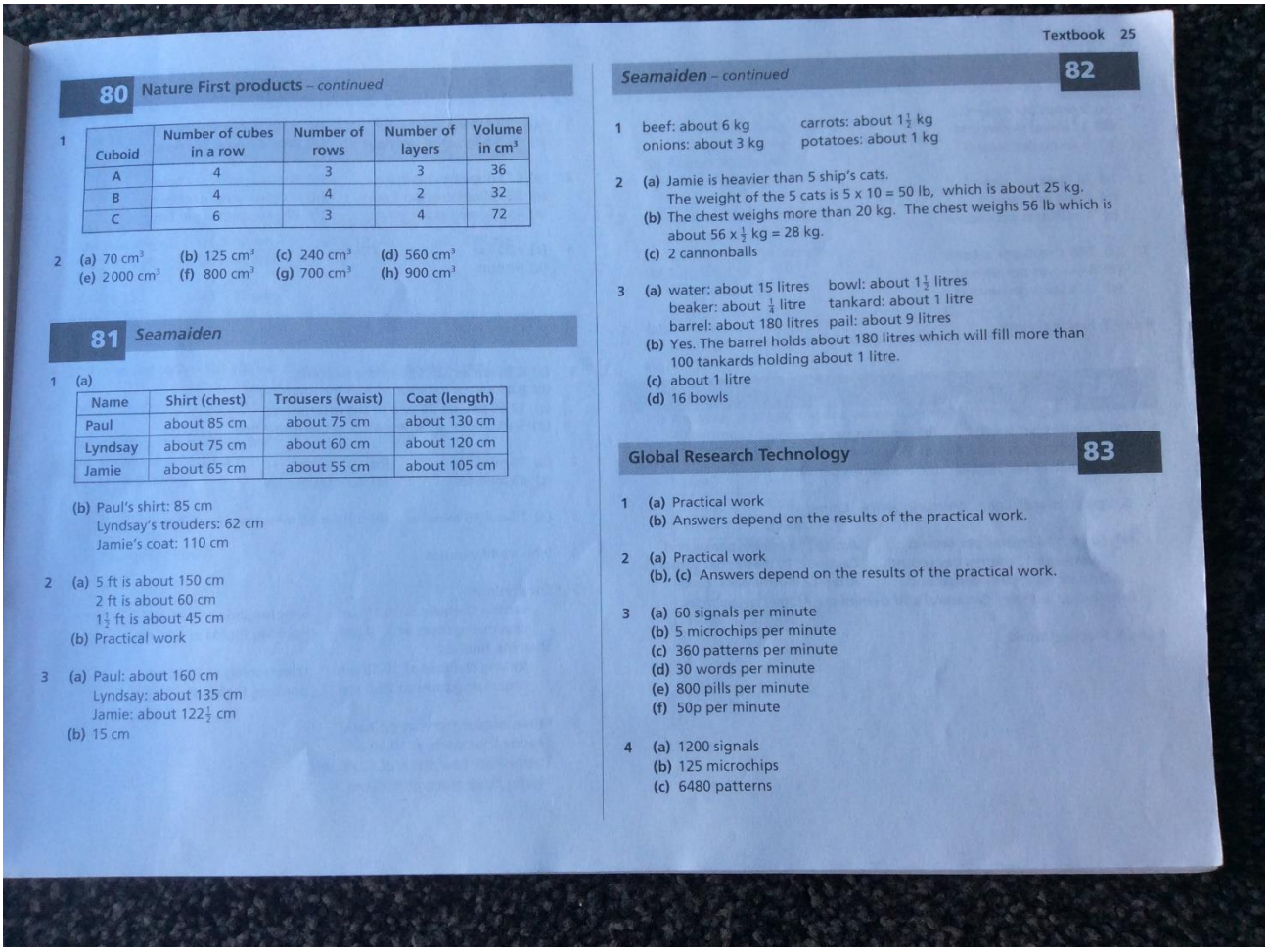


79 Nature First products

1 (a) 12 cm^3 (b) 20 cm^3 (c) 10 cm^3

2 (a) 32 cm^3 (b) 30 cm^3 (c) 72 cm^3 (d) 36 cm^3 (e) 80 cm^3

3 (a) 5 rows of 3 cubes or 3 rows of 5 cubes or
1 row of 15 cubes or 15 rows of 1 cube
(b) 5 rows of 2 cubes or 2 rows of 5 cubes or
1 row of 10 cubes or 10 rows of 1 cube
(c) 2 rows of 3 cubes or 3 rows of 2 cubes or
1 row of 6 cubes or 6 rows of 1 cube



