



# The Cipher Station Intruder

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

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

An elite intelligence base has been breached! A mysterious double agent has stolen the master codebook from the Chief Codebreaker. With the base on lockdown, we have compiled a list of suspect operatives. We must use logic and mathematical clues to identify the double agent before they can smuggle the secrets out of the station.

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 double agent is** \_\_\_\_\_

# Possible suspects

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

| NAME               | SPECIALTY        | GEAR           | WRITING HAND | HAIR EVIDENCE     | VULNERABILITY      |
|--------------------|------------------|----------------|--------------|-------------------|--------------------|
| Odette Sansom      | Radio Hacking    | Micro Camera   | Right Handed | Rusty Red Hair    | Squeaky Floorboard |
| Gordon Welchman    | Radio Hacking    | Invisible Ink  | Left Handed  | Jet Black Hair    | Squeaky Floorboard |
| Douglas MacArthur  | Signal Intercept | Invisible Ink  | Left Handed  | Rusty Red Hair    | Squeaky Floorboard |
| Alan Turing        | Radio Hacking    | Signal Flare   | Left Handed  | Sandy Blonde Hair | Squeaky Floorboard |
| George Patton      | Code Cracking    | Morse Clicker  | Right Handed | Sandy Blonde Hair | Bright Spotlight   |
| Winston Churchill  | Radio Hacking    | Micro Camera   | Right Handed | Rusty Red Hair    | Loud Siren         |
| Virginia Hall      | Map Forgery      | Pocket Compass | Right Handed | Jet Black Hair    | Squeaky Floorboard |
| Harry Truman       | Signal Intercept | Morse Clicker  | Right Handed | Sandy Blonde Hair | Squeaky Floorboard |
| Guy Gibson         | Night Flying     | Signal Flare   | Right Handed | Sandy Blonde Hair | Bright Spotlight   |
| Violette Szabo     | Radio Hacking    | Signal Flare   | Right Handed | Jet Black Hair    | Bright Spotlight   |
| James Doolittle    | Signal Intercept | Invisible Ink  | Right Handed | Rusty Red Hair    | Squeaky Floorboard |
| George Marshall    | Night Flying     | Micro Camera   | Left Handed  | Jet Black Hair    | Loud Siren         |
| Nancy Wake         | Night Flying     | Signal Flare   | Right Handed | Jet Black Hair    | Bright Spotlight   |
| Joan Clarke        | Night Flying     | Pocket Compass | Right Handed | Rusty Red Hair    | Squeaky Floorboard |
| Eleanor Roosevelt  | Night Flying     | Morse Clicker  | Left Handed  | Rusty Red Hair    | Loud Siren         |
| Mavis Batey        | Radio Hacking    | Pocket Compass | Right Handed | Rusty Red Hair    | Squeaky Floorboard |
| Bernard Montgomery | Night Flying     | Pocket Compass | Right Handed | Rusty Red Hair    | Bright Spotlight   |
| Tommy Flowers      | Radio Hacking    | Morse Clicker  | Right Handed | Rusty Red Hair    | Squeaky Floorboard |
| Richard Sorge      | Night Flying     | Morse Clicker  | Left Handed  | Rusty Red Hair    | Bright Spotlight   |
| Omar Bradley       | Night Flying     | Invisible Ink  | Right Handed | Rusty Red Hair    | Bright Spotlight   |
| Matthew Ridgway    | Map Forgery      | Morse Clicker  | Right Handed | Jet Black Hair    | Loud Siren         |

## CLUE 1 Addition

We counted the extra codebooks and spare radio tubes in the supply room to find our first clue. Add up the total supplies to reveal the agent's gear.

