



The Cosmic Crystal Caper

Grade 7 math · Place value, Addition, Multiplication, Skip counting, Missing addends · Reading level grades 5-6

Detective: _____ Date: _____

A high-energy glowing moon crystal has vanished from the research lab on Lunar Outpost Alpha! Someone snuck past the security sensors during the orbital shift. Work through the station clues to unmask the space rogue before the supply shuttle leaves for Mars.

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 Space Rogue is _____

Possible suspects

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

NAME	SPACE TOOL	SUIT GEAR	GLOVE DOMINANCE	HELMET STRIPE	DEFENSIVE COUNTER BALANCE
Peggy Whitson	Pulse Beam	Solar Shield	Right Handed	Crimson Stripe	Strobe Flare
Kalpana Chawla	Laser Torch	Solar Shield	Left Handed	Silver Stripe	Magnet Pulser
Eileen Collins	Laser Torch	Thruster Pack	Left Handed	Silver Stripe	Magnet Pulser
Chris Hadfield	Pulse Beam	Solar Shield	Right Handed	Silver Stripe	Magnet Pulser
Guion Bluford	Pulse Beam	Thruster Pack	Right Handed	Gold Stripe	Strobe Flare
Ellen Ochoa	Pulse Beam	Stealth Cloak	Left Handed	Gold Stripe	Strobe Flare
Sally Ride	Laser Torch	Cargo Net	Right Handed	Crimson Stripe	Magnet Pulser
Mark Kelly	Plasma Cutter	Cargo Net	Left Handed	Crimson Stripe	Strobe Flare
Sunita Williams	Pulse Beam	Radio Jammer	Right Handed	Crimson Stripe	Magnet Pulser
Robert Crippen	Laser Torch	Cargo Net	Left Handed	Silver Stripe	Foam Spray
Victor Glover	Gravity Hook	Cargo Net	Right Handed	Crimson Stripe	Magnet Pulser
Story Musgrave	Gravity Hook	Stealth Cloak	Right Handed	Crimson Stripe	Strobe Flare
Stephanie Wilson	Plasma Cutter	Stealth Cloak	Right Handed	Gold Stripe	Foam Spray
Mae Jemison	Laser Torch	Cargo Net	Right Handed	Crimson Stripe	Strobe Flare
Leland Melvin	Gravity Hook	Radio Jammer	Left Handed	Gold Stripe	Magnet Pulser
Buzz Aldrin	Gravity Hook	Cargo Net	Right Handed	Crimson Stripe	Foam Spray
Anousheh Ansari	Jet Booster	Thruster Pack	Right Handed	Crimson Stripe	Strobe Flare
Joan Higginbotham	Laser Torch	Thruster Pack	Right Handed	Crimson Stripe	Strobe Flare
Bernard Harris	Pulse Beam	Stealth Cloak	Right Handed	Gold Stripe	Foam Spray
Jessica Meir	Jet Booster	Thruster Pack	Right Handed	Silver Stripe	Magnet Pulser
John Glenn	Gravity Hook	Stealth Cloak	Right Handed	Silver Stripe	Strobe Flare

CLUE 1 Place value

The station telemetry monitor displayed encrypted coordinate codes, highlighting specific digit positions on the screen.

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

T																			
1000	70	8000	80	9000	80	100	8000	800	1000	5000	90	5000	40	500	1000	9000	80	8000	

	T											
80	1000	8000	10	3000	1000	70	800	3000	500	10	700	

What is the value of the 1 in 61,556? → **T**

What is the value of the 1 in 778,516? → **A**

What is the value of the 7 in 85,075? → **H**

What is the value of the 3 in 13,476? → **L**

What is the value of the 7 in 339,741? → **K**

What is the value of the 8 in 65,850? → **C**

What is the value of the 9 in 39,671? → **U**

What is the value of the 8 in 56,384? → **S**

What is the value of the 5 in 22,597? → **O**

What is the value of the 8 in 698,013? → **E**

What is the value of the 5 in 15,749? → **D**

What is the value of the 1 in 74,144? → **P**

What is the value of the 9 in 122,594? → **I**

What is the value of the 4 in 97,841? → **N**

Scratch space:

CLUE 2 Addition

A deck engineer tallied up the spare oxygen tanks stored across the three cargo bays.

