



# The Dead Rails Derailer

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

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

A mysterious hacker has hijacked the Roblox Dead Rails system! They locked the Lead Conductor in a runaway minecart and are scrambling the signals along the tracks. We must decrypt the system, find the clues, and stop the Saboteur before the final crash.

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 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 SABOTAGE   | GLITCH POWER     | GOGGLES TYPE        | ROBLOX HAIR        | DEFEAT TOOL      |
|--------------|-----------------|------------------|---------------------|--------------------|------------------|
| RoboBlip     | Steam Bursting  | Gravity Flipping | Wears Light Goggles | Spiky Blue Hair    | Super Bloxi Cola |
| GlitchHunter | Cart Derailing  | Block Spawning   | Wears Light Goggles | Blocky Yellow Hair | Golden Wrench    |
| SignalMan    | Speed Glitching | Laser Welding    | Wears Light Goggles | Neon Green Hair    | Super Bloxi Cola |
| DominoCrown  | Speed Glitching | Block Spawning   | Wears Heavy Visor   | Blocky Yellow Hair | Rusty Crowbar    |
| ProCartRider | Signal Jamming  | Laser Welding    | Wears Heavy Visor   | Blocky Yellow Hair | Golden Wrench    |
| Cheezburger  | Track Sabotage  | Gravity Flipping | Wears Heavy Visor   | Neon Green Hair    | Rusty Crowbar    |
| NoobKing     | Steam Bursting  | Block Spawning   | Wears Light Goggles | Neon Green Hair    | Super Bloxi Cola |
| BaconHairPro | Speed Glitching | Block Spawning   | Wears Light Goggles | Spiky Blue Hair    | Rusty Crowbar    |
| Guest666     | Signal Jamming  | Gravity Flipping | Wears Light Goggles | Neon Green Hair    | Super Bloxi Cola |
| SpikeDodge   | Speed Glitching | Magnet Pulling   | Wears Light Goggles | Blocky Yellow Hair | Rusty Crowbar    |
| BloxyDev     | Steam Bursting  | Magnet Pulling   | Wears Heavy Visor   | Blocky Yellow Hair | Golden Wrench    |
| SteamViper   | Track Sabotage  | Block Spawning   | Wears Light Goggles | Neon Green Hair    | Super Bloxi Cola |
| CartCrasher  | Speed Glitching | Ghost Speeding   | Wears Light Goggles | Neon Green Hair    | Super Bloxi Cola |
| PixelCrusher | Steam Bursting  | Ghost Speeding   | Wears Light Goggles | Neon Green Hair    | Super Bloxi Cola |
| OofMaster    | Speed Glitching | Laser Welding    | Wears Heavy Visor   | Blocky Yellow Hair | Super Bloxi Cola |
| ValiantValk  | Steam Bursting  | Magnet Pulling   | Wears Heavy Visor   | Neon Green Hair    | Golden Wrench    |
| Builderman   | Signal Jamming  | Laser Welding    | Wears Heavy Visor   | Neon Green Hair    | Super Bloxi Cola |
| Telamon      | Track Sabotage  | Ghost Speeding   | Wears Light Goggles | Neon Green Hair    | Rusty Crowbar    |
| Shedletsky   | Track Sabotage  | Magnet Pulling   | Wears Heavy Visor   | Spiky Blue Hair    | Super Bloxi Cola |
| TixSpender   | Cart Derailing  | Laser Welding    | Wears Light Goggles | Blocky Yellow Hair | Super Bloxi Cola |
| TrackRacer   | Track Sabotage  | Block Spawning   | Wears Heavy Visor   | Neon Green Hair    | Golden Wrench    |

## CLUE 1 Addition

We found the switchboard at Station One. The saboteur added extra dummy circuits to overload the power. Add up the active circuits on the grid to reveal our first hidden file.