80 Nature First products – *continued*

1

Cuboid	Number of cubes in a row	Number of rows	Number of layers	Volume in cm^3
A	4	3	3	36
B	4	4	2	32
C	6	3	4	72

2 (a) 70 cm^3 (b) 125 cm^3 (c) 240 cm^3 (d) 560 cm^3
(e) 2000 cm^3 (f) 800 cm^3 (g) 700 cm^3 (h) 900 cm^3

81 Seamaiden

1 (a)

Name	Shirt (chest)	Trousers (waist)	Coat (length)
Paul	about 85 cm	about 75 cm	about 130 cm
Lyndsay	about 75 cm	about 60 cm	about 120 cm
Jamie	about 65 cm	about 55 cm	about 105 cm

(b) Paul's shirt: 85 cm
Lyndsay's trouders: 62 cm
Jamie's coat: 110 cm

2 (a) 5 ft is about 150 cm
2 ft is about 60 cm
$1\frac{1}{2}$ ft is about 45 cm
(b) Practical work

3 (a) Paul: about 160 cm
Lyndsay: about 135 cm
Jamie: about $122\frac{1}{2}$ cm
(b) 15 cm

Seamaiden – *continued* 82

1 beef: about 6 kg carrots: about $1\frac{1}{2}$ kg
onions: about 3 kg potatoes: about 1 kg

2 (a) Jamie is heavier than 5 ship's cats.
The weight of the 5 cats is 5 x 10 = 50 lb, which is about 25 kg.
(b) The chest weighs more than 20 kg. The chest weighs 56 lb which is about 56 x $\frac{1}{2}$ kg = 28 kg.
(c) 2 cannonballs

3 (a) water: about 15 litres bowl: about $1\frac{1}{2}$ litres
beaker: about $\frac{1}{4}$ litre tankard: about 1 litre
barrel: about 180 litres pail: about 9 litres
(b) Yes. The barrel holds about 180 litres which will fill more than 100 tankards holding about 1 litre.
(c) about 1 litre
(d) 16 bowls

