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Rapid Recall Whiteboard

Research Project Handbook

Contents

Rapid Recall Whiteboard Research Project

Suggested Timeline

Week 1 8th – 12th January 2018

- Read Research Handbook
- Tuesday 9th January: Twilight Introduction to Project at Gillingham St Michael's Primary School, Gillingham
- Complete pre-test with children by end of week. Complete diagnostic spreadsheet of results and send to Propeller

Week 2 – Week 5

Use boards with class for one hour per week. This time can be 3x20 minute session, 1x 1 hour session...

Week 5

Schools Face to Face meeting (TBC)

Half Term 13th – 20th February 2018

Week 6 – Week 10

Use boards with class for one hour per week. This time can be 3x20 minute session, 1x 1 hour session...

Week 9

Post-test delivered to schools

Week 10

- Complete post-test with children by end of week
- Complete diagnostic spreadsheet of results
- Complete child and teacher testimonials. By the end of the Spring Term, send diagnostic test results and testimonials to **grahame.chambers@propeller.education**

FAO Grahame Chambers
Propeller, Eastpoint House,
Rotterdam Road, Lowestoft, NR32 2EX

Thank you for agreeing to take part in the Rapid Recall 10-Week Evaluation Project. Engaging in research is an excellent way to reflect upon and adapt current practice in the light of new information and ideas. It is at the heart of any good CPD.

Diary – Keeping Track

We have provided a simple diary for recording sessions - see page 12. We would really appreciate it if you could keep a daily record of your involvement. It will prove invaluable when undertaking the final evaluation.

Mastering Marking

We have provided a set of possible approaches to marking – certainly not definitive!
See pages 8–9.

Measuring Up!

We have developed Year 2 and Year 4 pre-tests to help you establish a baseline before delivering the intervention. Both tests are supported by a diagnostic spreadsheet created in Microsoft Excel for you to populate. This is an essential part of the project. Please email back your completed spreadsheet to **grahame.chambers@propeller.education**

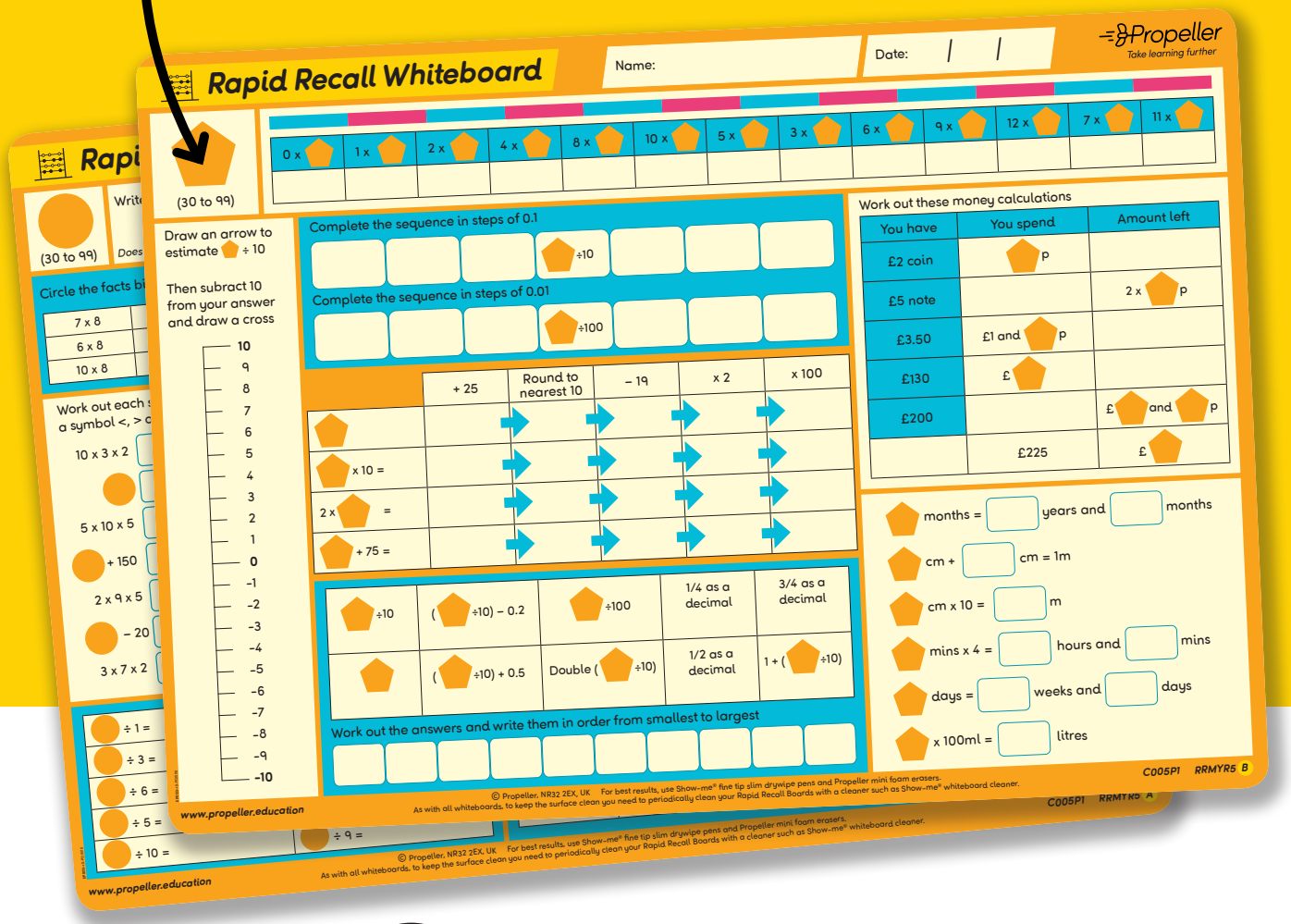
What Next?

