

The Mystery of the Olympic Ringer

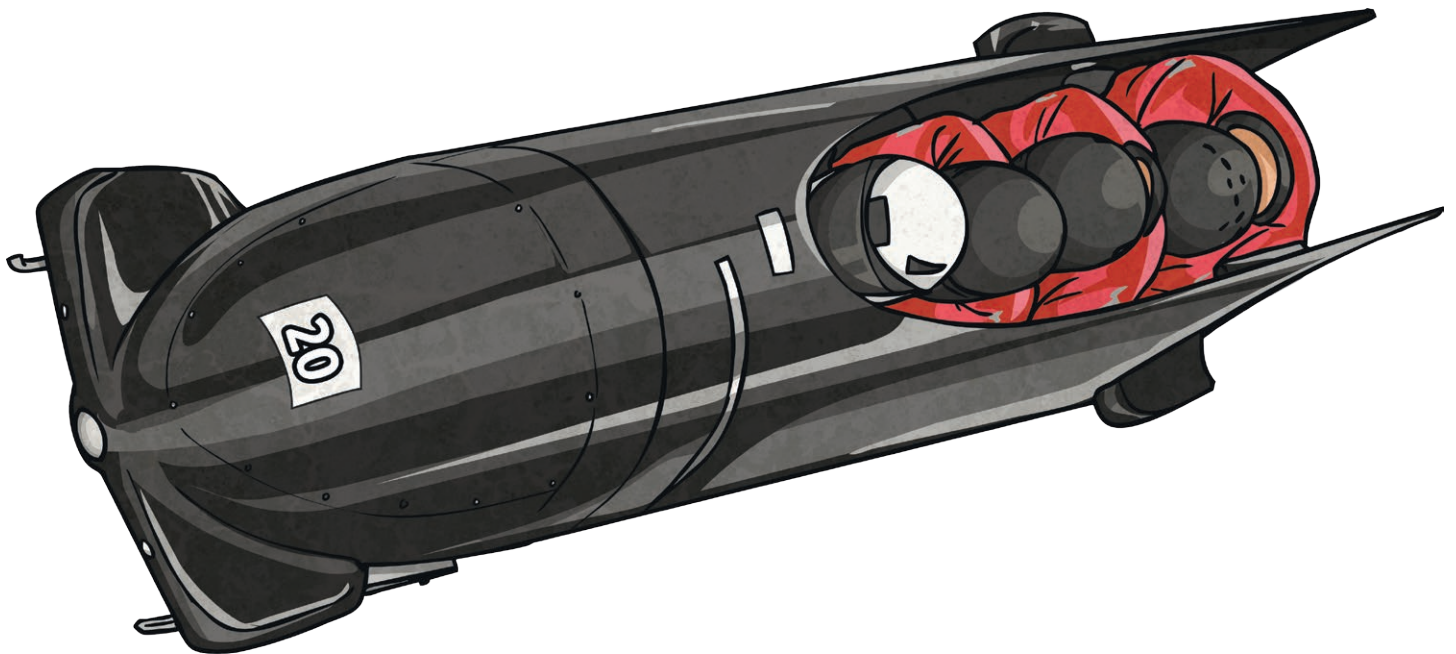
It is the final day of the bobsleigh competition at the 2018 Winter Olympics in PyeongChang. During the last safety check, just thirty minutes before the final begins, an alarm is raised as officials find that the track has been sabotaged!

Someone has melted a whole section of ice track making the run extremely dangerous and unusable until it has been re-iced.

You are the chief detective in charge of the case and, with the help of your Scene of Crime Officers (SOCOs), you have only one day to find the de-icer before the whole competition is cancelled.

The only people with access to the area are the competing athletes. Solve the following clues to find out the identity of the perpetrator based on their country and its colours, Olympic sport, weight and current personal best.

Good luck! The athletes, officials and the worldwide viewers are relying on you!



