Place Values and Decimals

Mana Maths

Te reo Māori terms

uara tū
place value
Open in Te Aka

mati
digit
Open in Te Aka

tau ā-ira
decimal
Open in Te Aka

mati whaiira
decimal place
Open in Te Aka

Place Values and Decimals

Key idea

A digit's value depends on its place. The same digit can mean very different amounts in different positions.

Steps

1. Look at the digit you care about.
2. Name its place: ones, tens, tenths, hundredths, and so on.
3. Write its value, not just the digit.
4. Compare left to right.

Place-value reminder

- In 347, the 4 means 40.
- In 5.3, the 3 means 0.3.
- In 2.74, the 7 means 0.7.
- In 2.74, the 4 means 0.04.

Common mistake

Saying the value is just the digit. In 862, the digit is 6, but its value is 60. In 2.74, the digit is 7, but its value is 0.7.

Try these

1. What is the value of the 4 in 347?
2. What is the value of the 5 in 5.3?
3. What is the value of the 4 in 3.48?

Place Values and Decimals

Example 1: value of a digit

Find the value of the 6 in 862.

$$862 = 800 + 60 + 2$$

So the value of the 6 is 60.

Example 2: decimal place value

Find the value of the 7 in 2.74.

$$2.74 = 2 + 0.7 + 0.04$$

So the value of the 7 is 0.7.

Try these

1. Find the value of the 9 in 291.
2. Find the value of the 6 in 4.63.
3. Find the value of the 2 in 8.205.

Place Values and Decimals

Comparing numbers

When two numbers have the same whole-number part, compare the decimal places next.

Example 3: compare decimals

Which is greater: 0.8 or 0.08?

$$0.8 = 8 \text{ tenths}$$

$$0.08 = 8 \text{ hundredths}$$

A tenth is bigger than a hundredth, so $0.8 > 0.08$.

Example 4: order numbers

Order $3.2,\ 2.9,\ 3.02$ from smallest to largest.

$$2.9 < 3.02 < 3.2$$

So the order is $2.9,\ 3.02,\ 3.2$.

Common mistake

Thinking more digits means a bigger decimal. For example, 0.08 is not bigger than 0.8. It is smaller because 8 hundredths is less than 8 tenths.

Place Values and Decimals

Partitioning numbers

Split a number into place-value parts.

Example 5: whole number

Partition 407.

$$407 = 400 + 0 + 7$$

Usually we write this as $407 = 400 + 7$.

Example 6: decimal number

Partition 3.48.

$$3.48 = 3 + 0.4 + 0.08$$

That is 3 ones, 4 tenths, and 8 hundredths.

Try these

1. Which is greater: 45 or 54?
2. Order from smallest to largest: $0.5,\ 0.05,\ 0.15$.
3. Partition 4.7.

Start Tasks

1. 4 in 347 has value _____.

2. 6 in 862 has value _____.

3. 5 in 5.3 has value _____.

4. 7 in 2.74 has value _____.

5. 9 in 19.6 has value _____.

6. 2 in 0.27 has value _____.

