

WA4MNAMU1

Calculating with number

Core + Challenge

Doubling & Halving Strategies

I can use doubling and halving as mental strategies for multiplying and dividing.

Name: _____ Date: _____ Score: / 53

Key idea

Doubling and halving: doubling a number twice is the same as multiplying by 4; doubling three times is the same as multiplying by 8. Halving a number is the same as dividing by 2, and halving twice is the same as dividing by 4.

Multiplying by 5 can also be found by multiplying by 10 then halving.

E.g. 14×4 : double 14 to get 28, then double again to get **56**.

A Fluency *practise the skill*

/16 marks

Use a doubling or halving strategy (not standard written multiplication) to find each answer.

- | | |
|---|--|
| 1. Double 34 _____ | 9. 18×5 (half of $\times 10$) _____ |
| 2. Double 57 _____ | 10. 26×5 (half of $\times 10$) _____ |
| 3. 15×4 (double, double) _____ | 11. 19×4 _____ |
| 4. 23×4 (double, double) _____ | 12. 7×8 _____ |
| 5. 12×8 (double three times) _____ | 13. Half of 250 _____ |
| 6. 9×8 (double three times) _____ | 14. 32×5 _____ |
| 7. Half of 86 _____ | 15. 21×4 _____ |
| 8. Half of 144 _____ | 16. 14×8 _____ |

B Core *apply the skill to problems*

/21 marks

- 1 A charity doubles every donation it receives, up to \$50. A donor gives \$24.
How much does the charity end up with after doubling?

[3 marks]

Answer: _____

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2

A bakery sells trays of 16 muffins. (a) Use doubling to find how many muffins are in 4 trays (double, then double again). (b) If each muffin costs \$2, how much do 4 trays of muffins cost in total?

[4 marks]

Answer: _____

3

A runner's training plan doubles her distance each week, starting at 7km in Week 1. Use doubling to find her distance in Week 3.

[3 marks]

Answer: _____

4

A football stadium has 2,400 seats on the ground floor, and the balcony has half as many seats. (a) Use halving to find how many seats are in the balcony. (b) How many seats does the stadium have in total?

[4 marks]

Answer: _____

5

A jacket costs \$46. It goes on sale at half price. What is the sale price?

[3 marks]

Answer: _____

6

A school fundraiser sponsor will double any amount raised in the first hour, up to a maximum \$400 contribution from the sponsor. (a) In the first hour, \$180 was raised. Using doubling, how much will the sponsor contribute? (b) What is the total amount raised in the first hour, including the sponsor's matched donation?

[4 marks]

Answer: _____

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C**Reasoning** *explain, justify and check***/9 marks****1**

Explain why doubling a number twice is the same as multiplying it by 4.

[2 marks]**2**

A student says halving 86 and then halving the result again is the same as dividing 86 by 4. Is the student correct? Explain.

[2 marks]**3**Explain how you could use doubling to work out 17×8 without multiplying by 8 directly.**[2 marks]****4**

A student says halving is always exactly the same as dividing by 2, so there's no point learning it as a separate strategy. Do you agree? Explain your answer.

[3 marks]**D****Challenge** *multi-step and problem-solving***/7 marks****1**

A number doubled three times gives 96. What was the original number?

[2 marks]

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Answer: _____

2

Half of half of a number is 15. What was the original number?

[2 marks]

Answer: _____

3

A number is doubled, then doubled again, then halved once. The result is 56. What was the original number?

[3 marks]

Answer: _____

How did I go?

Fluency ____/16 Core ____/21 Reasoning ____/9 Challenge ____/7 **Total ____/53**

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