The Mystery of Lunar Outpost Alpha

Grade 5 math · Place value, Multiplication, Skip counting, Word problems, Division · Reading level grades 5-6

Detective: _____ **Date:** _____

A rogue saboteur disrupted the primary airlock at Lunar Outpost Alpha! Station Commander Vance needs your help reviewing telemetry and crew records to identify the culprit before the emergency shuttle leaves.

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

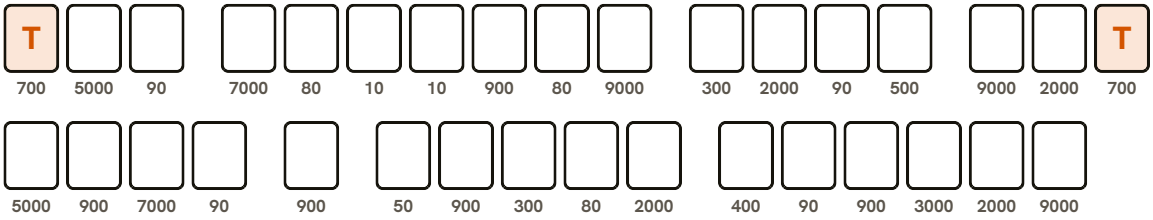
Cross off a row as each clue rules it out. The one left at the end is the culprit.

NAME	PRIMARY GEAR	BACKUP MODULE	DOMINANT HAND	HELMET COLOR	SUIT VULNERABILITY
Valentina Tereshkova	GRAVITY BOOTS	OXYGEN TANK	LEFT HANDED	GOLD HELMET	NEON LIGHT
Neil Armstrong	LASER CUTTER	SOLAR PANEL	RIGHT HANDED	RED HELMET	LUNAR DUST
Guion Bluford	PLASMA TORCH	ROVER KEY	LEFT HANDED	RED HELMET	NEON LIGHT
Chris Hadfield	LASER CUTTER	RADIO BEACON	LEFT HANDED	RED HELMET	NEON LIGHT
Bernard Harris	GRAVITY BOOTS	OXYGEN TANK	LEFT HANDED	RED HELMET	HIGH HEAT
Michael Collins	PLASMA TORCH	OXYGEN TANK	RIGHT HANDED	BLUE HELMET	NEON LIGHT
Jeanette Epps	LASER CUTTER	STARDUST COMPASS	LEFT HANDED	RED HELMET	NEON LIGHT
Buzz Aldrin	LASER CUTTER	SOLAR PANEL	RIGHT HANDED	BLUE HELMET	LUNAR DUST
Christina Koch	JET PACK	STARDUST COMPASS	RIGHT HANDED	RED HELMET	NEON LIGHT
Victor Glover	MAG SHIELD	ROVER KEY	LEFT HANDED	GOLD HELMET	LUNAR DUST
Yuri Gagarin	MAG SHIELD	STARDUST COMPASS	LEFT HANDED	GOLD HELMET	HIGH HEAT
Eileen Collins	LASER CUTTER	RADIO BEACON	LEFT HANDED	BLUE HELMET	LUNAR DUST
Leland Melvin	JET PACK	ROVER KEY	LEFT HANDED	RED HELMET	HIGH HEAT
Leo Sterling	MAG SHIELD	ROVER KEY	RIGHT HANDED	BLUE HELMET	LUNAR DUST
Sally Ride	GRAVITY BOOTS	OXYGEN TANK	LEFT HANDED	RED HELMET	NEON LIGHT
John Glenn	JET PACK	RADIO BEACON	RIGHT HANDED	GOLD HELMET	NEON LIGHT
Kalpana Chawla	PLASMA TORCH	ROVER KEY	LEFT HANDED	BLUE HELMET	NEON LIGHT
Astrid Vance	MAG SHIELD	SOLAR PANEL	LEFT HANDED	RED HELMET	NEON LIGHT
Orion Blake	PLASMA TORCH	RADIO BEACON	LEFT HANDED	BLUE HELMET	HIGH HEAT
Mae Jemison	JET PACK	ROVER KEY	LEFT HANDED	BLUE HELMET	LUNAR DUST
Sunita Williams	LASER CUTTER	ROVER KEY	LEFT HANDED	GOLD HELMET	NEON LIGHT

CLUE 1 Place value

The station computer displays raw coordinates using place value columns pointing to key evidence.