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

|              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
| <div>T</div> |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 6771         | 5264 | 2865 | 3667 | 7240 | 6903 | 9488 | 7357 | 2865 | 6385 | 9698 | 2865 | 3708 | 6771 | 3667 | 7240 | 2865 | 3225 |  |  |
|              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |  |  |
| 3708         | 7240 | 6771 | 6903 | 3225 | 2865 | 6385 | 6446 | 5717 | 6937 | 4512 | 7240 | 6937 | 6385 | 6446 | 2865 | 4512 | 6385 |  |  |

|                                              |                                              |                                              |
|----------------------------------------------|----------------------------------------------|----------------------------------------------|
| $2716 + 4055 = \square \rightarrow \text{T}$ | $4340 + 2106 = \square \rightarrow \text{M}$ | $2789 + 1723 = \square \rightarrow \text{R}$ |
| $2368 + 2896 = \square \rightarrow \text{H}$ | $2535 + 1173 = \square \rightarrow \text{N}$ | $4574 + 5124 = \square \rightarrow \text{G}$ |
| $2376 + 1291 = \square \rightarrow \text{D}$ | $2454 + 3931 = \square \rightarrow \text{A}$ | $2750 + 4153 = \square \rightarrow \text{U}$ |
| $1454 + 1411 = \square \rightarrow \text{E}$ | $2725 + 2992 = \square \rightarrow \text{I}$ | $3891 + 3466 = \square \rightarrow \text{L}$ |
| $2918 + 6570 = \square \rightarrow \text{B}$ | $1645 + 1580 = \square \rightarrow \text{S}$ | $3204 + 4036 = \square \rightarrow \text{O}$ |
| $3169 + 3768 = \square \rightarrow \text{C}$ |                                              |                                              |

Scratch space:

## CLUE 2 Subtraction

The telegraph operator compared the number of sent messages against the incoming wire logs. Find the difference between these tallies to reveal the writing hand of the intruder.

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

|                              |                             |                             |                             |                             |                              |                             |                             |                             |                             |                              |                             |                             |                             |                             |                             |                             |                              |                             |                             |
|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------------|-----------------------------|-----------------------------|
| <div>T</div> <div>5986</div> | <div></div> <div>6513</div> | <div></div> <div>7690</div> | <div></div> <div>4751</div> | <div></div> <div>4106</div> | <div>T</div> <div>5986</div> | <div></div> <div>8927</div> | <div></div> <div>4702</div> | <div></div> <div>7165</div> | <div></div> <div>7690</div> | <div></div> <div>8927</div>  | <div></div> <div>6017</div> | <div></div> <div>4751</div> | <div></div> <div>8963</div> | <div></div> <div>4106</div> | <div></div> <div>7690</div> | <div></div> <div>7165</div> | <div>T</div> <div>5986</div> | <div></div> <div>6513</div> | <div></div> <div>7690</div> |
| <div></div> <div>5009</div>  | <div></div> <div>7690</div> | <div></div> <div>7165</div> | <div></div> <div>8963</div> | <div></div> <div>7690</div> | <div></div> <div>8927</div>  | <div></div> <div>8927</div> | <div></div> <div>4751</div> | <div></div> <div>8963</div> | <div></div> <div>6513</div> | <div>T</div> <div>5986</div> | <div></div> <div>6513</div> | <div></div> <div>3698</div> | <div></div> <div>4106</div> | <div></div> <div>7165</div> | <div></div> <div>7690</div> | <div></div> <div>7165</div> |                              |                             |                             |