We would like the final data, questionnaires and any evaluation of the project sent to us by the end of the Spring Term. Send replies to Grahame Chambers, Propeller, Eastpoint House, Rotterdam Road, Lowestoft. NR32 2EX

How do you use the whiteboard?

1 In the top left corner of the board, you will see a symbol which varies according to the side of the board and the year group.

2 Within this symbol write the chosen number – selected from the range given below the shape



3 Now complete the board, using the symbol each time to represent your chosen number.

4 Once finished, you can mark the board. We've compiled just a few ways to do this on pages 8–9.

Getting the best from the whiteboard

The example methods on the following two pages have been created by teachers and we look forward to hearing your own innovative approaches when we next meet!

Getting the best from the whiteboard

The 'Pilot and Navigator' / 'Professor and Scribe' Approach

This approach is a great way to encourage mathematical discussion and develop reasoning. It promotes the regular use of mathematical vocabulary and modelling of good practice between pupils.

Pupils sit in pairs and decide who will be the 'Pilot' (Scribe) and who will be the 'Navigator' (Professor) for one section of the board.

The Navigator works out the answers to the questions and must explain to the pilot how they reached their answer. When the pilot is convinced, they write down the answer on the board. When one section is complete, the pupils swap roles.

The Timed Snapshot

This was the original intent of the whiteboard and is still just as relevant now.

As the teacher, you pick the number and then set a time limit. Explain to your pupils that they can complete the board in any order they choose. When the time is up, an adult can easily assess:

- ***How much of the board was completed?***
- ***How many questions were completed correctly?***
- ***Were any questions missed and why?***
- ***Misconceptions***

This is a great visual assessment; the parts of the board that are incomplete are often the areas of mathematics that the pupil finds most difficult.

Teachers often like to take a photo of the completed board and then revisit the same number on the board after half a term. How much more can the pupil complete now?

Everybody In!

Changing the starting number provides easy differentiation and allows every child within a year group to access all, or parts, of the whiteboard. The choice of number greatly varies the difficulty of the board. For example, using a multiple of ten is far simpler than choosing to use a prime number. Children of differing abilities can sit beside one another using the same board. The children feel in control of their learning and confident in the knowledge that they get to 'wipe-clean' their work at the end of the session, ready to start afresh next time.

How Many and How Much?

Children can work on the whiteboard individually, in pairs and in teams. They can take their time or race against the clock. The teacher might ask children to complete the whole board or they may focus on one aspect. The whiteboard can be approached in a variety of ways. Children can work individually, in pairs or in teams. They can work at their own pace or against the clock, completing the whole board or focusing on a specific aspect.

Regular assessment allows the teacher the opportunity to adjust their teaching, eliminating mathematical misconceptions as they occur. Individual concepts can be explored by the whole class with the teacher asking key 'open questions' such as "How many ways can we..."

