



The Great Cog Caper

Grade 4 math · Rounding, Addition, Subtraction, Multiplication, Division · Reading level grades 3-4

Detective: _____ **Date:** _____

A mischievous bot scrambled the blueprints for the city generator! Help Chief Engineer Sprocket follow the gear tracks and deduce who committed the malfunction.

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 bot is _____

Possible suspects

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

NAME	GIMMICK TOOL	LOCOMOTION	ANTENNA TILT	WIRING COLOR	SYSTEM VULNERABILITY
Cipher Sam	magnet pulse	hover jets	left antenna bent	neon green wires	oil splashes
Piston Pam	frost beam	stealth cloak	right antenna bent	bright blue wires	oil splashes
Widget Bot	frost beam	stealth cloak	right antenna bent	bright blue wires	magnet traps
Radar Ray	frost beam	grapple arm	right antenna bent	neon green wires	magnet traps
Unit A1	laser torch	hover jets	right antenna bent	neon green wires	magnet traps
Unit C3	magnet pulse	stealth cloak	right antenna bent	glowing red wires	rust spray
Data Daisy	frost beam	hover jets	right antenna bent	neon green wires	magnet traps
Gizmo Gabe	sonic hum	turbo treads	right antenna bent	glowing red wires	magnet traps
Logic Leo	laser torch	hover jets	right antenna bent	neon green wires	oil splashes
Circuit Chip	plasma spark	grapple arm	right antenna bent	glowing red wires	magnet traps
Unit B2	plasma spark	hover jets	left antenna bent	neon green wires	magnet traps
Beep Boop	laser torch	stealth cloak	right antenna bent	glowing red wires	oil splashes
Matrix Meg	laser torch	stealth cloak	right antenna bent	neon green wires	magnet traps
Servo Max	plasma spark	hover jets	left antenna bent	bright blue wires	magnet traps
Unit D4	sonic hum	grapple arm	left antenna bent	bright blue wires	oil splashes
Tread Racer	magnet pulse	grapple arm	left antenna bent	glowing red wires	magnet traps
Gearhead Sprocket	laser torch	hover jets	right antenna bent	glowing red wires	magnet traps
Binary Ben	frost beam	grapple arm	right antenna bent	neon green wires	oil splashes
Sparky Axle	sonic hum	grapple arm	left antenna bent	bright blue wires	magnet traps
Bolts Dynamo	sonic hum	turbo treads	left antenna bent	bright blue wires	rust spray
Rust Catcher	sonic hum	hover jets	right antenna bent	neon green wires	magnet traps

CLUE 1

9

Diagram illustrating the distribution of 10000 items across 100 bins. The first row shows the first 10 bins, with the first bin containing 20 items and labeled 'T'. The second row shows the remaining 90 bins, with the last bin containing 20 items and labeled 'T'. The values for each bin are: 20, 90, 170, 3700, 2900, 200, 200, 4300, 2900, 430, 1100, 7000, 170, 3000, 430, 7000, 20, 290, 3000, 170, 4300, 230, 50, 4300, 1700, 1700, 200, 170, 4300, 50, 130.

Round 24 to the nearest ten → **T**

Round 152 to the nearest hundred $\rightarrow$ **L**

Round 168 to the nearest ten → **E**

Round 286 to the nearest ten →

Round 131 to the nearest ten → **M**

Round 48 to the nearest ten → **R**

Round 1,141 to the nearest hundred → **D**

Round 4,311 to the nearest hundred → **A**

Round 94 to the nearest ten → **H**

Round 428 to the nearest ten → **N**

Round 233 to the nearest ten → **G**

Round 3,702 to the nearest hundred →

Round 1,663 to the nearest hundred → **P**

Round 7,448 to the nearest thousand $\rightarrow$

Round 2,884 to the nearest hundred $\rightarrow$

Round 3,359 to the nearest thousand → **S**

Scratch space:

CLUE 2

Addition

Mechanic Meg counted all the spare gears from both storage bins. Add them up to find where the suspect went.

