Percentage Increase and Decrease Bar Modelling

Aim: I can use bar modelling to increase and decrease by percentages.

Section 1

Here are some bars divided into equal parts. Complete the percentage in each part of the bar. The first one is done for you:

50%	50%

Section 2

In the following bars show how you can use a combination of the above to make the following percentages. The first one is done for you:

75%

25%	25%	25%	

or

50%	25%	

60%

30%

80%

85%

45%

15%

95%

Section 3

50% of 140 = 70

50%	50%
70	70

25% of 260 =

40% of 380 =

90% of 510 =

75% of 420 =

60% of 160 =

80% of 80 =

70% of 740 =

30% of 620 =

Section 4

To decrease a number by 10%, find 10% and subtract this from the number.

Decrease 80 by 10%.

									10%
									8

10% of 80 = 8   80 - 8 = 72   80 decreased by 10% = 72

Decrease the following numbers by 10%.

140

60

150

230

380

760

980

1020

Section 5

To increase a number by 10%, find 10% and add this to the number.

Increase 80 by 10%

100%	10%
80	8

10% of 80 = 8.   80 + 8 = 88   80 increased by 10% = 88

Increase the following numbers by 10%.

170

280

450

50

490

610

770

920

Section 6

1. A bag of popcorn costs £1.20. A shop discounts bags of popcorn by 10%.
   What is the new cost?

2. An athlete's best time for running 400m is 50 seconds. After a year's training
   the athlete cuts their time by 10%. What is their new best time?

3. A grocer normally buys 670kg of potatoes each week. One week he decides
   to buy 10% less potatoes. What mass of potatoes does he buy?

4. A school raises £420 for their chosen charity. In the previous year, the school
   raised 10% less. How much did the school raise the previous year?

5. A shop has to increase the cost of a set of books by 10%.
   The original price was £25. What is the new price?

6. A football team has an average attendance of 5680 in one season. The following season
   their average attendance increases by 10%. What is the new average attendance?

7. A runner is training for a marathon. One week she runs 44 miles over the whole week.
   In each of the next two weeks, she increases the distance she runs by 10%. How far
   will she have run in the second week? Round the answer to one decimal place.

Percentage Increase and Decrease Bar Modelling **Answers**

Aim: I can use bar modelling to increase and decrease by percentages.

Section 1

Here are some bars divided into equal parts. Complete the percentage in each part of the bar. The first one is done for you:

50%	50%

25%	25%	25%	25%

20%	20%	20%	20%	20%

12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%	12.5%

10%	10%	10%	10%	10%	10%	10%	10%	10%	10%

5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

Section 2

In the following bars show how you can use a combination of the above to make the following percentages. The first one is done for you:

70%

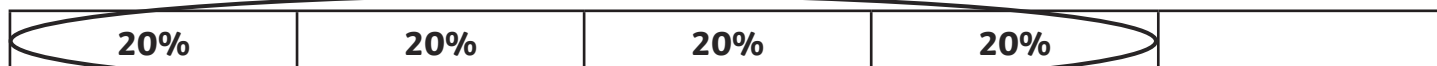| 25%	25%	25%	

or

50%	25%	

60%

20%	20%	20%		

30%

10%	10%	10%							

visit twinkl.com

80%

20%	**20%**	**20%**	**20%**	

85%

20%	**20%**	**20%**	**20%**	**5%**		

45%

20%	**20%**	**5%**				

15%

10%	**5%**				

95%
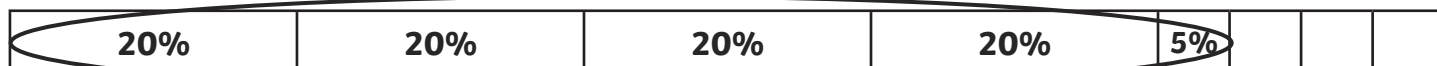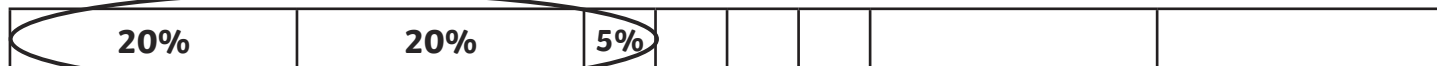
50%	**20%**	**20%**	**5%**	

Section 3

50% of 140 = 70

50%	50%
70	70
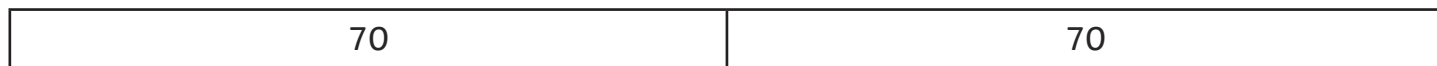
25% of 260 = **65 - find 25% by halving and halving again (130, 65)**

