



The Cosmic Core Heist

Grade 7 math · Integers, Percentages, Order of operations, Exponents, Two-step equations · Reading level grades 5-6

Detective: _____ **Date:** _____

Alert! A rogue Space Thief has sneaked onto Nebula Station Nine and swiped the glowing Cosmic Core. Without it, the station's gravity will fail! Use your math skills to track down the thief before they escape into the asteroid belt.

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 Thief is _____

Possible suspects

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

NAME	JETPACK POWER	SUIT TOOL	VISOR TINT	HELMET STRIPE	GEAR GLITCH
John Glenn	Solar Glider	Laser Cutter	Gold Glow	Red Stripe	Gravity Leaks
Peggy Whitson	Gravity Anchor	Comms Jammer	Blue Glow	Silver Stripe	Gravity Leaks
Katherine Johnson	Magnetic Boots	Laser Cutter	Gold Glow	Red Stripe	Static Buzz
Mae Jemison	Quantum Warp	Cargo Grabber	Gold Glow	Red Stripe	Gravity Leaks
Michael Collins	Solar Glider	Cargo Grabber	Gold Glow	Red Stripe	Static Buzz
Helen Sharman	Solar Glider	Flare Launcher	Blue Glow	Green Stripe	Power Drains
Tim Peake	Quantum Warp	Flare Launcher	Blue Glow	Silver Stripe	Static Buzz
Chris Hadfield	Magnetic Boots	Comms Jammer	Blue Glow	Green Stripe	Static Buzz
Christina Koch	Ion Thruster	Laser Cutter	Gold Glow	Red Stripe	Static Buzz
Mark Watney	Solar Glider	Laser Cutter	Blue Glow	Red Stripe	Gravity Leaks
Guion Bluford	Magnetic Boots	Flare Launcher	Blue Glow	Red Stripe	Static Buzz
Franklin Chang-Diaz	Quantum Warp	Flare Launcher	Gold Glow	Red Stripe	Gravity Leaks
Yuri Gagarin	Magnetic Boots	Flare Launcher	Blue Glow	Green Stripe	Power Drains
Scott Kelly	Solar Glider	Comms Jammer	Blue Glow	Silver Stripe	Gravity Leaks
Sally Ride	Magnetic Boots	Net Shooter	Gold Glow	Red Stripe	Gravity Leaks
Ellen Ochoa	Solar Glider	Laser Cutter	Gold Glow	Silver Stripe	Gravity Leaks
Neil Armstrong	Quantum Warp	Comms Jammer	Gold Glow	Green Stripe	Static Buzz
Charles Bolden	Solar Glider	Comms Jammer	Blue Glow	Red Stripe	Gravity Leaks
Alan Shepard	Gravity Anchor	Cargo Grabber	Gold Glow	Red Stripe	Gravity Leaks
Buzz Aldrin	Gravity Anchor	Flare Launcher	Blue Glow	Green Stripe	Power Drains
Valentina Tereshkova	Solar Glider	Net Shooter	Gold Glow	Red Stripe	Power Drains

CLUE 1

The airlock sensors are tracking the suspect. The temperature outside keeps dropping deep into negative numbers. Solve this integer puzzle to lock onto their current quadrant!

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

$$16 - (-5) = \boxed{} \rightarrow \boxed{\text{T}}$$

$$16 - (-8) = \boxed{} \rightarrow \boxed{\text{N}}$$

$$(-11) + 15 = \boxed{} \rightarrow \boxed{\text{U}}$$

$$(-2) + 15 = \boxed{} \rightarrow \boxed{\text{L}}$$

$$(-6) + 21 = \boxed{} \rightarrow \boxed{\text{F}}$$

$$(-13) + 24 = \boxed{} \rightarrow \boxed{\text{R}}$$

$14 - (-15) = \boxed{} \rightarrow \boxed{\text{O}}$

$$(-12) + 15 = \boxed{} \rightarrow \boxed{\text{S}}$$

$$(-2) + 30 = \boxed{} \rightarrow \boxed{\text{C}}$$

$$16 - (-14) = \boxed{} \rightarrow \mathbf{A}$$

$$2 - (-3) = \boxed{} \rightarrow \boxed{\text{E}}$$

$$(-7) + 25 = \boxed{} \rightarrow \boxed{\mathbf{D}}$$

$$21 - (-1) = \boxed{} \rightarrow \boxed{\text{P}}$$

$$(-8) + 33 = \boxed{} \rightarrow \boxed{\text{H}}$$

Scratch space:

CLUE 2
Percentages

The emergency scanners are low on battery. We need to calculate the exact percentage of charge remaining to sweep the deck. Work out the percentage below to boot up the scanner!