$$7359 - 1373 = \boxed{\phantom{0000}} \rightarrow \boxed{T}$$

$$6089 - 1080 = \boxed{\phantom{0000}} \rightarrow \boxed{L}$$

$$10355 - 1392 = \boxed{\phantom{0000}} \rightarrow \boxed{G}$$

$$13573 - 4646 = \boxed{\phantom{0000}} \rightarrow \boxed{R}$$

$$11543 - 4378 = \boxed{\phantom{0000}} \rightarrow \boxed{D}$$

$$7832 - 1815 = \boxed{\phantom{0000}} \rightarrow \boxed{S}$$

$$12551 - 4861 = \boxed{\phantom{0000}} \rightarrow \boxed{E}$$

$$11230 - 4717 = \boxed{\phantom{0000}} \rightarrow \boxed{H}$$

$$5950 - 1844 = \boxed{\phantom{0000}} \rightarrow \boxed{N}$$

$$6646 - 1895 = \boxed{\phantom{0000}} \rightarrow \boxed{I}$$

$$4411 - 713 = \boxed{\phantom{0000}} \rightarrow \boxed{A}$$

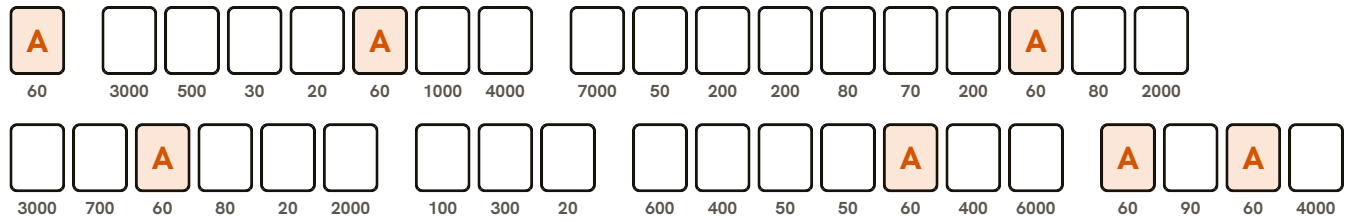
$$9576 - 4874 = \boxed{\phantom{0000}} \rightarrow \boxed{U}$$

Scratch space:

### CLUE 3 Place value

A dial on the high-frequency radar receiver is stuck on a specific number. Look at the value of the digit in the hundreds place to discover the intruder's hair color.

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



What is the value of the 6 in 548,768?  → **A**

What is the value of the 9 in 25,891?  → **W**

What is the value of the 7 in 206,718?  → **C**

What is the value of the 1 in 827,137?  → **T**

What is the value of the 5 in 81,859?  → **L**

What is the value of the 3 in 40,632?  → **U**

What is the value of the 2 in 12,130?  → **D**

What is the value of the 4 in 54,651?  → **Y**

What is the value of the 2 in 874,216?  → **O**

What is the value of the 5 in 304,572?  → **Q**

What is the value of the 6 in 26,398?  → **N**

What is the value of the 7 in 44,975?  → **B**

What is the value of the 7 in 87,390?  → **F**

What is the value of the 3 in 83,148?  → **S**

What is the value of the 4 in 88,458?  → **I**

What is the value of the 8 in 702,383?  → **R**

What is the value of the 2 in 91,626?  → **E**

What is the value of the 6 in 48,654?  → **V**

What is the value of the 3 in 71,386?  → **H**

What is the value of the 1 in 931,985?  → **K**

Scratch space:

CLUE 4

## Fractions of a number

Our courier recovered a bundle of classified files, but some are damaged by water. Calculate the fraction of readable files to pinpoint the suspect's vulnerability.

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

|                            |                           |                          |                           |                           |                           |                            |                           |                           |                            |                           |                            |                           |                           |                           |                           |                          |                           |                          |                           |
|----------------------------|---------------------------|--------------------------|---------------------------|---------------------------|---------------------------|----------------------------|---------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|---------------------------|---------------------------|---------------------------|--------------------------|---------------------------|--------------------------|---------------------------|
| <div>T</div> <div>40</div> | <div></div> <div>5</div>  | <div></div> <div>6</div> | <div></div> <div>34</div> | <div></div> <div>14</div> | <div></div> <div>2</div>  | <div></div> <div>14</div>  | <div></div> <div>34</div> | <div></div> <div>28</div> | <div>T</div> <div>40</div> | <div></div> <div>14</div> | <div>T</div> <div>40</div> | <div></div> <div>9</div>  | <div></div> <div>20</div> | <div></div> <div>13</div> | <div></div> <div>18</div> | <div></div> <div>5</div> | <div></div> <div>14</div> | <div></div> <div>9</div> | <div></div> <div>34</div> |
| <div></div> <div>5</div>   | <div></div> <div>14</div> | <div></div> <div>2</div> | <div></div> <div>34</div> | <div></div> <div>15</div> | <div></div> <div>28</div> | <div>T</div> <div>40</div> | <div></div> <div>19</div> | <div></div> <div>34</div> | <div></div> <div>6</div>   | <div></div> <div>2</div>  | <div></div> <div>5</div>   | <div></div> <div>14</div> | <div></div> <div>9</div>  | <div></div> <div>34</div> |                           |                          |                           |                          |                           |

