



# The Saboteur of Stellar Outpost Nova

Grade 6 math · Place value, Percentages, Exponents, Order of operations, Division · Reading level grades 5-6

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

A sneaky space saboteur has hijacked the primary computer core of Stellar Outpost Nova! They scrambled the ship's docking codes and locked the life support controls. The Chief Commander needs your help to crack the security logs. Decode the clues left behind by the outpost's robotic sentries to identify the thief before they escape into deep space!

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 saboteur is** \_\_\_\_\_

## Possible suspects

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

| NAME              | MAIN SPACE TOOL    | EXTRA SPACE GEAR | TELEMETRY WATCH | SPACE SUIT HELMET | SYSTEM VULNERABILITY |
|-------------------|--------------------|------------------|-----------------|-------------------|----------------------|
| Edgar Mitchell    | Plasma Torch       | Stellar Map      | right wrist     | Gold Visor        | Strobe Lights        |
| Pete Conrad       | Gravity Boots      | Oxygen Tank      | right wrist     | Gold Visor        | Strobe Lights        |
| Kalpana Chawla    | Gravity Boots      | Oxygen Tank      | left wrist      | Gold Visor        | Strobe Lights        |
| Guion Bluford     | Hologram Projector | Radar Visor      | right wrist     | Silver Helmet     | Extreme Cold         |
| Mae Jemison       | Hologram Projector | Radar Visor      | left wrist      | Silver Helmet     | Magnetic Fields      |
| Jack Swigert      | Laser Welder       | Stellar Map      | left wrist      | Silver Helmet     | Magnetic Fields      |
| Carl Sagan        | Gravity Boots      | Oxygen Tank      | left wrist      | Silver Helmet     | Magnetic Fields      |
| Christa McAuliffe | Sonic Scanner      | Solar Shield     | right wrist     | Gold Visor        | Magnetic Fields      |
| Alan Shepard      | Laser Welder       | Stellar Map      | right wrist     | Gold Visor        | Magnetic Fields      |
| David Scott       | Hologram Projector | Oxygen Tank      | left wrist      | Silver Helmet     | Magnetic Fields      |
| Neil Armstrong    | Hologram Projector | Solar Shield     | right wrist     | Blue Hood         | Magnetic Fields      |
| Gherman Titov     | Plasma Torch       | Thrust Pack      | left wrist      | Silver Helmet     | Magnetic Fields      |
| Buzz Aldrin       | Laser Welder       | Radar Visor      | left wrist      | Blue Hood         | Magnetic Fields      |
| James Lovell      | Plasma Torch       | Solar Shield     | left wrist      | Silver Helmet     | Extreme Cold         |
| Yuri Gagarin      | Hologram Projector | Radar Visor      | right wrist     | Silver Helmet     | Magnetic Fields      |
| Chris Hadfield    | Sonic Scanner      | Stellar Map      | left wrist      | Silver Helmet     | Extreme Cold         |
| Sally Ride        | Plasma Torch       | Oxygen Tank      | right wrist     | Blue Hood         | Magnetic Fields      |
| James Irwin       | Sonic Scanner      | Thrust Pack      | left wrist      | Gold Visor        | Extreme Cold         |
| Michael Collins   | Hologram Projector | Oxygen Tank      | right wrist     | Silver Helmet     | Magnetic Fields      |
| Edwin Hubble      | Plasma Torch       | Thrust Pack      | left wrist      | Blue Hood         | Strobe Lights        |
| Fred Haise        | Laser Welder       | Thrust Pack      | right wrist     | Blue Hood         | Extreme Cold         |

## CLUE 1 Place value

Our security console flashed a giant coordinate number. Check the value of the hundreds place to decrypt this first log.

