

Mathematical challenges for able pupils

Year 3 A Counting, partitioning and calculating



Queen Esmerelda's coins

Queen Esmerelda had 20 gold coins.
She put them in four piles.



- The first pile had four more coins than the second.
- The second pile had one less coin than the third.
- The fourth pile had twice as many coins as the second.

How many gold coins did Esmerelda put in each pile?



Learning Objective:

pile?

- Solve mathematical problems or puzzles.
- Use vocabulary of comparing and ordering numbers.
- Explain methods and reasoning.

Solution for Queen Esmerelda's coins

There were **7, 3, 4** and **6** coins in each pile.

The problem can be solved by trial and error.



Learning Objective:

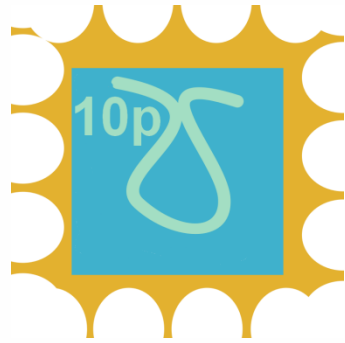
- Solve mathematical problems or puzzles.
- Use vocabulary of comparing and ordering numbers.
- Explain methods and reasoning.

Stamps

Tilly's parcel cost 55p to post.

She stuck on eight stamps.

Each stamp was either 10p or 5p.



How many of each stamp did Tilly stick on her parcel?



Learning Objective:

- Solve mathematical problems or puzzles.
- Know multiplication facts for 5 and 10 times tables.

Stamps

Tilly stuck three 10p stamps and five 5p stamps on her parcel.

No. of 5p stamps	No. of 10p stamps	Total value
8	0	40p
7	1	45p
6	2	50p
5	3	55p
4	4	60p
3	5	65p
2	6	70p
1	7	75p
0	8	80p

To adapt the problem, change the cost of the parcel, or use different stamps.



Learning Objective:

- Solve mathematical problems or puzzles.
- Know multiplication facts for 5 and 10 times tables.

Dan the detective - Part 1

1. Dan the detective looked for a number.

He found a two-digit number less than 50.

The sum of its digits was 12.

Their difference was 4.

What number did Dan find?



Learning Objective:

- Solve a given problem by organising and interpreting data in a simple table.
- Write whole numbers in figures; know what each digit represents.

Dan the detective - Part 2

2. Dan found a two-digit odd number.

One of its digits was half the other.

The number was greater than 50.

What number did Dan find?



Learning Objective:

- Solve a given problem by organising and interpreting data in a simple table.
- Write whole numbers in figures; know what each digit represents.

Solution to Dan the detective

1. **48**

2. **63**



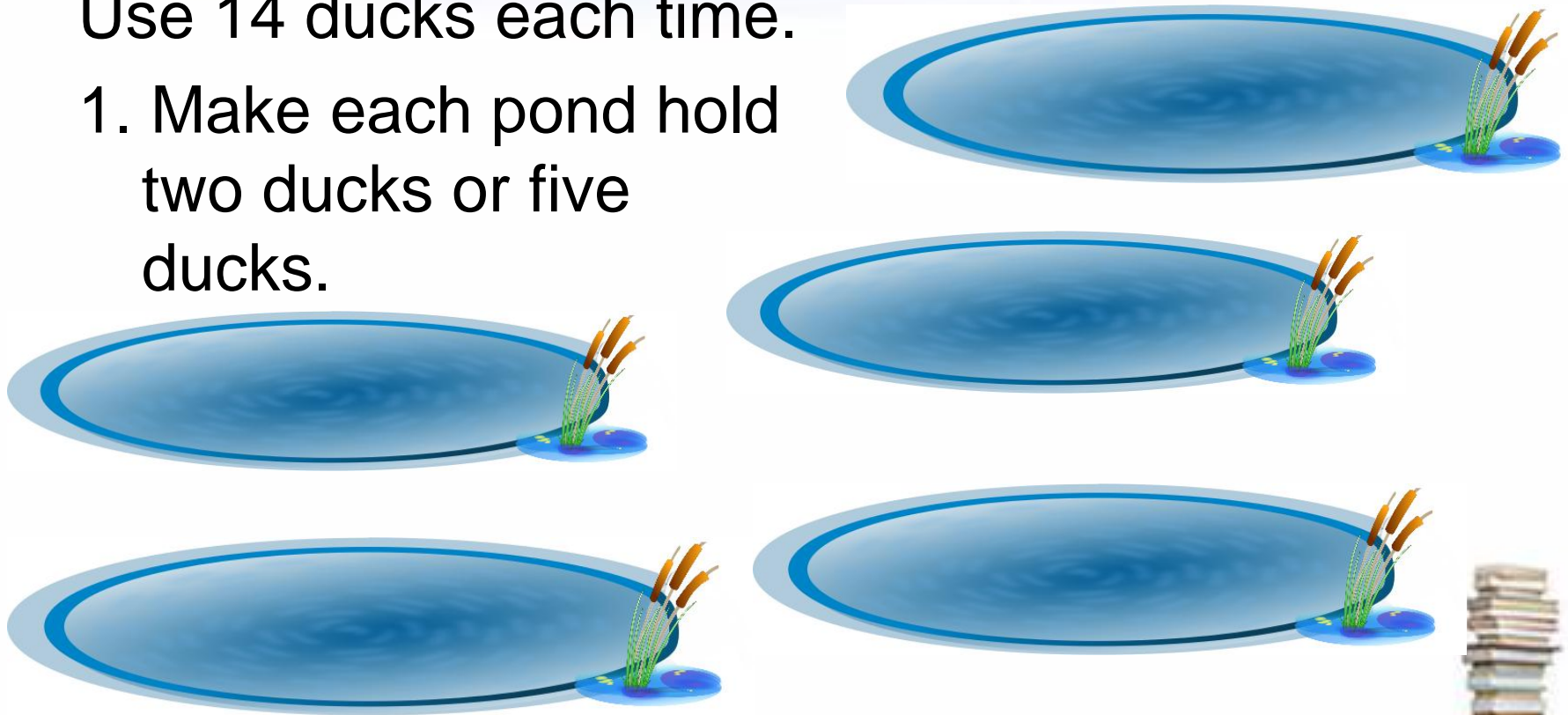
Learning Objective:

- Solve a given problem by organising and interpreting data in a simple table.
- Write whole numbers in figures; know what each digit represents.

Duck ponds

Use 14 ducks each time.

1. Make each pond hold two ducks or five ducks.

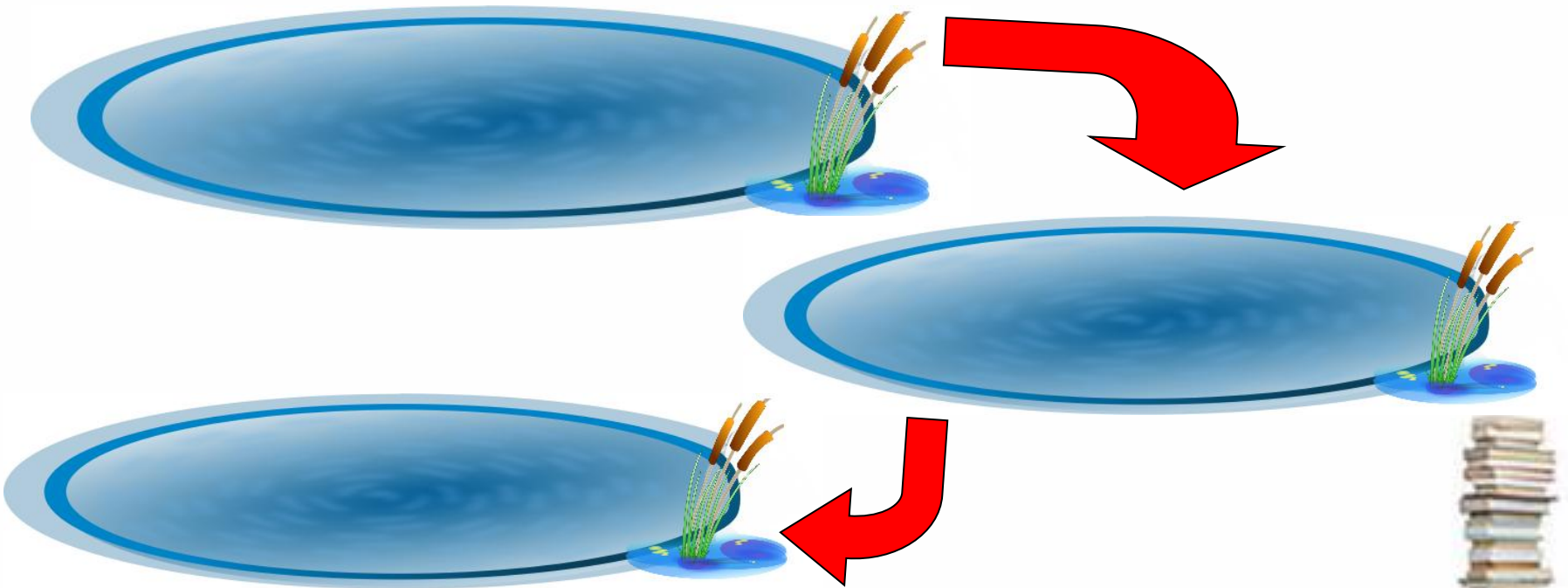


Learning Objective:

- Solve mathematical problems or puzzles.
- Know multiplication facts for 2 and 5 times tables.
- Add three or four small numbers.

