



The Lunar Base Sabotage

Grade 7 math · Place value, Integers, Percentages, Order of operations, Two-step equations · Reading level grades 7-9

Detective: _____ Date: _____

Someone tampered with the emergency life support scrubbers in Sector 4! Commander Vance needs your mathematical skills to analyze telemetry logs, narrow down the suspect pool, and unmask the saboteur before they flee on the supply shuttle.

1. Solve each math problem. The answer is a number, and the letter beside it is what that number stands for.
2. In the clue boxes, write that letter in every box showing the same number, then read the secret clue.
3. Use each clue to cross suspects off the list. The one suspect left at the end is the culprit!

My answer: the Saboteur is _____

Possible suspects

Cross off a row as each clue rules it out. The one left at the end is the culprit.

NAME	PRIMARY GADGET	AUXILIARY GEAR	WATCH WRIST	HELMET TRIM	COUNTERMEASURE
Katherine Johnson	Gravity Boots	Thermal Shield	Right Handed Watch	Neon Blue Trim	Water Mist
John Glenn	Plasma Torch	Stealth Cloak	Right Handed Watch	Neon Blue Trim	Water Mist
Mae Jemison	Ion Thruster	Stealth Cloak	Right Handed Watch	Neon Blue Trim	Foam Spray
Carolyn Porco	EMP Grenade	Signal Jammer	Right Handed Watch	Cosmic Red Trim	Water Mist
Yuri Gagarin	EMP Grenade	Thermal Shield	Right Handed Watch	Neon Blue Trim	Magnet Lock
Chris Hadfield	Plasma Torch	Hologram Projector	Right Handed Watch	Solar Yellow Trim	Water Mist
Peggy Whitson	Ion Thruster	Hack Tool	Right Handed Watch	Neon Blue Trim	Water Mist
Vera Rubin	Laser Cutter	Signal Jammer	Right Handed Watch	Neon Blue Trim	Foam Spray
Christina Koch	Laser Cutter	Hack Tool	Left Handed Watch	Solar Yellow Trim	Foam Spray
Neil Armstrong	Ion Thruster	Hologram Projector	Right Handed Watch	Neon Blue Trim	Water Mist
Sally Ride	Ion Thruster	Thermal Shield	Right Handed Watch	Cosmic Red Trim	Water Mist
Kalpana Chawla	Plasma Torch	Thermal Shield	Right Handed Watch	Solar Yellow Trim	Foam Spray
Michael Collins	Gravity Boots	Signal Jammer	Right Handed Watch	Neon Blue Trim	Water Mist
Buzz Aldrin	EMP Grenade	Stealth Cloak	Left Handed Watch	Solar Yellow Trim	Foam Spray
Alan Shepard	EMP Grenade	Signal Jammer	Left Handed Watch	Solar Yellow Trim	Foam Spray
Carl Sagan	Plasma Torch	Thermal Shield	Left Handed Watch	Neon Blue Trim	Water Mist
Hakeem Oluseyi	Gravity Boots	Hack Tool	Right Handed Watch	Solar Yellow Trim	Magnet Lock
Nancy Roman	Laser Cutter	Hack Tool	Left Handed Watch	Cosmic Red Trim	Water Mist
Kip Thorne	Gravity Boots	Stealth Cloak	Left Handed Watch	Neon Blue Trim	Magnet Lock
Ellen Ochoa	Plasma Torch	Signal Jammer	Left Handed Watch	Neon Blue Trim	Foam Spray
Victor Glover	Plasma Torch	Hack Tool	Right Handed Watch	Solar Yellow Trim	Magnet Lock

CLUE 1 Place value

A security log recorded a digital passcode entry where digit placement reveals the gear code.

Solve each problem, then write its letter in every clue box that shows the same number.