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



What is the value of the 7 in 69,700? ☐ → T

What is the value of the 3 in 23,860? ☐ → C

What is the value of the 8 in 19,380? ☐ → I

What is the value of the 1 in 753,510? ☐ → L

What is the value of the 9 in 65,690? ☐ → E

What is the value of the 3 in 72,301? ☐ → D

What is the value of the 2 in 372,603? ☐ → O

What is the value of the 5 in 142,530? ☐ → S

What is the value of the 4 in 975,451? ☐ → B

What is the value of the 7 in 827,029? ☐ → V

What is the value of the 5 in 65,370? ☐ → H

What is the value of the 9 in 465,986? ☐ → A

What is the value of the 5 in 278,054? ☐ → R

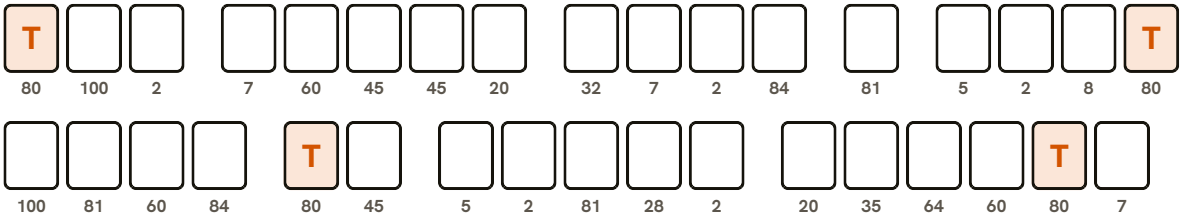
What is the value of the 9 in 79,866? ☐ → N

Scratch space:

CLUE 2 Multiplication facts (1-12)

In the cargo bay crates of replacement visor glass are arranged in equal rows and stacks.

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



8 × 10 = ☐ → T

9 × 5 = ☐ → O

10 × 10 = ☐ → H

5 × 7 = ☐ → R

7 × 1 = ☐ → S

4 × 7 = ☐ → V

1 × 5 = ☐ → L

8 × 8 = ☐ → I

1 × 8 = ☐ → F

4 × 8 = ☐ → U

5 × 4 = ☐ → P

5 × 12 = ☐ → N

7 × 12 = ☐ → D

9 × 9 = ☐ → A

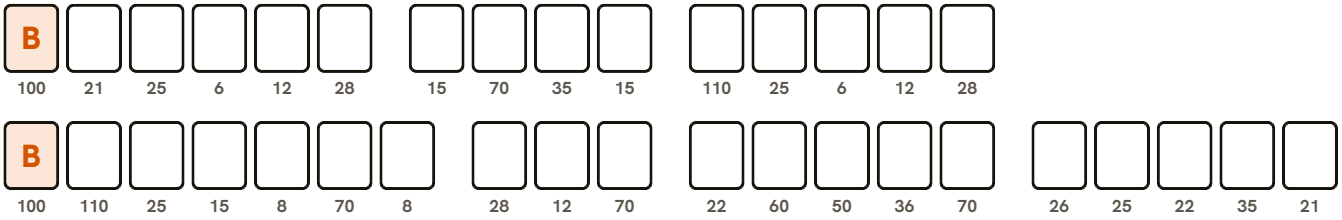
1 × 2 = ☐ → E

Scratch space:

CLUE 3 Skip counting

> Walking down the habitat corridor oxygen pressure gauges flash numbers in steady leaps.