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

|      |      |      |      |      |      |    |      |      |      |      |      |      |      |      |      |    |      |   |
|------|------|------|------|------|------|----|------|------|------|------|------|------|------|------|------|----|------|---|
| T    |      |      |      |      |      |    |      | T    |      |      |      |      |      |      |      |    |      | T |
| 1000 | 10   | 5000 | 8000 | 9000 | 90   | 20 | 1000 | 5000 | 500  | 70   | 200  | 20   | 5000 | 8000 | 7000 | 20 | 1000 |   |
|      |      |      |      |      |      |    | T    |      |      |      |      |      |      |      |      |    | T    |   |
| 10   | 9000 | 60   | 5000 | 9000 | 1000 | 10 | 70   | 500  | 8000 | 1000 | 2000 | 9000 | 3000 | 800  |      |    |      |   |

What is the value of the 1 in 41,852?  → **T**

What is the value of the 1 in 48,815?  → **H**

What is the value of the 3 in 903,802?  → **C**

What is the value of the 6 in 73,561?  → **V**

What is the value of the 2 in 65,625?  → **O**

What is the value of the 9 in 89,512?  → **A**

What is the value of the 8 in 978,704?  → **S**

What is the value of the 2 in 62,403?  → **P**

What is the value of the 5 in 315,134?  → **E**

What is the value of the 9 in 372,092?  → **B**

What is the value of the 5 in 648,568?  → **U**

What is the value of the 8 in 744,847?  → **K**

What is the value of the 2 in 47,274?  → **D**

What is the value of the 7 in 59,376?  → **R**

What is the value of the 7 in 237,415?  → **N**

Scratch space:

## CLUE 2

The backup battery is draining quickly. Calculate the percentage of power remaining to unlock the security transmission.

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

Diagram illustrating a sequence of numbers arranged in two rows. The top row contains 15 boxes, and the bottom row contains 10 boxes. Some boxes are highlighted in orange and labeled 'T'.

Top row values (from left to right): 5, 22, 36, 5, 36, 18, 36, 25, 36, 5, 31, 19, 40, 34, 5, 44, 22, 40, 34, 3.

Bottom row values (from left to right): 3, 36, 36, 21, 20, 21, 5, 22, 36, 18, 36, 33, 5.

10% of 50 =  → **T**

50% of 6 =   $\rightarrow$  **S**

25% of 176 =  → **C**

75% of 24 =  → **L**

25% of 80 =  →

50% of 80 =  → **W**

50% of 68 =  → **A**

5% of 500 =  → **M**

20% of 155 =  → **R**

40% of 55 =  → **H**

60% of 60 =  → **E**

10% of 330 =  → **F**

20% of 95 =  → **Y**

20% of 105 =  → **N**

Scratch space:

## CLUE 3

## Exponents

The central computer core is multiplying its backup signals rapidly. Solve the exponential equation to reveal the suspect's helmet details.

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

|     |     |     |     |     |    |     |     |    |   |    |    |     |    |     |     |    |  |
|-----|-----|-----|-----|-----|----|-----|-----|----|---|----|----|-----|----|-----|-----|----|--|
| T   |     |     |     |     |    |     |     | T  |   |    |    |     |    |     |     |    |  |
| 128 | 243 | 121 | 144 | 196 | 64 | 196 | 128 | 36 | 4 | 8  | 16 | 64  |    |     |     |    |  |
|     |     |     |     |     |    |     |     |    |   |    |    |     |    |     |     | T  |  |
| 8   | 121 | 16  | 25  | 121 | 49 | 121 | 125 | 32 | 9 | 27 | 16 | 256 | 49 | 121 | 128 | 64 |  |

|                                |                               |                               |                                |
|--------------------------------|-------------------------------|-------------------------------|--------------------------------|
| $2^7 = \square \rightarrow$ T  | $3^2 = \square \rightarrow$ Y | $3^3 = \square \rightarrow$ M | $12^2 = \square \rightarrow$ V |
| $14^2 = \square \rightarrow$ I | $2^2 = \square \rightarrow$ R | $2^5 = \square \rightarrow$ B | $11^2 = \square \rightarrow$ E |
| $2^3 = \square \rightarrow$ W  | $4^4 = \square \rightarrow$ G | $5^3 = \square \rightarrow$ D | $5^2 = \square \rightarrow$ K  |
| $6^2 = \square \rightarrow$ O  | $7^2 = \square \rightarrow$ N | $3^5 = \square \rightarrow$ H | $4^3 = \square \rightarrow$ S  |
| $2^4 = \square \rightarrow$ A  |                               |                               |                                |

Scratch space:

## Order of operations

To trace the escape route through the asteroid field, we must follow a precise navigation path. Use the order of operations to find their weakness.