T							T										T
400	3000	5000	80	60	70	40	400	5000	900	600	2000	40	5000	80	4000	40	400
							T										
900	80	5000	60	80	400	5000	60	100	400	3000	500	100	40	60	1000		

What is the value of the 4 in 909,455? → **T**

What is the value of the 5 in 701,541? → **C**

What is the value of the 8 in 457,283? → **S**

What is the value of the 2 in 72,335? → **D**

What is the value of the 6 in 875,651? → **R**

What is the value of the 4 in 658,246? → **O**

What is the value of the 1 in 751,329? → **K**

What is the value of the 1 in 72,189? → **L**

What is the value of the 4 in 14,786? → **N**

What is the value of the 5 in 25,409? → **E**

What is the value of the 6 in 970,565? → **A**

What is the value of the 7 in 48,072? → **B**

What is the value of the 3 in 793,998? → **H**

What is the value of the 9 in 18,972? → **U**

Scratch space:

CLUE 2 Integers

Thermal sensors tracked altitude and temperature shifts below zero to pinpoint the target bay.

Solve each problem, then write its letter in every clue box that shows the same number.

T									T					
4	28	2	12	24	12	11	2	10	4	7	8	13	2	18

		T					T							T
7	18	4	10	28	8	5	4	28	2	13	21	3	28	4

				T
7	13	21	12	4

$2 - (-2) = \square \rightarrow \text{T}$	$24 - (-4) = \square \rightarrow \text{H}$	$12 - (-1) = \square \rightarrow \text{R}$
$16 - (-8) = \square \rightarrow \text{U}$	$(-6) + 8 = \square \rightarrow \text{E}$	$(-10) + 20 = \square \rightarrow \text{C}$
$(-8) + 11 = \square \rightarrow \text{G}$	$(-6) + 24 = \square \rightarrow \text{A}$	$16 - (-5) = \square \rightarrow \text{I}$
$(-10) + 21 = \square \rightarrow \text{P}$	$(-8) + 15 = \square \rightarrow \text{W}$	$(-1) + 6 = \square \rightarrow \text{N}$
$(-11) + 23 = \square \rightarrow \text{S}$	$(-11) + 19 = \square \rightarrow \text{O}$	

Scratch space:

CLUE 3 Percentages

The life support console displayed battery drain percentages during the power surge.

Solve each problem, then write its letter in every clue box that shows the same number.

T										T							
31	29	45	57	21	57	47	45	53	31	37	7	57	29	45	50	35	

								T						T
10	7	53	23	10	54	37	7	31	45	5	40	59	57	31

$50\% \text{ of } 62 = \boxed{} \rightarrow \boxed{\text{T}}$

$10\% \text{ of } 230 = \boxed{} \rightarrow \boxed{\text{K}}$

$20\% \text{ of } 235 = \boxed{} \rightarrow \boxed{\text{P}}$

$20\% \text{ of } 175 = \boxed{} \rightarrow \boxed{\text{D}}$

$5\% \text{ of } 580 = \boxed{} \rightarrow \boxed{\text{H}}$

$25\% \text{ of } 228 = \boxed{} \rightarrow \boxed{\text{S}}$

$20\% \text{ of } 35 = \boxed{} \rightarrow \boxed{\text{A}}$

$50\% \text{ of } 80 = \boxed{} \rightarrow \boxed{\text{M}}$

$50\% \text{ of } 106 = \boxed{} \rightarrow \boxed{\text{C}}$

$10\% \text{ of } 100 = \boxed{} \rightarrow \boxed{\text{B}}$

$10\% \text{ of } 210 = \boxed{} \rightarrow \boxed{\text{U}}$

$50\% \text{ of } 118 = \boxed{} \rightarrow \boxed{\text{I}}$

$10\% \text{ of } 50 = \boxed{} \rightarrow \boxed{\text{R}}$

$25\% \text{ of } 200 = \boxed{} \rightarrow \boxed{\text{L}}$

$10\% \text{ of } 540 = \boxed{} \rightarrow \boxed{\text{Y}}$

$10\% \text{ of } 450 = \boxed{} \rightarrow \boxed{\text{E}}$

$10\% \text{ of } 370 = \boxed{} \rightarrow \boxed{\text{W}}$

Scratch space:

CLUE 4

Order of operations

An automated diagnostic routine ran a multistep formula to calculate power distribution.