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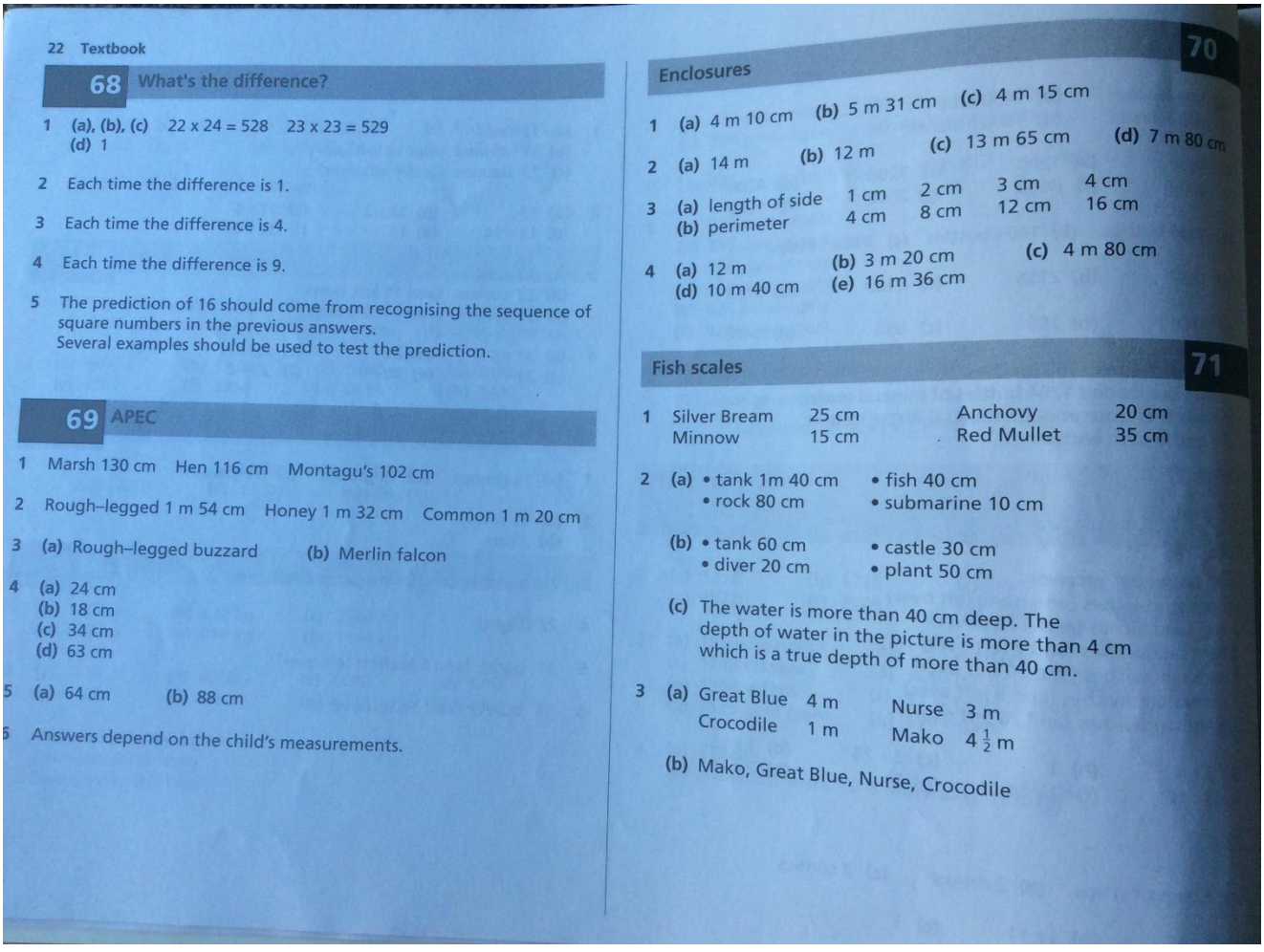
1 (a) Practical work
(b) Answers depend on the results of the practical work.

2 (a) Practical work
(b), (c) Answers depend on the results of the practical work.

3 (a) 60 signals per minute
(b) 5 microchips per minute
(c) 360 patterns per minute
(d) 30 words per minute
(e) 800 pills per minute
(f) 50p per minute

4 (a) 1200 signals
(b) 125 microchips
(c) 6480 patterns

SPMG Book 6



68 What's the difference?

1 (a), (b), (c) 22 x 24 = 528 23 x 23 = 529
(d) 1

2 Each time the difference is 1.

3 Each time the difference is 4.

4 Each time the difference is 9.

5 The prediction of 16 should come from recognising the sequence of square numbers in the previous answers.
Several examples should be used to test the prediction.

69 APEC

1 Marsh 130 cm Hen 116 cm Montagu's 102 cm

2 Rough–legged 1 m 54 cm Honey 1 m 32 cm Common 1 m 20 cm

3 (a) Rough–legged buzzard (b) Merlin falcon

4 (a) 24 cm
(b) 18 cm
(c) 34 cm
(d) 63 cm

5 (a) 64 cm (b) 88 cm

6 Answers depend on the child's measurements.

Enclosures 70

1 (a) 4 m 10 cm (b) 5 m 31 cm (c) 4 m 15 cm

2 (a) 14 m (b) 12 m (c) 13 m 65 cm (d) 7 m 80 cm

3 (a) length of side 1 cm 2 cm 3 cm 4 cm
(b) perimeter 4 cm 8 cm 12 cm 16 cm

4 (a) 12 m (b) 3 m 20 cm (c) 4 m 80 cm
(d) 10 m 40 cm (e) 16 m 36 cm

Fish scales 71

1 Silver Bream 25 cm Anchovy 20 cm
Minnow 15 cm Red Mullet 35 cm

2 (a) • tank 1m 40 cm • fish 40 cm
• rock 80 cm • submarine 10 cm

(b) • tank 60 cm • castle 30 cm
• diver 20 cm • plant 50 cm

(c) The water is more than 40 cm deep. The depth of water in the picture is more than 4 cm which is a true depth of more than 40 cm.