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

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| T    |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      | T    |
| 5799 | 5953 | 7226 | 9743 | 2144 | 6700 | 6700 | 7572 | 2144 | 5641 | 6552 | 3229 | 7226 | 5591 | 5641 | 3229 | 5799 |
|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 5991 | 5591 | 7226 | 7477 | 6700 | 3229 | 8558 | 9423 | 5591 | 8827 | 7572 | 8839 | 5641 | 2144 | 5641 | 4294 |      |

|                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|
| $3130 + 2669 = \square \rightarrow$ T | $4945 + 3882 = \square \rightarrow$ P | $4887 + 2339 = \square \rightarrow$ E |
| $3816 + 2175 = \square \rightarrow$ U | $3082 + 2509 = \square \rightarrow$ S | $1796 + 3845 = \square \rightarrow$ N |
| $6633 + 3110 = \square \rightarrow$ V | $4656 + 3902 = \square \rightarrow$ C | $3271 + 3281 = \square \rightarrow$ D |
| $1569 + 1660 = \square \rightarrow$ O | $1646 + 2648 = \square \rightarrow$ G | $1068 + 1076 = \square \rightarrow$ I |
| $4553 + 2147 = \square \rightarrow$ L | $4882 + 2595 = \square \rightarrow$ B | $4126 + 5297 = \square \rightarrow$ K |
| $4141 + 1812 = \square \rightarrow$ H | $3049 + 4523 = \square \rightarrow$ A | $5629 + 3210 = \square \rightarrow$ W |

Scratch space:

## CLUE 2

The cart's fuel cell is leaking rapidly! We need to calculate how much fuel was lost between the two checkpoints. Subtract the current level from the starting amount to unlock the next data node.

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

7163 3442 1483 8463 8970 4482 4482 7139 8970 5974 7369 1483 7139 5971 2198 4482 8970 2314 3442 7163

2314 1330 2314 2314 4482 1483 2198

$$12092 - 4929 = \boxed{\phantom{0000}} \rightarrow \boxed{\mathbf{T}}$$

$$5649 - 4166 = \boxed{\phantom{000}} \rightarrow \boxed{\text{E}}$$

$$6375 - 4061 = \boxed{\phantom{000}} \rightarrow \boxed{\mathbf{G}}$$

$$7435 - 66 = \boxed{\phantom{000}} \rightarrow \boxed{\mathbf{W}}$$

$$1462 - 132 = \boxed{\phantom{000}} \rightarrow \boxed{0}$$

$$8574 - 1435 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{A}}$$

$$3753 - 1555 = \boxed{\phantom{000}} \rightarrow \boxed{\text{S}}$$

$$6044 - 2602 = \boxed{\phantom{000}} \rightarrow \boxed{\text{H}}$$

$10339 - 4368 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{R}}$

$$11450 - 2480 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{I}}$$

$$9328 - 3354 = \boxed{\phantom{0000}} \rightarrow \boxed{\text{N}}$$

$$8520 - 4038 = \boxed{\phantom{000}} \rightarrow \boxed{\text{L}}$$

9893 - 1430 =  → **V**

Scratch space:

## Multiplication facts (1-12)

The backup generator is locked behind rows of cargo containers. The layout is a massive grid of stacked boxes. Multiply the number of rows by the boxes in each row to bypass the lock and get the hair clue.

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

A number line from 0 to 120. Boxes are provided for every 10 units (0, 10, 20, ..., 120). The box for 10 is labeled 'T' for tens. The numbers 120, 40, 12, 42, 10, 100, 100, 21, 10, 108, 63, 66, 49, 12, 27, 50, 21, and 120 are placed in the boxes. The box for 10 is labeled 'T' for tens.