The Athletes

Name	Sport	Country	Country's Colours	Weight	Personal Best
Albertville Alpine	Downhill	USA	Red/White/Blue	100.5kg	Time 2:06.98
Alexa Axel	Skeleton	GB	Red/White/Blue	63.9kg	Time 3:53.773
Bhuto Boggan	Luge	Canada	Red/White	84.6kg	Time 3:29.226
Benji Beijing	Snowboard	Australia	Yellow/Green	82.4kg	Time 1:37.82
Chamonix Calgary	Ski Jump	France	Red/White/Blue	64.8kg	245.6m
Cresta Curling	Curling	USA	Red/White/Blue	99.7kg	Gold medal
Deanna Downhill	Speed Skate	Sweden	Yellow/Blue	65.4kg	Time 4:00.62
Dean Deck	Skeleton	GB	Red/White/Blue	85.6kg	Time 3:47.652
Eilish Edge	Figure Skate	Australia	Yellow/Green	66.2kg	218.13 points
Edward Eagle	Luge	Canada	Red/White	82.0kg	Time 3:29.506
Fiona Freestyle	Downhill	France	Red/White/Blue	70.1kg	Time 1:42.88
Farquhar Frozen	Snowboard	USA	Red/White/Blue	85.7kg	Time 1:38.68
Gav Garmisch	Curling	Germany	Black/Red/Yellow	104kg	Bronze medal
Grenda Grenoble	Ski Jump	France	Red/White/Blue	70.4kg	244.7m
Helen Helsinki	Luge	GB	Red/White/Blue	71.8kg	Time 3:21.118
Harfur Half-Pipe	Snowboard	Sweden	Yellow/Blue	81.6kg	Time 1:37.99
Isa Icicle	Speed Skate	Canada	Red/White	62.7kg	Time 4:01.73
Ichabod Innsbruck	Skeleton	Germany	Black/Red/Yellow	79.5kg	Time 3:48.294
Julie Jump	Figure Skate	Australia	Yellow/Green	63.9kg	219.02 points
Jimmy Jibbing	Curling	Germany	Black/Red/Yellow	103kg	Bronze medal
Kitty Kicker	Luge	USA	Red/White/Blue	71.3kg	Time 3:21.009
Karim Korea	Ski Jump	Germany	Black/Red/Yellow	78.4kg	264.5m

The Athletes

Name	Sport	Country	Country's Colours	Weight	Personal Best
Lutz Lillehammer	Biathlon	France	Red/White/Blue	97.9kg	Time 50:13.65
Lainy Lake Placid	Speed Skate	Australia	Yellow/Green	75.5kg	Time 4:00.88
Mo Mogul	Downhill	GB	Red/White/Blue	77.1kg	Time 1:42.16
Mohammed Mohawk	Figure Skate	Sweden	Yellow/Blue	80.2kg	270.43 points
Nora Nordic	Snowboard	Canada	Red/White	64.6kg	Time 1:47.55
Nate Nagano	Figure Skate	Germany	Black/Red/Yellow	75.2kg	269.33 points
Ossie Oslo	Skeleton	Australia	Yellow/Green	90.6kg	Time 3:47.074
Ophelia Off-Piste	Curling	Sweden	Yellow/Blue	79.3kg	Silver medal
Preetie PyeongChang	Downhill	France	Red/White/Blue	72.1kg	Time 1:42.72
Porter Poles	Luge	USA	Red/White/Blue	84.9kg	Time 3:29.852



Clue 1

On closer inspection of the melted section of the ice track, your SOCOs have found a singed piece of fabric which they have concluded came from the culprit's outfit. They have found a colour match.

To find which colour outfit the culprit had on, follow each of these trails. Only one trail is correct and leads to the right colour.