3 (a) Great Blue 4 m Nurse 3 m
Crocodile 1 m Mako $4\frac{1}{2}$ m

(b) Mako, Great Blue, Nurse, Crocodile

72 Dinosaurs

1 Iguanodon 8 m Brachiosaurus 24 m
Cetiosaurus 18 m

2 (a) Brachiosaurus was the longest.
It was about 3 times longer.
(b) Answer depends on the length of the classroom.
(c) A blue whale can be longer than any of these dinosaurs.

3 (a) Tyrannosaurus 6 m Iguanodon 5 m
Brachiosaurus 12 m Cetiosuarus 9 m
(b) Brachiosaurus was the tallest.
Answer depends on the height of the classroom.

4 (a) • Dino World length 80 m breadth 60 m
• grounds length 180 m breadth 100 m
(b) 10 Cetiosaurus lengths would fit.
(c) Yes, 3 Brachiosaurus lengths would fit.
Three Brachiosaurus lengths are 3 x 24 m = 72 m
which is shorter than the length, 80 metres, of Dino World.

73 Race for APEC

Practical work.

Practical work

(a) 3 km (b) 5 km (c) 10 km (d) 25 km

8 km 437 m

Race for APEC – *continued* 73

5 (a) 3 km 960 m (b) 4 km 936 m (c) 6 km 174 m (d) 18 km 258 m
(e) 3 km 55 m (f) 12 km 90 m (g) 5 km 5 m (h) 70 km

6 (a) 2350 m (b) 4746 m (c) 11 400 m (d) 3025 m
(e) 15 005 m (f) 500 m (g) 1500 m (h) 3500 m

7 Answers depend on children's town.

Routes 74

1 (a) 2 km 150 m
(b) 750 m shorter

2 (a) 1 km 850 m (b) 1 km
(c) 1 km 220 m (d) 2 km 450 m

3 (a) abbey → dunhill → hotel → pier → farm → quarry
(distance 7 km)
(b) 3 km 930 m

4 (a) • red route 3 km 75 m • blue route 7 km 632 m
(b) 4 km 557 m longer

5 Various routes are possible. One possible route is
park centre → cross → cliff → tower → pond → park centre
(distance 9 km 65 m)

75 Weighing at APEC

1 (a) 20 g, 20 g (b) 50 g, 20 g, 5 g
(c) 500 g, 200 g, 100 g, 50 g, 10 g
(d) 500 g, 100 g, 50 g, 20 g, 10 g (e) 200 g, 100 g, 20 g, 10g, 5 g

2 (a) 2000g (b) 3120 g (c) 1080 g (d) 2006 g
(e) 4500 g

3 (a) 1 kg 300 g (b) 2 kg 345 g (c) 3 kg 650 g (d) 2 kg 35 g
(e) 4 kg 9 g

4 (a) 1 kg 500 g (b) 1 kg 310 g (c) 1 kg 100 g

5 (a) 2 kg 340 g
(b) 3 kg 375 g
(c) 3 kg 100 g
(d) 3 kg 135 g

6 difference between the cream and
• spotted egg, 380 g
• pale blue egg, 380 g
• brown egg, 275 g
• grey egg, 140 g

7 (a) Children's answers may vary.
(b) An egg weighs about 60g. The children's explanation should relate to the weight of 30 such eggs weighing more or less than the ostrich egg.

Feeding time at APEC 76

1 (a) 340 g (b) 90 g

2

cabbage	140 g
turnip	520 g
kale	780 g
lettuce	75 g
apple	260 g
oats	480 g
banana	350 g
potato	675 g

The weigh-in 77

1 hamster 600 g cat 2 kg 400 g gerbil 75 g
kitten 225 g guinea pig 350 g

2

rat	600 g to the nearest mark
pigeon	480 g to the nearest mark
cat	2 kg 500 g to the nearest mark
dormouse	135 g to the nearest mark
seagull	1 kg 800 g to the nearest mark
mole	410 g to the nearest mark
field mouse	70 g to the nearest mark
grass snake	225 g to the nearest mark

3 Practical work.

78 APEC foodstore

1 (a) 7 kg 500 g (b) 10 kg 800 g (c) 10 kg 600 g
(d) 31 kg 500 g (e) 6 kg 75 g (f) 2 kg