Mastering Marking

One of the key aims of the Rapid Recall Whiteboard is to allow assessment to be quick, efficient and informative. Below are some of our suggestions of different ways to assess / mark using the whiteboard.

Walkabout

As the children complete the whiteboard, the teacher moves around the room making quick notes of areas that children are struggling with either because these are left blank or have been answered wrong. Do the class share common misconceptions? The teacher may choose to only discuss / mark those areas of the board at the end of the session or may choose to plan the next session dealing with misconceptions about these areas.

Silent Assassin

The teacher, or a chosen child, moves around the room as the class complete the whiteboard either individually or in pairs. When they see an answer that they disagree with, they silently remove the answer from the board and move away. The children working on the board can then revisit the question. At the end of the session there could be a discussion about one of the errors. Children could be asked to explain why they had made the error and how they reviewed it.

Paired Marking

Children work on the whiteboard individually but must work on the same number as their partner. Before they begin, they could even decide as a pair the order in which they will complete one side of the board. At the end of the timed session, the children compare and discuss their answers.

Divide and Conquer

Each child has a board. In pairs, they choose a number and then choose which parts of one side of the board they will each complete (basically divide one side of the board in two). At the end of the session, if the two whiteboards were put side to side, the pair should have answered every question on one side of the board. The pair check one another's work – are they then happy that every answer on the board is correct?

Table Marking

Have all children sitting at one table working on the same number. When it comes to mark, each child takes a turn offering the answers for a section of the board with explanations of how they reached their answers. If the table believe the answer provided is incorrect, they circle their answer and then check with an adult at the end of the session. The adults in the class could support different tables every week / session.

Off the Board

The whole class use the same number on their whiteboard. At the end of the session, the teacher shows the answers on the IWB and children mark. Once marked, the teacher asks children to vote for the section they found most difficult – each child must vote once. This then informs the focus of teaching for the next section or could allow for a follow up session with a specific group of children on a chosen concept.

Pupil Pick

A pupil's board is picked at random and shown under a visualizer. Pupils compliment the pupil using 'What has worked well...' and 'Even Better if...'

Peer Marking

Children complete the boards using a number of their own choice. At the end of the session, they swap boards and use the marking guide to check one another's work. (An interactive answers guide is available on-line). They could even fill in their partner's mark on the pupil record sheet.

Focused Marking

If all children work on the same number, the teacher may ask them to complete the board in a certain order. They might then choose to mark the first one or two sections with the class to allow time to explore concepts in greater depth.

Take your Pick

Throughout the project, the teacher / TA may choose to take 4 - 6 whiteboards at the end of each session to look at in more detail. Pupils may then be asked to work with an adult to discuss the chosen whiteboard in more detail.

Impact

When using the whiteboard, many schools have chosen to take a photo of each board after the child's first attempt and then again 10 weeks later using the same number. The two photos then clearly show the development of knowledge and skills within the ten-week period.

How big a Maths Geek can you become this term?

Many children like to record their progress. Here are a few suggestions of ways they can do this but it is entirely your decision and we are keen to hear your great ideas. The suggested tables (shown below) can be printed from www.propeller.education/rrb-support-material/

Suggestion 1 How well did I do?

After each attempt at completing the board, the pupil fills in a simple table noting how confidently they approached the challenge, their strengths and their areas for development. These could then be used to inform teachers' planning.

Name:			
Number used	Confidence rating (1-10)	Strengths	Area to develop
32	6/10	Adding, x and – 10	Subtracting 2 digit numbers

Suggestion 2 Plot your progress to Planet Geekdom!

After each attempt at completing the whole board to a specified time, the pupils write their results in the table below. After each week, they plot their mark on a line graph (great for an ICT lesson using Excel!) Can they predict where they feel they will be at the end of the following week? The teacher could collect all results to create a class average and plot on a class line graph.

	Name:					
	Attempt 1	Attempt 2	Attempt 3	Attempt 4	Attempt 5	Attempt 6
Score						

Suggestion 3 Make your mark!

After each attempt at completing the whole board to a specified time, the pupils write their results in the table below. If they have improved their previous score they receive a stamp. If they can collect three stamps they achieve a reward / Maths Geek certificate / merit / choice of the teacher.

