



The Sparkbolt Expo Sabotage

Grade 5 math · Fractions of a number, Order of operations, Multiplication, Rounding · Reading level grades 5-6

Detective: _____ **Date:** _____

During the grand finale of the Sparkbolt Robotics Expo, a mysterious Rogue Bot hacked the main mainframe, stole the experimental master microchip, and escaped into the server ducts. Detective, we must analyze the data logs to identify the culprit before they upload the code to the global network!

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	PRIMARY TOOL	SECONDARY MOD	OPTICAL LENS	WIRING COLOR	SYSTEM VULNERABILITY
Murphys	Plasma Welder	Grappling Hook	Right Eye Sensor Activated	Copper Wiring	Extreme Heat
Data	Plasma Welder	Grappling Hook	Left Eye Sensor Activated	Gold Wiring	Extreme Heat
Ash	Sonic Drill	Rocket Boosters	Right Eye Sensor Activated	Copper Wiring	Extreme Heat
Bishop	Hologram Projector	Hover Jets	Right Eye Sensor Activated	Gold Wiring	Static Electricity
Gort	Magnetic Claw	Grappling Hook	Left Eye Sensor Activated	Copper Wiring	Static Electricity
Deckard	Sonic Drill	Stealth Cloak	Left Eye Sensor Activated	Copper Wiring	Extreme Heat
Astro	Magnetic Claw	Hover Jets	Left Eye Sensor Activated	Silver Wiring	Extreme Heat
Ultron	Plasma Welder	Rocket Boosters	Left Eye Sensor Activated	Silver Wiring	Extreme Heat
Lovell	Magnetic Claw	Grappling Hook	Left Eye Sensor Activated	Copper Wiring	Extreme Heat
Turing	Hologram Projector	Tread Wheels	Left Eye Sensor Activated	Copper Wiring	Extreme Heat
HAL	Sonic Drill	Hover Jets	Left Eye Sensor Activated	Copper Wiring	Magnets
Babbage	Sonic Drill	Rocket Boosters	Left Eye Sensor Activated	Copper Wiring	Static Electricity
Eve	Sonic Drill	Grappling Hook	Left Eye Sensor Activated	Gold Wiring	Extreme Heat
R2	Sonic Drill	Grappling Hook	Right Eye Sensor Activated	Gold Wiring	Static Electricity
Bender	Magnetic Claw	Grappling Hook	Left Eye Sensor Activated	Silver Wiring	Extreme Heat
Jarvis	Laser Cutter	Stealth Cloak	Left Eye Sensor Activated	Copper Wiring	Extreme Heat
Optimus	Magnetic Claw	Tread Wheels	Right Eye Sensor Activated	Gold Wiring	Static Electricity
Robbie	Sonic Drill	Grappling Hook	Right Eye Sensor Activated	Copper Wiring	Static Electricity
Connor	Laser Cutter	Rocket Boosters	Right Eye Sensor Activated	Silver Wiring	Extreme Heat
3PO	Plasma Welder	Hover Jets	Left Eye Sensor Activated	Copper Wiring	Extreme Heat
Walle	Hologram Projector	Grappling Hook	Right Eye Sensor Activated	Gold Wiring	Magnets

Fractions of a number

We cracked open the battery mainframe and must calculate the fraction of functional backup cells to unlock the first secure log.

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

Diagram illustrating the arrangement of boxes and numbers:

Row 1: 18, 8, 3, 21, 35, 20, 28, 3, 10, 35, 18, 36, 35, 3, 33, 40, 35, 18

Row 2: 28, 33, 3, 18, 21, 3, 34, 36, 22, 8, 3, 3, 30, 33

$3/5$ of 30 = $\rightarrow$ **T**

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

$3/5$ of 50 = $\rightarrow$ **L**

$$2/10 \text{ of } 140 = \boxed{} \rightarrow \boxed{\text{U}}$$

$6/8$ of 28 = $\rightarrow$ **R**

$2/10$ of $40 = \boxed{} \rightarrow \boxed{\text{H}}$

$$\frac{1}{5} \text{ of } 200 = \boxed{} \rightarrow \boxed{\mathbf{N}}$$

$\frac{1}{3}$ of 102 = $\rightarrow$ **A**

5/6 of 42 = → **O**

$$\frac{1}{5} \text{ of } 180 = \boxed{} \rightarrow \boxed{\text{D}}$$

$\frac{1}{6}$ of 198 = $\rightarrow$ **S**

4/6 of 15 = → **B**

$\frac{3}{4}$ of 4 = → **E**

$\frac{1}{6}$ of 120 = $\rightarrow$ **G**

Scratch space:

CLUE 2

To bypass the security firewall, we must solve a multi-step diagnostic equation using the correct mathematical order of operations.

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

A 2x10 grid of boxes. The top row contains the following sequence: an orange box with 'T', an empty box, an empty box, an empty box, an empty box, an empty box, an orange box with 'T', an empty box, an empty box, an orange box with 'T', an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box. The bottom row contains the following sequence: an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an orange box with 'T', an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box, an empty box. Below each box is a number. The top row numbers are: 38, 9, 44, 63, 44, 58, 38, 76, 74, 38, 79, 8, 59, 63, 28, 44, 7, 28, 76, 71. The bottom row numbers are: 28, 9, 79, 7, 44, 28, 24, 71, 79, 43, 9, 38, 63, 66.

$5 \times 9 - 7 = \square \rightarrow \boxed{\text{T}}$

$$10 \times 10 - 21 = \boxed{} \rightarrow \boxed{\text{I}}$$

$$23 + 6 \times 6 = \boxed{} \rightarrow \boxed{\text{A}}$$

$$68 + 3 \times 2 = \boxed{} \rightarrow \boxed{\text{P}}$$

$$28 + 4 \times 4 = \boxed{} \rightarrow \boxed{\text{E}}$$

$$43 + 5 \times 3 = \boxed{} \rightarrow \boxed{\text{F}}$$

$$5 + 2 \times 2 = \boxed{} \rightarrow \boxed{\text{H}}$$

$$11 \times 9 - 28 = \boxed{} \rightarrow \boxed{\text{R}}$$

$$28 + 3 \times 5 = \boxed{} \rightarrow \boxed{\text{G}}$$

$$6 \times 4 - 17 = \boxed{} \rightarrow \boxed{\text{N}}$$

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

$10 + 7 \times 2 = \boxed{} \rightarrow \boxed{\text{B}}$

$$11 \times 7 - 14 = \boxed{} \rightarrow \boxed{\text{L}}$$

$11 \times 7 - 11 = \boxed{} \rightarrow \boxed{\text{Y}}$

$$10 + 6 \times 3 = \boxed{} \rightarrow \boxed{\text{S}}$$

$$8 \times 12 - 20 = \boxed{} \rightarrow \boxed{0}$$

Scratch space:

CLUE 3 Multiplication facts (1-12)

The robot grid scanner is divided into multiple rows and columns, and multiplying these grid sectors will pin down the signal location.

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

Diagram illustrating the arrangement of boxes and their associated numbers:

Box	Top Row	Bottom Row	Label
1	35	14	
2	28	55	
3	10	2	
4	35	22	H
5	35	24	H
6	24	15	
7	18	15	
8	144	2	
9		55	
10	12	63	
11	24	2	
12	56	28	
13	144	90	
14	15	144	
15	144		
16	35		H
17	24		

