The Telescope Trouble on Star Base Alpha

Grade 6 math · Place value, Percentages, Exponents, Order of operations, Division · Reading level grades 3-4

Detective: _____ **Date:** _____

Someone scrambled the coordinates on the giant space telescope. Now the Chief Astronomer cannot find the new planet! We must track down the Cosmic Saboteur before they hide in 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 Cosmic Saboteur is _____

Possible suspects

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

NAME	SPACE GEAR	BACKPACK TOOL	HANDEDNESS	HELMET HIGHLIGHT	SYSTEM GLITCH
Kalpana Chawla	energy shield	starlight cloak	left-handed writer	bright blue hair	magnetic fields
Edwin Hubble	jetpack wings	cosmic magnet	left-handed writer	neon green hair	solar flares
Chris Hadfield	energy shield	nebula dust	right-handed writer	neon green hair	magnetic fields
Carl Sagan	jetpack wings	starlight cloak	right-handed writer	bright blue hair	cosmic dust clouds
Valentina Tereshkova	gravity boots	gravity disruptor	left-handed writer	cosmic purple hair	magnetic fields
Guion Bluford	radar helmet	plasma torch	right-handed writer	cosmic purple hair	cosmic dust clouds
Neil Armstrong	jetpack wings	gravity disruptor	right-handed writer	neon green hair	magnetic fields
Katherine Johnson	gravity boots	starlight cloak	right-handed writer	bright blue hair	magnetic fields
Peggy Whitson	radar helmet	nebula dust	right-handed writer	neon green hair	magnetic fields
Alan Shepard	gravity boots	nebula dust	right-handed writer	bright blue hair	magnetic fields
Vera Rubin	gravity boots	nebula dust	left-handed writer	bright blue hair	magnetic fields
Ellen Ochoa	laser blaster	cosmic magnet	right-handed writer	cosmic purple hair	solar flares
Mae Jemison	energy shield	starlight cloak	left-handed writer	neon green hair	solar flares
Isaac Asimov	jetpack wings	cosmic magnet	right-handed writer	neon green hair	cosmic dust clouds
Stephen Hawking	gravity boots	gravity disruptor	right-handed writer	bright blue hair	magnetic fields
John Glenn	gravity boots	plasma torch	right-handed writer	cosmic purple hair	cosmic dust clouds
Yuri Gagarin	gravity boots	starlight cloak	right-handed writer	bright blue hair	solar flares
Franklin Chang	radar helmet	plasma torch	right-handed writer	cosmic purple hair	solar flares
Sally Ride	laser blaster	starlight cloak	right-handed writer	cosmic purple hair	magnetic fields
Buzz Aldrin	laser blaster	nebula dust	right-handed writer	bright blue hair	magnetic fields
Arthur Clarke	gravity boots	cosmic magnet	right-handed writer	bright blue hair	magnetic fields

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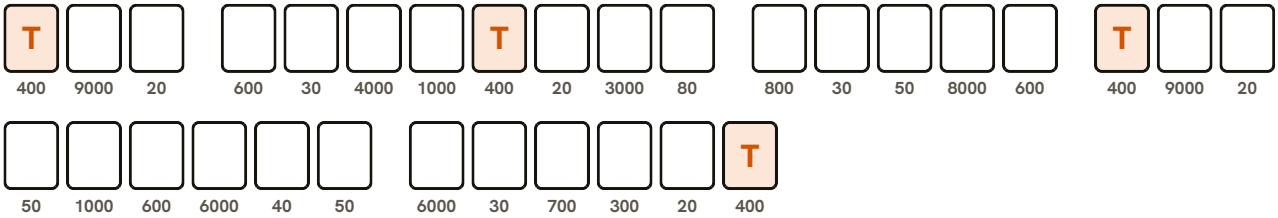
CLUE 1 Place value

We found a weird signal on the main screen. The numbers are scrambled by their place values.

