Notes for Teachers:

Differentiation for Maths Mystery Games

The Maths Mystery Games are meant to be 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.

- 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.

- There may also be an option to edit the mystery games if you feel you want specific differentiation for your class.

- Starters: There will also be your own reminders of work you have done in class with maybe a reminder on the board of specific areas such as making common denominators or a mental starter that recaps on certain skills.
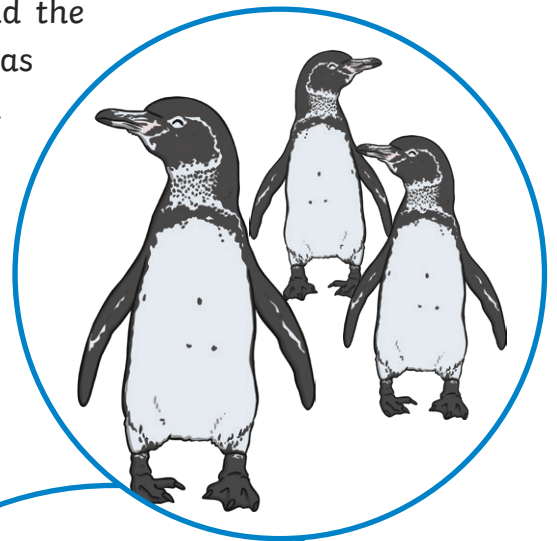
The Mystery of the Pilfered Penguins

It's feeding time at The Safari So Goody Park and the keepers are all in their areas with various vegetables, meat and fish and some expectant animals.

However, while Sonia Seafood was feeding the penguins she noticed that eight penguins were missing. She searched high and low but they were nowhere to be seen. There was no way for them to escape, and penguins can't fly. They must have been stolen!

You are the chief detective in charge of the case. You and the Scenes of Crime Officers (SOCOs) need to find the culprit as soon as possible before more animals go missing. You need to find the penguins, too, so that they can have the right care and food.

The last time they were seen was after the park closed to the public, so only the safari keepers are the suspects as no one else was around. Solve the following clues to whittle down the suspects and find our penguin pincher!

Name	Gender	Works with	Vehicle	Park Area	Shoe Size
Andy Animal	M	Invertebrates	Jeep	Rainforests	8
Alice Anteater	F	Mammals	Walks	Polar	7
Beatrice Boa	F	Fish	Bike	Rivers & Seas	6
Bobby Baboon	M	Birds	Car	Woodland	9
Callum Capybara	M	Mammals	Walks	Savannah	5
Camilla Camel	F	Mammals	Jeep	Polar	6
Denise Dove	F	Reptiles	Bike	Woodland	8
Duncan Duck	M	Mammals	Motorbike	Rainforests	6
Elsa Emu	F	Birds	Walks	Desert	7
Edwin Elephant	M	Invertebrates	Car	Woodland	10
Federica Frog	F	Mammals	Motorbike	Savannah	9
Franz Flamingo	M	Mammals	Car	Rivers & Seas	6
Genie Giraffe	F	Invertebrates	Jeep	Rivers & Seas	10
Goran Gibbon	M	Fish	Bike	Polar	9
Hannu Hog	M	Reptiles	Motorbike	Desert	5
Heidi Hornbill	F	Birds	Walks	Rainforests	4
Isabella Ibis	F	Invertebrates	Car	Savannah	8
Igor Iguana	M	Mammals	Car	Desert	10
Jethro Jerboa	M	Amphibians	Jeep	Woodland	7
Jenka Jaguar	F	Birds	Car	Rivers & Seas	6
Kojo Kangaroo	M	Fish	Car	Rainforests	7
Kirstin Koala	F	Mammals	Walks	Polar	7
Lin Lemur	F	Fish	Bike	Rainforests	8
Lucas Lechwe	M	Reptiles	Jeep	Savannah	6
Matteo Macaque	M	Invertebrates	Motorbike	Desert	9
Marissa Macaw	F	Birds	Car	Rivers & Seas	7
Neil Newt	M	Mammals	Bike	Desert	10
Nandita Numbat	F	Amphibians	Walks	Polar	8
Olivier Ostrich	M	Mammals	Car	Savannah	6
Omana Oragutan	F	Reptiles	Jeep	Rainforests	7
Pablo Pelican	M	Invertebrates	Motorbike	Woodland	6
Pauline Panda	F	Fish	Jeep	Rivers & Seas	10

Clue 1

On the gate to the penguin enclosure, the SOCOs have found traces of fabric from some keeper's trousers. The scrap of fabric is not a match to any of the keepers' trousers who work with the penguins and it's from a certain style of trouser only which you can find out below.

Convert these water measurements by filling in the gaps. Each missing value will give you a number to use the code 1=A, 2=B, 3=C etc.

You'll probably need a calculator and to know that
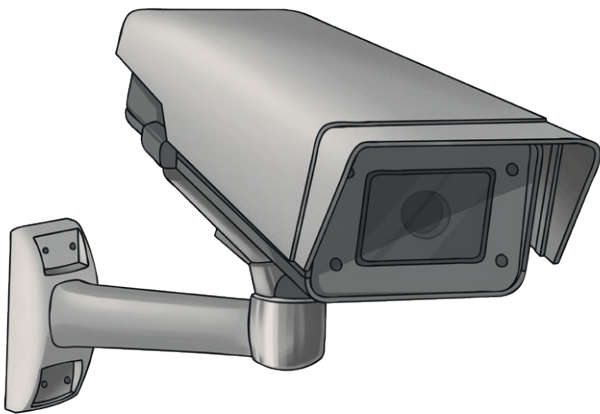### 1 litre = 1.75 pints

Pints	Litres	Letter
40.25		
26.25		
22.75		
8.75		
	8	
33.25		
35		
31.5		
26.25		
	12	
33.25		
8.75		
31.5		
33.25		

Clue 2

You first thought it strange that it was possible for the penguins to go missing as there is a safari park webcam covering all of the penguin enclosure 24-hours a day. However, you have since found out that the cameras were down due to a power cut between 1800h and 1830h hours. You have checked the footage and indeed the penguins were all there before 1800h and there were 8 less at 1830h.

