Reasoning and Problem Solving
Step 10: Decimal Sequences

National Curriculum Objectives:

Mathematics Year 5: (5F10) Solve problems involving number up to 3dp
Mathematics Year 5: (5M9a) Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Compare statements and a given sequence deciding whether the statements are correct. Reasoning requires interpreting the sequence rule and applying the rule and reverse operation. Decimal places involve tenths and hundredths.
Expected Compare statements and a given sequence deciding whether the statements are correct. Reasoning requires interpreting the sequence rule, applying the rule and projecting into future terms. Decimal places involve tenths, hundredths and thousandths.
Greater Depth Compare statements and a given sequence deciding whether they are correct. Reasoning requires interpreting the sequence rule, applying the rule, projecting into future terms and showing understanding of how sequences progress. Decimal places involve tenths, hundredths and thousandths.

Questions 2, 5 and 8 (Reasoning)
Developing Compare two sequences and calculate the difference between relative terms. Children to describe simple patterns including tenths and hundredths.
Expected Compare two sequences and calculate the difference between relative terms. Children to describe simple patterns including tenths, hundredths and thousandths, and compare sequence rules.
Greater Depth Compare two sequences and calculate the difference between relative terms. Children to describe complex patterns including tenths, hundredths and thousandths, and elicit sequence rules which are compound.

Questions 3, 6 and 9 (Problem Solving)
Developing Apply sequence knowledge to real life situation, extending the sequence by 2 further terms. Decimal places involve tenths and hundredths.
Expected Apply sequence knowledge to real life situation, extending the sequence by 4 further terms. Decimal places involve tenths, hundredths and thousandths.
Greater Depth Apply sequence knowledge to real life situation, extending the sequence by 7 further terms. Sequences involve addition of differing values in an increasing pattern. Decimal places involve tenths, hundredths and thousandths.

More Year 5 Decimals resources.

Did you like this resource? Don't forget to review it on our website.

Decimal Sequences

1a. The children have been learning about decimal sequences.

5.24	5.64	6.04	6.44	6.84

Luke

7.24 will be the next term.

The term before this section was 5.2

Rayaan

Who is correct? Explain your answer.

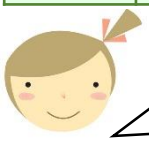
D

R

Decimal Sequences

1b. The children have been learning about decimal sequences.

3.55	3	2.45	1.9	1.35



Lily

The rule is + 0.55

The rule is subtract a half.

Adelina

Who is correct? Explain your answer.

D

R

2a. Compare the two sequences below.

0.5	1	1.5
5	10	15

Calculate the difference between the same terms in the two sequences.

Find and describe any patterns.

D

R

2b. Compare the two sequences below.

0.4	0.8	1.2
2.4	2.8	3.2

Calculate the difference between the same terms in the two sequences.

Find and describe any patterns.

D

R

3a. Prices have increased by £0.40 every year. Complete the table below to plot the price changes.

2016	2017	2018
£3.00		
£2.90		

How much will the price be in 2020?

D

PS

3b. Prices have increased by £0.16 per year. Complete the table below to plot the price changes.

2016	2017	2018
£1.94		
£3.65		

How much will the price be in 2020?

D

PS

Decimal Sequences

4a. The children have been learning about decimal sequences.

0.763	0.7	0.637	0.574	0.511

Emily: 0.5 will be a term in this sequence.

Adam: The sequence is reducing by 0.63 with each term.

Who is correct? Explain your answer.

E R

Decimal Sequences

4b. The children have been learning about decimal sequences.

7.98	6.99	6	5.01	4.02

Jon: Our next term will be a smaller number than we have now.

Rhianna: If 7.98 is the 1st term then the 7th will be 2.04

Who is correct? Explain your answer.

E R

5a. Compare the two sequences below.

0.151	0.15	0.511
↓	↓	↓
0.511	0.15	0.151

Calculate the difference between the same terms in the two sequences.

Find and describe any patterns.

E R

5b. Compare the two sequences below.

0.222	0.444	0.666
↓	↓	↓
2	4	6

Calculate the difference between the same terms in the two sequences.

Find and describe any patterns.

E R

6a. Car sales have increased by £1.771m per year. Complete the table below to plot the price changes.

2016	2017	2018
£2.54m		
£7.43m		

How much will the price be in 2022?

E PS

6b. Property sales have decreased by £0.232m per year. Complete the table below to plot the price changes.

