



Sabotage on Orion-9

Grade 9 math · Two-step equations, Word problems, Exponents, Square roots · Reading level grades 7-9

Detective: _____ **Date:** _____

Someone has hijacked the station's artificial gravity grid, risking the lives of everyone on board. The Chief Astrophysicist has gone missing, leaving behind a locked data pad. We must crack the security codes, scan the telemetry files, and track down the culprit before the oxygen reserves run out.

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 Rogue 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 POWER	SUB-SYSTEM GEAR	NAVIGATION PREFERENCE	STRAND EVIDENCE	COUNTER-MEASURE
Ellen Ochoa	Gravity-bending	Laser-cutting	Left-handed pilot	Chrome buzzcut	Ice-pellets
Isaac Asimov	Cyber-hacking	Laser-cutting	Left-handed pilot	Copper dreadlocks	Magnet-clutches
Peggy Whitson	Solar-flaring	Jetpack-flight	Right-handed pilot	Copper dreadlocks	Water-mist
Mae Jemison	Plasma-welding	Laser-cutting	Left-handed pilot	Copper dreadlocks	Magnet-clutches
Buzz Aldrin	Quantum-shifting	EMP-blasting	Left-handed pilot	Neon-blue hair	Magnet-clutches
Guion Bluford	Solar-flaring	Shield-generation	Left-handed pilot	Neon-blue hair	Magnet-clutches
Alexey Leonov	Quantum-shifting	Jetpack-flight	Left-handed pilot	Neon-blue hair	Ice-pellets
Carl Sagan	Cyber-hacking	Laser-cutting	Left-handed pilot	Chrome buzzcut	Ice-pellets
Roberta Bondar	Plasma-welding	Laser-cutting	Left-handed pilot	Neon-blue hair	Magnet-clutches
Stephen Hawking	Cyber-hacking	EMP-blasting	Left-handed pilot	Copper dreadlocks	Water-mist
Edwin Hubble	Solar-flaring	Hologram-projection	Left-handed pilot	Neon-blue hair	Magnet-clutches
Valentina Tereshkova	Gravity-bending	EMP-blasting	Left-handed pilot	Chrome buzzcut	Magnet-clutches
John Glenn	Solar-flaring	EMP-blasting	Right-handed pilot	Copper dreadlocks	Magnet-clutches
Mark Kelly	Quantum-shifting	Hologram-projection	Right-handed pilot	Copper dreadlocks	Ice-pellets
Charles Bolden	Plasma-welding	Laser-cutting	Left-handed pilot	Neon-blue hair	Ice-pellets
Scott Kelly	Solar-flaring	Laser-cutting	Left-handed pilot	Neon-blue hair	Magnet-clutches
Yuri Gagarin	Plasma-welding	Hologram-projection	Right-handed pilot	Copper dreadlocks	Ice-pellets
Kip Thorne	Cyber-hacking	Shield-generation	Right-handed pilot	Neon-blue hair	Magnet-clutches
Arthur Clarke	Plasma-welding	Hologram-projection	Left-handed pilot	Chrome buzzcut	Water-mist
Alan Shepard	Gravity-bending	Laser-cutting	Right-handed pilot	Neon-blue hair	Magnet-clutches
Kalpana Chawla	Cyber-hacking	Shield-generation	Right-handed pilot	Neon-blue hair	Water-mist

CLUE 1

We intercepted a scrambled distress signal from the sector drone. Solving this word problem about rocket fuel canisters reveals the first encryption key.

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

Three rows of number boxes for a multiplication exercise. The boxes are arranged in groups of three, with some boxes highlighted in orange and containing the letter 'T'.

Row 1: 14, 3, 18, 16, 6, 5, 5, 2, 6, 17, 4, 21, 18, 11, 17, 21, 14

Row 2: 9, 11, 18, 3, 21, 5, 21, 15, 7, 2, 13

Row 3: 10, 7, 21, 19, 18, 12, 14, 6, 21, 17

$$4x + 6 = 62, x = \boxed{} \rightarrow \boxed{\text{T}}$$

$$4x + 1 = 21, x = \boxed{} \rightarrow \boxed{\text{L}}$$

$$6x + 7 = 25, x = \boxed{} \rightarrow \boxed{\text{H}}$$

$$9x + 5 = 86, x = \boxed{} \rightarrow \boxed{\text{U}}$$

$$9x + 10 = 73, x = \boxed{} \rightarrow \boxed{\text{R}}$$

$$7x + 4 = 116, x = \boxed{} \rightarrow \boxed{\mathbf{V}}$$

$$8x + 6 = 110, x = \boxed{} \rightarrow \boxed{\text{M}}$$

$$7x + 6 = 132, x = \boxed{} \rightarrow \boxed{\text{E}}$$

$8x + 11 = 43$, $x = \boxed{} \rightarrow \boxed{\text{D}}$

$$7x + 6 = 111, x = \boxed{} \rightarrow \boxed{\text{G}}$$

$$9x + 9 = 63, x = \boxed{} \rightarrow \boxed{\text{I}}$$

$$5x + 2 = 107, x = \boxed{} \rightarrow \boxed{0}$$

$$6x + 5 = 17, x = \boxed{} \rightarrow \boxed{\text{A}}$$

$$2x + 5 = 25, x = \boxed{} \rightarrow \boxed{\text{P}}$$

$$4x + 8 = 52, x = \boxed{} \rightarrow \boxed{\text{S}}$$

$$6x + 7 = 79, x = \boxed{} \rightarrow \boxed{\text{C}}$$

$$6x + 5 = 119, x = \boxed{} \rightarrow \boxed{\text{J}}$$

$$4x + 4 = 72, x = \boxed{} \rightarrow \boxed{\text{N}}$$

Scratch space:

CLUE 2

Word problems

The hangar cargo scale is acting up, weighing empty crates and loaded fuel cell pallets. Solve this two-step equation to find the weight of a single fuel cell and unlock the flight log.

Solve each problem, then write its letter in the boxes to fill in the missing word.

A witness saw the villain was

L							D		D	P	I	L	O		.
84	105	113	40	22	56	9		105				84		40	

Astronomer lined up 12 rows of 7 laser-tools. How many laser-tools in all?

Answer: → **L**

Astronomer lined up 3 rows of 3 space-probes. How many space-probes in all?

Answer: → **N**

Astronomer found 20 laser-tools yesterday and 93 more today. How many laser-tools in all?

Answer: → **F**

Astronomer found 11 space-probes yesterday and 94 more today. How many space-probes in all?

Answer: → **E**

Astronomer lined up 8 rows of 7 star-maps. How many star-maps in all?

Answer: → **A**

There were 39 comet-samples. 17 were used up. How many comet-samples are left?

Answer: → **H**

There were 49 star-maps. 9 were used up. How many star-maps are left?

Answer: → **T**

Scratch space:

CLUE 3 Exponents

The station's supercomputer is running a virus that multiplies exponentially every second. Calculate the total server damage to access the security footage.

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

T																			
121	81	169	144	9	169	343	4	64	343	144	144	T	196	128	128	169	361		

							T				T								
625	216	27	343	729	9	169	121	16	243	32	121	16	81	169	144				

$11^2 = \square \rightarrow$ T	$13^2 = \square \rightarrow$ E	$14^2 = \square \rightarrow$ O	$9^3 = \square \rightarrow$ G
$5^4 = \square \rightarrow$ B	$2^7 = \square \rightarrow$ P	$6^3 = \square \rightarrow$ Y	$9^2 = \square \rightarrow$ H
$2^2 = \square \rightarrow$ K	$2^4 = \square \rightarrow$ C	$19^2 = \square \rightarrow$ D	$2^5 = \square \rightarrow$ U
$2^6 = \square \rightarrow$ W	$7^3 = \square \rightarrow$ A	$3^3 = \square \rightarrow$ M	$3^5 = \square \rightarrow$ L
$3^2 = \square \rightarrow$ N	$12^2 = \square \rightarrow$ S		

Scratch space:

CLUE 4 Square roots

The life support grid is organized in a massive square array. Find the side length of the main power grid to pinpoint where the saboteur cut the wire.

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

N			N														
7	21	9	7	23	19	13	21	16	17	11	15	10	17	12			
			N			N						N					
6	9	13	7	3	11	7	18	16	21	22	21	7	18				

$\sqrt{49} = \square \rightarrow \boxed{\text{N}}$

$\sqrt{169} = \square \rightarrow \boxed{\text{U}}$

$\sqrt{256} = \square \rightarrow \boxed{\text{H}}$

$\sqrt{36} = \square \rightarrow \boxed{\text{F}}$

$\sqrt{289} = \square \rightarrow \boxed{\text{A}}$

$\sqrt{121} = \square \rightarrow \boxed{\text{I}}$

$\sqrt{9} = \square \rightarrow \boxed{\text{D}}$

$\sqrt{225} = \square \rightarrow \boxed{\text{R}}$

$\sqrt{484} = \square \rightarrow \boxed{\text{V}}$

$\sqrt{441} = \square \rightarrow \boxed{\text{E}}$

$\sqrt{81} = \square \rightarrow \boxed{\text{O}}$

$\sqrt{144} = \square \rightarrow \boxed{\text{S}}$

$\sqrt{100} = \square \rightarrow \boxed{\text{W}}$

$\sqrt{529} = \square \rightarrow \boxed{\text{B}}$

$\sqrt{361} = \square \rightarrow \boxed{\text{L}}$

$\sqrt{324} = \square \rightarrow \boxed{\text{T}}$

Scratch space:

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

To bypass the locked laboratory door, we must balance the engine's thrust variables. Solve this algebraic equation to slide the heavy blast doors open.