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



Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, 90, ___, 110, 120 ☐ → **B**

Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, ___, 65, 70 ☐ → **P**

Skip-count by 2s. Fill the blank: 2, 4, 6, ___, 10, 12 ☐ → **D**

Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, ___, 30, 32 ☐ → **T**

Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, ___, 24, 27 ☐ → **R**

Skip-count by 2s. Fill the blank: 2, 4, ___, 8, 10 ☐ → **G**

Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, ___, 40, 45 ☐ → **O**

Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, ___, 120, 130 ☐ → **L**

Skip-count by 3s. Fill the blank: 3, 6, 9, 12, ___, 18, 21 ☐ → **N**

Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, ___, 24, 26 ☐ → **S**

Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, ___, 14, 16 ☐ → **H**

Skip-count by 5s. Fill the blank: 5, 10, 15, 20, ___, 30, 35 ☐ → **I**

Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, ___, 39, 42 ☐ → **C**

Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, 45, ___, 55, 60 ☐ → **A**

Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, ___, 28, 30 ☐ → **V**

Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, ___, 75, 80 ☐ → **E**

Scratch space:

CLUE 4 Word problems

The crew log tracks energy fuel cells used during overnight module maintenance.

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

A strand of

R									
31	119	58	116	119	50	63	119	43	

hair turned up at the scene.

Astronaut Sam found 19 solar batteries yesterday and 12 more today. How many solar batteries in all?

Answer: ☐ → **R**

There were 147 space crystals. 31 were used up. How many space crystals are left?

Answer: ☐ → **H**

Astronaut Sam found 6 oxygen canisters yesterday and 44 more today. How many oxygen canisters in all?

Answer: ☐ → **L**

Astronaut Sam found 36 meteorite samples yesterday and 27 more today. How many meteorite samples in all?

Answer: ☐ → **M**

Astronaut Sam found 7 meteorite samples yesterday and 36 more today. How many meteorite samples in all?

Answer: ☐ → **T**

There were 128 meteorite samples. 9 were used up. How many meteorite samples are left?

Answer: ☐ → **E**

There were 68 space crystals. 10 were used up. How many space crystals are left?

Answer: ☐ → **D**

Scratch space:

CLUE 5 Division facts (1-12) - the last clue

> Before locking down the sector the cadet divides remaining power packs equally among safety pods.

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:

10 ÷ 10 = ☐ | 72 ÷ 9 = ☐ | 15 ÷ 5 = ☐ | 28 ÷ 4 = ☐ | 72 ÷ 6 = ☐

121 ÷ 11 = ☐ | 36 ÷ 4 = ☐ | 12 ÷ 2 = ☐ | 48 ÷ 12 = ☐ | 120 ÷ 12 = ☐

5 ÷ 1 = ☐

Step 2 - cross out the sentence with each answer:

1. The villain sliced with the laser cutter, then checked a stardust compass.
2. The villain fired the plasma torch, then grabbed a rover key.
3. The villain raised the mag shield, then adjusted a solar panel.
4. The villain fired the plasma torch, then switched off a radio beacon.
5. The villain activated the gravity boots, then adjusted a solar panel.
6. The villain raised the mag shield, then grabbed a rover key.
7. The villain activated the gravity boots, then grabbed a rover key.
8. The villain activated the gravity boots, then refilled an oxygen tank.
9. The villain sliced with the laser cutter, then switched off a radio beacon.
10. The villain fired the plasma torch, then adjusted a solar panel.
11. The villain raised the mag shield, then switched off a radio beacon.
12. The villain boosted using the jet pack, then adjusted a solar panel.