2016	2017	2018
£4.95m		
£9.03m		

How much will the price be in 2022?

E PS

Decimal Sequences

7a. The children have been learning about decimal sequences.

5.555	5.666	5.777	5.888	5.999

Delilah: 6.666 will be a term in our sequence.

Raymond: Our sequence will always have 3 decimal places.

Who is correct? Explain your answer.

GD R

7b. The children have been learning about decimal sequences.

5.035	5.69	6.345	7	7.655

Venkat: If 7 is a term in the sequence then all multiples of 7 will also be terms.

Lou: Our sequence will never have more than 3 decimal places.

Who is correct? Explain your answer.

GD R

8a. Compare the two sequences below.

8.932	8.964	8.996
↓	↓	↓
8.932	8.996	9.06

- Calculate the difference between the same terms in the two sequences.
- Find and describe any patterns.
- Calculate the next term in each sequence to check your pattern works.

GD R

8b. Compare the two sequences below.

4.231	4.331	4.531
↓	↓	↓
2	3	5

- Calculate the difference between the same terms in the two sequences.
- Find and describe any patterns.
- Calculate the next term in each sequence to check your pattern works.

GD R

9a. Biscuit production grew by an increasing difference of 0.003 per year. Complete the table below to plot the production changes.

2016	2017	2018	2019
6.95m	6.953m		
8.39m	8.393m		

What will production be in 2025?

GD PS

9b. Ice cream sales grew by a increasing difference of £0.011m per year. Complete the table below to plot the sales changes.

2016	2017	2018	2019
£6.933m	£6.944m		
£7.772m	£7.783m		

What will sales be in 2025?

GD PS

Reasoning and Problem Solving
Decimal Sequences

Developing

1a. Luke is correct, the rule is + 0.4 and 6.84 + 0.4 = 7.24.

2a. Various possible answers, including: Differences: 4.5, 9, 13.5. The differences create a sequence with a rule + 4.5

3a.

2016	2017	2018
£3.00	£3.40	£3.80
£2.90	£3.30	£3.70

2020: £4.60, £4.50

Expected

4a. Emily and Adam are both incorrect. The rule is – 0.063. 0.511 will be followed by 0.448, 0.5 will be skipped.

5a. Various possible answers, including: Differences: + 0.36, 0, – 0.36. Sequences change by the same amount but with the opposite operation.

6a.

2016	2017	2018
£2.54m	£4.311m	£6.082m
£7.43m	£9.201m	£10.972m

2022: £13.166, £18.056

Greater Depth

7a. Delilah and Raymond are both incorrect. The rule is + 0.111 so the next term is 6.11. The nearest term to 6.666 is 6.665.

8a. Various possible answers, including: Differences: 0, + 0.032, + 0.064
The two sequences have the same 1st term, but different rules + 0.032, and + 0.064.
The next two terms are 9.028 and 9.124.

9a.

2016	2017	2018	2019
6.95m	6.953m	6.959m	6.968m
8.39m	8.393m	8.396m	8.399m

2025: 7.085m, 8.525m

Reasoning and Problem Solving
Decimal Sequences

Developing

1b. Lily and Adelina are both incorrect. The rule is – 0.55. Adelina had the correct operation but wrong amount, Lily had the correct amount but wrong operation.

2b. Various possible answers, including: Difference is 2. The second sequence will appear later in the first sequence.

3b.

2016	2017	2018
£1.94	£2.10	£2.26
£3.65	£3.81	£3.97

2020: £2.58, £4.29

Expected

4b. Both Jon and Rhianna are correct. The rule is – 0.99; as a subtraction the terms will decrease and reach 2.04.

5b. Various possible answers, including: Differences: 1.778, 3.556, 5.334. The differences create their own sequence of + 1.778.

6b.

2016	2017	2018
£4.95m	£4.718m	£4.486m
£9.03m	£8.798m	£8.566

2022: £3.558, £7.638

Greater Depth

7b. Lou is correct. The rule is + 0.655, as the thousandths column is always 5 or 0 the answer will never be more than 3 decimal places.

8b. Example answers: Differences: – 2.231, – 1.331, + 0.469. Number of possible interpretations, for example: first sequence rule is + 0.1; second sequence rule is the difference between terms increases by 1 each time.
The next two terms are 4.631and 8.

9b.

2016	2017	2018	2019
£6.933m	£6.944m	£6.966m	£6.999m
£7.772m	£7.783m	£7.805m	£7.838m

2025: £7.428m, £8.267m