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

A									A		A				
8261	2167	2204	4599	4978	9176	2723	2723	2723	8261	2167	8261	9551	9176	4978	4599

					A						A
9770	2204	6314	4434	4599	8261	4978	4599	9176	4978	4978	8261

$3274 + 4987 = \square \rightarrow \text{A}$

$1218 + 986 = \square \rightarrow \text{I}$

$2623 + 2355 = \square \rightarrow \text{N}$

$2693 + 1741 = \square \rightarrow \text{H}$

$1227 + 940 = \square \rightarrow \text{W}$

$1557 + 1166 = \square \rightarrow \text{S}$

$2959 + 1640 = \square \rightarrow \text{T}$

$5278 + 3898 = \square \rightarrow \text{E}$

$3448 + 2866 = \square \rightarrow \text{G}$

$3413 + 6357 = \square \rightarrow \text{R}$

$5037 + 4514 = \square \rightarrow \text{B}$

Scratch space:

CLUE 3

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

[illegible]

$$6950 - 3631 = \boxed{} \rightarrow \boxed{\text{T}}$$

$$6383 - 2327 = \boxed{} \rightarrow \boxed{\text{Y}}$$

$$4197 - 3190 = \boxed{} \rightarrow \boxed{\text{G}}$$

$$4249 - 1294 = \boxed{} \rightarrow \boxed{\text{P}}$$

$$4856 - 2127 = \boxed{} \rightarrow \boxed{\text{H}}$$

$$8176 - 4790 = \boxed{} \rightarrow \boxed{\text{N}}$$

$$7494 - 4190 = \boxed{} \rightarrow \boxed{\text{B}}$$

$$4725 - 1174 = \boxed{} \rightarrow \boxed{\text{W}}$$

$$7366 - 3887 = \boxed{} \rightarrow \boxed{\text{M}}$$

$$11815 - 3518 = \boxed{} \rightarrow \boxed{0}$$

$5157 - 3139 = \boxed{} \rightarrow \boxed{\text{A}}$

$$8750 - 3582 = \boxed{} \rightarrow \boxed{\text{S}}$$

$$9950 - 1363 = \boxed{} \rightarrow \boxed{\text{R}}$$

$11963 - 3547 = \boxed{} \rightarrow \boxed{\text{D}}$

$11267 - 4606 = \boxed{} \rightarrow \boxed{\text{E}}$

Scratch space:

CLUE 4

Multiplication facts (1-12)

The factory floor has equal rows of charging pods. Multiply the rows and pods to locate the hidden wire.

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

S												S	S			
8	99	1	27	54	49	100	36	49	30	27	42	8	8	40	48	55

												S	
88	49	48	88	18	1	49	49	88	55	110	1	49	8

$2 \times 4 = \square \rightarrow \boxed{\text{S}}$

$8 \times 11 = \square \rightarrow \boxed{\text{N}}$

$4 \times 10 = \square \rightarrow \boxed{\text{H}}$

$3 \times 6 = \square \rightarrow \boxed{\text{G}}$

$11 \times 5 = \square \rightarrow \boxed{\text{W}}$

$3 \times 9 = \square \rightarrow \boxed{\text{A}}$

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

$10 \times 10 = \square \rightarrow \boxed{\text{D}}$

$1 \times 1 = \square \rightarrow \boxed{\text{R}}$

$7 \times 7 = \square \rightarrow \boxed{\text{E}}$

$11 \times 9 = \square \rightarrow \boxed{\text{C}}$

$8 \times 6 = \square \rightarrow \boxed{\text{O}}$

$6 \times 9 = \square \rightarrow \boxed{\text{P}}$

$11 \times 10 = \square \rightarrow \boxed{\text{I}}$

$9 \times 4 = \square \rightarrow \boxed{\text{M}}$

$3 \times 10 = \square \rightarrow \boxed{\text{T}}$

Scratch space:

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

The repair bots must share the oil canisters equally. Divide the batch to get the final passcode.

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:

$25 \div 5 = \boxed{}$

$60 \div 5 = \boxed{}$

$4 \div 2 = \boxed{}$

$63 \div 9 = \boxed{}$

$11 \div 11 = \boxed{}$

$12 \div 4 = \boxed{}$

$110 \div 10 = \boxed{}$

$42 \div 7 = \boxed{}$

$40 \div 10 = \boxed{}$

$120 \div 12 = \boxed{}$

$9 \div 1 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain zapped a plasma spark, then zoomed up on rocket boots.
2. The villain blasted a frost beam, then flew away with hover jets.
3. The villain fired a laser torch, then swung off with a grapple arm.
4. The villain blasted a frost beam, then zipped off on turbo treads.
5. The villain fired a laser torch, then vanished in a stealth cloak.
6. The villain pulsed a magnet beam, then vanished in a stealth cloak.
7. The villain pulsed a magnet beam, then swung off with a grapple arm.
8. The villain fired a laser torch, then flew away with hover jets.
9. The villain blasted a frost beam, then zoomed up on rocket boots.
10. The villain emitted a sonic hum, then swung off with a grapple arm.
11. The villain zapped a plasma spark, then flew away with hover jets.
12. The villain emitted a sonic hum, then flew away with hover jets.

