More Warm-up Activities

Source: Numeracy for Year 5 – 8
        Rob Vingerhoets
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Task 1: HOW MUCH MONEY IS IN MY POCKET?

Students have 8 <u>questions</u> to ask in order to work out how much money is in the pocket. The 9th turn is a guess of the amount.
Only one questions can be asked per person.
Clearly mark down the side of the whiteboard the numbers 1 – 9, but place a dotted line between 4 and 5, 7 and 8, and 8 and 9. These dotted lines indicate pauses.
Determine your starting range: $0 - $500
The only answers that can be given to the student questions are: Yes/No.
Do the thinking out aloud for the students and discuss the relationships.
Eg: make the connections 50% which is the same as 0.5 which can also be expressed as ½.

Pause the game after question 4. Delete any of the information that is now superfluous due to the new range.

After you have given your response to Question 7, then list all of the numbers which are available as potential answers. The students need to have 15 or less options to proceed to Question 8.

Example below: (This is the task we were given and we still do not know the amount of money that was in the pocket.)

	Question	Response
1		
2		
3		
4		

5		
6		
7		

8		

9	- Guess the value!	

The questions the audience asked were: Responses
  1.   Is the value less than $250?   Yes
  2.   Is the value an even number?   No
  3.   Is the value less than or equal to $99?   Yes
  4.   Are there any coins in the pocket?   Yes – but no decimals. (Extra hint given here)

Now go back and look at the questions. Which ones are now unnecessary? You can delete question 1 and the response. This does NOT mean an extra question is given to the students.

The audience continued with these questions: Responses
  5.   Is the value a multiple of 3?   No
  6.   Is there the digit '9' in the value?   No
  7.   Is there more than 10 coins?   No

Now go back and look at all of the possible remaining answers. Remember: if there are more than 15 the game stops.   1, 5, 7, 11, 13, 17, 23, 25, 29, 31, 35, 37, 41, 43, 47, 53, ... and the list continues.
THIS GAME STOPS!!!!

Task 2: FIND THE CONNECTIONS

35		500		16		90		100
	12		30		*206		200	
18				4		6		2
	10	50		3	20		5	8
1000		*71		15		48		72
	54		60		*1000 000	25		7
*101		9		*624				

Choose a number on the board. X or ÷ by another number on the board AND locate the answer in the board to make an equation. (Also use the terms "product" and "quotient" with the students as another relationship connection.) Example: 4 x 15 = 60
If the student can use 4 numbers - they get to also use addition and score a BONUS point. Eg: 7 x 4 = 20 + 8
If a student uses a number with a * beside in the equation, they get a BONUS point.
Only one response per student.
500 x 100 x 20 x 10 = 1000 000 student will get DOUBLE BONUS points as they have used more than 4 terms and one had a *.

Alternatively – determine your own scoring system.

Start with students finding 10 equations. Give them time to work independently to create a couple of options and they need to try and maximise their points.
If students are capable, they can use numbers as powers (indices) too.

The 10 Equations
1
2
3
4
5
6
7
8
9
10

Task 3: I have .... Who has...?

I have 9. Who has twice my number less 4?	I have 14. Who has my number doubled?	I have 28. Who has my number subtract 13?	I have 15. Who has three times my number?
I have 45. Who has 19 larger than my number?	I have 64. Who has my number divided by 8?	I have 8. Who has six times my number?	I have 48. Who has one-third my number?
I have 16. Who has my number times 5?	I have 80. Who has 25% of my number?	I have 20. Who has my number multiplied by 50% of my number?	I have 200. Who has three-quarters of my number?
I have 150. Who has the largest number that can be made using my digits?	I have 510. Who has 9 less than me?	I have 501. Who has 401 less than my number?	I have 100. Who is my number divided evenly into me 4 times?

I have 25. Who is my number doubled, then divided by 10?	I have 5. Who has my number multiplied by 200?	I have 1000. Who has my number subtract 901?	I have 99. Who has my number divided by 9?
I have 11. Who has my number multiplied by 4, then subtract 12?	I have 32. Who has my number that is halved, halved, then halved again?	I have 4. Who has 15 times my number?	I have 60. Who has two-thirds of my number?
I have 40. Who has my number divided by 5, then add (5 times one-fifth)?			

Also, look at the web address: www.mathwire.com/whohas/whohas

Or Google: I have who has

As another activity – get the students to design their own looping cards.

Task 4: Mind Reader #1 This can be played as a game or used as an activity.

VERBALLY give students only 5 clues to determine a number.
Say all of the 5 clues ONCE, then repeat a second time. DO NOT repeat again.
Students may work in pairs or as a trio.
The number they finally select MUST fit all 5 clues.
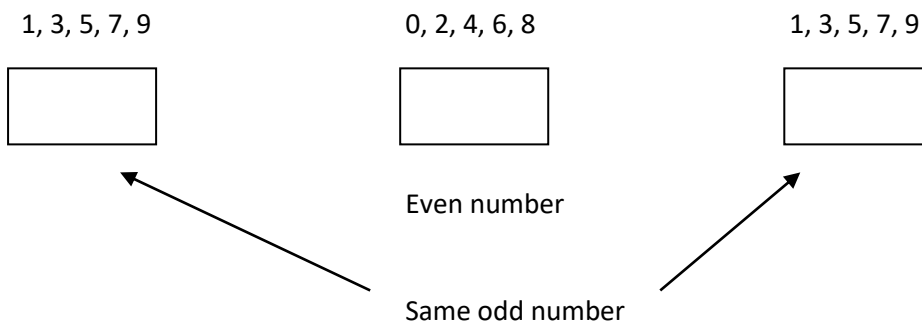
Example:
The Clues
    1.   It is a 3 digit number.
    2. It is an odd number.
    3. The middle digit is even.
    4. The digits at either end are the same.
    5. When you add (sum) the 3 digits together, they equal 18.