7. Write in numerals: three hundred and six.

8. Write in numerals: nine hundred and forty-two.

9. Write in numerals: six and five tenths.

Place Values and Decimals — Answers

1. 40

2. 60

3. 5

4. 0.7

5. 0.9

6. 0.02

7. 306

8. 942

9. 6.5

Start Tasks

10. Write in words: 508.

11. Write in words: 3.6.

12. Write in words: 12.04.

13. Which is greater: 45 or 54?

14. Which is smaller: 0.8 or 0.08?

15. Which is greater: 6.2 or 6.02?

16. Which is smaller: 101 or 110?

17. Order ascending: $3.2, 2.9, 3.02$.

18. Order descending: $406, 460, 640$.

Place Values and Decimals — Answers

10. five hundred and eight

11. three point six

12. twelve point zero four

13. 54

14. 0.08

15. 6.2

16. 101

17. 2.9, 3.02, 3.2

18. 640, 460, 406

Start Tasks

19. Order ascending: $0.4, 0.04, 0.44$.

20. Partition 58 into tens and ones.

21. Partition 407 into hundreds, tens, and ones.

22. Partition 4.7 into ones and tenths.

23. Partition 3.48 into ones, tenths, and hundredths.

24. Partition 90.6 into tens, ones, and tenths.

25. Complete: $2.3 = 2 + \frac{\square}{10}$.

26. Complete: $540 = 5 \times 100 + \square \times 10$.

27. In 8.14, the tenths digit is _____.

Place Values and Decimals — Answers

19. 0.04, 0.4, 0.44

20. 50 + 8

21. 400 + 0 + 7

22. 4 + 0.7

23. 3 + 0.4 + 0.08

24. 90 + 0.6

25. 3

26. 4

27. 1

Build Tasks

1. Value of the 8 in $4,836$.

2. Value of the 3 in 7.34.

3. Value of the 9 in 0.692.

4. Value of the 5 in 2.507.

5. Value of the 7 in $7,104$.

6. Value of the 4 in 0.041.

7. Write in words: $2,045$.

8. Write in words: 14.09.

9. Write in words: 0.307.

Place Values and Decimals — Answers

1. 800

2. 0.3

3. 0.09

4. 0.005

5. 7,000

6. 0.04

7. two thousand and forty-five

8. fourteen point zero nine

9. zero point three zero seven

Build Tasks

10. Write in numerals: six thousand and seventy-three.

11. Write in numerals: eight and five tenths.

12. Write in numerals: nine and twenty-four hundredths.

13. Compare: $5.07 \square 5.7$.

14. Compare: $0.43 \square 0.403$.

15. Compare: $3.500 \square 3.5$.

16. Compare: $9.08 \square 9.8$.

17. Order ascending: $0.6, 0.06, 0.606, 0.66$.

18. Order descending: $9.1, 9.01, 9.11, 8.99$.

Place Values and Decimals — Answers

10. 6,073

11. 8.5

12. 9.24

13. $<$

14. $>$

15. $=$

16. $<$

17. 0.06, 0.6, 0.606, 0.66

18. 9.11, 9.1, 9.01, 8.99

Build Tasks

19. Order ascending: $2.05, 2.5, 2.005, 2.15$.

20. Partition $5,302$ fully.

21. Partition 7.208 fully.

22. Partition 40.56 fully.

23. Digit in the tenths place of 3.58.

24. Digit in the hundreds place of $6,482$.

25. Digit in the thousandths place of 8.371.

26. Complete: $4.3 = 4 + \frac{\square}{10}$.

27. Complete: $608 = 6 \times 100 + \square \times 10 + 8$.

Place Values and Decimals — Answers

19. 2.005, 2.05, 2.15, 2.5

20. 5,000 + 300 + 0 + 2

21. 7 + 0.2 + 0.008

22. 40 + 0 + 0.5 + 0.06

23. 5

24. 4

25. 1

26. 3

27. 0

Push Tasks

1. Is the 4 in 0.48 worth 4? Explain.

2. Is $3.09 > 3.9$? Explain.

3. Which is greater: 2.305 or 2.35? Justify.

4. Which is smaller: 7.08 or 7.8? Explain.

5. Write 5.406 as place-value parts.

6. Write $2,070$ as place-value parts.

7. Write 9.304 as place-value parts.

8. In 8.472, the hundredths digit is _____.

9. Complete: $6.08 = 6 + \frac{\square}{100}$.

Place Values and Decimals — Answers

1. **No — the 4 is in tenths, worth 0.4**

2. **No —** $3.09 < 3.9$

3. 2.35 **(hundredths digit 5** $>$ **0)**

4. 7.08 **(0 tenths vs 8 tenths)**

5. $5 + 0.4 + 0.006$

6. $2,000 + 0 + 70 + 0$

7. $9 + 0.3 + 0.004$

8. **7**

9. **8**

Push Tasks

10. Complete:
$4.5 = 4 + \frac{\square}{10} = \frac{45}{10}$.

11. Ascending order:
$4.09, 4.9, 4.099, 4.19$.

12. Descending order:
$12.3, 12.03, 12.300, 12.29$.

13. Ascending order:
$0.909, 0.99, 0.9, 0.099$.

14. Which does not belong:
$0.7, 0.70, 0.07, 0.700$?

15. Write the number:
3 ones, 4 tenths, 7 hundredths.

16. Write the number:
5 hundreds, 0 tens, 8 ones, 2 tenths.

17. Write the number:
1 ten, 6 ones, 0 tenths, 9 hundredths.

18. When does adding a zero change nothing?

Place Values and Decimals — Answers

10. ? = 5

11. 4.09, 4.099, 4.19, 4.9

12. 12.3, 12.300, 12.29, 12.03

13. 0.099, 0.9, 0.909, 0.99

14. 0.07 (others are 0.7)

15. 3.47

16. 500.82

17. 16.09

18. When it's after the decimal point at the end

Push Tasks

19. Write a 3 d.p. number between 6.4 and 6.5.

20. Write a decimal between 2.09 and 2.1.

21. Why is $4.60 = 4.6$ but $460 \neq 46$?

22. Complete: $0.304 = \frac{3}{10} + \frac{\square}{100} + \frac{4}{1000}$.

23. Complete: $7,050 = 7 \times 1000 + \square \times 100 + 5 \times 10$.

24. Write as a decimal: $8 + \frac{2}{10} + \frac{5}{1000}$.

25. Why is $0.125 < 0.2$?

26. Write a 4-digit number with a 6 worth 600.

27. Write a 3 d.p. decimal with 7 in the thousandths place.

Place Values and Decimals — Answers

19. e.g. 6.401

20. e.g. 2.095

21. Decimal trailing zeros don't change value; whole-number trailing zeros multiply by 10

22. 0

23. 0

24. 8.205

25. 0.125 is 125 thousandths; 0.2 is 200 thousandths

26. e.g. 1,600

27. e.g. 0.007