	Calculations Trails	Colour
1	$14 \div 10 \rightarrow \times 2 \rightarrow - 5.5 \rightarrow + (2^3) = 5.5$	Black
2	$3^3 \times 12 \rightarrow \div 100 \rightarrow \times 2 \rightarrow + 0.5 = 6.97$	Red
3	$\text{MCMXCV} - \text{D} \rightarrow \div 2 \rightarrow \div 100 = 7.45$	Yellow
4	$2 \times (150 \div 6) \rightarrow \times \frac{3}{4} \rightarrow \times 10 \rightarrow \div 15 = 20$	Green
5	$\text{MMIV} \div 4 \rightarrow \div 100 \rightarrow \times 3 \rightarrow - 7.5 = 7.53$	Blue
6	$4^3 \div 10 \rightarrow + 3.9 \rightarrow \div 2 \rightarrow \times 10 = 5.15$	White

Clue 2

The SOCOs have found footprints in some of the melted ice which they have matched with a type of footwear. Only certain athletes wear this type of footwear which has uncovered the following information. To unravel the clue, find the words described below in the word search. At the end, the unused squares will spell out the clue.

t	h	e	k	w	r	m	f	l	a	h	o	s	m
l	n	g	i	d	o	a	n	g	l	e	i	p	i
a	i	n	l	g	a	r	t	h	l	x	e	a	x
r	o	n	o	n	a	g	o	n	t	a	t	r	e
e	r	e	g	c	o	m	p	y	w	g	e	a	d
t	i	e	r	t	e	m	f	t	e	o	e	l	n
a	g	s	a	w	o	o	n	s	l	n	n	l	u
l	i	o	m	o	u	s	u	r	f	a	c	e	m
i	n	v	e	r	s	e	w	a	t	l	n	l	b
r	a	t	i	o	v	e	n	n	h	p	d	n	e
d	e	n	u	m	e	r	a	t	o	r	v	e	r
a	r	t	n	i	o	p	l	a	m	i	c	e	d
u	h	u	n	d	r	e	d	t	h	s	o	n	i
q	u	a	r	t	e	r	i	c	e	m	o	d	e

- A nine-sided 2D shape.
- 1000g is equivalent to a...
- 8^2
- A 3D tube shape with 8 faces and used for a chocolate sweet brand.
- The top number of a fraction.
- The symbol used to separate ones from tenths when writing numbers.
- The official title of a number that includes both a whole number and a fraction.
- The name of a diagram that uses overlapping circles.
- Half of $\frac{1}{6}$
- The name of the column to the right of the tenths column.
- The name of any four-sided shape.
- 2 lots of $\frac{1}{8}$
- A method of checking your answer by doing the opposite calculation.
- A thousandth of a kilogram.
- The value that occurs most frequently in a set of data.
- A sphere has one curved s_____.
- $100\text{cm} = 1$ _____
- The name given to the coordinates (0,0).
- 75 is _____ of 150.
- 3:4 is an example of a _____.
- 90° is also called a right _____.
- A cube, used for playing games with dotted number patterns on each face.
- 1% of 200
- Name given to two lines of equal distance apart that never meet.

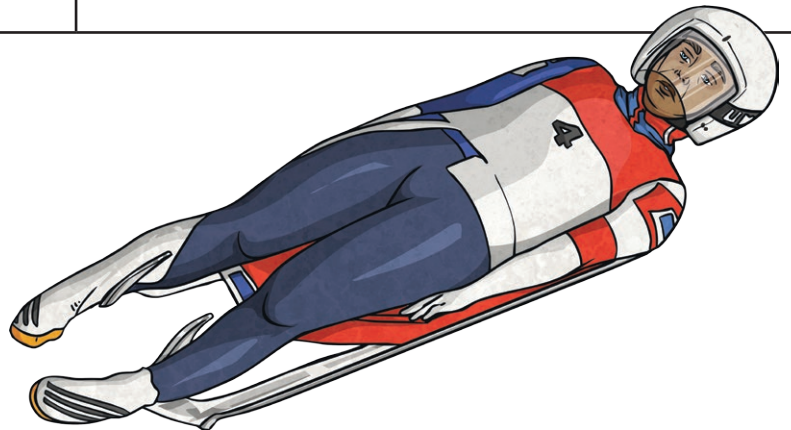


Clue 3

The SOCOs have done some in-depth analysis on a particular part of the ice that broke under the weight of the criminal. Therefore, they can ascertain the minimum weight of the maverick melter.

