Notes for Teachers

Differentiation for Maths Mystery Games

The Maths Mystery Games are intended as a fun way to work on different maths skills whilst using them in real-life situations with the added bonus of catching a criminal and solving a crime!

The games can be done clue by clue over a number of days/lessons or as a whole lesson at the end of a week or unit.

The games are meant to bring a class together and in preparation for SATs tests all children work on the same game. However, differentiation can be done in a number of ways:

- Buddying up HA/LA and other mixed ability children encouraging them to work as a team listening to everyone and HA children taking on mentoring roles. HA could even be team leaders in groups also responsible for making sure everyone is included.

- Letting children use the UKS2 Maths hint Revision Cards to work with during the game.
Maths Hint Revision Cards

- Having some children work with an adult.

- Letting some children use calculators.

- Working together as a class and giving different children or table groups different parts to work on and pooling ideas and working through it together.

- There are also LKS2 maths mystery games available if you prefer lower differentiation bearing in mind that the subject matter and clues will not be the same.

- You can also edit the mystery games if you feel you want specific differentiation for your class.

- Starters: You may also have your own reminders of work you have done in class, perhaps with a reminder on the board of specific areas, such as making common denominators. You may also have a mental starter that recaps certain skills.

The Mystery of The Firework Filcher.

It's is the morning of the 5th November and the Mayor of Great Fawkingham has just received a phone call to say that every last one of the fireworks for the grand firework extravaganza has been stolen! Unless someone finds them, there will be no fireworks on bonfire night!

You are the chief detective in charge of the case and with the help of your Scene of Crime Officers (SOCOs) you have just half a day to find the fireworks in time for ignition at 6:30 p.m. this evening.

Solve the following clues to find out the identity of the perpetrator based on where they live in Great Fawkingham, their gender, their vehicle, their hair colour and their height.

Good luck! The mayor and people of Great Fawkingham are counting on you!

Name	Gender	Area	Vehicle	Hair Colour	Height (m)
Alison Apple-Bobber	F	North	Car	Brown	1.80
Alphonse Ablaze	M	East	Van	Blonde	1.72
Barry Banger	M	West	Motorbike	Black	1.66
Bonny Bonfire	F	East	Quadbike	Ginger	1.77
Catherine C-Wheel	F	South	Cycle	Bald	1.59
Chris Crackers	M	North	Van	Brown	1.69
Davina Damp-Squib	F	West	Car	Brown	1.57
Dudley Dud	M	East	4x4	Grey	1.75
Ebony Explosion	F	South	Motorbike	Bald	1.82
Efron Effigy	M	West	Van	Grey	1.60
Fliss Flare	F	North	Quadbike	Blonde	1.71
Felix Fawkes	M	East	Cycle	Ginger	1.78
Giacomo Guy	M	South	Car	Black	1.63
Gaby Gunpowder	F	North	4x4	Grey	1.65
Hans Houses-of-Parlia-ment	M	East	4x4	Bald	1.56
Hannah Hanabi	F	South	Van	Brown	1.70
Iolanthe Ignite	F	West	Van	Grey	1.54
Iwan Incandescence	M	West	Cycle	Black	1.83
Jackie Jacket-Spud	F	North	Motorbike	Grey	1.58
Jack Jumping	M	South	4x4	Blonde	1.67
Krista Krakatoa	F	East	Cycle	Grey	1.55
Kin King-James	M	South	Car	Ginger	1.85
Lars Laser	M	North	Quadbike	Brown	1.76
Leila Light	F	West	Cycle	Bald	1.64
Missy Misfire	F	West	Van	Black	1.74
Mort Mortar	M	East	4x4	Ginger	1.62
Nia Night	F	South	Car	Blonde	1.86
Noel November	M	North	Motorbike	Brown	1.84
Olaf Oooo-Aaaah	M	South	4x4	Grey	1.68
Olivia Ottery-St-Mary	F	East	Van	Ginger	1.53
Peter Parkin	F	West	Cycle	Bald	1.79
Paige Pyrotechnic	M	North	Car	Brown	1.73

Clue 1

The SOCOs have found some DNA evidence on the broken door lock of the safe room where the fireworks were kept. This has told them something about the criminal.

Solve the clue below to see what the SOCOs have found out.

First find out the value of each emoji, then solve the code using the rule 1 = A, 2 = B, 3 = C etc.