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

A number line from 0 to 100 with boxes for numbers. The number 16 is highlighted in orange and labeled 'S'. The number 50 is also labeled 'S'. The numbers 16, 50, and 66 are marked with dots on the line.

| Box | Number | Label |
|-----|--------|-------|
| 1   | 16     | S     |
| 2   | 23     |       |
| 3   | 32     |       |
| 4   | 72     |       |
| 5   | 49     |       |
| 6   | 66     |       |
| 7   | 9      |       |
| 8   | 64     |       |
| 9   | 66     |       |
| 10  | 62     |       |
| 11  | 23     |       |
| 12  | 55     |       |
| 13  | 32     |       |
| 14  | 49     |       |
| 15  | 16     | S     |
| 16  | 50     | S     |
| 17  | 49     |       |
| 18  | 66     |       |
| 19  | 49     |       |

$$8 + 2 \times 4 = \boxed{\phantom{00}} \rightarrow \boxed{\mathbf{S}}$$

$$18 + 2 \times 7 = \boxed{\phantom{00}} \rightarrow \boxed{\text{L}}$$

$$20 + 6 \times 5 = \boxed{\phantom{00}} \rightarrow \mathbf{W}$$

$$28 + 3 \times 7 = \boxed{\phantom{00}} \rightarrow \boxed{\mathbf{E}}$$

$$4 \times 6 - 1 = \boxed{\phantom{00}} \rightarrow \boxed{\text{I}}$$

$$46 + 7 \times 2 = \boxed{\phantom{00}} \rightarrow \boxed{\text{F}}$$

$1 + 4 \times 2 = \boxed{\phantom{00}} \rightarrow \boxed{\text{P}}$

$$20 + 2 \times 2 = \boxed{\phantom{00}} \rightarrow \boxed{\text{N}}$$

$$39 + 9 \times 3 = \boxed{\phantom{000}} \rightarrow \boxed{\text{R}}$$

$$7 \times 11 - 5 = \boxed{\phantom{00}} \rightarrow \left[ \mathbf{v} \right.$$

$$6 + 7 \times 7 = \boxed{\phantom{00}} \rightarrow \boxed{\text{C}}$$

$$27 + 5 \times 7 = \boxed{\phantom{00}} \rightarrow \boxed{\text{T}}$$

$$10 \times 7 - 27 = \boxed{\phantom{00}} \rightarrow \boxed{\text{H}}$$

$12 \times 6 - 8 = \boxed{\phantom{000}} \rightarrow \boxed{\text{A}}$

Scratch space:

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

The maintenance robots are dividing the remaining fuel cylinders equally among the rescue pods. Calculate the division problem to discover the telemetry watch details.

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:**

$48 \div 8 = \boxed{\phantom{00}}$

$96 \div 12 = \boxed{\phantom{00}}$

$132 \div 12 = \boxed{\phantom{00}}$

$9 \div 1 = \boxed{\phantom{00}}$

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

$33 \div 11 = \boxed{\phantom{00}}$

$110 \div 11 = \boxed{\phantom{00}}$

$4 \div 2 = \boxed{\phantom{00}}$

$63 \div 9 = \boxed{\phantom{00}}$

$25 \div 5 = \boxed{\phantom{00}}$

$36 \div 9 = \boxed{\phantom{00}}$

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

1. The villain fired up their laser welder, then deployed the solar shield.
2. The villain activated their gravity boots, then adjusted the radar visor.
3. The villain activated their gravity boots, then consulted the stellar map.
4. The villain fired up their laser welder, then engaged the thrust pack.
5. The villain tuned their sonic scanner, then engaged the thrust pack.
6. The villain fired up their laser welder, then consulted the stellar map.
7. The villain ignited their plasma torch, then deployed the solar shield.
8. The villain activated their gravity boots, then vented the oxygen tank.
9. The villain activated their hologram projector, then engaged the thrust pack.
10. The villain fired up their laser welder, then adjusted the radar visor.
11. The villain activated their hologram projector, then vented the oxygen tank.
12. The villain activated their hologram projector, then adjusted the radar visor.