Duck ponds

2. Make each pond hold twice as many ducks as the one before.

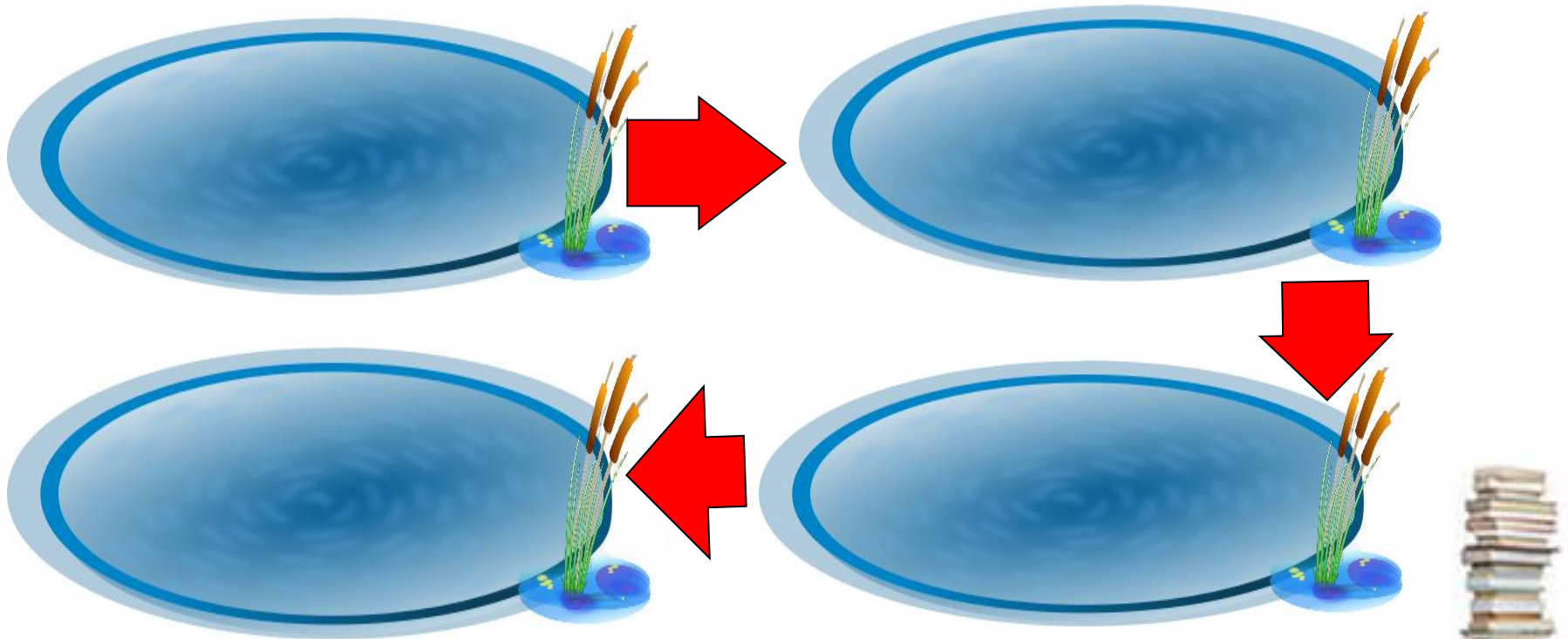


Learning Objective:

- Solve mathematical problems or puzzles.
- Know multiplication facts for 2 and 5 times tables.
- Add three or four small numbers.

Duck ponds

- 3. Make each pond hold one less duck than the one before.



Learning Objective:

- Solve mathematical problems or puzzles.
- Know multiplication facts for 2 and 5 times tables.
- Add three or four small numbers.

Extension to Duck ponds

You could try similar problems with other numbers.

For example, using 15 ducks and

5 ponds make each hold 1 more than the one before

4 ponds make each hold twice as many as the one before

3 ponds make each hold 4 more than the one before

3 ponds make each hold 2 less than the one before



Learning Objective:

- Solve mathematical problems or puzzles.
- Know multiplication facts for 2 and 5 times tables.
- Add three or four small numbers.

Solution to Duck ponds

1. (2) (2) (5) (5)

2. (2) (4) (8)

3. (5) (4) (3) (2)



Learning Objective:

- Solve mathematical problems or puzzles.
- Know multiplication facts for 2 and 5 times tables.
- Add three or four small numbers.

Extension to Duck pools

- 15 ducks and 5 ponds make each hold 1 more than the one before (1, 2, 3, 4, 5)
- 4 ponds make each hold twice as many as the one before (1, 2, 4, 8)
- 3 ponds make each hold 4 more than the one before (1, 5, 9)
- 3 ponds make each hold 2 less than the one before (7, 5, 3)



Learning Objective:

- Solve mathematical problems or puzzles.
- Know multiplication facts for 2 and 5 times tables.
- Add three or four small numbers.

The end, thank you!



References and additional resources.

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Mathematical challenges for able pupils in Key Stages 1 and 2

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Thank You

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These Mental Maths challenges can be found as a PDF file at :

http://www.edu.dudley.gov.uk/numeracy/problem_solving/Mathematical%20Challenges%20Book.pdf

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These units were organised using advice given at:

http://www.edu.dudley.gov.uk/numeracy/problem_solving/Challenges%20and%20Blocks.doc