	Name:					
	Attempt 1	Attempt 2	Attempt 3	Attempt 4	Attempt 5	Attempt 6
Score						
Stamp						

Rapid Recall Record

Please briefly fill in the diary every time you use the Rapid Recall Whiteboards with the class / group. Ideally, we would like you to use the whiteboards for a minimum of 1 hour per week but we do understand that this is an ideal. The first two rows are filled in as an example.

Date	Time Spent (mins)	What did I do?	Action
5/9/17	20	Whole board – set number and children had 20 mins to complete individually – marked as whole class.	Misconception re Roman numerals – identifying L and C
7/9/17	15	Worked on misconception of Roman numerals – identifying numbers containing L and C. Then in pairs tried Roman numeral area	

Date	Time Spent (mins)	What did I do?	Action

Rapid Recall Record

Date	Time Spent (mins)	What did I do?	Action

Date	Time Spent (mins)	What did I do?	Action

Date	*Time Spent (mins)*	*What did I do?*	*Action*

Rapid Recall Whiteboards Testimonial – Child

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Please could all pupils involved in the project complete this survey at the end of the ten-week project.

Child's name:	Year Group:

Did you find the Rapid Recall Whiteboard fun to use?

*(Where **0** is no fun at all and **10** is great fun)*

0	1	2	3	4	5	6	7	8	9	10

Did the Rapid Recall Whiteboard challenge you?

*(Where **0** is no challenge at all and **10** is high challenge)*

0	1	2	3	4	5	6	7	8	9	10

Over the 10 weeks, did your maths improve?

*(Where **0** is no improvement at all and **10** is a big improvement)*

0	1	2	3	4	5	6	7	8	9	10

What was your favourite way of using the board?

Was there a way of using the board you did not like?

Rapid Recall Whiteboards Testimonial – Teacher

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Thank you for trialling our Rapid Recall Whiteboard. To help us in future product development please could you answer the following questions.

Teacher/School:	Year Group:

The level of preparation required:

*(Where **0** is excess preparation and **10** is no preparation)*

0	1	2	3	4	5	6	7	8	9	10

Please add any comments

Ease of use:

*(Where **0** is very difficult to use and **10** is extremely easy)*

0	1	2	3	4	5	6	7	8	9	10

Please add any comments

Ability to differentiate:

*(Where **0** is poor and **10** is excellent)*

0	1	2	3	4	5	6	7	8	9	10

Please add any comments

Rapid Recall Whiteboards Testimonial – Teacher

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How appropriate is the board in developing number recall for your year group?

*(Where **0** is not at all appropriate and **10** is very appropriate)*

0	1	2	3	4	5	6	7	8	9	10

Please add any comments

How useful are the whiteboards as a tool for assessment?

*(Where **0** is not useful at all and **10** is very useful)*

0	1	2	3	4	5	6	7	8	9	10

Please add any comments

What do you think would be the educational impact of using the whiteboard regularly throughout the year?

*(Where **0** is no impact and **10** is high impact)*

0	1	2	3	4	5	6	7	8	9	10

Please add any comments

Would you recommend the Rapid Recall resources to colleagues?

Year 2 Pre-test Marking Guide

Diagnostic answer spreadsheets for both Year 2 and Year 4 are available at: **www.propeller.education/rrb-support-material/**

To protect the anonymity of the children when supplying results, please refer to them as child 1, child 2 etc. Please ensure that the children are written in the same order on the post-tests so that results can easily be compared. When completed please send to **grahame.chambers@propeller.education**

Question	Answer Guidance	Mark
1	14	1
2	35	1
3	81	1
4	5	1
5	51	1
6	26	1
7	80	1
8	8 + 26 = 34 26 + 8 = 34 34 – 8 = 26 8 = 34 - 26	4 marks Award 1 mark for each correct calculation
9	28, 16	2 marks (1 mark for each correct answer)
10	6, 24	2 marks (1 mark for each correct answer)
11	41, 70	2 marks (1 mark for each correct answer)
12	15, 25 and 35	3 marks (1 mark for each correct answer)
13	7, 15	2 marks (1 mark for each correct answer)
14	9, 20	2 marks (1 mark for each correct answer)
15	15, 5x5	2 marks (1 mark for each correct answer)
16	12	1
17	20, 29	2 marks (1 mark for each correct answer)
18	10 4	2 marks (1 mark for each correct answer)
19	20p	1
Total score out of a possible 32		