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



What is the value of the 4 in 51,457? ☐ → T

What is the value of the 3 in 522,376? ☐ → N

What is the value of the 6 in 16,544? ☐ → M

What is the value of the 3 in 483,469? ☐ → U

What is the value of the 9 in 89,271? ☐ → H

What is the value of the 8 in 99,684? ☐ → R

What is the value of the 8 in 58,703? ☐ → K

What is the value of the 2 in 843,829? ☐ → E

What is the value of the 3 in 18,538? ☐ → A

What is the value of the 6 in 97,632? ☐ → S

What is the value of the 5 in 767,053? ☐ → C

What is the value of the 4 in 24,096? ☐ → B

What is the value of the 8 in 355,801? ☐ → L

What is the value of the 4 in 37,345? ☐ → I

What is the value of the 7 in 685,708? ☐ → G

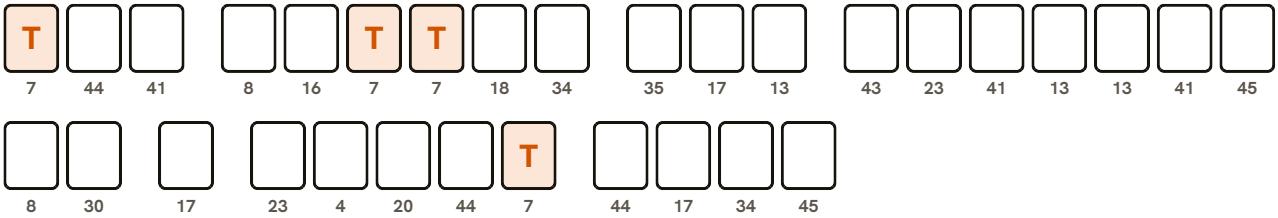
What is the value of the 1 in 321,896? ☐ → O

Scratch space:

CLUE 2 Percentages

The rocket ship fuel tank is almost empty. The dial shows the remaining power as a percentage.

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



10% of 70 = ☐ → T

10% of 130 = ☐ → S

10% of 230 = ☐ → R

40% of 20 = ☐ → B

60% of 75 = ☐ → D

20% of 150 = ☐ → Y

10% of 440 = ☐ → H

10% of 340 = ☐ → N

25% of 140 = ☐ → W

75% of 24 = ☐ → O

20% of 85 = ☐ → A

25% of 16 = ☐ → I

50% of 32 = ☐ → U

50% of 82 = ☐ → E

25% of 80 = ☐ → G

25% of 172 = ☐ → P

Scratch space:

CLUE 3 Exponents

A cluster of space dust is growing fast. The radar counts the dust particles using exponents.

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

2^6 = ☐ → M

7^3 = ☐ → I

18^2 = ☐ → E

3^2 = ☐ → O

4^2 = ☐ → H

19^2 = ☐ → D

2^7 = ☐ → F

11^2 = ☐ → T

12^2 = ☐ → S

17^2 = ☐ → C

5^2 = ☐ → G

2^8 = ☐ → A

20^2 = ☐ → N

2^2 = ☐ → L

6^2 = ☐ → U

6^3 = ☐ → R

3^3 = ☐ → W

Scratch space:

CLUE 4 Order of operations

We must press the override buttons in a special order. We have to solve the equation using order of operations.

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

A															A								
50	41	23	68	24	26	57	41	58	47	65	44	57	23	50	73	29							
	A						A																
76	50	44	68	73	57	26	65	80	50	38													

14 + 9 × 4 = ☐ → A

11 + 6 × 2 = ☐ → R

6 + 3 × 6 = ☐ → G

8 + 3 × 7 = ☐ → D

7 × 10 - 2 = ☐ → I

20 + 3 × 2 = ☐ → H

14 + 3 × 9 = ☐ → B

11 × 5 - 17 = ☐ → P

12 × 7 - 11 = ☐ → N

5 × 12 - 2 = ☐ → L

10 × 7 - 26 = ☐ → S

28 + 8 × 6 = ☐ → W

47 + 2 × 5 = ☐ → T

29 + 6 × 6 = ☐ → E

32 + 8 × 6 = ☐ → C

29 + 3 × 6 = ☐ → U

Scratch space:

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

> We have a pack of space snacks to share. We need to divide them up among the crew to get our energy back.

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:

60 ÷ 10 = ☐	80 ÷ 8 = ☐	16 ÷ 2 = ☐	14 ÷ 2 = ☐	24 ÷ 12 = ☐
36 ÷ 12 = ☐	12 ÷ 3 = ☐	36 ÷ 3 = ☐	81 ÷ 9 = ☐	12 ÷ 12 = ☐
22 ÷ 2 = ☐				

Step 2 - cross out the sentence with each answer:

1. The villain scans the area with a radar helmet, then blinds the cameras with nebula dust.
2. The villain scans the area with a radar helmet, then floats the cargo using a gravity disruptor.
3. The villain flies past with jetpack wings, then blinds the cameras with nebula dust.
4. The villain zaps the console with a laser blaster, then cuts through the lock with a plasma torch.
5. The villain zaps the console with a laser blaster, then blinds the cameras with nebula dust.
6. The villain clomps around in gravity boots, then vanishes under a starlight cloak.
7. The villain clomps around in gravity boots, then steals the tools with a cosmic magnet.
8. The villain clomps around in gravity boots, then floats the cargo using a gravity disruptor.
9. The villain scans the area with a radar helmet, then vanishes under a starlight cloak.
10. The villain clomps around in gravity boots, then blinds the cameras with nebula dust.
11. The villain blocks the doorway with an energy shield, then floats the cargo using a gravity disruptor.
12. The villain flies past with jetpack wings, then steals the tools with a cosmic magnet.