Solve each problem, then write its letter in every clue box that shows the same number.

S				S					S											
107	114	77	91	107	94	11	50	12	107	78	50	57	65	25	103	65				
43	84	114	25	91	11	77	36													

$97 + 5 \times 2 = \square \rightarrow \boxed{\text{S}}$

$9 \times 10 - 25 = \square \rightarrow \boxed{\text{N}}$

$11 \times 11 - 18 = \square \rightarrow \boxed{\text{O}}$

$4 \times 7 - 16 = \square \rightarrow \boxed{\text{P}}$

$8 \times 5 - 4 = \square \rightarrow \boxed{\text{M}}$

$7 \times 10 - 20 = \square \rightarrow \boxed{\text{A}}$

$10 \times 10 - 9 = \square \rightarrow \boxed{\text{T}}$

$78 + 4 \times 9 = \square \rightarrow \boxed{\text{U}}$

$5 + 2 \times 3 = \square \rightarrow \boxed{\text{R}}$

$15 + 7 \times 9 = \square \rightarrow \boxed{\text{H}}$

$30 + 8 \times 8 = \square \rightarrow \boxed{\text{C}}$

$9 \times 10 - 6 = \square \rightarrow \boxed{\text{L}}$

$7 \times 10 - 13 = \square \rightarrow \boxed{\text{D}}$

$9 + 8 \times 2 = \square \rightarrow \boxed{\text{E}}$

$7 \times 8 - 13 = \square \rightarrow \boxed{\text{B}}$

$65 + 2 \times 6 = \square \rightarrow \boxed{\text{I}}$

Scratch space:

CLUE 5**Two-step equations - the last clue**

The station AI set up a balance equation between oxygen production and usage to isolate the discrepancy.

First solve each problem. Then find each answer in the numbered list below and cross that sentence out. One sentence will be left - that is exactly what the villain did!

Step 1 - solve these:

$6x + 1 = 7, x = \boxed{}$

$2x + 4 = 14, x = \boxed{}$

$2x + 9 = 13, x = \boxed{}$

$2x + 4 = 12, x = \boxed{}$

$5x + 8 = 53, x = \boxed{}$

$4x + 5 = 49, x = \boxed{}$

$2x + 2 = 22, x = \boxed{}$

$3x + 7 = 28, x = \boxed{}$

$3x + 3 = 12, x = \boxed{}$

$6x + 2 = 38, x = \boxed{}$

$4x + 9 = 57, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain walked up the exterior bulkhead, then deflected high heat alarms.
2. The villain blasted across the docking bay, then bypassed security firewalls.
3. The villain melted the secondary airlock seal, then blocked emergency transmissions.
4. The villain melted the secondary airlock seal, then vanished from sensor feeds.
5. The villain blasted across the docking bay, then created a false decoy signal.
6. The villain blasted across the docking bay, then blocked emergency transmissions.
7. The villain melted the secondary airlock seal, then deflected high heat alarms.
8. The villain walked up the exterior bulkhead, then blocked emergency transmissions.
9. The villain sliced through the maintenance hatch, then vanished from sensor feeds.
10. The villain fried the local relay circuit, then vanished from sensor feeds.
11. The villain melted the secondary airlock seal, then bypassed security firewalls.
12. The villain blasted across the docking bay, then vanished from sensor feeds.