Find the Values:

😊 = $\sqrt{25}$

2^2 = 😁

😊 − 😁 = 😉

😉 + 😊 = 😘

😐 = 😘 − 😁

$\dfrac{(😐 + 😐 + 😐)}{2}$ = 😎

Code:

😊 × 😁 =

😊 + 😎 =

😎^{2} ☐ =

😊 =

😐 × 😎 =

😊 + 😁 =

(😘 × 😎) + 😉 =

(😁 × 😎) + 😉 =

😉 =

😐 × 😘 =

😊 =

Values:

😊 =	😘 =	😉 =	😎 =	😁 =	😐 =

Clue 2

You have looked at a map of Great Fawkingham and worked out that the fireworks could have only been stolen from two areas of the town.

Answer the questions below and fill in the grid. The shaded squares will reveal the clue.

1. The same as 1000ml

2. The opposite of a function.

3. A line that is perpendicular to a horizontal line.

4. An educated guess.

5. A triangle with no sides the same.

6. A triangle with two sides equal.

7. The number of degrees in a right angle.

8. A 9-sided 2D shape.

9. An angle between 90° and 180°.

10. A quadrilateral with all sides the same length, no right angles and opposite sides parallel.

11. A quadrilateral with only one set of opposite parallel sides.

12. The direction of the x-axis.

13. An 8-sided 3D shape.

14. The measurement from the centre of a circle to the edge.

15. A fraction that means the same but has a different numerator and denominator.

16. An angle of less than 90°.

17. A list of numbers that follows a pattern that can be continued.

18. The same as 1000kg.

Clue 3

The SOCOs have been taking some detailed measurements from around the area and have worked out that there is a minimum height that the culprit must have been.

Unfortunately, different SOCOs have used different units of measurement so you're going to have to take that into consideration when working out the clue.

First, you'll need to work out each of the calculations and then work out the mean average of all eight heights to find the minimum height of the firework filcher.

a) 250mm × 5 =

b) 67cm + 1290mm =

c) 150cm - 80mm =

d) 2000mm - 31cm =

e) 770mm × 2 =

f) 4140mm ÷ 2 =

g) 70mm + 90mm + 172cm =
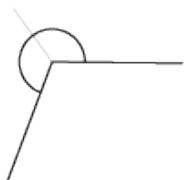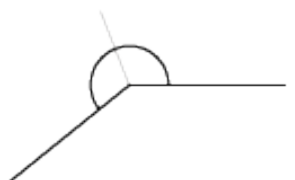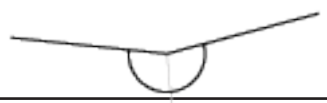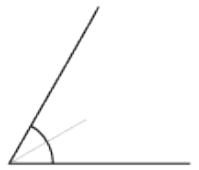
h) 633cm ÷ 3 =

Work out the mean average height and that is the minimum height that the criminal could be.

Clue 4

The SOCOs have gone back to the firework safe room and found some hair caught near the broken lock. It does not belong to any of the pyrotechnicians (who are the only people allowed to enter the room) so it must belong to the thief.

To reveal what they have found out about the culprit's hair, you will need a protractor. Measure each angle (to the nearest 10 degrees), divide the number of degrees by 10 and translate it to a letter of the alphabet using the code: 26 = A, 25 = B, 24 = C etc.

Clue 5

Finally, you have inspected the ground around the firework store and found fresh footprints that do not match any of the pyrotechnicians or staff. What you have also found is that the footprints lead to some vehicle tracks leading off the site.

The SOCOs have checked the tyre tracks against any known vehicles and there is no match so this vehicle must belong to the culprit.

To find out what type of vehicle it is, complete the four dot-to-dot trails in and amongst the numbers below.

Start here for the first six cube numbers.

Start here a sequence of six numbers taking away 1.25 each time

18 .
23 .
22 .   24 .   6 .   -0.5 .   52 .   30 .   28 .
20 .   16 .   19 .   25 .   0.5 .   54 .   36 .   22 .
29 ·   1.25 .   40 .   21 .
15 .   17 .   21 .   -4.5 .   1 .   0 .   56 .   45 .   20 .
14 .   31 ·   8   -1.25 .   -6.5 .   15 .   90 .
13 .   8 .   4 .   26 .   27 .   -2.5   55 .   14 .   105 .   120 .
12 .   37 ·   -3.5 .   10 .
11 .   7 .   5 .   3 .   2   -3.75 .   . 64   -2.25 .   66 .   78 .   91 .   105 .   120 .
9 .   41 .   -5   125 .   65 .   77 .   4 .   6 .   100 .
42 .   40 .   -6.25 .   -6 .   . 216   200 .   3 .   5 .   121 .
10 .   43 .   60 .   1 .
44 .   47 .   180 .   190 .   206 .   126 .   76 .