$5/8 \text{ of } 64 = \square \rightarrow \text{T}$

$2/6 \text{ of } 102 = \square \rightarrow \text{R}$

$1/10 \text{ of } 130 = \square \rightarrow \text{N}$

$2/6 \text{ of } 57 = \square \rightarrow \text{Y}$

$5/6 \text{ of } 24 = \square \rightarrow \text{O}$

$4/8 \text{ of } 30 = \square \rightarrow \text{U}$

$1/6 \text{ of } 84 = \square \rightarrow \text{A}$

$1/10 \text{ of } 50 = \square \rightarrow \text{H}$

$3/6 \text{ of } 18 = \square \rightarrow \text{I}$

$4/8 \text{ of } 36 = \square \rightarrow \text{C}$

$4/6 \text{ of } 42 = \square \rightarrow \text{S}$

$5/10 \text{ of } 4 = \square \rightarrow \text{D}$

$1/10 \text{ of } 60 = \square \rightarrow \text{E}$

Scratch space:

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

The generator must be shared among several sectors of the bunker. Divide the spare electricity units evenly among the stations to unlock the final piece of the puzzle.

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:**

$40 \div 8 = \boxed{\phantom{00}}$

$50 \div 5 = \boxed{\phantom{00}}$

$32 \div 4 = \boxed{\phantom{00}}$

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

$18 \div 6 = \boxed{\phantom{00}}$

$144 \div 12 = \boxed{\phantom{00}}$

$54 \div 9 = \boxed{\phantom{00}}$

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

$28 \div 7 = \boxed{\phantom{00}}$

$22 \div 11 = \boxed{\phantom{00}}$

$90 \div 10 = \boxed{\phantom{00}}$

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

1. The villain flew the scout plane, then hid a pocket spy camera.
2. The villain hacked the wireless transmitter, then sabotaged the engine gears.
3. The villain cracked the encrypted codes, then escaped into the dark night.
4. The villain forged the invasion map, then hid a pocket spy camera.
5. The villain forged the invasion map, then sabotaged the engine gears.
6. The villain hacked the wireless transmitter, then stole the secret blueprints.
7. The villain flew the scout plane, then sabotaged the engine gears.
8. The villain cracked the encrypted codes, then stole the secret blueprints.
9. The villain cracked the encrypted codes, then sabotaged the engine gears.
10. The villain hacked the wireless transmitter, then escaped into the dark night.
11. The villain forged the invasion map, then stole the secret blueprints.
12. The villain hacked the wireless transmitter, then scrambled the radar array.

# Answer Key

## The Cipher Station Intruder

### Culprit: Mavis Batey

Radio Hacking · Pocket Compass · Right Handed · Rusty Red Hair · Squeaky Floorboard

