



# The Starlight Station Sabotage

Grade 4 math · Addition, Subtraction, Multiplication, Fractions of a number, Division · Reading level grades 5-6

Detective: \_\_\_\_\_ Date: \_\_\_\_\_

A rogue astronaut has locked down the main observatory at Starlight Station and scrambled the colony star-charts. We must trace the culprit's energy signature across the sector before our fleet goes off course!

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 astronaut is** \_\_\_\_\_

## Possible suspects

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

| NAME                 | THRUSTER SUIT | PRIMARY TOOL  | CONTROL GRIP      | HELMET STRIPE | SUIT VULNERABILITY |
|----------------------|---------------|---------------|-------------------|---------------|--------------------|
| Roger Chaffee        | Plasma Jet    | Plasma Torch  | Left-Handed Grip  | Green Stripe  | Solar Flares       |
| Sunita Williams      | Plasma Jet    | Plasma Torch  | Left-Handed Grip  | Blue Stripe   | Magnet Dust        |
| Buzz Aldrin          | Gravity Boots | Hydro Spanner | Right-Handed Grip | Blue Stripe   | Magnet Dust        |
| Alan Shepard         | Plasma Jet    | Hydro Spanner | Left-Handed Grip  | Blue Stripe   | Frost Gas          |
| Chris Hadfield       | Gravity Boots | Hydro Spanner | Left-Handed Grip  | Red Stripe    | Solar Flares       |
| Scott Kelly          | Ion Engine    | Laser Welder  | Right-Handed Grip | Blue Stripe   | Magnet Dust        |
| Mae Jemison          | Fusion Pack   | Plasma Torch  | Left-Handed Grip  | Blue Stripe   | Magnet Dust        |
| Frank Borman         | Plasma Jet    | Laser Welder  | Left-Handed Grip  | Blue Stripe   | Magnet Dust        |
| Fred Haise           | Solar Sail    | Laser Welder  | Left-Handed Grip  | Red Stripe    | Magnet Dust        |
| Peggy Whitson        | Solar Sail    | Sonic Cutter  | Left-Handed Grip  | Blue Stripe   | Magnet Dust        |
| Mark Kelly           | Fusion Pack   | Hydro Spanner | Right-Handed Grip | Blue Stripe   | Magnet Dust        |
| Tim Peake            | Plasma Jet    | Sonic Cutter  | Left-Handed Grip  | Red Stripe    | Frost Gas          |
| Kalpana Chawla       | Ion Engine    | Laser Welder  | Left-Handed Grip  | Red Stripe    | Frost Gas          |
| Sally Ride           | Ion Engine    | Laser Welder  | Left-Handed Grip  | Blue Stripe   | Magnet Dust        |
| Gene Cernan          | Solar Sail    | Laser Welder  | Right-Handed Grip | Green Stripe  | Solar Flares       |
| Guion Bluford        | Ion Engine    | Hydro Spanner | Right-Handed Grip | Blue Stripe   | Magnet Dust        |
| Helen Sharman        | Fusion Pack   | Hydro Spanner | Left-Handed Grip  | Red Stripe    | Solar Flares       |
| Valentina Tereshkova | Ion Engine    | Nano Wrench   | Right-Handed Grip | Red Stripe    | Magnet Dust        |
| Jim Lovell           | Ion Engine    | Hydro Spanner | Right-Handed Grip | Red Stripe    | Magnet Dust        |
| Ed White             | Gravity Boots | Laser Welder  | Right-Handed Grip | Green Stripe  | Solar Flares       |
| Michael Collins      | Ion Engine    | Sonic Cutter  | Left-Handed Grip  | Green Stripe  | Solar Flares       |

**CLUE 1** Addition

To unlock the dock archives, we must calculate the total number of active radar satellites by adding up the tallies from all four space sectors.

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

Diagram showing three rows of boxes representing a 3x12 grid. The boxes are labeled with numbers. The top row has 12 boxes, the middle row has 12 boxes, and the bottom row has 6 boxes. The boxes are labeled with numbers: 8125, 4809, 8975, 4832, 6701, 6751, 2341, 8975, 4393, 9502, 8125, 4832, 6701, 8998, 4393, 2341, 8125, 9760, 6701, 8975, 9502, 8998, 6701, 8125, 2341, 9502, 8975, 8125, 4809, 8975, 9502, 6701, 8998, 8258, 8131, 8131, 2341, 8125, 8125, 8975, 4832. The boxes with the number 8125 are highlighted in orange.

$$4157 + 3968 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{T}}$$

$$986 + 1355 = \boxed{\phantom{000}} \rightarrow \boxed{\text{U}}$$

$$3847 + 4411 = \boxed{\phantom{0000}} \rightarrow \boxed{\phantom{0000}}$$

$$3313 + 1496 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{H}}$$

$$5067 + 3931 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{N}}$$

$$3290 + 6212 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{S}}$$

$$5856 + 3904 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{D}}$$

$$2635 + 2197 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{R}}$$

$$3840 + 2911 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{G}}$$

$2799 + 6176 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{E}}$

$3095 + 5036 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{C}}$

$$3397 + 3304 = \boxed{\phantom{0000}} \rightarrow \boxed{0}$$

$$1364 + 3029 = \boxed{\phantom{0000}} \rightarrow \boxed{\mathbf{A}}$$

Scratch space:

## CLUE 2 Subtraction

A damaged utility line is leaking fuel. We must subtract the wasted canisters from our total reserves to see how long our backup sensors will last.