The minimum weight in kg will be revealed on solving the following percentage questions and then finding the mean average of the answers.

a) 5% of 600 =	b) 75% of 148 =
c) 20% of 250 =	d) 30% of 180 =
e) 25% of 288 =	f) 10% of 450 =
g) 40% of 250 =	h) 50% of 276 =



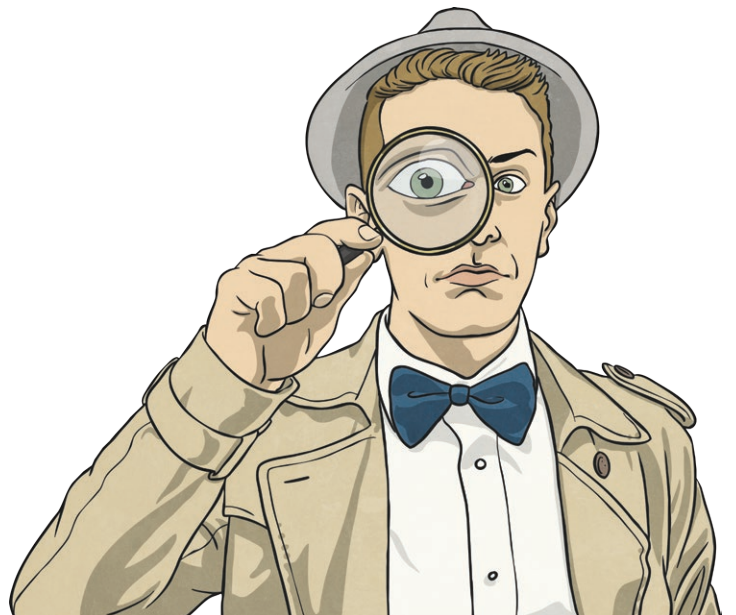
Clue 4

You and the SOCOs have scoured the area for clues left by the ice melter and have found a slip of paper with a personal best record noted down on it. However, the paper is ripped and difficult to read so only part of it is visible but from it you can work out what the personal best must be under.

In order to find out what that is, you need to work out the time differences for each of these pairs of times to reveal 6 answers.

The maximum personal best time you are looking for is the one which appears most frequently.

