



The Great Mech Workshop Mystery

Grade 4 math · Fractions of a number, Multiplication, Multi-step word problems, Rounding · Reading level grades 3-4

Detective: _____ **Date:** _____

Someone broke into the Gearshift City Robotics Lab and scrambled the master blueprint for the ultimate helper robot! As lead detective of the Robotics Squad, you must examine the evidence, solve the clues, and catch the rogue bot before the grand unveiling.

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 Automaton is _____

Possible suspects

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

NAME	PRIMARY SYSTEM	SECONDARY MODULE	SENSOR LIGHT	HEAD GEAR	SYSTEM VULNERABILITY
Sparky	Turbo Jump	Oil Sprayer	Flashing Red LED	Copper Crown	Strong Magnets
Byte	Turbo Jump	Solar Panel	Flashing Blue LED	Neon Wires	Strong Magnets
Circuit	Laser Beam	Rocket Boots	Flashing Blue LED	Neon Wires	Giant Sponge
Vector	Shield Guard	Solar Panel	Flashing Red LED	Neon Wires	Giant Sponge
Sprocket	Sonic Blast	Smoke Screen	Flashing Red LED	Copper Crown	Giant Sponge
Voltage	Laser Beam	Rocket Boots	Flashing Red LED	Neon Wires	Strong Magnets
Transistor	Sonic Blast	Oil Sprayer	Flashing Red LED	Steel Spikes	Strong Magnets
RustE	Repair Arm	Hacking Chip	Flashing Blue LED	Copper Crown	Strong Magnets
Matrix	Sonic Blast	Rocket Boots	Flashing Red LED	Copper Crown	Strong Magnets
Bolt	Sonic Blast	Solar Panel	Flashing Red LED	Neon Wires	Giant Sponge
Micro	Sonic Blast	Smoke Screen	Flashing Blue LED	Neon Wires	Giant Sponge
Turbo	Repair Arm	Hacking Chip	Flashing Red LED	Neon Wires	Giant Sponge
Widget	Sonic Blast	Rocket Boots	Flashing Red LED	Neon Wires	Strong Magnets
Cogsworth	Repair Arm	Smoke Screen	Flashing Blue LED	Steel Spikes	Rusty Water
Amp	Laser Beam	Hacking Chip	Flashing Red LED	Copper Crown	Strong Magnets
Pixel	Turbo Jump	Rocket Boots	Flashing Red LED	Neon Wires	Giant Sponge
Dynamo	Turbo Jump	Smoke Screen	Flashing Blue LED	Steel Spikes	Rusty Water
Capacitor	Sonic Blast	Smoke Screen	Flashing Red LED	Neon Wires	Giant Sponge
Gearhead	Shield Guard	Oil Sprayer	Flashing Blue LED	Steel Spikes	Strong Magnets
Glitch	Laser Beam	Smoke Screen	Flashing Blue LED	Neon Wires	Giant Sponge
Gizmo	Turbo Jump	Oil Sprayer	Flashing Blue LED	Steel Spikes	Strong Magnets

CLUE 1
Fractions of a number

We scanned the lab crates to find out which missing parts were taken.

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

T											T							T
27	17	22	10	19	22	16	28	18	2	34	27	3	34	22	10	19	34	27
40	10	22	16	17	16	13	28	36	19	20	13	17	36	38				

$6/10 \text{ of } 45 = \square \rightarrow \text{ T }$

$2/10 \text{ of } 90 = \square \rightarrow \text{ Y }$

$2/8 \text{ of } 64 = \square \rightarrow \text{ A }$

$4/10 \text{ of } 85 = \square \rightarrow \text{ O }$

$1/5 \text{ of } 65 = \square \rightarrow \text{ C }$

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

$1/3 \text{ of } 9 = \square \rightarrow \text{ D }$

$4/5 \text{ of } 25 = \square \rightarrow \text{ G }$

$2/6 \text{ of } 66 = \square \rightarrow \text{ E }$

$2/5 \text{ of } 95 = \square \rightarrow \text{ P }$

$5/10 \text{ of } 72 = \square \rightarrow \text{ I }$

$2/4 \text{ of } 56 = \square \rightarrow \text{ K }$

$3/6 \text{ of } 80 = \square \rightarrow \text{ U }$

$1/5 \text{ of } 95 = \square \rightarrow \text{ N }$

$1/5 \text{ of } 85 = \square \rightarrow \text{ H }$

$2/5 \text{ of } 25 = \square \rightarrow \text{ S }$

Scratch space:

CLUE 2

Multiplication facts (1-12)

Our scanner counted the power cells organized in even rows across the storage grid.