Year 4 Pre-test Marking Guide

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Question	Answer Guidance	Mark
1	105	1
2	30	1
3	350	1
4	612	1
5	56	1
6	4006	1
7	448	1
8	420	1
9	340	1
10	1159	1
11	30	1
12	0	1
13	56	1
14 a	12	1
14 b	169	1
15	70	1
16	4	1
17	12	1
18	19	1
19	18	1
20	845	1
21	5000	1
22	1900	1
23	2346	1
24	1198, 1357, 1392, 1566, 1802	1
25	**25, 28, 31,** 34, 37, 40, **43, 46, 49**	1
26	68	1
27	89	1
28	Circle 750 400	1
29	**62**, **50**, **77**	1
30	5 years, 3 days, 12 weeks	3
31	5 hours 33 minutes	1
32	15p £1.75	1
33	1 **8** 1 + **7** 1 9	1
34	65,400 65,400 65,000	3
35	115	1
36	Any two numbers that make the calculation accurate	1
Total score out of a possible 40		

Year 2 Pre-test

Allow 30 minutes 

Please could all pupils complete this test independently prior to the first Rapid Recall Whiteboard session. Please make sure you record the time it takes each child to finish the test.

Name:	**Date:** / /

Q 1. 8 + 6 = ☐ ☐ 1 mark

Q 2. 12 + 23 = ☐ ☐ 1 mark

Q 3. 37 + 44 = ☐ ☐ 1 mark

Q 4. 12 – 7 = ☐ ☐ 1 mark

Q 5. 71 – 10 – 10 = ☐ ☐ 1 mark

Q 6. 93 – 67 = ☐ ☐ 1 mark

Q 7. $8 \times 10 =$ ☐

1 mark

Q 8. Look at the number sentences.

Use **26** and **34** each time to make these correct.

8	+		=	
	+	**8**	=	
	−	**8**	=	
8	=		−	

4 marks

Q 9. Draw a ring around each **even** number.

35 **28** **29**

11 **16**

2 marks

Q 10. Write the correct numbers in the boxes.

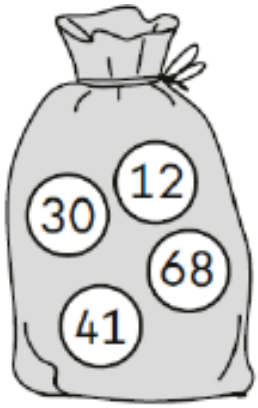
Half of **12** is ☐

Double 12 is ☐

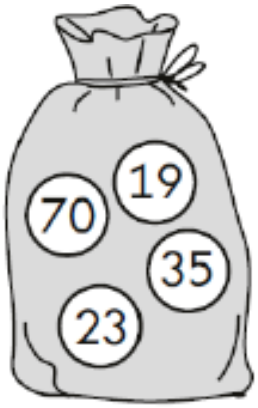
☐ 2 marks

Q 11. Two of the numbers are in the **wrong** bag

Draw a cross (✘) on each of them.



even number



odd number

☐ 2 marks

Q 12. Write the answers.

5 + 10 = ☐

15 + 10 = ☐

25 + 10 = ☐

☐ 3 marks

Q 13. Write the 2 missing numbers in the grey boxes in this sequence.

5		9	11	13		17	19

2 marks

Q 14. Write the missing numbers.

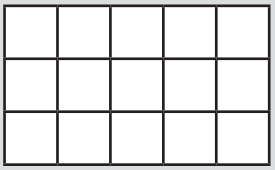
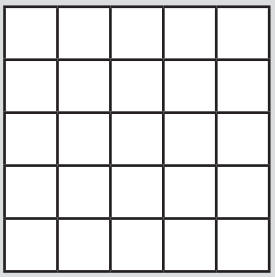
79 = 70 + ☐

23 = ☐ + 3

2 marks

Q 15. Complete the table.

The first row is done for you.

	1 × 5	5
	3 × 5	
		25

2 marks

Q 16. Look at these numbers.

37 12

45 60

72 27

Which of these numbers is between **10** and **20**?

1 mark

Q 17. Write the missing number in each box.

19 is 1 less than →

19 is 10 less than →

2 marks

Q 18. How many 

coins make **20p** ?

coins

How many 

coins make **20p** ?

coins

2 marks

Q 19. Fred wants to buy this drink.