Answer Key

The Lunar Base Sabotage

Culprit: Michael Collins

Gravity Boots · Signal Jammer · Right Handed Watch · Neon Blue Trim · Water Mist

Trail: Start 21 → Clue 1 17 → Clue 2 12 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Place value): "THE SABOTEUR DOES NOT USE A STEALTH CLOAK"

What is the value of the 4 in 909,455? = 400 (T) · What is the value of the 5 in 701,541? = 500 (C) · What is the value of the 8 in 457,283? = 80 (S) · What is the value of the 2 in 72,335? = 2000 (D) · What is the value of the 6 in 875,651? = 600 (R) · What is the value of the 4 in 658,246? = 40 (O) · What is the value of the 1 in 751,329? = 1000 (K) · What is the value of the 1 in 72,189? = 100 (L) · What is the value of the 4 in 14,786? = 4000 (N) · What is the value of the 5 in 25,409? = 5000 (E) · What is the value of the 6 in 970,565? = 60 (A) · What is the value of the 7 in 48,072? = 70 (B) · What is the value of the 3 in 793,998? = 3000 (H) · What is the value of the 9 in 18,972? = 900 (U)

Clue 2 (Integers): "THE SUSPECT WORE A WATCH ON THE RIGHT WRIST"

$2 - (-2) = 4$ (T) · $24 - (-4) = 28$ (H) · $12 - (-1) = 13$ (R) · $16 - (-8) = 24$ (U) · $(-6) + 8 = 2$ (E) · $(-10) + 20 = 10$ (C) · $(-8) + 11 = 3$ (G) · $(-6) + 24 = 18$ (A) · $16 - (-5) = 21$ (I) · $(-10) + 21 = 11$ (P) · $(-8) + 15 = 7$ (W) · $(-1) + 6 = 5$ (N) · $(-11) + 23 = 12$ (S) · $(-11) + 19 = 8$ (O)

Clue 3 (Percentages): "THE SUSPECT WAS HELD BACK BY WATER MIST"

50% of 62 = 31 (T) · 10% of 230 = 23 (K) · 20% of 235 = 47 (P) · 20% of 175 = 35 (D) · 5% of 580 = 29 (H) · 25% of 228 = 57 (S) · 20% of 35 = 7 (A) · 50% of 80 = 40 (M) · 50% of 106 = 53 (C) · 10% of 100 = 10 (B) · 10% of 210 = 21 (U) · 50% of 118 = 59 (I) · 10% of 50 = 5 (R) · 25% of 200 = 50 (L) · 10% of 540 = 54 (Y) · 10% of 450 = 45 (E) · 10% of 370 = 37 (W)

Clue 4 (Order of operations): "SUIT SCRAPS HAD NEON BLUE TRIM"

$97 + 5 \times 2 = 107$ (S) · $9 \times 10 - 25 = 65$ (N) · $11 \times 11 - 18 = 103$ (O) · $4 \times 7 - 16 = 12$ (P) · $8 \times 5 - 4 = 36$ (M) · $7 \times 10 - 20 = 50$ (A) · $10 \times 10 - 9 = 91$ (T) · $78 + 4 \times 9 = 114$ (U) · $5 + 2 \times 3 = 11$ (R) · $15 + 7 \times 9 = 78$ (H) · $30 + 8 \times 8 = 94$ (C) · $9 \times 10 - 6 = 84$ (L) · $7 \times 10 - 13 = 57$ (D) · $9 + 8 \times 2 = 25$ (E) · $7 \times 8 - 13 = 43$ (B) · $65 + 2 \times 6 = 77$ (I)

Clue 5 (Two-step equations): surviving statement is box 8 → Michael Collins

$6x + 1 = 7, x = 1$ · $2x + 4 = 14, x = 5$ · $2x + 9 = 13, x = 2$ · $2x + 4 = 12, x = 4$ · $5x + 8 = 53, x = 9$ · $4x + 5 = 49, x = 11$ · $2x + 2 = 22, x = 10$ · $3x + 7 = 28, x = 7$ · $3x + 3 = 12, x = 3$ · $6x + 2 = 38, x = 6$ · $4x + 9 = 57, x = 12$