$$7 \times 5 = \boxed{} \rightarrow \boxed{\text{H}}$$

$$12 \times 12 = \boxed{} \rightarrow \boxed{\text{T}}$$

$7 \times 4 = \boxed{} \rightarrow \boxed{\text{I}}$

$$2 \times 1 = \boxed{} \rightarrow \boxed{0}$$

$6 \times 4 = \boxed{} \rightarrow \boxed{\text{E}}$

$11 \times 2 = \boxed{} \rightarrow \boxed{\text{C}}$

$$5 \times 3 = \boxed{} \rightarrow \boxed{\mathbf{S}}$$

$11 \times 5 = \boxed{} \rightarrow \boxed{\text{R}}$

$2 \times 9 = \boxed{} \rightarrow \boxed{\mathbf{A}}$

$5 \times 2 = \square \rightarrow \boxed{\mathbf{G}}$

$8 \times 7 = \boxed{} \rightarrow \boxed{\text{L}}$

$10 \times 9 = \boxed{} \rightarrow \boxed{\text{N}}$

$1 \times 12 = \boxed{} \rightarrow \boxed{\mathbf{M}}$

$7 \times 2 = \boxed{} \rightarrow \boxed{\text{P}}$

$9 \times 7 = \square \rightarrow \mathbf{J}$

Scratch space:

CLUE 4 Rounding

The tracking radar is glitching and only shows rounded distances, so we need to round the telemetry data to locate the suspect.

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

G						G													
170	110	9000	230	50	90	170	130	9000	5000	5000	500	4300	230	50	4300	500	70		
230	500	4300	500	110	500	900	2900	20	500	3000	50	90	30						

Round 166 to the nearest ten → **G**

Round 5,283 to the nearest thousand → **P**

Round 126 to the nearest ten → **C**

Round 33 to the nearest ten → **D**

Round 8,747 to the nearest thousand → **O**

Round 68 to the nearest ten → **S**

Round 2,900 to the nearest hundred → **T**

Round 510 to the nearest hundred → **E**

Round 3,329 to the nearest thousand → **H**

Round 21 to the nearest ten → **B**

Round 904 to the nearest hundred → **F**

Round 51 to the nearest ten → **I**

Round 114 to the nearest ten → **L**

Round 4,293 to the nearest hundred → **R**

Round 91 to the nearest ten → **N**

Round 231 to the nearest ten → **W**

Scratch space:

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

We found a corrupted drive and must isolate a fraction of the megabytes to extract the final decrypted video frame.

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:

$1/6 \text{ of } 12 = \boxed{}$

$4/10 \text{ of } 30 = \boxed{}$

$2/5 \text{ of } 10 = \boxed{}$

$2/6 \text{ of } 18 = \boxed{}$

$1/2 \text{ of } 22 = \boxed{}$

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

$3/5 \text{ of } 5 = \boxed{}$

$1/5 \text{ of } 50 = \boxed{}$

$2/8 \text{ of } 36 = \boxed{}$

$1/6 \text{ of } 48 = \boxed{}$

$2/4 \text{ of } 10 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain pulled the heavy titanium safe close, then swung up into the ceiling vents.
2. The villain sliced through the heavy steel beams, then disappeared instantly with a stealth cloak.
3. The villain sliced through the heavy steel beams, then fled the scene using hover jets.
4. The villain drilled a hole directly into the vault, then disappeared instantly with a stealth cloak.
5. The villain drilled a hole directly into the vault, then blasted out of the window with rocket boosters.
6. The villain pulled the heavy titanium safe close, then fled the scene using hover jets.
7. The villain fused the steel vault lock with a welder, then disappeared instantly with a stealth cloak.
8. The villain distracted the guards with a light show, then rolled away quickly on tread wheels.
9. The villain drilled a hole directly into the vault, then swung up into the ceiling vents.
10. The villain distracted the guards with a light show, then disappeared instantly with a stealth cloak.
11. The villain pulled the heavy titanium safe close, then disappeared instantly with a stealth cloak.
12. The villain fused the steel vault lock with a welder, then fled the scene using hover jets.