TEACHER / PARENT

Answer Key

The Telescope Trouble on Star Base Alpha

Culprit: Buzz Aldrin

laser blaster · nebula dust · right-handed writer · bright blue hair · magnetic fields

Trail: Start 21 → Clue 1 17 → Clue 2 13 → Clue 3 8 → Clue 4 4 → Clue 5 1

Clue 1 (Place value): "THE SABOTEUR LACKS THE COSMIC MAGNET"

What is the value of the 4 in 51,457? = 400 (T) · What is the value of the 3 in 522,376? = 300 (N) · What is the value of the 6 in 16,544? = 6000 (M) · What is the value of the 3 in 483,469? = 3000 (U) · What is the value of the 9 in 89,271? = 9000 (H) · What is the value of the 8 in 99,684? = 80 (R) · What is the value of the 8 in 58,703? = 8000 (K) · What is the value of the 2 in 843,829? = 20 (E) · What is the value of the 3 in 18,538? = 30 (A) · What is the value of the 6 in 97,632? = 600 (S) · What is the value of the 5 in 767,053? = 50 (C) · What is the value of the 4 in 24,096? = 4000 (B) · What is the value of the 8 in 355,801? = 800 (L) · What is the value of the 4 in 37,345? = 40 (I) · What is the value of the 7 in 685,708? = 700 (G) · What is the value of the 1 in 321,896? = 1000 (O)

Clue 2 (Percentages): "THE BUTTON WAS PRESSED BY A RIGHT HAND"

10% of 70 = 7 (T) · 10% of 130 = 13 (S) · 10% of 230 = 23 (R) · 40% of 20 = 8 (B) · 60% of 75 = 45 (D) · 20% of 150 = 30 (Y) · 10% of 440 = 44 (H) · 10% of 340 = 34 (N) · 25% of 140 = 35 (W) · 75% of 24 = 18 (O) · 20% of 85 = 17 (A) · 25% of 16 = 4 (I) · 50% of 32 = 16 (U) · 50% of 82 = 41 (E) · 25% of 80 = 20 (G) · 25% of 172 = 43 (P)

Clue 3 (Exponents): "MAGNETIC FIELDS SHUT DOWN THEIR GEAR"

2^6 = 64 (M) · 7^3 = 343 (I) · 18^2 = 324 (E) · 3^2 = 9 (O) · 4^2 = 16 (H) · 19^2 = 361 (D) · 2^7 = 128 (F) · 11^2 = 121 (T) · 12^2 = 144 (S) · 17^2 = 289 (C) · 5^2 = 25 (G) · 2^8 = 256 (A) · 20^2 = 400 (N) · 2^2 = 4 (L) · 6^2 = 36 (U) · 6^3 = 216 (R) · 3^3 = 27 (W)

Clue 4 (Order of operations): "A BRIGHT BLUE STRAND WAS IN THE CAP"

14 + 9 × 4 = 50 (A) · 11 + 6 × 2 = 23 (R) · 6 + 3 × 6 = 24 (G) · 8 + 3 × 7 = 29 (D) · 7 × 10 - 2 = 68 (I) · 20 + 3 × 2 = 26 (H) · 14 + 3 × 9 = 41 (B) · 11 × 5 - 17 = 38 (P) · 12 × 7 - 11 = 73 (N) · 5 × 12 - 2 = 58 (L) · 10 × 7 - 26 = 44 (S) · 28 + 8 × 6 = 76 (W) · 47 + 2 × 5 = 57 (T) · 29 + 6 × 6 = 65 (E) · 32 + 8 × 6 = 80 (C) · 29 + 3 × 6 = 47 (U)

Clue 5 (Division facts (1-12)): surviving statement is box 5 → Buzz Aldrin

60 ÷ 10 = 6 · 80 ÷ 8 = 10 · 16 ÷ 2 = 8 · 14 ÷ 2 = 7 · 24 ÷ 12 = 2 · 36 ÷ 12 = 3 · 12 ÷ 3 = 4 · 36 ÷ 3 = 12 · 81 ÷ 9 = 9 · 12 ÷ 12 = 1 · 22 ÷ 2 = 11