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

|                              |                             |                             |                             |                             |                             |                             |                             |                             |                              |                             |                             |                              |                             |                             |                             |                             |                             |                              |
|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|
| <div>T</div> <div>7753</div> | <div></div> <div>8818</div> | <div></div> <div>3717</div> | <div></div> <div>7764</div> | <div></div> <div>2514</div> | <div></div> <div>7764</div> | <div></div> <div>3193</div> | <div></div> <div>3717</div> | <div></div> <div>3127</div> | <div>T</div> <div>7753</div> | <div></div> <div>2514</div> | <div></div> <div>7764</div> | <div></div> <div>3717</div>  | <div></div> <div>8209</div> | <div></div> <div>4150</div> | <div></div> <div>5897</div> | <div></div> <div>3717</div> | <div></div> <div>5184</div> | <div>T</div> <div>7753</div> |
| <div></div> <div>8818</div>  | <div></div> <div>4150</div> | <div></div> <div>6051</div> | <div></div> <div>8209</div> | <div></div> <div>3717</div> | <div></div> <div>8209</div> | <div></div> <div>5753</div> | <div></div> <div>3580</div> | <div></div> <div>3028</div> | <div></div> <div>3193</div>  | <div></div> <div>1591</div> | <div></div> <div>6051</div> | <div>T</div> <div>7753</div> | <div></div> <div>8818</div> | <div></div> <div>3717</div> |                             |                             |                             |                              |
| <div></div> <div>5897</div>  | <div></div> <div>3717</div> | <div></div> <div>3482</div> | <div></div> <div>3717</div> | <div></div> <div>3580</div> |                             |                             |                             |                             |                              |                             |                             |                              |                             |                             |                             |                             |                             |                              |

$$12677 - 4924 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{T}}$$

$$12513 - 4304 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{D}}$$

$$12111 - 4347 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{S}}$$

$$5523 - 1806 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{E}}$$

$$10030 - 4133 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{L}}$$

$$7572 - 3422 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{A}}$$

$$3499 - 306 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{P}}$$

$$6216 - 3702 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{U}}$$

$$4858 - 1731 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{C}}$$

$$11657 - 2839 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{H}}$$

$$5670 - 2642 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{I}}$$

$$6820 - 769 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{N}}$$

$$4413 - 833 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{R}}$$

$$8135 - 2382 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{G}}$$

$$4227 - 2636 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{O}}$$

$$5411 - 227 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{F}}$$

$$6582 - 3100 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{V}}$$

Scratch space:

**CLUE 3**
**Multiplication facts (1-12)**

The shuttle hangar holds our emergency tracking probes, neatly arranged in rows. We must multiply the rows by the columns to count our cameras.

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

|    |    |    |    |    |     |   |    |     |     |     |    |     |    |    |    |    |  |
|----|----|----|----|----|-----|---|----|-----|-----|-----|----|-----|----|----|----|----|--|
| M  |    |    |    |    |     |   |    |     |     |     |    |     |    |    |    |    |  |
| 32 | 80 | 77 | 12 | 33 | 110 | 7 | 90 | 121 | 110 | 110 | 16 | 110 | 80 | 88 | 88 | 54 |  |

  

|    |    |    |    |    |   |     |    |    |    |    |    |    |    |    |    |  |
|----|----|----|----|----|---|-----|----|----|----|----|----|----|----|----|----|--|
|    |    | M  | M  |    |   |     |    |    |    |    |    |    |    |    |    |  |
| 44 | 80 | 32 | 32 | 33 | 7 | 110 | 20 | 33 | 63 | 35 | 88 | 88 | 80 | 35 | 12 |  |