Answer Key

The Sparkbolt Expo Sabotage

Culprit: Lovell

Magnetic Claw · Grappling Hook · Left Eye Sensor Activated · Copper Wiring · Extreme Heat

Trail: Start 21 → Clue 1 19 → Clue 2 12 → Clue 3 9 → Clue 4 4 → Clue 5 1

Clue 1 (Fractions of a number): "THE ROGUE BOT DOES NOT USE TREAD WHEELS"

$\frac{3}{5}$ of 30 = 18 (T) · $\frac{1}{4}$ of 88 = 22 (W) · $\frac{3}{5}$ of 50 = 30 (L) · $\frac{2}{10}$ of 140 = 28 (U) · $\frac{6}{8}$ of 28 = 21 (R) · $\frac{2}{10}$ of 40 = 8 (H) · $\frac{1}{5}$ of 200 = 40 (N) · $\frac{1}{3}$ of 102 = 34 (A) · $\frac{5}{6}$ of 42 = 35 (O) · $\frac{1}{5}$ of 180 = 36 (D) · $\frac{1}{6}$ of 198 = 33 (S) · $\frac{4}{6}$ of 15 = 10 (B) · $\frac{3}{4}$ of 4 = 3 (E) · $\frac{1}{6}$ of 120 = 20 (G)

Clue 2 (Order of operations): "THE LEFT OPTICAL SENSOR SHINES BRIGHTLY"

$5 \times 9 - 7 = 38$ (T) · $10 \times 10 - 21 = 79$ (I) · $23 + 6 \times 6 = 59$ (A) · $68 + 3 \times 2 = 74$ (P) · $28 + 4 \times 4 = 44$ (E) · $43 + 5 \times 3 = 58$ (F) · $5 + 2 \times 2 = 9$ (H) · $11 \times 9 - 28 = 71$ (R) · $28 + 3 \times 5 = 43$ (G) · $6 \times 4 - 17 = 7$ (N) · $4 + 2 \times 2 = 8$ (C) · $10 + 7 \times 2 = 24$ (B) · $11 \times 7 - 14 = 63$ (L) · $11 \times 7 - 11 = 66$ (Y) · $10 + 6 \times 3 = 28$ (S) · $8 \times 12 - 20 = 76$ (O)

Clue 3 (Multiplication facts (1-12)): "HIGH HEAT MELTS THE PROCESSOR JOINT"

$7 \times 5 = 35$ (H) · $12 \times 12 = 144$ (T) · $7 \times 4 = 28$ (I) · $2 \times 1 = 2$ (O) · $6 \times 4 = 24$ (E) · $11 \times 2 = 22$ (C) · $5 \times 3 = 15$ (S) · $11 \times 5 = 55$ (R) · $2 \times 9 = 18$ (A) · $5 \times 2 = 10$ (G) · $8 \times 7 = 56$ (L) · $10 \times 9 = 90$ (N) · $1 \times 12 = 12$ (M) · $7 \times 2 = 14$ (P) · $9 \times 7 = 63$ (J)

Clue 4 (Rounding): "GLOWING COPPER WIRES WERE LEFT BEHIND"

Round 166 to the nearest ten = 170 (G) · Round 5,283 to the nearest thousand = 5000 (P) · Round 126 to the nearest ten = 130 (C) · Round 33 to the nearest ten = 30 (D) · Round 8,747 to the nearest thousand = 9000 (O) · Round 68 to the nearest ten = 70 (S) · Round 2,900 to the nearest hundred = 2900 (T) · Round 510 to the nearest hundred = 500 (E) · Round 3,329 to the nearest thousand = 3000 (H) · Round 21 to the nearest ten = 20 (B) · Round 904 to the nearest hundred = 900 (F) · Round 51 to the nearest ten = 50 (I) · Round 114 to the nearest ten = 110 (L) · Round 4,293 to the nearest hundred = 4300 (R) · Round 91 to the nearest ten = 90 (N) · Round 231 to the nearest ten = 230 (W)

Clue 5 (Fractions of a number): surviving statement is box 1 → Lovell

$\frac{1}{6}$ of 12 = 2 · $\frac{4}{10}$ of 30 = 12 · $\frac{2}{5}$ of 10 = 4 · $\frac{2}{6}$ of 18 = 6 · $\frac{1}{2}$ of 22 = 11 · $\frac{1}{4}$ of 28 = 7 · $\frac{3}{5}$ of 5 = 3 · $\frac{1}{5}$ of 50 = 10 · $\frac{2}{8}$ of 36 = 9 · $\frac{1}{6}$ of 48 = 8 · $\frac{2}{4}$ of 10 = 5