# Answer Key

## The Saboteur of Stellar Outpost Nova

### Culprit: Mae Jemison

Hologram Projector · Radar Visor · left wrist · Silver Helmet · Magnetic Fields

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

#### Clue 1 (Place value): "THE SABOTEUR DOES NOT HAVE A THRUST PACK"

What is the value of the 1 in 41,852? = 1000 (T) · What is the value of the 1 in 48,815? = 10 (H) · What is the value of the 3 in 903,802? = 3000 (C) · What is the value of the 6 in 73,561? = 60 (V) · What is the value of the 2 in 65,625? = 20 (O) · What is the value of the 9 in 89,512? = 9000 (A) · What is the value of the 8 in 978,704? = 8000 (S) · What is the value of the 2 in 62,403? = 2000 (P) · What is the value of the 5 in 315,134? = 5000 (E) · What is the value of the 9 in 372,092? = 90 (B) · What is the value of the 5 in 648,568? = 500 (U) · What is the value of the 8 in 744,847? = 800 (K) · What is the value of the 2 in 47,274? = 200 (D) · What is the value of the 7 in 59,376? = 70 (R) · What is the value of the 7 in 237,415? = 7000 (N)

#### Clue 2 (Percentages): "THE TELEMETRY WATCH WAS SEEN ON THE LEFT"

10% of 50 = 5 (T) · 50% of 6 = 3 (S) · 25% of 176 = 44 (C) · 75% of 24 = 18 (L) · 25% of 80 = 20 (O) · 50% of 80 = 40 (W) · 50% of 68 = 34 (A) · 5% of 500 = 25 (M) · 20% of 155 = 31 (R) · 40% of 55 = 22 (H) · 60% of 60 = 36 (E) · 10% of 330 = 33 (F) · 20% of 95 = 19 (Y) · 20% of 105 = 21 (N)

#### Clue 3 (Exponents): "THE VISITOR WAS WEAKENED BY MAGNETS"

$2^7 = 128$  (T) ·  $3^2 = 9$  (Y) ·  $3^3 = 27$  (M) ·  $12^2 = 144$  (V) ·  $14^2 = 196$  (I) ·  $2^2 = 4$  (R) ·  $2^5 = 32$  (B) ·  $11^2 = 121$  (E) ·  $2^3 = 8$  (W) ·  $4^4 = 256$  (G) ·  $5^3 = 125$  (D) ·  $5^2 = 25$  (K) ·  $6^2 = 36$  (O) ·  $7^2 = 49$  (N) ·  $3^5 = 243$  (H) ·  $4^3 = 64$  (S) ·  $2^4 = 16$  (A)

#### Clue 4 (Order of operations): "SILVER PARTICLES WERE LEFT IN THE VENT"

$8 + 2 \times 4 = 16$  (S) ·  $18 + 2 \times 7 = 32$  (L) ·  $20 + 6 \times 5 = 50$  (W) ·  $28 + 3 \times 7 = 49$  (E) ·  $4 \times 6 - 1 = 23$  (I) ·  $46 + 7 \times 2 = 60$  (F) ·  $1 + 4 \times 2 = 9$  (P) ·  $20 + 2 \times 2 = 24$  (N) ·  $39 + 9 \times 3 = 66$  (R) ·  $7 \times 11 - 5 = 72$  (V) ·  $6 + 7 \times 7 = 55$  (C) ·  $27 + 5 \times 7 = 62$  (T) ·  $10 \times 7 - 27 = 43$  (H) ·  $12 \times 6 - 8 = 64$  (A)

#### Clue 5 (Division facts (1-12)): surviving statement is box 12 → Mae Jemison

$48 \div 8 = 6$  ·  $96 \div 12 = 8$  ·  $132 \div 12 = 11$  ·  $9 \div 1 = 9$  ·  $3 \div 3 = 1$  ·  $33 \div 11 = 3$  ·  $110 \div 11 = 10$  ·  $4 \div 2 = 2$  ·  $63 \div 9 = 7$  ·  $25 \div 5 = 5$  ·  $36 \div 9 = 4$