Answer Key

The Great Cog Caper

Culprit: Unit A1

laser torch · hover jets · right antenna bent · neon green wires · magnet traps

Trail: Start 21 → Clue 1 15 → Clue 2 11 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Rounding): "THE VILLAIN DOES NOT USE A GRAPPLE ARM"

Round 24 to the nearest ten = 20 (T) · Round 152 to the nearest hundred = 200 (L) · Round 168 to the nearest ten = 170 (E) · Round 286 to the nearest ten = 290 (U) · Round 131 to the nearest ten = 130 (M) · Round 48 to the nearest ten = 50 (R) · Round 1,141 to the nearest hundred = 1100 (D) · Round 4,311 to the nearest hundred = 4300 (A) · Round 94 to the nearest ten = 90 (H) · Round 428 to the nearest ten = 430 (N) · Round 233 to the nearest ten = 230 (G) · Round 3,702 to the nearest hundred = 3700 (V) · Round 1,663 to the nearest hundred = 1700 (P) · Round 7,448 to the nearest thousand = 7000 (O) · Round 2,884 to the nearest hundred = 2900 (I) · Round 3,359 to the nearest thousand = 3000 (S)

Clue 2 (Addition): "A WITNESS SAW A BENT RIGHT ANTENNA"

$3274 + 4987 = 8261$ (A) · $1218 + 986 = 2204$ (I) · $2623 + 2355 = 4978$ (N) · $2693 + 1741 = 4434$ (H) · $1227 + 940 = 2167$ (W) · $1557 + 1166 = 2723$ (S) · $2959 + 1640 = 4599$ (T) · $5278 + 3898 = 9176$ (E) · $3448 + 2866 = 6314$ (G) · $3413 + 6357 = 9770$ (R) · $5037 + 4514 = 9551$ (B)

Clue 3 (Subtraction): "THE SNOOP WAS STOPPED BY MAGNET TRAPS"

$6950 - 3631 = 3319$ (T) · $6383 - 2327 = 4056$ (Y) · $4197 - 3190 = 1007$ (G) · $4249 - 1294 = 2955$ (P) · $4856 - 2127 = 2729$ (H) · $8176 - 4790 = 3386$ (N) · $7494 - 4190 = 3304$ (B) · $4725 - 1174 = 3551$ (W) · $7366 - 3887 = 3479$ (M) · $11815 - 3518 = 8297$ (O) · $5157 - 3139 = 2018$ (A) · $8750 - 3582 = 5168$ (S) · $9950 - 1363 = 8587$ (R) · $11963 - 3547 = 8416$ (D) · $11267 - 4606 = 6661$ (E)

Clue 4 (Multiplication facts (1-12)): "SCRAPED METALS SHOW NEON GREEN WIRES"

$2 \times 4 = 8$ (S) · $8 \times 11 = 88$ (N) · $4 \times 10 = 40$ (H) · $3 \times 6 = 18$ (G) · $11 \times 5 = 55$ (W) · $3 \times 9 = 27$ (A) · $6 \times 7 = 42$ (L) · $10 \times 10 = 100$ (D) · $1 \times 1 = 1$ (R) · $7 \times 7 = 49$ (E) · $11 \times 9 = 99$ (C) · $8 \times 6 = 48$ (O) · $6 \times 9 = 54$ (P) · $11 \times 10 = 110$ (I) · $9 \times 4 = 36$ (M) · $3 \times 10 = 30$ (T)

Clue 5 (Division facts (1-12)): surviving statement is box 8 → Unit A1

$25 \div 5 = 5$ · $60 \div 5 = 12$ · $4 \div 2 = 2$ · $63 \div 9 = 7$ · $11 \div 11 = 1$ · $12 \div 4 = 3$ · $110 \div 10 = 11$ · $42 \div 7 = 6$ · $40 \div 10 = 4$ · $120 \div 12 = 10$ · $9 \div 1 = 9$