You have worked out that only keepers in certain areas would be able to get there and back in that time. Those areas are in the code below.

The answer to each percentage question will give you a number that relates to a letter to spell out the areas.

Question	Answer	Letter
50% of 36		
2% of 50		
100% of 9		
25% of 56		
75% of 8		
10% of 150		
20% of 90		
5% of 100		
25% of 76		
200% of 10		
20% of 95		
15% of 120		
1% of 900		
40% of 55		
20% of 25		
30% of 60		
200% of 9.5		
50% of 38		
25% of 20		
10% of 10		
5% of 380		

Clue 3

You have found a footprint near the exit of the penguin enclosure that doesn't belong to any of the keepers. The SOCOs have examined it and have narrowed down the shoe size.

To find the possible shoe sizes, start with the grid below. Cross off the numbers below and you will be left with the possible shoe sizes.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Cross out the following sets of numbers:

1. All the prime numbers

2. All the square numbers

3. All the cube numbers

4. All the numbers in the 12 times table

5. Multiples of 15

6. The 7 times table

7. 11 times table

8. Anything over 50% of 100

9. Multiples of 20

10. These Roman numerals: XVIII, XXVI, XXXII, XXXIV, XXXVIII, XXXIX, XLVI, L

Clue 4

The SOCOs have also found traces of animal food that isn't penguin food on the handles of the enclosure gates.

The samples have been tested and it has revealed which type of animal the culprit works with.

For each set of fractions, find what the lowest common denominator could be (less than 26) and the number will give you a letter using the reverse alphabet code of 1=Z, 2=Y, 3=X and 26=A.

Fractions	Lowest Common Denominator	Letter
¾ and ½		
⁴⁄₆ and ¹¹⁄₁₂		
⅓ and ¹⁰⁄₁₈		
⅞ and ¹¹⁄₁₆		
⅞ and ⁸⁄₁₆		
⁶⁄₈ and ¼		
¹¹⁄₁₈ and ²⁄₆		
³⁄₇ and ⁸⁄₁₄		
³⁄₁₉ and ⁴⁄₃₈		
¹⁷⁄₂₁ and ³⁄₇		
³⁄₉, ²⁄₆ and ¹⁷⁄₁₈		
½, ¾ and ¹⁴⁄₁₆		
¹²⁄₁₉ and ³⁴⁄₃₈		

Clue 5

The final clue that will lead you to the subject is that you have found some tyre tracks near to a track that leads out of the safari park, not far from the penguin enclosure. You are sure it belongs to the culprit as the SOCOs have verified that the footprints around the tracks also belong to the penguin pincher.

Solve the clue below to see what the type track tell us.

The number that is represented by 😅 will tell you the number of wheels that the vehicle has.

🙂 + 🙂 = 6

😰 - 🙂 = 5

🙂 + 😰 = 😁

2 × 🙂 = 😵

$\dfrac{3 × 😵}{2}$ = 🙁

🙁 - (😰 - 🙂) = 😅

🙂 = _____

😰 = _____

😁 = _____

😵 = _____

🙁 = _____

😅 = _____

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The Confession

When the culprit was finally caught and the penguins were all safely back in their enclosure, they had this to say...

x	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	16	40	80	180	36	32	180	120

3000	12	3000	12	3000	12	3000	21	15	1200	108	3000

40	80	36	21	28	24	180	12	3000	40	15	1200

120	45	3000	36	80	28	108	21	80	42	63

Answers

Clue 1:
Reveals: WOMENS TROUSERS

Pints	Litres	Letter
40.25	**23**	**W**
26.25	**15**	**O**
22.75	**13**	**M**
8.75	**5**	**E**
14	8	**N**
33.25	**19**	**S**
35	**20**	**T**
31.5	**18**	**R**
26.25	**15**	**O**
21	12	**U**
33.25	**19**	**S**
8.75	**5**	**E**
31.5	**18**	**R**
33.25	**19**	**S**

Clue 3:
Leaves the numbers 6 and 10.

Clue 4:
Spells: WORKS WITH FISH

Lowest Common Denominators are:

4, 12, 9, 16, 8, 4, 18, 7, 19, 21, 18, 8, 19

(Remember this code is 1=Z, 2=Y, 3=X... 26=A.)

Clue 2:
Spells: **RAINFORESTS/RIVERS/SEAS**

Question	Answer	Letter
50% of 36	**18**	**R**
2% of 50	**1**	**A**
100% of 9	**9**	**I**
25% of 56	**14**	**N**
75% of 8	**6**	**F**
10% of 150	**15**	**O**
20% of 90	**18**	**R**
5% of 100	**5**	**E**
25% of 76	**19**	**S**
200% of 10	**20**	**T**
20% of 95	**19**	**S**
15% of 120	**18**	**R**
1% of 900	**9**	**I**
40% of 55	**22**	**V**
20% of 25	**5**	**E**
30% of 60	**18**	**R**
200% of 9.5	**19**	**S**
50% of 38	**19**	**S**
25% of 20	**5**	**E**
10% of 10	**1**	**A**
5% of 380	**19**	**S**

Clue 5:
The vehicle has 4 wheels as 😅 = 4

🙂 =3   😳 =8   😁 =11   🥴 =6   😒 =9

The Culprit:
Pauline Panda

The Confession:
I wanted to p-p-p-pick up an eight-pack of penguins!