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

W									W					
4739	2583	6412	3263	9758	6974	6974	6974	6157	4739	7928	2583	9000	8756	6412
8756	6157	3263	5379	9758	5379	9000	7928	2583	6667	2069	3263	8756	6157	6412

$2282 + 2457 = \square \rightarrow \text{W}$	$3308 + 6450 = \square \rightarrow \text{E}$	$1206 + 2057 = \square \rightarrow \text{N}$
$3796 + 4960 = \square \rightarrow \text{H}$	$1959 + 4198 = \square \rightarrow \text{A}$	$3662 + 5338 = \square \rightarrow \text{G}$
$678 + 1391 = \square \rightarrow \text{O}$	$3189 + 3478 = \square \rightarrow \text{P}$	$2853 + 2526 = \square \rightarrow \text{D}$
$1432 + 712 = \square \rightarrow \text{C}$	$3779 + 3195 = \square \rightarrow \text{S}$	$1469 + 1114 = \square \rightarrow \text{I}$
$2591 + 5337 = \square \rightarrow \text{R}$	$2962 + 3450 = \square \rightarrow \text{T}$	

Scratch space:

CLUE 3

Multiplication facts (1-12)

The solar array grid was organized into equal rows of solar panels waiting for inspection.

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

D					D						D						
24	15	2	15	121	24	15	99	49	12	15	24	12	96	99	11	70	15
											D						
2	14	66	99	15	96	11	70	14	84	121	24	96	88	15	77		

$8 \times 3 = \square \rightarrow \text{D}$

$6 \times 11 = \square \rightarrow \text{A}$

$12 \times 7 = \square \rightarrow \text{I}$

$7 \times 7 = \square \rightarrow \text{U}$

$7 \times 10 = \square \rightarrow \text{B}$

$1 \times 2 = \square \rightarrow \text{F}$

$8 \times 12 = \square \rightarrow \text{T}$

$5 \times 3 = \square \rightarrow \text{E}$

$8 \times 11 = \square \rightarrow \text{H}$

$11 \times 7 = \square \rightarrow \text{M}$

$11 \times 11 = \square \rightarrow \text{N}$

$11 \times 9 = \square \rightarrow \text{R}$

$11 \times 1 = \square \rightarrow \text{O}$

$6 \times 2 = \square \rightarrow \text{S}$

$7 \times 2 = \square \rightarrow \text{L}$

Scratch space:

CLUE 4 Skip counting

The security lights flashed in a steady repeating pattern down the launch corridor.

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

8 33 90 60 25 16 110 60 22 24 90 26 8 6 9

8 60 24 90 42 16 110 25 16 22 120 8 45 60 8 90 60 16

Skip-count by 2s. Fill the blank: 2, 4, 6, __, 10, 12 → **S**

Skip-count by 3s. Fill the blank: 3, 6, __, 12, 15 → **N**

Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, __, 45, 48 → **P**

Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, __, 36, 39 → **U**

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

Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, __, 50, 55 → **A**

Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, __, 130, 140 → **K**

Skip-count by 2s. Fill the blank: 2, 4, __, 8, 10 →

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

Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, 21, __, 27, 30 → **R**

Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, __, 18, 20 → **E**

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

Skip-count by 5s. Fill the blank: 5, 10, 15, 20, __, 30, 35 → **L**

Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, __, 100, 110

→

I

Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, __, 120, 130

→

F

Scratch space:

CLUE 5**Missing addends - the last clue**

The life support log recorded total energy units used, but one section was missing from the summary.

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:

$24 + \underline{\quad} = 36$

$15 + \underline{\quad} = 19$

$28 + \underline{\quad} = 35$

$18 + \underline{\quad} = 20$

$13 + \underline{\quad} = 24$

$4 + \underline{\quad} = 5$

$16 + \underline{\quad} = 24$

$10 + \underline{\quad} = 15$

$5 + \underline{\quad} = 11$

$5 + \underline{\quad} = 8$

$28 + \underline{\quad} = 38$

Step 2 - cross out the sentence with each answer:

1. The villain sped past the navigation deck, then trapped the robotic helper drone.
2. The villain sped past the navigation deck, then blocked the solar flare sensors.
3. The villain grabbed the heavy research container, then vanished from the radar display.
4. The villain sped past the navigation deck, then escaped into the dark asteroid belt.
5. The villain sped past the navigation deck, then vanished from the radar display.
6. The villain melted the main vault lock, then trapped the robotic helper drone.
7. The villain blasted the security grid, then blocked the solar flare sensors.
8. The villain grabbed the heavy research container, then blocked the solar flare sensors.
9. The villain sliced through the station bulkhead, then trapped the robotic helper drone.
10. The villain grabbed the heavy research container, then escaped into the dark asteroid belt.
11. The villain blasted the security grid, then escaped into the dark asteroid belt.
12. The villain sliced through the station bulkhead, then escaped into the dark asteroid belt.