30p

He has these two coins.  

He needs **one more** coin. Draw a ring around it.

1 mark

Year 4 Pre-test

Allow 30 minutes 

Please could all pupils complete this test independently prior to the first Rapid Recall Whiteboard session. Please make sure you record the time it takes each child to finish the test.

Name:	**Date:** / /

Q 1. 10 + 95 = ☐ 1 mark

Q 2. 18 + 6 + 6 = ☐ 1 mark

Q 3. 46 + 304 = ☐ 1 mark

Q 4. 349 + 263 = ☐ 1 mark

Q 5. 105 – 49 = ☐ 1 mark

Q 6. 7006 – 1000 – 1000 - 1000= ☐ 1 mark

Q 7. 687 – 239 = ☐ 1 mark

Q 8. 700 - ☐ = 280 1 mark

Q 9. ☐ + 110 = 450 1 mark

Q 10. ☐ - 100 = 1,059

1 mark

Q 11. 5 x 6 = ☐

1 mark

Q 12. 25 x 0 = ☐

1 mark

Q 13. 8 x 7 = ☐

1 mark

Q 14. 96 ÷ 8 = ☐

1 mark

Q 15. 169 ÷ 1 = ☐

1 mark

Q 16. 2 x 7 x 5 = ☐

1 mark

Q 17. $\frac{1}{2} = \frac{\square}{8}$

1 mark

Q 18. $\frac{1}{4} = \frac{3}{\square}$

1 mark

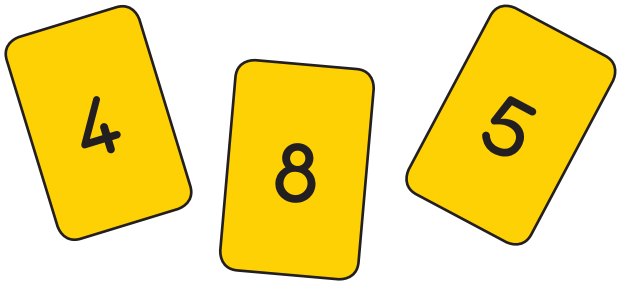
Q 19. $\frac{1}{2}$ of 38 = ☐

1 mark

Q 20. $\frac{3}{4}$ of 24 = ☐

1 mark

Q 21. Holly made a number using these digit cards.



The **hundreds** digit is greater than 4

Holly's number is **odd**.

What number did Holly make?

1 mark

Q 22. Write the missing numbers.

4000 → is one thousand **less** than ☐

2000 → is one hundred **more** than ☐

1 mark

Q 23. Use all of these digits.

4 2 6 3

Write the lowest number.

1 mark

Q 24. Write these numbers in order of size.

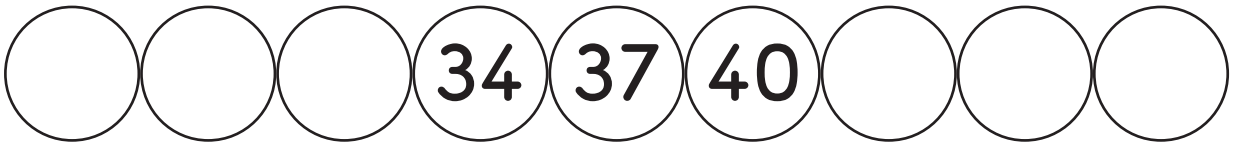
1357 1198 1802

1392 1566

smallest

1 mark

Q 25. Continue the number sequence in both directions.



1 mark

Q 26. A bottle contains 568 millilitres of milk.
Jack pours out half a litre.

How much milk is left? ml

1 mark

Q 27. 100 = 1 + 10 +

1 mark

Q 28. Here is part of a number sequence.
The numbers in the sequence increase by 25 each time.

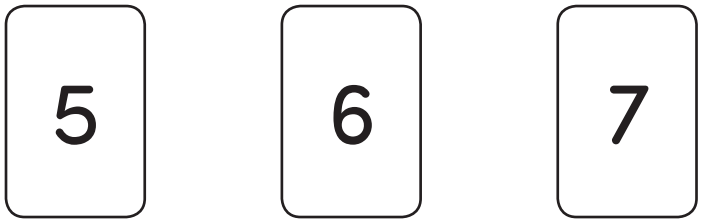
50 75 100 125 ...