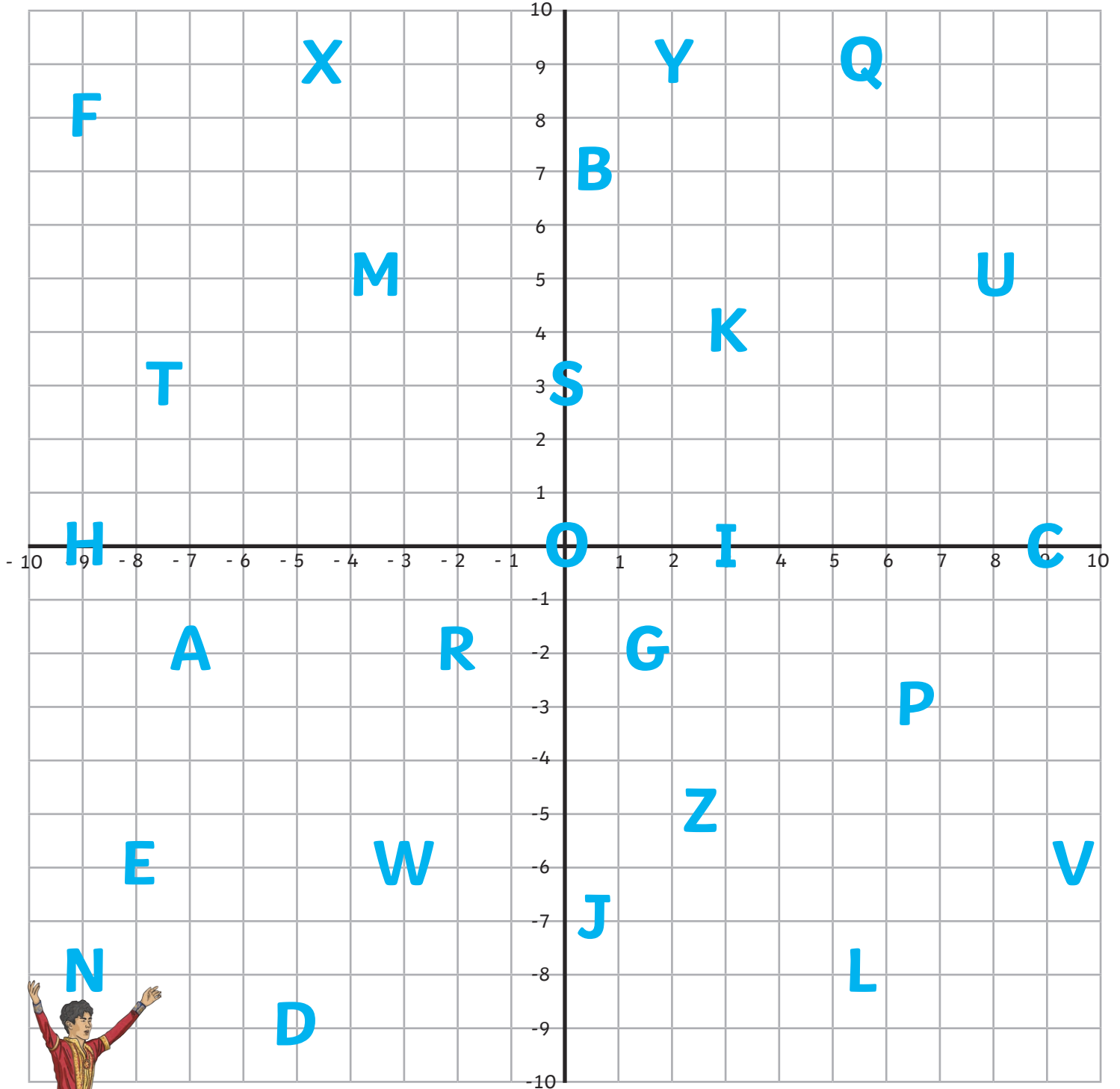
	1st Time	2nd Time	Difference
1	14:35	16:15	
2	23:50	01:35	
3	19:55	21:45	
4	13:38	15:18	
5	17:47	19:32	
6	22:29	00:09	



Clue 5

You have found the final piece of evidence in and amongst the ice where the crime took place. The culprit dropped a coin that is specific to a particular country and this is the final clue you need.

Work out the coordinates of the letters below to reveal the answer.



Coordinate Message:

(2,9) (0,0) (8,5) (-9,8) (0,0) (8,5) (-9,-8) (-5,-9) (-7,-2)
 (0,3) (-3,-6) (-8,-6) (-5,-9) (3,0) (0,3) (-9,0)
 (3,4) (-2,-2) (0,0) (-9,-8) (-7,-2) (9,0) (0,0) (3,0) (-9,-8)

The Confession

When the culprit was finally caught, they were asked why they had committed the sabotage and 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	180	24	120	108	28	24	180