TEACHER / PARENT

Answer Key

The Mystery of Lunar Outpost Alpha

Culprit: Guion Bluford

PLASMA TORCH · ROVER KEY · LEFT HANDED · RED HELMET · NEON LIGHT

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

Clue 1 (Place value): "THE VILLAIN DOES NOT HAVE A RADIO BEACON"

What is the value of the 7 in 69,700? = 700 (T) · What is the value of the 3 in 23,860? = 3000 (C) · What is the value of the 8 in 19,380? = 80 (I) · What is the value of the 1 in 753,510? = 10 (L) · What is the value of the 9 in 65,690? = 90 (E) · What is the value of the 3 in 72,301? = 300 (D) · What is the value of the 2 in 372,603? = 2000 (O) · What is the value of the 5 in 142,530? = 500 (S) · What is the value of the 4 in 975,451? = 400 (B) · What is the value of the 7 in 827,029? = 7000 (V) · What is the value of the 5 in 65,370? = 5000 (H) · What is the value of the 9 in 465,986? = 900 (A) · What is the value of the 5 in 278,054? = 50 (R) · What is the value of the 9 in 79,866? = 9000 (N)

Clue 2 (Multiplication facts (1-12)): "THE SNOOP USED A LEFT HAND TO LEAVE PRINTS"

8 × 10 = 80 (T) · 9 × 5 = 45 (O) · 10 × 10 = 100 (H) · 5 × 7 = 35 (R) · 7 × 1 = 7 (S) · 4 × 7 = 28 (V) · 1 × 5 = 5 (L) · 8 × 8 = 64 (I) · 1 × 8 = 8 (F) · 4 × 8 = 32 (U) · 5 × 4 = 20 (P) · 5 × 12 = 60 (N) · 7 × 12 = 84 (D) · 9 × 9 = 81 (A) · 1 × 2 = 2 (E)

Clue 3 (Skip counting): "BRIGHT NEON LIGHT BLINDED THE SPACE VISOR"

Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, 90, ___, 110, 120 = 100 (B) · Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, ___, 65, 70 = 60 (P) · Skip-count by 2s. Fill the blank: 2, 4, 6, ___, 10, 12 = 8 (D) · Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, ___, 30, 32 = 28 (T) · Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, ___, 24, 27 = 21 (R) · Skip-count by 2s. Fill the blank: 2, 4, ___, 8, 10 = 6 (G) · Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, ___, 40, 45 = 35 (O) · Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, ___, 120, 130 = 110 (L) · Skip-count by 3s. Fill the blank: 3, 6, 9, 12, ___, 18, 21 = 15 (N) · Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, ___, 24, 26 = 22 (S) · Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, ___, 14, 16 = 12 (H) · Skip-count by 5s. Fill the blank: 5, 10, 15, 20, ___, 30, 35 = 25 (I) · Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, ___, 39, 42 = 36 (C) · Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, 45, ___, 55, 60 = 50 (A) · Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, ___, 28, 30 = 26 (V) · Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, ___, 75, 80 = 70 (E)

Clue 4 (Word problems): "RED HELMET"

Astronaut Sam found 19 solar batteries yesterday and 12 more today. How many solar batteries in all? = 31 (R) · There were 147 space crystals. 31 were used up. How many space crystals are left? = 116 (H) · Astronaut Sam found 6 oxygen canisters yesterday and 44 more today. How many oxygen canisters in all? = 50 (L) · Astronaut Sam found 36 meteorite samples yesterday and 27 more today. How many meteorite samples in all? = 63 (M) · Astronaut Sam found 7 meteorite samples yesterday and 36 more today. How many meteorite samples in all? = 43 (T) · There were 128 meteorite samples. 9 were used up. How many meteorite samples are left? = 119 (E) · There were 68 space crystals. 10 were used up. How many space crystals are left? = 58 (D)

Clue 5 (Division facts (1-12)): surviving statement is box 2 → Guion Bluford

10 ÷ 10 = 1 · 72 ÷ 9 = 8 · 15 ÷ 5 = 3 · 28 ÷ 4 = 7 · 72 ÷ 6 = 12 · 121 ÷ 11 = 11 · 36 ÷ 4 = 9 · 12 ÷ 2 = 6 · 48 ÷ 12 = 4 · 120 ÷ 12 = 10 · 5 ÷ 1 = 5