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

A									A		A							
14	70	80	110	66	108	24	24	24	14	70	14							
		A																
21	44	14	24	72	80	66	96	54	108	90	44	108	90	121	66	110	121	9

$7 \times 2 = \square \rightarrow \boxed{\text{A}}$

$6 \times 11 = \square \rightarrow \boxed{\text{N}}$

$12 \times 9 = \square \rightarrow \boxed{\text{E}}$

$11 \times 11 = \square \rightarrow \boxed{\text{O}}$

$9 \times 10 = \square \rightarrow \boxed{\text{D}}$

$8 \times 12 = \square \rightarrow \boxed{\text{G}}$

$11 \times 4 = \square \rightarrow \boxed{\text{L}}$

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

$3 \times 3 = \square \rightarrow \boxed{\text{P}}$

$4 \times 6 = \square \rightarrow \boxed{\text{S}}$

$10 \times 8 = \square \rightarrow \boxed{\text{I}}$

$12 \times 6 = \square \rightarrow \boxed{\text{H}}$

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

$3 \times 7 = \square \rightarrow \boxed{\text{F}}$

$7 \times 10 = \square \rightarrow \boxed{\text{W}}$

Scratch space:

CLUE 3

Multi-step word problems

We tracked the battery usage across three charging stations to calculate total energy left.

Solve each problem, then write its letter in the boxes to fill in the missing word.

Someone scared the villain off with

G **O** **G** **E** .

9 59 7 87 60 74 78 87 9

Head engineer collected 15 copper coils in the morning and 3 copper coils in the afternoon, then split them equally among 2 Robotics Squad. How many copper coils did each get?

Answer: → **G**

Head engineer filled 6 boxes with 8 microchips each, then found 26 more microchips. How many microchips are there in all?

Answer: → **S**

Head engineer collected 25 copper coils in the morning and 3 copper coils in the afternoon, then split them equally among 4 Robotics Squad. How many copper coils did each get?

Answer: → **A**

Head engineer collected 18 copper coils in the morning and 330 copper coils in the afternoon, then split them equally among 4 Robotics Squad. How many copper coils did each get?

Answer: → **N**

There were 413 gear wheels in all. 23 gear wheels were set aside. The rest were shared equally among 5 Robotics Squad. How many gear wheels did each get?

Answer: → **P**

Head engineer filled 3 boxes with 9 battery packs each, then found 33 more battery packs. How many battery packs are there in all?

Answer: → **T**

Head engineer earned 2 battery packs in each of 4 rounds, plus 55 bonus battery packs. Then 4 battery packs were lost. How many battery packs are left?

Answer: → **I**

Scratch space:

CLUE 4 Rounding

The digital radar display rounded the distance to the nearest ten meters.

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

W										W					
1100	290	2000	110	2300	700	4300	700	290	110	700	1100	1700	170	290	50

70	290	2000	20	3000	20	20	2900	290	90	170	1700	900	290	50	90	290	700	290

Round 1,087 to the nearest hundred → **W**

Round 18 to the nearest ten → **T**

Round 2,911 to the nearest hundred → **H**

Round 69 to the nearest ten → **L**

Round 289 to the nearest ten → **E**

Round 1,692 to the nearest hundred → **I**

Round 660 to the nearest hundred → **N**

Round 2,315 to the nearest hundred → **U**

Round 2,254 to the nearest thousand → **F**

Round 110 to the nearest ten → **O**

Round 905 to the nearest hundred → **M**

Round 50 to the nearest ten → **S**

Round 90 to the nearest ten → **C**

Round 171 to the nearest ten → **R**

Round 4,297 to the nearest hundred → **D**

Round 2,747 to the nearest thousand → **A**

Scratch space:

CLUE 5**Fractions of a number - the last clue**

We analyzed a fraction of the digital log entries left on the central mainframe.

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:

$1/10 \text{ of } 80 = \boxed{}$

$1/5 \text{ of } 55 = \boxed{}$

$1/2 \text{ of } 24 = \boxed{}$

$4/10 \text{ of } 15 = \boxed{}$

$5/10 \text{ of } 4 = \boxed{}$

$6/10 \text{ of } 5 = \boxed{}$

$2/6 \text{ of } 3 = \boxed{}$

$1/2 \text{ of } 20 = \boxed{}$

$1/4 \text{ of } 28 = \boxed{}$

$6/8 \text{ of } 12 = \boxed{}$

$2/6 \text{ of } 15 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain used turbo jump, then installed a hacking chip.
2. The villain activated repair arm, then released a smoke screen.
3. The villain blasted sonic waves, then boosted with rocket boots.
4. The villain blasted sonic waves, then charged solar panels.
5. The villain fired a laser beam, then released a smoke screen.
6. The villain blasted sonic waves, then installed a hacking chip.
7. The villain used turbo jump, then charged solar panels.
8. The villain raised shield guard, then charged solar panels.
9. The villain activated repair arm, then boosted with rocket boots.
10. The villain activated repair arm, then sprayed slippery oil.
11. The villain used turbo jump, then boosted with rocket boots.
12. The villain blasted sonic waves, then released a smoke screen.