2 Two bags of mixed vegetables weigh the same as five bags of dog biscuits (9000 g).

3 (a), (b) Practical work

4 Answers depend on things in the classroom.

5 (a), (b), (c) Practical work

79 The Guard Room

1 (a) 54 squares (b) 28 squares (c) 56 squares
(d) 64 squares (e) 78 squares (f) 85 squares
(g) 189 squares

2 (a) 1 square metre *or* 1 m^2
(b) 20 square metres *or* 20 m^2

80 Groovy gallery

1 (a) 27 squares
(b) 8 squares
(c) 9 squares
(d) 44 squares

2 (a) 48 squares (b) 32 squares

3 (a) 50 squares (b) 45 squares
(c) 64 squares (d) 65 squares

81 Medicine

1 (a) 4 spoonfuls
(b) 3 cupfuls
(c) 40 spoonfuls
(d) 5 cupfuls

2 (a) 300 ml (b) 500 ml (c) 200 ml (d) 800 ml

3 (a) Seal Syrup contains about $\frac{1}{2}$ litre.
(b) Budgie Boost contains less than $\frac{1}{4}$ litre.

4 (a) Each small interval represents 10 ml.
(b) 440 ml
(c) *Monkey Mix*

Water	260 ml
Plant juice	310 ml
Tonic	180 ml
Factor X	250 ml

The total volume is 1000 ml, or 1 litre.

82 To the nearest mark

1 A – Balm B – Antiseptic C – Spirit D – Lotion

2 (a) 700 ml (b) 300 ml (c) 700 ml (d) 400 ml

3 (a) 280 ml (b) 490 ml (c) 350 ml

4 Practical work.

83 Vitamin cubes

1 (a) 9 cm^3 (b) 8 cm^3 (c) 12 cm^3 (d) 16 cm^3

2 (a) • 2 layers • 18 cm^3 (b) • 3 layers • 24 cm^3 (c) • 3 layers • 36 cm^3 (d) • 2 layers • 32 cm^3

3 (a) 27 cm^3 (b) 48 cm^3 (c) 36 cm^3 (d) 64 cm^3

4 Practical work.

84 Litre of cubes

1 (a) 20 cm^3
(b) • 3 layers
• 5 layers
• 50 layers

2 100 cm^3

3 (a) 10 flats
(b) 1000 cm^3

4 1000 cm^3

5 The children should notice that the cube just holds one litre of water *or* the litre of water takes up the same space as 1000 cm^3 (the 10 flats).

6 72 cm^3

SPMG Book 5

67 Pooling ideas

1 Answers could include long tape, metre stick, trundle wheel etc.

2 (a), (b), (c) Answers depend on the size of the school hall.

3 (a), (b), (c), (d) Answers depend on the size of the school's netball court and dining room.

4 (a) Answer depends on the size of the school playground.
(b) Answers will vary.

68 Pooling ideas – *continued*

1 25m or 50m. Each race distance will be a whole number of lengths.

2 (a) 10 lengths
(b) 50m freestyle. This race would be $2\frac{1}{2}$ lengths of St Andrew's pool. It would finish in the middle of the pool.

3 (a) Lara swam 33m
Rob swam 66m
Karen swam 132m
(b) Practical work
(c) Practical work

4 64 metres

5 96 metres

St Andrew's School pool 69

1 (a) The depth at the shallow end is 70cm.
The depth at the deep end is 130cm.
(b), (c) The answers depend on the child's measurements.

2 (a), (b), (c), (d) The answers depend on the child's measurements.

3 (a), (b), (c) The answers depend on the teacher's and child's measurements.

4 Practical drawing work.
Possible rectangles:
11 cm x 1 cm 10 cm x 2 cm
9 cm x 3 cm 8 cm x 4 cm
7 cm x 5 cm 6 cm x 6 cm

Glides and dives 70

1 Naomi – 4 metres and 35 centimetres
Kris – 4 metres and 97 centimetres
Gordon – 376 centimetres
Marie – 429 centimetres
Rashmi – 304 centimetres

2 (a) Naomi – 7 m 81 cm
Kris – 9 m 9 cm
Gordon – 6 m 81 cm
Marie – 7 m 28 cm
Rashmi – 7 m 4 cm
(b) The winner is Kris.
Next are Naomi and Marie.

