ESTIMATION PROBLEMS

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

Round to friendly numbers to get a quick answer.

Prices: round to the nearest pound.

Lengths: round to the nearest whole number.

£4.99 ≈ £5

9.8 cm ≈ 10 cm

1 Round each price to the nearest pound. Then estimate the total cost.

a) £2.95 ≈ £ ☐ notebook

£4.10 ≈ £ ☐ pencil case

£0.98 ≈ £ ☐ ruler

b) Estimate the total cost. £ ☐

2 Round each length to the nearest whole number. Estimate the area of the rectangle.



Area = length × width

≈ ☐ × ☐ = ☐ cm²

3 Each pack has 19 stickers. Estimate the number of stickers in 4 packs.



4 packs

19 ≈ ☐

4 × ☐ = ☐

4 Sam has £20. She wants to buy all three of these items.

£6.95 £8.10 £3.99

a) Estimate the total cost. £ ☐

b) Does Sam have enough money? YES NO

ESTIMATION PROBLEMS

SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Round each value to 1 significant figure, then calculate.

Then ask: is my estimate too big (over) or too small (under)?



Area ≈ 40 × 8 = 320 cm²

1 Estimate the area of this field.



Area ≈

[ ] × [ ] = [ ] m²

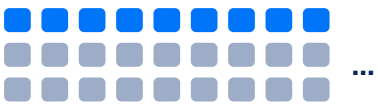
2 A theme park ticket costs £18.75. Estimate the cost of 4 tickets.



4 × £ [ ] = £ [ ]

This is an OVERESTIMATE UNDERESTIMATE

3 Estimate the number of seats in the cinema.



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21 rows, 38 seats in each row

Seats ≈ [ ] × [ ] = [ ]

4 Liam spends £61 on 3 games. Each game costs the same.

a) Estimate the price of one game. £ [ ]

b) Is your estimate an overestimate or an underestimate? Explain.

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ESTIMATION PROBLEMS

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Round each value to 1 significant figure, estimate, then check that your answer is realistic. Be careful with division: rounding the number you divide by up makes the answer smaller.

FLUENCY

1 Here is a rectangle.



a) Estimate the area. ☐

b) Is it an over- or underestimate?

OVERESTIMATE UNDERESTIMATE

2 112 students go on a trip. The coach costs £395 and entry costs £8.75 per student.

a) Estimate the total cost of the trip. £ ☐

b) Estimate the cost per student. £ ☐

REASONING

3 Zara estimates $79 \div 1.6 \approx 80 \div 2 = 40$. She says, "This is an overestimate because I rounded both numbers up." Explain why Zara is wrong.

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4 A phone screen measures 6.1 cm by 13.9 cm. Ben uses a calculator and says the area is 847.9 cm². Use an estimate to show that Ben has made a mistake.

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ESTIMATION PROBLEMS

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) In a ÷ b, rounding a and b up overestimates. ALWAYS SOMETIMES NEVER

b) Rounding the divisor down gives a bigger estimate. ALWAYS SOMETIMES NEVER

c) Rounding to 1 s.f. gives a close estimate. ALWAYS SOMETIMES NEVER

d) Rounding a square's side down underestimates its area. ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 A school buys 28 tablets at £189 each. The budget is £5000

a) Estimate the total cost by rounding to 1 s.f. £ ____

b) Explain why this does not prove the school is over budget.

c) Use a different estimate to show that the school is over budget.

3 A wall is 4.85 m wide and 2.4 m tall. One tin of paint covers 9.8 m².

a) Estimate the area by rounding to 1 s.f. How many tins does this suggest? ____

b) The exact area is 11.64 m². How many tins are needed? ____

c) Why was the estimate in part a) misleading? _____

★ CHALLENGE FOR ALL

4 A square garden has an area of 90 m².

a) Between which two whole numbers is the side length? ____

b) Estimate the side length to 1 decimal place. ____

c) Fencing comes in 5 m rolls. How many rolls go around the garden? ____

ESTIMATION PROBLEMS ? ANSWERS

ANSWERS

BUILDING BLOCKS

Q1 a) £3, £4, £1 · b) £8

Q2 10 × 4 = 40 cm²

Q3 4 × 20 ≈ 80 stickers (19 ≈ 20)

Q4 a) £7 + £8 + £4 = £19 · b) Yes (the exact total is £19.04)

SUPPORT

Q1 60 × 20 = 1200 m²

Q2 4 × £20 = £80 · overestimate (£18.75 was rounded up)

Q3 20 × 40 = 800 seats

Q4 a) £60 ÷ 3 = £20 · b) underestimate: £61 was rounded down, so the real price is a bit more (£20.33)

CORE

Q1 a) 20 × 6 = 120 cm² · b) overestimate: both lengths were rounded up

Q2 a) £400 + 100 × £9 = £1300 · b) £1300 ÷ 100 = £13

Q3 Rounding 1.6 up to 2 makes the divisor bigger, which makes the answer smaller. This is bigger than the effect of rounding 79 up to 80, so 40 is an underestimate (79 ÷ 1.6 = 49.375)

Q4 6 × 10 = 60 cm², so 847.9 cm² is far too big (exact 84.79 cm²; Ben has the decimal point in the wrong place)

GREATER DEPTH

Q1 a) Sometimes: 76 ÷ 1.95 ≈ 40 is over (38.97), but 79 ÷ 1.6 ≈ 40 is under (49.4) · b) Always · c) Sometimes: 1.4 × 1.4 ≈ 1 but the answer is 1.96 · d) Always

Q2 a) 30 × £200 = £6000 · b) both numbers were rounded up, so £6000 is an overestimate; the real cost could still be under £5000 · c) e.g. 28 × £180 = £5040 is an underestimate and is already over £5000 (exact cost £5292)

Q3 a) 5 × 2 = 10 m², which suggests about 1 tin · b) 2 tins · c) 2.4 was rounded down a lot (to 2), so the estimate was much too small

Q4 a) 9 and 10 ($9^2 = 81$, $10^2 = 100$) · b) 9.5 ($9.5^2 = 90.25$) · c) perimeter ≈ 4 × 9.5 = 38 m, so 8 rolls