21	16	40	42	180	24	36	180

80	120	30	42	36	28	120	32

500	180	24	40	16	144	63

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Answers

Clue 1

Correct answer: **blue**

Calculations Trails Answers						Colour
1	$14 \div 10 = 1.4$	$1.4 \times 2 = 2.8$	$2.8 - 5.5 = -2.7$	$2.7 + 8$	$= 5.3$ (not 5.5)	Black
2	$27 \times 12 = 324$	$324 \div 100 = 3.24$	$3.24 \times 2 = 6.48$	$6.48 + 0.5 =$	$= 6.98$ (not 6.97)	Red
3	$1995 - 500 =$ 1495	$1495 \div 2 =$ 747.5	$747.5 \div 100$	$= 7.475$ (not 7.45)		Yellow
4	$2 \times 25 = 50$	$50 \times \frac{3}{4} = 37.5$	$37.5 \times 10 = 375$	$375 \div 15$	$= 25$ (not 20)	Green
5	$2004 \div 4 = 501$	$501 \div 100 =$ 5.01	$5.01 \times 3 =$ 15.03	$15.03 - 7.5$	$= 7.53$ correct	Blue
6	$64 \div 10 = 6.4$	$6.4 + 3.9 = 10.3$	$10.3 \div 2 = 5.15$	5.15×10	$= 51.5$ (not 5.15)	White

Clue 2

Reveals: **The wrongdoing athlete competes on snow and never on ice.**

t	h	e	k	w	r	m	f	l	a	h	o	s	m
l	n	g	i	d	o	a	n	g	l	e	i	p	i
a	i	n	l	g	a	r	t	h	l	x	e	a	x
r	o	n	o	n	a	g	o	n	t	a	t	r	e
e	r	e	g	c	o	m	p	y	w	g	e	a	d
t	i	e	r	t	e	m	f	t	e	o	e	l	n
a	g	s	a	w	o	o	n	s	l	n	n	l	u
l	i	o	m	o	u	s	u	r	f	a	c	e	m
i	n	v	e	r	s	e	w	a	t	l	n	l	b
r	a	t	i	o	v	e	n	n	h	p	d	n	e
d	e	n	u	m	e	r	a	t	o	r	v	e	r
a	r	t	n	i	o	p	l	a	m	i	c	e	d
u	h	u	n	d	r	e	d	t	h	s	o	n	i
q	u	a	r	t	e	r	i	c	e	m	o	d	e

- A nine-sided 2D shape. **nonagon**
- 1000g is equivalent to a... **kilogram**
- 8^2 **sixty-four**
- A 3D tube shape with 8 faces and used for a chocolate sweet brand. **hexagonal prism**
- The top number of a fraction. **numerator**
- The symbol used to separate ones from tenths when writing numbers. **decimal**
- The official title of a number that includes both a whole number and a fraction. **mixed number**
- The name of a diagram that uses overlapping circles. **Venn**
- Half of $\frac{1}{6}$. **twelfth**
- The name of the column to the right of the tenths column. **hundredths**
- The name of any four-sided shape. **quadrilateral**
- 2 lots of $\frac{1}{8}$ **quarter**
- A method of checking your answer by doing the opposite calculation. **inverse**
- A thousandth of a kilogram. **gram**
- The value that occurs most frequently in a set of data. **mode**
- A sphere has one curved **surface**.
- $100\text{cm} = 1$ **metre**
- The name given to the coordinates (0,0). **origin**
- 75 is **half** of 150
- 3:4 is an example of a **ratio**.
- 90° is also called a right **angle**.
- A cube, used for playing games with dotted number patterns on each face. **die**
- 1% of 200 **two**
- Name given to two lines of equal distance apart that never meet. **parrallel**

Ice events are: luge, skeleton, figure skating, speed skating and curling.

Snow events are: snowboard, downhill, ski jump and biathlon.

Clue 3

Reveals: **minimum weight is 75kg**

a) 5% of 600 = 30	b) 75% of 148 = 111
c) 20% of 250 = 50	d) 30% of 180 = 54
e) 25% of 288 = 72	f) 10% of 450 = 45
g) 40% of 250 = 100	h) 50% of 276 = 138

Clue 4

Reveals: **personal best is under 1 minute 40 seconds**

	1st Time	2nd Time	Difference
1	14:35	16:15	1:40
2	23:50	01:35	1:45
3	19:55	21:45	1:50
4	13:38	15:18	1:40
5	17:47	19:32	1:45
6	22:29	00:09	1:40

Clue 5

Spells: **You found a Swedish krona coin.**

The Culprit: **Harfur Half-Pipe**

The Confession: **I thought I was the Norse God 'Thaw'!**