70 Glides and dives – *continued*

3 (a) The difference in depth is:

Naomi	84 cm
Kris	1 m 16 cm or 116 cm
Gordon	1 m 25 cm or 125 cm
Marie	34 cm
Jan	1 m 11 cm or 111 cm

(b) The deepest dive is Gordon's – 2 m 14 cm
The difference in depth is:

Naomi	41 cm
Kris	9 cm
Marie	91 cm
Jan	14 cm
Rashmi	1 m 25 cm or 125 cm

71 In at the deep end

(a) 10
(b) $\frac{1}{10}$

The answers depend on the objects measured.

The answers depend on the answers to Q2.

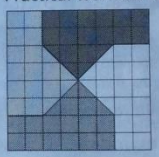
(a) 2 tiles – 0·6 m 3 tiles – 0·8 m
(b) 7 tiles

Junior Rangers 72

1 (a) $13\frac{1}{2}$ cm^2 (b) 8 cm^2 (c) 11 cm^2

2 (a) Answers depend on badges drawn by the children.
(b) Practical drawing work. The square badge should have side length 6 cm.
(c) Practical drawing work. The rectangular badge is likely to have these sizes: $7\frac{1}{2}$ cm x 3 cm or 5 cm x $4\frac{1}{2}$ cm

3 (a) 16 cm^2
(b), (c), (d) Practical work on **centimetre** squared grids.



(e) 64 cm^2

Carol's Carpets 73

1 Practical work

2 (a) Answer depends on the size of the desk.
(b) Practical work

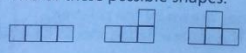
3 (a) Practical work
(b) 1 metre or 100 centimetres

4 (a), (b), (c) Answers depend on the children and the objects used.

5 (a), (b), (c) Various answers are possible.

74 Carol's Carpets – *continued*

6 **(a)** 1 square metre
(b) Two of these possible shapes:



7 Practical work

8 **(a)** She needs 12 m^2 of carpet.
(b) No. The wall is 8 m^2 and she has only enough paint to cover 6m^2.

75 The Kluless laboratory

1 **(a)** **(b)** **(c)** } Answers depend on the children's choice of object.

2 **(a)** sludge (350g) **(b)** nettles (170g)
(c) yuck (80g) **(d)** thorns (125g)
(e) slime (265g) **(f)** squidge (205g)

3 **(a)** 500g, 20g, 10g
(b) 20g, 10g, 5g
(c) 200g, 20g, 20g
(d) 200g, 100g, 50g, 20g, 20g, 5g
(e) 100g, 50g, 5g
(f) 500g, 200g, 50g, 10g

The Kluless laboratory – *continued* 76

1 Assuming that the parcels have the weights suggested in the Teacher's Notes, the answers are:
(a) A, D **(b)** B, C, E

2 Assuming that the parcels have the weights suggested in the Teacher's Notes, the weights are:
A 50g B 210g C 140g D 70g E 290g

3 **(a)** Weight of grime: between 130g and 150g
(b) Weight of gunge: between 60g and 70g

4 Answers depend on the children's choice of objects.

5 One box of fungus weighs 21g.
(1 box of mildew weighs 35g.
3 boxes of mildew weigh 105g.
5 boxes of fungus weigh 105g.
so 1 box of fungus weighs 21g (105 ÷ 5).)

The pickling room 77

1 **(a)** 260g **(b)** 260g

2

honey	310g
nettles	540g
vinegar	680g
thistle heads	920g
salt	20g
chilli	140g
dandelion	180g
factor X	260g

78 The pickling room – *continued*

1

hops	1860 g or 1 kg 860 g
elderflowers	480 g
watercress	1140 g or 1 kg 140 g
garlic	420 g
marigold	480 g
spearmint	850 g
basil	1250 g or 1 kg 250 g

2 The answers depend on the weights of the boxes provided by the teacher.

3 Practical work

79 Zantha's Special Fudge

Practical work

80 The Green Hut Gang

1 **(a)** 35 minutes past 9
25 minutes to 10
(b) 55 minutes past 9
5 minutes to 10
(c) 40 minutes past 10
20 minutes to 11
(d) 55 minutes past 10
5 minutes to 11
(e) 35 minutes past 11
25 minutes to 12
(f) 50 minutes past 11
10 minutes to 12
(g) 40 minutes past 12
20 minutes to 1
(h) 45 minutes past 12
15 minutes to 1
(i) 50 minutes past 1
10 minutes to 2