Start here for the first fifteen prime numbers.

Start here for the first fifteen triangle numbers.

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The Confession

When the culprit was finally caught, you discovered that the fireworks were still in their garage. Special Officers returned the fireworks to their rightful place just in time for the display.

The thief missed the display, but had this to say before he was taken to the Police Station.

✖	12	9	7	3	20	6	8	4	30	5
10	O	M	©	R	Q	V	N	A	L	)
5	V	F	:	C	#	R	A	(	@	=
4	B	E	G	-	N	H	D	W	O	+
7	"	!	Z	I	\	S	.	G	$	:
9	U	[	!	☹	T	☺	Y	E	<	F
100	K	/	£	L	&	J	%	>	P	'
3	E	☹	I	~	V	,	H	-	M	C
8	]	Y	"	H	*	B	X	D	?	A
12	'	U	"	E	?	Y	"	B	;	V
6	Y	☺	S	,	O	E	B	H	T	R

21		600	108	42	180		16	40	80	180	36	32
180	120		28	120		120	108	180		16	21	180	24
	40		48	40	80	28	63					

Answers

Clue 1: Reveals: thief is male

Code:		
😊 × 😁 =	**20 = t**	
😊 + 😎 =	**8 = h**	
😎² □ =	**9 = i**	
😊 =	**5 = e**	
😐 × 😎 =	**6 = f**	
😊 + 😁 =	**9 = i**	
(😗 × 😎) + 😉 =	**19 = s**	
(😁 × 😎) + 😉 =	**13 = m**	
😉 =	**1 = a**	
😉 × 😗 =	**12 = l**	
😊 =	**5 = e**	

Clue 2: Reveals: lives in north or east

| 1	l	i	t	r	e			
2	i	n	v	e	r	s	e	
3	v	e	r	t	i	c	a	l
4	e	s	t	i	m	a	t	e
5	s	c	a	l	e	n	e	
6	i	s	o	s	c	e	l	e	s
7	n	i	n	e	t	y		
8	n	o	n	a	g	o	n	
9	o	b	t	u	s	e		
10	r	h	o	m	b	u	s	
11	t	r	a	p	e	z	i	u	m
12	h	o	r	i	z	o	n	t	a	l
13	o	c	t	a	h	e	d	r	o	n
14	r	a	d	i	u	s		
15	e	q	u	i	v	a	l	e	n	t
16	a	c	u	t	e			
17	s	e	q	u	e	n	c	e
18	t	o	n	n	e			

Clue 3: eveals: The culprit must be over 1.74m tall.

a) 1.25m   b) 1.96m   c) 1.42m   d) 1.69m
e) 1.54m   f) 2.07m   g) 1.88m   h)2.11m

Clue 4: Spells: hair colour begins with 'g'

190° h	260° a	180° i
90° r	240° c	120° o
150° l	120° o	60° u
90° r	250° b	220° e
200° g	180° i	130° n
80° s	40° w	180° i
70° t	190° h	200° g

Clue 5: Reveals: 4x4
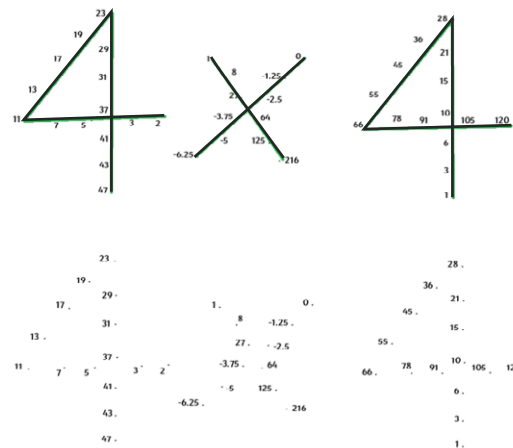
The Culprit: Dudley Dud

The Confession:I just wanted

to go out with a bang!