Trail: Start 21 → Clue 1 18 → Clue 2 13 → Clue 3 6 → Clue 4 4 → Clue 5 1

#### Clue 1 (Addition): "THE DOUBLE AGENT DOES NOT USE A MICRO CAMERA"

$2716 + 4055 = 6771$  (T) ·  $4340 + 2106 = 6446$  (M) ·  $2789 + 1723 = 4512$  (R) ·  $2368 + 2896 = 5264$  (H) ·  $2535 + 1173 = 3708$  (N) ·  $4574 + 5124 = 9698$  (G) ·  $2376 + 1291 = 3667$  (D) ·  $2454 + 3931 = 6385$  (A) ·  $2750 + 4153 = 6903$  (U) ·  $1454 + 1411 = 2865$  (E) ·  $2725 + 2992 = 5717$  (I) ·  $3891 + 3466 = 7357$  (L) ·  $2918 + 6570 = 9488$  (B) ·  $1645 + 1580 = 3225$  (S) ·  $3204 + 4036 = 7240$  (O) ·  $3169 + 3768 = 6937$  (C)

#### Clue 2 (Subtraction): "THE INTRUDER SIGNED THE LEDGER RIGHT HANDED"

$7359 - 1373 = 5986$  (T) ·  $6089 - 1080 = 5009$  (L) ·  $10355 - 1392 = 8963$  (G) ·  $13573 - 4646 = 8927$  (R) ·  $11543 - 4378 = 7165$  (D) ·  $7832 - 1815 = 6017$  (S) ·  $12551 - 4861 = 7690$  (E) ·  $11230 - 4717 = 6513$  (H) ·  $5950 - 1844 = 4106$  (N) ·  $6646 - 1895 = 4751$  (I) ·  $4411 - 713 = 3698$  (A) ·  $9576 - 4874 = 4702$  (U)

#### Clue 3 (Place value): "A SQUEAKY FLOORBOARD SCARED THE VILLAIN AWAY"

What is the value of the 6 in 548,768? = 60 (A) · What is the value of the 9 in 25,891? = 90 (W) · What is the value of the 7 in 206,718? = 700 (C) · What is the value of the 1 in 827,137? = 100 (T) · What is the value of the 5 in 81,859? = 50 (L) · What is the value of the 3 in 40,632? = 30 (U) · What is the value of the 2 in 12,130? = 2000 (D) · What is the value of the 4 in 54,651? = 4000 (Y) · What is the value of the 2 in 874,216? = 200 (O) · What is the value of the 5 in 304,572? = 500 (Q) · What is the value of the 6 in 26,398? = 6000 (N) · What is the value of the 7 in 44,975? = 70 (B) · What is the value of the 7 in 87,390? = 7000 (F) · What is the value of the 3 in 83,148? = 3000 (S) · What is the value of the 4 in 88,458? = 400 (I) · What is the value of the 8 in 702,383? = 80 (R) · What is the value of the 2 in 91,626? = 20 (E) · What is the value of the 6 in 48,654? = 600 (V) · What is the value of the 3 in 71,386? = 300 (H) · What is the value of the 1 in 931,985? = 1000 (K)

#### Clue 4 (Fractions of a number): "THE RADAR STATION CHAIR HAD RUSTY RED HAIR"

$5/8$  of 64 = 40 (T) ·  $2/6$  of 102 = 34 (R) ·  $1/10$  of 130 = 13 (N) ·  $2/6$  of 57 = 19 (Y) ·  $5/6$  of 24 = 20 (O) ·  $4/8$  of 30 = 15 (U) ·  $1/6$  of 84 = 14 (A) ·  $1/10$  of 50 = 5 (H) ·  $3/6$  of 18 = 9 (I) ·  $4/8$  of 36 = 18 (C) ·  $4/6$  of 42 = 28 (S) ·  $5/10$  of 4 = 2 (D) ·  $1/10$  of 60 = 6 (E)

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

$40 \div 8 = 5$  ·  $50 \div 5 = 10$  ·  $32 \div 4 = 8$  ·  $63 \div 9 = 7$  ·  $18 \div 6 = 3$  ·  $144 \div 12 = 12$  ·  $54 \div 9 = 6$  ·  $5 \div 5 = 1$  ·  $28 \div 7 = 4$  ·  $22 \div 11 = 2$  ·  $90 \div 10 = 9$