|                                               |                                              |                                               |
|-----------------------------------------------|----------------------------------------------|-----------------------------------------------|
| $8 \times 4 = \square \rightarrow$ <b>M</b>   | $3 \times 11 = \square \rightarrow$ <b>E</b> | $11 \times 11 = \square \rightarrow$ <b>S</b> |
| $7 \times 5 = \square \rightarrow$ <b>I</b>   | $9 \times 10 = \square \rightarrow$ <b>U</b> | $10 \times 2 = \square \rightarrow$ <b>H</b>  |
| $11 \times 8 = \square \rightarrow$ <b>L</b>  | $11 \times 7 = \square \rightarrow$ <b>G</b> | $9 \times 7 = \square \rightarrow$ <b>V</b>   |
| $1 \times 7 = \square \rightarrow$ <b>D</b>   | $11 \times 4 = \square \rightarrow$ <b>J</b> | $3 \times 4 = \square \rightarrow$ <b>N</b>   |
| $10 \times 11 = \square \rightarrow$ <b>T</b> | $8 \times 2 = \square \rightarrow$ <b>O</b>  | $8 \times 10 = \square \rightarrow$ <b>A</b>  |
| $9 \times 6 = \square \rightarrow$ <b>Y</b>   |                                              |                                               |

Scratch space:

## CLUE 4

## Fractions of a number

Only a fraction of our giant solar array is active after the power surge. We must find exactly three-fifths of the total output to reboot the main terminal.

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

Diagram illustrating a sequence of numbers and positions:

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|----|----|
| T  |    |    |    |    |    |    |    |    |    |    | T  |    |    | T |    |    |
| 6  | 12 | 17 | 20 | 17 | 15 | 20 | 36 | 39 | 14 | 17 | 6  | 17 | 37 | 6 | 17 | 14 |
|    |    |    |    |    |    |    |    | T  |    |    |    |    |    |   |    |    |
| 35 | 24 | 26 | 17 | 12 | 17 | 24 | 22 | 17 | 6  | 7  | 24 | 36 | 11 |   |    |    |

$$1/2 \text{ of } 12 = \boxed{\phantom{00}} \rightarrow \boxed{\mathbf{T}}$$

4/8 of 30 =  → **N**

$$\frac{1}{2} \text{ of } 78 = \boxed{\phantom{00}} \rightarrow \boxed{\text{R}}$$

$$2/10 \text{ of } 180 = \boxed{\phantom{00}} \rightarrow \boxed{\text{O}}$$

2/6 of 111 =  → **C**

$\frac{1}{4}$  of 88 =   $\rightarrow$  **M**

$$2/6 \text{ of } 21 = \boxed{\phantom{00}} \rightarrow \boxed{\text{G}}$$

$$\frac{1}{6} \text{ of } 156 = \boxed{\phantom{000}} \rightarrow \boxed{\text{U}}$$

$3/10$  of  $40 = \boxed{\phantom{000}} \rightarrow \mathbf{H}$

$$1/5 \text{ of } 175 = \boxed{\phantom{000}} \rightarrow \boxed{\mathbf{B}}$$

$$\frac{1}{4} \text{ of } 80 = \boxed{\phantom{00}} \rightarrow \boxed{\text{S}}$$

$$\frac{1}{6} \text{ of } 144 = \boxed{\phantom{000}} \rightarrow \boxed{\text{L}}$$

$4/6$  of 21 =   $\rightarrow$  **D**

2/6 of 33 =  → **W**

$$2/6 \text{ of } 51 = \boxed{\phantom{00}} \rightarrow \boxed{\text{E}}$$

Scratch space:

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

The cargo bay computer holds encrypted distress signals. We must divide the total data files equally among the patrol bots to crack the final code.

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:**

$30 \div 6 = \boxed{\phantom{00}}$

$108 \div 12 = \boxed{\phantom{00}}$

$30 \div 10 = \boxed{\phantom{00}}$

$10 \div 1 = \boxed{\phantom{00}}$

$12 \div 1 = \boxed{\phantom{00}}$

$88 \div 11 = \boxed{\phantom{00}}$

$12 \div 6 = \boxed{\phantom{00}}$

$66 \div 11 = \boxed{\phantom{00}}$

$8 \div 2 = \boxed{\phantom{00}}$

$21 \div 3 = \boxed{\phantom{00}}$

$4 \div 4 = \boxed{\phantom{00}}$

**Step 2 - cross out the sentence with each answer:**

1. The villain zoomed past the dock with a fusion pack, then welded the escape hatch shut.
2. The villain glided silently on a solar sail, then adjusted the sensor dishes.
3. The villain zoomed past the dock with a fusion pack, then melted the vault hinges.
4. The villain glided silently on a solar sail, then unscrewed the main computer core.
5. The villain burned through the lock with a plasma jet, then welded the escape hatch shut.
6. The villain leaped across the hull in gravity boots, then welded the escape hatch shut.
7. The villain burned through the lock with a plasma jet, then unscrewed the main computer core.
8. The villain glided silently on a solar sail, then welded the escape hatch shut.
9. The villain blasted off using an ion engine, then welded the escape hatch shut.
10. The villain leaped across the hull in gravity boots, then sliced the communication wires.
11. The villain burned through the lock with a plasma jet, then melted the vault hinges.
12. The villain zoomed past the dock with a fusion pack, then sliced the communication wires.