Circle all of the numbers below that will appear in the sequence.

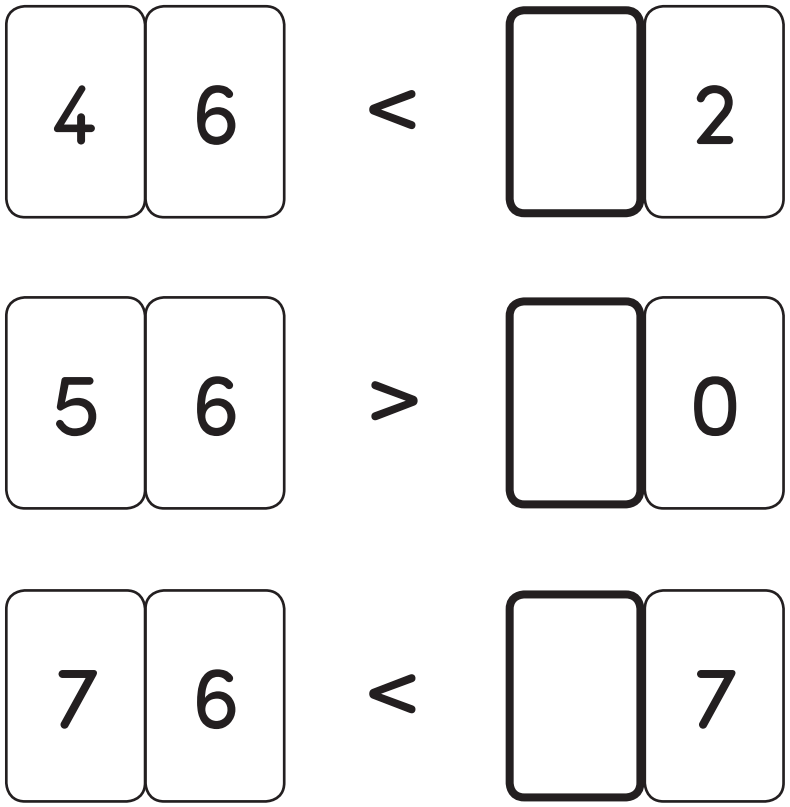
355 750 835 400 995

1 mark

Q 29. Here are three digit cards.



Use each card once to make these statements correct.



1 mark

Q 30. Write the missing numbers

60 months = ☐ years

72 hours = ☐ days

84 days = ☐ weeks

3 marks

Q 31. What is 333 minutes in hours and minutes?

hours	minutes	

1 mark

Q 32. Here is a set of stamps.

15p

50p

75p

£1.50

£1.75

David posts a parcel. It costs **£1.90.**

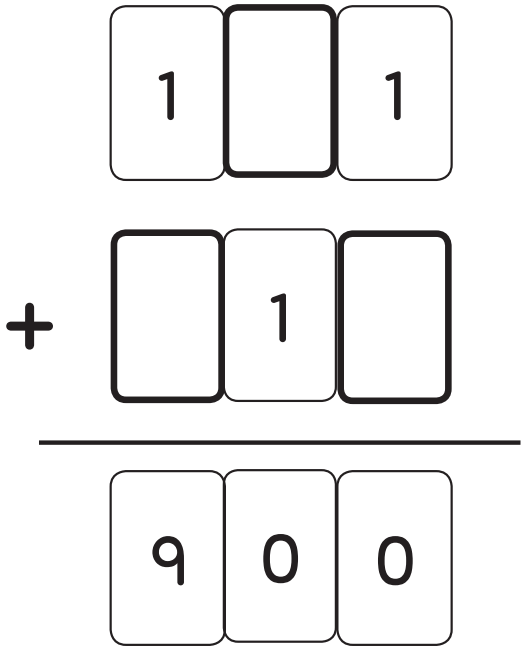
He uses two of these stamps.

Which **two** stamps does he use?

	and	

1 mark

Q 33. Write the missing digits to make the addition correct.



1 mark

Q 34. Round 65,395

To the nearest 10 ☐

To the nearest 100 ☐

To the nearest 1,000 ☐

3 marks

Q 35. Here is a number written in Roman numerals.

CXV

Write the number in figures. ☐

1 mark

Q 36. Insert numbers in the boxes to make this calculation correct

☐ - 400 = ☐ - 390

1 mark

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