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

T																		
53	32	2	49	16	4	2	52	16	29	52	2	49	15	52	54	2	54	16
					T													
22	52	1	26	32	53	26	15	20	54	26	20	15	50					

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

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

$20\% \text{ of } 145 = \square \rightarrow \boxed{\text{S}}$

$25\% \text{ of } 80 = \square \rightarrow \boxed{\text{L}}$

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

$10\% \text{ of } 490 = \square \rightarrow \boxed{\text{C}}$

$40\% \text{ of } 40 = \square \rightarrow \boxed{\text{A}}$

$25\% \text{ of } 208 = \square \rightarrow \boxed{\text{R}}$

$40\% \text{ of } 65 = \square \rightarrow \boxed{\text{G}}$

$10\% \text{ of } 10 = \square \rightarrow \boxed{\text{I}}$

$20\% \text{ of } 75 = \square \rightarrow \boxed{\text{O}}$

$40\% \text{ of } 5 = \square \rightarrow \boxed{\text{E}}$

$5\% \text{ of } 640 = \square \rightarrow \boxed{\text{H}}$

$5\% \text{ of } 440 = \square \rightarrow \boxed{\text{B}}$

$40\% \text{ of } 10 = \square \rightarrow \boxed{\text{M}}$

Scratch space:

CLUE 3

Order of operations

To unlock the suspect's flight path, we must boot the mainframe computer. You need to calculate the fuel sequence in the correct mathematical order. Solve this expression to get the code!

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

T									T				T		
46	50	43	62	10	62	90	43	47	46	30	43	105	46		
				T						T					
105	30	25	35	46	18	57	108	67	10	62	46	105	61	25	58
30	43	35	96	62											

$22 + 3 \times 8 = \square \rightarrow \boxed{\text{T}}$

$13 + 7 \times 7 = \square \rightarrow \boxed{\text{S}}$

$6 \times 9 - 4 = \square \rightarrow \boxed{\text{H}}$

$12 \times 11 - 24 = \square \rightarrow \boxed{\text{G}}$

$11 \times 6 - 23 = \square \rightarrow \boxed{\text{E}}$

$23 + 6 \times 4 = \square \rightarrow \boxed{\text{C}}$

$11 \times 10 - 20 = \square \rightarrow \boxed{\text{P}}$

$6 + 3 \times 4 = \square \rightarrow \boxed{\text{I}}$

$11 \times 8 - 30 = \square \rightarrow \boxed{\text{M}}$

$6 \times 7 - 12 = \square \rightarrow \boxed{\text{L}}$

$7 \times 11 - 20 = \square \rightarrow \boxed{\text{N}}$

$41 + 8 \times 8 = \square \rightarrow \boxed{\text{F}}$

$8 \times 11 - 27 = \square \rightarrow \boxed{\text{R}}$

$7 \times 2 - 4 = \square \rightarrow \boxed{\text{U}}$

$10 \times 12 - 24 = \square \rightarrow \boxed{\text{K}}$

$9 \times 8 - 5 = \square \rightarrow \boxed{\text{D}}$

$8 \times 7 - 21 = \square \rightarrow \boxed{\text{A}}$

$17 + 2 \times 4 = \square \rightarrow \boxed{\text{O}}$

Scratch space:

CLUE 4 Exponents

The escape pod's tracking signal is multiplying fast. The signal strength grows exponentially with each passing second. Solve this exponent problem to track the beacon!

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

A				A											
343	196	256	4	343	243	121	49	400	225	16	121	216	49	49	4

				A									
36	121	27	225	343	4	121	216	196	225	4	144	243	121

$7^3 = \square \rightarrow \mathbf{A}$	$2^4 = \square \rightarrow \mathbf{H}$	$6^2 = \square \rightarrow \mathbf{L}$	$11^2 = \square \rightarrow \mathbf{E}$
$3^3 = \square \rightarrow \mathbf{F}$	$14^2 = \square \rightarrow \mathbf{S}$	$4^4 = \square \rightarrow \mathbf{C}$	$6^3 = \square \rightarrow \mathbf{D}$
$3^5 = \square \rightarrow \mathbf{P}$	$2^2 = \square \rightarrow \mathbf{R}$	$20^2 = \square \rightarrow \mathbf{N}$	$7^2 = \square \rightarrow \mathbf{O}$
$15^2 = \square \rightarrow \mathbf{T}$	$12^2 = \square \rightarrow \mathbf{I}$		

Scratch space:

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

The cargo tram has a starting weight plus a steady stream of minerals being loaded. Solve this two-step equation to find the mystery weight and catch the runner!