Answer Key

The Great Mech Workshop Mystery

Culprit: Bolt

Sonic Blast · Solar Panel · Flashing Red LED · Neon Wires · Giant Sponge

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

Clue 1 (Fractions of a number): "THE SNEAKY BOT DOES NOT USE A HACKING CHIP"

$6/10$ of 45 = 27 (T) · $2/10$ of 90 = 18 (Y) · $2/8$ of 64 = 16 (A) · $4/10$ of 85 = 34 (O) · $1/5$ of 65 = 13 (C) · $4/8$ of 4 = 2 (B) · $1/3$ of 9 = 3 (D) · $4/5$ of 25 = 20 (G) · $2/6$ of 66 = 22 (E) · $2/5$ of 95 = 38 (P) · $5/10$ of 72 = 36 (I) · $2/4$ of 56 = 28 (K) · $3/6$ of 80 = 40 (U) · $1/5$ of 95 = 19 (N) · $1/5$ of 85 = 17 (H) · $2/5$ of 25 = 10 (S)

Clue 2 (Multiplication facts (1-12)): "A WITNESS SAW A FLASHING RED LED ON TOP"

$7 \times 2 = 14$ (A) · $6 \times 11 = 66$ (N) · $12 \times 9 = 108$ (E) · $11 \times 11 = 121$ (O) · $9 \times 10 = 90$ (D) · $8 \times 12 = 96$ (G) · $11 \times 4 = 44$ (L) · $10 \times 11 = 110$ (T) · $3 \times 3 = 9$ (P) · $4 \times 6 = 24$ (S) · $10 \times 8 = 80$ (I) · $12 \times 6 = 72$ (H) · $9 \times 6 = 54$ (R) · $3 \times 7 = 21$ (F) · $7 \times 10 = 70$ (W)

Clue 3 (Multi-step word problems): "GIANT SPONGE"

Head engineer collected 15 copper coils in the morning and 3 copper coils in the afternoon, then split them equally among 2 Robotics Squad. How many copper coils did each get? = 9 (G) · Head engineer filled 6 boxes with 8 microchips each, then found 26 more microchips. How many microchips are there in all? = 74 (S) · Head engineer collected 25 copper coils in the morning and 3 copper coils in the afternoon, then split them equally among 4 Robotics Squad. How many copper coils did each get? = 7 (A) · Head engineer collected 18 copper coils in the morning and 330 copper coils in the afternoon, then split them equally among 4 Robotics Squad. How many copper coils did each get? = 87 (N) · There were 413 gear wheels in all. 23 gear wheels were set aside. The rest were shared equally among 5 Robotics Squad. How many gear wheels did each get? = 78 (P) · Head engineer filled 3 boxes with 9 battery packs each, then found 33 more battery packs. How many battery packs are there in all? = 60 (T) · Head engineer earned 2 battery packs in each of 4 rounds, plus 55 bonus battery packs. Then 4 battery packs were lost. How many battery packs are left? = 59 (I)

Clue 4 (Rounding): "WE FOUND NEON WIRES LEFT AT THE CRIME SCENE"

Round 1,087 to the nearest hundred = 1100 (W) · Round 18 to the nearest ten = 20 (T) · Round 2,911 to the nearest hundred = 2900 (H) · Round 69 to the nearest ten = 70 (L) · Round 289 to the nearest ten = 290 (E) · Round 1,692 to the nearest hundred = 1700 (I) · Round 660 to the nearest hundred = 700 (N) · Round 2,315 to the nearest hundred = 2300 (U) · Round 2,254 to the nearest thousand = 2000 (F) · Round 110 to the nearest ten = 110 (O) · Round 905 to the nearest hundred = 900 (M) · Round 50 to the nearest ten = 50 (S) · Round 90 to the nearest ten = 90 (C) · Round 171 to the nearest ten = 170 (R) · Round 4,297 to the nearest hundred = 4300 (D) · Round 2,747 to the nearest thousand = 3000 (A)

Clue 5 (Fractions of a number): surviving statement is box 4 → Bolt

$1/10$ of 80 = 8 · $1/5$ of 55 = 11 · $1/2$ of 24 = 12 · $4/10$ of 15 = 6 · $5/10$ of 4 = 2 · $6/10$ of 5 = 3 · $2/6$ of 3 = 1 · $1/2$ of 20 = 10 · $1/4$ of 28 = 7 · $6/8$ of 12 = 9 · $2/6$ of 15 = 5