25%			
65			
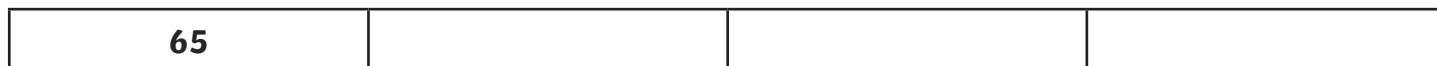
40% of 380 = **152 - find 20% by dividing by 10 and doubling (38, 76)**

20%	**20%**			
76	**76**			

90% of 510 = **495 - find 90% by subtracting 10%, adding 50% + 20% + 20% or 10% × 9**

				10%
				51
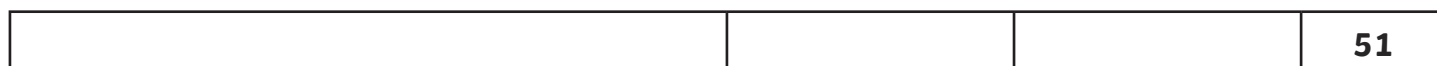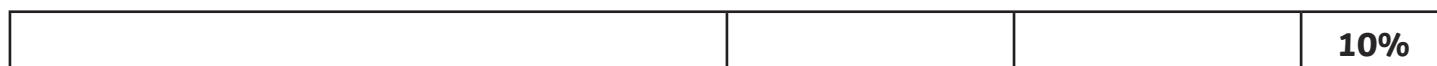
75% of 420 = **315 - find 75% by subtracting 25%, adding 50% + 25% or 25% × 3**

			25%
			105

60% of 160 = **96 - find 60% by 20% × 3 or 10% x 6**

20%	20%	20%		
32	32	32		

80% of 80 = **64 - find 80% by 20% × 4 or 10% × 8 or subtracting 20%**

				20%
				16

70% of 740 = **518 - find 70% by adding 50% and 20% or 50% + 10% + 10%**

50%			10%	10%			
370			74	74			

30% of 620 = **186 - find 30% by 10% × 3**

10%	10%	10%							
62	62	62							

Section 4

To decrease a number by 10%, find 10% and subtract this from the number.

Decrease 80 by 10%.

									10%
									8

10% of 80 = 8   80 - 8 = 72   80 decreased by 10% = 72

Decrease the following numbers by 10%.

140

									14

10% of 140 = 14   140 - 14 = 126   140 decreased by 10% = 126

60

									6

10% of 60 = 14   60 - 6 = 54   60 decreased by 10% = 54

150

									15

10% of 150 = 15   **150 - 15 = 135**   **150 decreased by 10% = 135**

230

									23

10% of 230 = 23   **230 - 23 = 207**   **230 decreased by 10% = 207**

380

									38

10% of 380 = 38   **380 - 38 = 342**   **380 decreased by 10% = 342**

760

									76

10% of 760 = 76   **760 - 76 = 684**   **760 decreased by 10% = 684**

980

									98

10% of 980 = 98   **980 - 98 = 882**   **980 decreased by 10% = 882**

1020

									102

10% of 1020 = 102   **1020 - 102 = 918**   **1020 decreased by 10% = 918**

Section 5

To increase a number by 10%, find 10% and add this to the number.

Increase 80 by 10%

100%	10%
80	8

10% of 80 = 8.   80 + 8 = 88   80 increased by 10% = 88

Increase the following numbers by 10%.

170

170	17

10% of 170 = 17   **170 + 17 = 187**   **170 increased by 10% = 187**

280

280	28

10% of 280 = 28   **280 + 28 = 308**   **280 increased by 10% = 308**

450

450	45

10% of 450 = 45   **450 + 45 = 495**   **450 increased by 10% = 495**

50

50	5

10% of 50 = 5   **50 + 5 = 55**   **50 increased by 10% = 55**

490

490	49

10% of 490 = 49   **490 + 49 = 539**   **490 increased by 10% = 539**

610

610	61

10% of 610 = 61   **610 + 61 = 671**   **610 increased by 10% = 671**

770

770	77

10% of 770 = 77   **770 + 77 = 847**   **770 increased by 10% = 847**

920

920	92

10% of 920 = 92   **920 + 92 = 1012**   **920 increased by 10% = 1012**

Section 6

1. A bag of popcorn costs £1.20. A shop discounts bags of popcorn by 10%.
   What is the new cost?

£1.08

2. An athlete's best time for running 400m is 50 seconds. After a year's training
   the athlete cuts their time by 10%. What is their new best time?

45 seconds

3. A grocer normally buys 670kg of potatoes each week. One week he decides
   to buy 10% less potatoes. What mass of potatoes does he buy?

603kg

4. A school raises £420 for their chosen charity. In the previous year, the school
   raised 10% less. How much did the school raise the previous year?

£378

5. A shop has to increase the cost of a set of books by 10%.
   The original price was £25. What is the new price?

£27.50

6. A football team has an average attendance of 5680 in one season. The following season
   their average attendance increases by 10%. What is the new average attendance?

6248

7. A runner is training for a marathon. One week she runs 44 miles over the whole week.
   In each of the next two weeks, she increases the distance she runs by 10%. How far
   will she have run in the second week? Round the answer to one decimal place.

53.24 miles rounded to 53.2 miles