Allow sufficient working time for the pairs/trios. Get them to SHOW how they worked out their number.

Possible working out:

    1, 3, 5, 7, 9   0, 2, 4, 6, 8   1, 3, 5, 7, 9

    [   ]   [   ]   [   ]

Even number

Same odd number

When you add the 3 digits together: If the middle digit is 0, the outsides must be 9.
    If the middle digit is 2, the outside digits must also be8. NO
    If the middle digit is 4, the outsides must be 7.
    If the middle digit is 6, the outsides must also be 6. NO
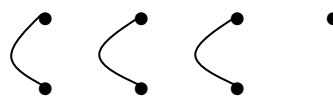   If the middle digit is 8, the outsides must be 5.

New possibilities (and solutions)   9 0 9,   7 4 7,   9 0 9.

When a group gives you a response, DO NOT say "yes" or "no". Check the response is correct by working through the clues in order.

CHECK the Clues for the answer 747.
    1.   It is a 3 digit number.   Yes
    2. It is an odd number.   (This means the last digit does not have a partner – cannot be paired.)
                        EG: 7

These have partners. No partner, so odd.

    3. The middle digit is even.   Yes (repeat process for 2 above to show all have partners.)
    4. The digits at either end are the same.   Yes.
    5. When you add (sum) the 3 digits together, they equal 18.   7 + 4 + 7 = 18   Yes.

Repeat checking process for all options.

Task 5: Mind Reader #2   This can be played as a game or used as an activity.

The clues:

1. I am a 2 digit number.
2. I am an even number.
3. The digit in the Ten's column is odd.
4. You can HIDE one digit inside the other.
5. If you add the two digits, the total is 11.

Possible final solutions with reasoning.

38   as the number 3 is hidden within the number 8. Talk about symmetry.
74   as the number 7 is hidden within the number 4. Talk about rotation.
56   as the number 5 is hidden within the number 6 when represented as a digit clock display.
56   as the roman numeral for 5 (V) is within the roman numeral for 6 (VI)

Task 6: Mind Reader #3   This can be played as a game or used as an activity.

The Clues:

1. I am a 2 digit number.
2. I am less than 10.   (Straight away the students should recognise that they will be dealing with decimal numbers to one decimal point.)
3.   The number is between 7 and 8.
4. The right hand side digit is even.
5. When you add the digits, the total is 15.

Solution: 7.8

Checking and proving.
Consider various scenarios for number lines.
Examples:
Put $7 and $8 on either end of a number line. Consider what the number might look like.
Put 7m and 8m on a number line and represent it as a tape measure. Consider what the number might look like.
Put the numbers 7 and 8 on a straight line. Get students to mark in the increments for themselves.

Task 7: WORD GOLF – 9 hole golf course

Objective: to use as few letters as possible to complete the word starting. The winner is the student with the smallest score. This course is par 18.

Rules:

NO initials, acronyms, greek or other languages, names, abbreviations, slang, or colloquialisms.

IF there is a spelling mistake in your word – there is a 2 stroke PENALTY.

Students have only 2 minutes to complete the course. If they have not finished the course in time, there is a 2 stroke penalty per word.

Understanding the course.

1. Ad (1) _   This means the word must start with AD and be completed by using only one letter. If a student needs to use more letters than what is indicated in the brackets, the extra letters become the penalty strokes.
IF the student can complete the word in LESS letters than required, then their score is reduced.

Setting up the course.	Possible solutions (letter endings)
1. ad (1) _	d, o = par
2. pr (2) _ _	y (1 under = birdie)
3. vi (2) _ _	a, e, m (1 under) or ne = par
4. wr (2) _ _	y (1 under = birdie)
5. al (1) _	e, l, m, p = par
6. sw (2) _ _	ap, im, ig, ay = par, but y = birdie
7. ph (3) _ _ _	one, ase, oto = par, but ew = birdie
8. gn (3) _ _ _	at, aw = 1 under, but u = 2 under
9. in (2) _ _	to = par, but k, n = 1 under.

So if par = 18 for the course, the students are to try and get a number smaller than 18 to "beat the course" and the leader is the student who has the minimum score.

Task 8: Number Master Mind (task to be done on the whiteboard)

Set the following grid up.

	Ten Thous	Thousands	Hundreds	Tens	Ones
1st guess					
2nd guess					
3rd guess					
4th guess					
5th guess					

The students are to "guess your number". They have 5 attempts to do this successfully. Each number is to be 5 digits long and each digit is to be clearly placed into a position.

Only clue – I have not repeated a digit.

After each guess, you mark EACH BOX in the following way.
X = this digit is NOT in my number.
○ = this digit IS in my number, but in the wrong place.
✓ = this digit IS correct.

Allow students time to consider the digits before determining the next guess.

Example:

	Ten Thous	Thousands	Hundreds	Tens	Ones
1st guess	1　○	2　X	3　X	4　○	5　○
2nd guess	6　X	7　○	8　X	9　X	0　○
3rd guess	7　✓	0　○	4　○	5　✓	1　○
4th guess	7　KNOW	1	0　KNOW	5　KNOW	4　✔
5th guess	NOT	REQUIRED			

VARIATION:
Record the results on the same grid, but does not line up with the cross, circle and tick results. If you use this process, add AT LEAST 3 more guesses.
(Example: From the above table, the corrections could have been ○○○XX)