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:

$3x + 11 = 23, x = \boxed{}$

$3x + 10 = 25, x = \boxed{}$

$2x + 6 = 22, x = \boxed{}$

$4x + 12 = 56, x = \boxed{}$

$7x + 8 = 29, x = \boxed{}$

$9x + 5 = 14, x = \boxed{}$

$5x + 9 = 19, x = \boxed{}$

$7x + 11 = 53, x = \boxed{}$

$5x + 12 = 47, x = \boxed{}$

$8x + 2 = 82, x = \boxed{}$

$7x + 6 = 90, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain scrambles the comms dish, then blocks pursuit with shield generation.
2. The villain locks the airlock gates, then forces entry with laser cutting.
3. The villain scrambles the comms dish, then knocks out power with EMP blasting.
4. The villain hacks the navigation terminal, then knocks out power with EMP blasting.
5. The villain overloads the thrusters, then blocks pursuit with shield generation.
6. The villain disrupts the fusion reactor, then escapes using jetpack flight.
7. The villain overloads the thrusters, then escapes using jetpack flight.
8. The villain disrupts the fusion reactor, then forces entry with laser cutting.
9. The villain overloads the thrusters, then forces entry with laser cutting.
10. The villain locks the airlock gates, then blocks pursuit with shield generation.
11. The villain disrupts the fusion reactor, then slips away with hologram projection.
12. The villain hacks the navigation terminal, then forces entry with laser cutting.

Answer Key

Sabotage on Orion-9

Culprit: Scott Kelly

Solar-flaring · Laser-cutting · Left-handed pilot · Neon-blue hair · Magnet-clutches

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

Clue 1 (Two-step equations): "THE VILLAIN DOES NOT USE HOLOGRAM PROJECTION"

$4x + 6 = 62, x = 14$ (T) · $4x + 1 = 21, x = 5$ (L) · $6x + 7 = 25, x = 3$ (H) · $9x + 5 = 86, x = 9$ (U) · $9x + 10 = 73, x = 7$ (R) · $7x + 4 = 116, x = 16$ (V) · $8x + 6 = 110, x = 13$ (M) · $7x + 6 = 132, x = 18$ (E) · $8x + 11 = 43, x = 4$ (D) · $7x + 6 = 111, x = 15$ (G) · $9x + 9 = 63, x = 6$ (I) · $5x + 2 = 107, x = 21$ (O) · $6x + 5 = 17, x = 2$ (A) · $2x + 5 = 25, x = 10$ (P) · $4x + 8 = 52, x = 11$ (S) · $6x + 7 = 79, x = 12$ (C) · $6x + 5 = 119, x = 19$ (J) · $4x + 4 = 72, x = 17$ (N)

Clue 2 (Word problems): "LEFT HANDED PILOT"

Astronomer lined up 12 rows of 7 laser-tools. How many laser-tools in all? = 84 (L) · Astronomer lined up 3 rows of 3 space-probes. How many space-probes in all? = 9 (N) · Astronomer found 20 laser-tools yesterday and 93 more today. How many laser-tools in all? = 113 (F) · Astronomer found 11 space-probes yesterday and 94 more today. How many space-probes in all? = 105 (E) · Astronomer lined up 8 rows of 7 star-maps. How many star-maps in all? = 56 (A) · There were 39 comet-samples. 17 were used up. How many comet-samples are left? = 22 (H) · There were 49 star-maps. 9 were used up. How many star-maps are left? = 40 (T)

Clue 3 (Exponents): "THE SNEAK WAS STOPPED BY MAGNET CLUTCHES"

$11^2 = 121$ (T) · $13^2 = 169$ (E) · $14^2 = 196$ (O) · $9^3 = 729$ (G) · $5^4 = 625$ (B) · $2^7 = 128$ (P) · $6^3 = 216$ (Y) · $9^2 = 81$ (H) · $2^2 = 4$ (K) · $2^4 = 16$ (C) · $19^2 = 361$ (D) · $2^5 = 32$ (U) · $2^6 = 64$ (W) · $7^3 = 343$ (A) · $3^3 = 27$ (M) · $3^5 = 243$ (L) · $3^2 = 9$ (N) · $12^2 = 144$ (S)

Clue 4 (Square roots): "NEON BLUE HAIR WAS FOUND IN THE VENT"

$\sqrt{49} = 7$ (N) · $\sqrt{169} = 13$ (U) · $\sqrt{256} = 16$ (H) · $\sqrt{36} = 6$ (F) · $\sqrt{289} = 17$ (A) · $\sqrt{121} = 11$ (I) · $\sqrt{9} = 3$ (D) · $\sqrt{225} = 15$ (R) · $\sqrt{484} = 22$ (V) · $\sqrt{441} = 21$ (E) · $\sqrt{81} = 9$ (O) · $\sqrt{144} = 12$ (S) · $\sqrt{100} = 10$ (W) · $\sqrt{529} = 23$ (B) · $\sqrt{361} = 19$ (L) · $\sqrt{324} = 18$ (T)

Clue 5 (Two-step equations): surviving statement is box 9 → Scott Kelly

$3x + 11 = 23, x = 4$ · $3x + 10 = 25, x = 5$ · $2x + 6 = 22, x = 8$ · $4x + 12 = 56, x = 11$ · $7x + 8 = 29, x = 3$ · $9x + 5 = 14, x = 1$ · $5x + 9 = 19, x = 2$ · $7x + 11 = 53, x = 6$ · $5x + 12 = 47, x = 7$ · $8x + 2 = 82, x = 10$ · $7x + 6 = 90, x = 12$