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:

$2x + 1 = 23, x = \boxed{}$

$2x + 1 = 13, x = \boxed{}$

$4x + 7 = 11, x = \boxed{}$

$3x + 3 = 30, x = \boxed{}$

$2x + 11 = 25, x = \boxed{}$

$4x + 10 = 58, x = \boxed{}$

$4x + 6 = 26, x = \boxed{}$

$4x + 4 = 44, x = \boxed{}$

$4x + 5 = 37, x = \boxed{}$

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

$5x + 3 = 13, x = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain locked the gravity anchor, then extended the cargo grabber.
2. The villain fired up the ion thruster, then fired up the laser cutter.
3. The villain engaged the magnetic boots, then launched the net shooter.
4. The villain fired up the ion thruster, then extended the cargo grabber.
5. The villain engaged the magnetic boots, then fired up the laser cutter.
6. The villain deployed the solar glider, then fired up the laser cutter.
7. The villain activated the quantum warp, then turned on the comms jammer.
8. The villain engaged the magnetic boots, then extended the cargo grabber.
9. The villain locked the gravity anchor, then triggered the flare launcher.
10. The villain locked the gravity anchor, then launched the net shooter.
11. The villain activated the quantum warp, then extended the cargo grabber.
12. The villain deployed the solar glider, then launched the net shooter.

Answer Key

The Cosmic Core Heist

Culprit: Sally Ride

Magnetic Boots · Net Shooter · Gold Glow · Red Stripe · Gravity Leaks

Trail: Start 21 → Clue 1 15 → Clue 2 10 → Clue 3 5 → Clue 4 4 → Clue 5 1

Clue 1 (Integers): "THE SUSPECT DOES NOT USE A FLARE LAUNCHER"

$16 - (-5) = 21$ (T) · $16 - (-8) = 24$ (N) · $(-11) + 15 = 4$ (U) · $(-2) + 15 = 13$ (L) · $(-6) + 21 = 15$ (F) · $(-13) + 24 = 11$ (R) · $14 - (-15) = 29$ (O) · $(-12) + 15 = 3$ (S) · $(-2) + 30 = 28$ (C) · $16 - (-14) = 30$ (A) · $2 - (-3) = 5$ (E) · $(-7) + 25 = 18$ (D) · $21 - (-1) = 22$ (P) · $(-8) + 33 = 25$ (H)

Clue 2 (Percentages): "THE CAMERAS RECORDED A BRIGHT GOLD GLOW"

50% of 106 = 53 (T) · 10% of 540 = 54 (D) · 20% of 145 = 29 (S) · 25% of 80 = 20 (L) · 25% of 200 = 50 (W) · 10% of 490 = 49 (C) · 40% of 40 = 16 (A) · 25% of 208 = 52 (R) · 40% of 65 = 26 (G) · 10% of 10 = 1 (I) · 20% of 75 = 15 (O) · 40% of 5 = 2 (E) · 5% of 640 = 32 (H) · 5% of 440 = 22 (B) · 40% of 10 = 4 (M)

Clue 3 (Order of operations): "THE SUSPECT LEFT FLOATING DUST FROM LEAKS"

$22 + 3 \times 8 = 46$ (T) · $13 + 7 \times 7 = 62$ (S) · $6 \times 9 - 4 = 50$ (H) · $12 \times 11 - 24 = 108$ (G) · $11 \times 6 - 23 = 43$ (E) · $23 + 6 \times 4 = 47$ (C) · $11 \times 10 - 20 = 90$ (P) · $6 + 3 \times 4 = 18$ (I) · $11 \times 8 - 30 = 58$ (M) · $6 \times 7 - 12 = 30$ (L) · $7 \times 11 - 20 = 57$ (N) · $41 + 8 \times 8 = 105$ (F) · $8 \times 11 - 27 = 61$ (R) · $7 \times 2 - 4 = 10$ (U) · $10 \times 12 - 24 = 96$ (K) · $9 \times 8 - 5 = 67$ (D) · $8 \times 7 - 21 = 35$ (A) · $17 + 2 \times 4 = 25$ (O)

Clue 4 (Exponents): "A SCRAPE ON THE DOOR LEFT A RED STRIPE"

$7^3 = 343$ (A) · $2^4 = 16$ (H) · $6^2 = 36$ (L) · $11^2 = 121$ (E) · $3^3 = 27$ (F) · $14^2 = 196$ (S) · $4^4 = 256$ (C) · $6^3 = 216$ (D) · $3^5 = 243$ (P) · $2^2 = 4$ (R) · $20^2 = 400$ (N) · $7^2 = 49$ (O) · $15^2 = 225$ (T) · $12^2 = 144$ (I)

Clue 5 (Two-step equations): surviving statement is box 3 → Sally Ride

$2x + 1 = 23, x = 11$ · $2x + 1 = 13, x = 6$ · $4x + 7 = 11, x = 1$ · $3x + 3 = 30, x = 9$ · $2x + 11 = 25, x = 7$ · $4x + 10 = 58, x = 12$ · $4x + 6 = 26, x = 5$ · $4x + 4 = 44, x = 10$ · $4x + 5 = 37, x = 8$ · $3x + 11 = 23, x = 4$ · $5x + 3 = 13, x = 2$