Answer Key

The Cosmic Crystal Caper

Culprit: Mae Jemison

Laser Torch · Cargo Net · Right Handed · Crimson Stripe · Strobe Flare

Trail: Start 21 → Clue 1 16 → Clue 2 11 → Clue 3 5 → Clue 4 4 → Clue 5 1

Clue 1 (Place value): "THE SUSPECT DID NOT USE STEALTH CLOAK"

What is the value of the 1 in 61,556? = 1000 (T) · What is the value of the 1 in 778,516? = 10 (A) · What is the value of the 7 in 85,075? = 70 (H) · What is the value of the 3 in 13,476? = 3000 (L) · What is the value of the 7 in 339,741? = 700 (K) · What is the value of the 8 in 65,850? = 800 (C) · What is the value of the 9 in 39,671? = 9000 (U) · What is the value of the 8 in 56,384? = 80 (S) · What is the value of the 5 in 22,597? = 500 (O) · What is the value of the 8 in 698,013? = 8000 (E) · What is the value of the 5 in 15,749? = 5000 (D) · What is the value of the 1 in 74,144? = 100 (P) · What is the value of the 9 in 122,594? = 90 (I) · What is the value of the 4 in 97,841? = 40 (N)

Clue 2 (Addition): "WITNESS SAW RIGHT HANDED GRIP ON HATCH"

2282 + 2457 = 4739 (W) · 3308 + 6450 = 9758 (E) · 1206 + 2057 = 3263 (N) · 3796 + 4960 = 8756 (H) · 1959 + 4198 = 6157 (A) · 3662 + 5338 = 9000 (G) · 678 + 1391 = 2069 (O) · 3189 + 3478 = 6667 (P) · 2853 + 2526 = 5379 (D) · 1432 + 712 = 2144 (C) · 3779 + 3195 = 6974 (S) · 1469 + 1114 = 2583 (I) · 2591 + 5337 = 7928 (R) · 2962 + 3450 = 6412 (T)

Clue 3 (Multiplication facts (1-12)): "DEFENDER USED STROBE FLARE TO BLIND THEM"

8 × 3 = 24 (D) · 6 × 11 = 66 (A) · 12 × 7 = 84 (I) · 7 × 7 = 49 (U) · 7 × 10 = 70 (B) · 1 × 2 = 2 (F) · 8 × 12 = 96 (T) · 5 × 3 = 15 (E) · 8 × 11 = 88 (H) · 11 × 7 = 77 (M) · 11 × 11 = 121 (N) · 11 × 9 = 99 (R) · 11 × 1 = 11 (O) · 6 × 2 = 12 (S) · 7 × 2 = 14 (L)

Clue 4 (Skip counting): "SUIT LEFT CRIMSON STRIPE FLECKS AT SITE"

Skip-count by 2s. Fill the blank: 2, 4, 6, __, 10, 12 = 8 (S) · Skip-count by 3s. Fill the blank: 3, 6, __, 12, 15 = 9 (N) · Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, __, 45, 48 = 42 (P) · Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, __, 36, 39 = 33 (U) · Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, __, 28, 30 = 26 (M) · Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, __, 50, 55 = 45 (A) · Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, __, 130, 140 = 120 (K) · Skip-count by 2s. Fill the blank: 2, 4, __, 8, 10 = 6 (O) · Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, __, 24, 26 = 22 (C) · Skip-count by 3s. Fill the blank: 3, 6, 9, 12, 15, 18, 21, __, 27, 30 = 24 (R) · Skip-count by 2s. Fill the blank: 2, 4, 6, 8, 10, 12, 14, __, 18, 20 = 16 (E) · Skip-count by 5s. Fill the blank: 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, __, 65, 70 = 60 (T) · Skip-count by 5s. Fill the blank: 5, 10, 15, 20, __, 30, 35 = 25 (L) · Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, __, 100, 110 = 90 (I) · Skip-count by 10s. Fill the blank: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, __, 120, 130 = 110 (F)

Clue 5 (Missing addends): surviving statement is box 9 → Mae Jemison

24 + __ = 36 = 12 · 15 + __ = 19 = 4 · 28 + __ = 35 = 7 · 18 + __ = 20 = 2 · 13 + __ = 24 = 11 · 4 + __ = 5 = 1 · 16 + __ = 24 = 8 · 10 + __ = 15 = 5 · 5 + __ = 11 = 6 · 5 + __ = 8 = 3 · 28 + __ = 38 = 10