# Answer Key

## The Starlight Station Sabotage

### Culprit: Sunita Williams

Plasma Jet · Plasma Torch · Left-Handed Grip · Blue Stripe · Magnet Dust

Trail: Start 21 → Clue 1 18 → Clue 2 10 → Clue 3 5 → Clue 4 4 → Clue 5 1

#### Clue 1 (Addition): "THE ROGUE ASTRONAUT DOES NOT USE THE SONIC CUTTER"

$4157 + 3968 = 8125$  (T) ·  $986 + 1355 = 2341$  (U) ·  $3847 + 4411 = 8258$  (I) ·  $3313 + 1496 = 4809$  (H) ·  $5067 + 3931 = 8998$  (N) ·  $3290 + 6212 = 9502$  (S) ·  $5856 + 3904 = 9760$  (D) ·  $2635 + 2197 = 4832$  (R) ·  $3840 + 2911 = 6751$  (G) ·  $2799 + 6176 = 8975$  (E) ·  $3095 + 5036 = 8131$  (C) ·  $3397 + 3304 = 6701$  (O) ·  $1364 + 3029 = 4393$  (A)

#### Clue 2 (Subtraction): "THE SUSPECT USED A LEFT HANDED GRIP ON THE LEVER"

$12677 - 4924 = 7753$  (T) ·  $12513 - 4304 = 8209$  (D) ·  $12111 - 4347 = 7764$  (S) ·  $5523 - 1806 = 3717$  (E) ·  $10030 - 4133 = 5897$  (L) ·  $7572 - 3422 = 4150$  (A) ·  $3499 - 306 = 3193$  (P) ·  $6216 - 3702 = 2514$  (U) ·  $4858 - 1731 = 3127$  (C) ·  $11657 - 2839 = 8818$  (H) ·  $5670 - 2642 = 3028$  (I) ·  $6820 - 769 = 6051$  (N) ·  $4413 - 833 = 3580$  (R) ·  $8135 - 2382 = 5753$  (G) ·  $4227 - 2636 = 1591$  (O) ·  $5411 - 227 = 5184$  (F) ·  $6582 - 3100 = 3482$  (V)

#### Clue 3 (Multiplication facts (1-12)): "MAGNET DUST TOTALLY JAMMED THE VILLAIN"

$8 \times 4 = 32$  (M) ·  $3 \times 11 = 33$  (E) ·  $11 \times 11 = 121$  (S) ·  $7 \times 5 = 35$  (I) ·  $9 \times 10 = 90$  (U) ·  $10 \times 2 = 20$  (H) ·  $11 \times 8 = 88$  (L) ·  $11 \times 7 = 77$  (G) ·  $9 \times 7 = 63$  (V) ·  $1 \times 7 = 7$  (D) ·  $11 \times 4 = 44$  (J) ·  $3 \times 4 = 12$  (N) ·  $10 \times 11 = 110$  (T) ·  $8 \times 2 = 16$  (O) ·  $8 \times 10 = 80$  (A) ·  $9 \times 6 = 54$  (Y)

#### Clue 4 (Fractions of a number): "THE SENSOR DETECTED BLUE HELMET GLOW"

$\frac{1}{2}$  of 12 = 6 (T) ·  $\frac{4}{8}$  of 30 = 15 (N) ·  $\frac{1}{2}$  of 78 = 39 (R) ·  $\frac{2}{10}$  of 180 = 36 (O) ·  $\frac{2}{6}$  of 111 = 37 (C) ·  $\frac{1}{4}$  of 88 = 22 (M) ·  $\frac{2}{6}$  of 21 = 7 (G) ·  $\frac{1}{6}$  of 156 = 26 (U) ·  $\frac{3}{10}$  of 40 = 12 (H) ·  $\frac{1}{5}$  of 175 = 35 (B) ·  $\frac{1}{4}$  of 80 = 20 (S) ·  $\frac{1}{6}$  of 144 = 24 (L) ·  $\frac{4}{6}$  of 21 = 14 (D) ·  $\frac{2}{6}$  of 33 = 11 (W) ·  $\frac{2}{6}$  of 51 = 17 (E)

#### Clue 5 (Division facts (1-12)): surviving statement is box 11 → Sunita Williams

$30 \div 6 = 5$  ·  $108 \div 12 = 9$  ·  $30 \div 10 = 3$  ·  $10 \div 1 = 10$  ·  $12 \div 1 = 12$  ·  $88 \div 11 = 8$  ·  $12 \div 6 = 2$  ·  $66 \div 11 = 6$  ·  $8 \div 2 = 4$  ·  $21 \div 3 = 7$  ·  $4 \div 4 = 1$