$$12 \times 10 = \boxed{\phantom{00}} \rightarrow \boxed{\text{T}}$$

$$10 \times 5 = \boxed{\phantom{00}} \rightarrow \boxed{\text{S}}$$

$$8 \times 11 = \boxed{\phantom{00}} \rightarrow \boxed{\text{U}}$$

$6 \times 2 = \boxed{\phantom{00}} \rightarrow \boxed{\text{E}}$

$$10 \times 4 = \boxed{\phantom{00}} \rightarrow \boxed{\text{H}}$$

$10 \times 10 = \boxed{\phantom{00}} \rightarrow \mathbf{L}$

$1 \times 10 = \boxed{\phantom{00}} \rightarrow \boxed{\phantom{00}} \mid$

$9 \times 3 = \boxed{\phantom{00}} \rightarrow \boxed{\mathbf{R}}$

$9 \times 12 = \boxed{\phantom{000}} \rightarrow \mathbf{N}$

$4 \times 11 = \boxed{\phantom{00}} \rightarrow \boxed{\mathbf{B}}$

$2 \times 9 = \square \rightarrow \boxed{\mathbf{X}}$

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

$$3 \times 5 = \boxed{\phantom{00}} \rightarrow \boxed{\text{P}}$$

$7 \times 7 =$    $\rightarrow$  **W**

$11 \times 6 = \square \rightarrow \square$

$7 \times 6 = \square \rightarrow \mathbf{V}$

$3 \times 7 = \square \rightarrow \boxed{\mathbf{A}}$

Scratch space:

## CLUE 4 Place value

A strange signal is blinking on the speed monitor. The numbers are scrambled, and we need to identify the exact digit in the thousands place to decode the frequency. Read the digit carefully to find the tell.

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

|     |    |     |     |     |     |    |    |     |      |      |     |     |
|-----|----|-----|-----|-----|-----|----|----|-----|------|------|-----|-----|
| N   |    |     | N   |     |     |    |    | N   |      |      |     |     |
| 800 | 40 | 500 | 800 | 700 | 900 | 40 | 40 | 800 | 9000 | 7000 | 100 | 900 |

  

|    |      |     |    |    |     |     |     |      |     |    |     |    |    |     |      |     |      |
|----|------|-----|----|----|-----|-----|-----|------|-----|----|-----|----|----|-----|------|-----|------|
|    |      |     |    |    |     | N   |     |      |     |    |     |    |    |     | N    |     |      |
| 90 | 3000 | 100 | 70 | 70 | 100 | 800 | 700 | 6000 | 400 | 40 | 900 | 40 | 50 | 500 | 4000 | 800 | 2000 |

What is the value of the 8 in 15,844?  → **N**

What is the value of the 3 in 63,585?  → **L**

What is the value of the 4 in 15,147?  → **E**

What is the value of the 1 in 657,128?  → **I**

What is the value of the 9 in 49,615?  → **H**

What is the value of the 4 in 753,406?  → **W**

What is the value of the 5 in 230,956?  → **F**

What is the value of the 9 in 150,494?  → **C**

What is the value of the 7 in 556,795?  → **G**

What is the value of the 9 in 51,988?  → **R**

What is the value of the 5 in 21,534?  → **O**

What is the value of the 4 in 24,113?  → **U**

What is the value of the 6 in 346,427?  → **S**

What is the value of the 7 in 61,275?  → **P**

What is the value of the 7 in 437,558?  → **A**

What is the value of the 2 in 52,313?  → **D**

Scratch space:

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

The final track switch is jammed. We have a set of light bulbs, but only a fraction of them need to be turned on to reset the mechanism. Calculate the exact fraction of bulbs to light up, and we will reveal the villain's true weakness!

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:**

$1/4 \text{ of } 24 = \boxed{\phantom{00}}$

$2/4 \text{ of } 22 = \boxed{\phantom{00}}$

$1/4 \text{ of } 8 = \boxed{\phantom{00}}$

$8/10 \text{ of } 10 = \boxed{\phantom{00}}$

$2/8 \text{ of } 16 = \boxed{\phantom{00}}$

$4/10 \text{ of } 25 = \boxed{\phantom{00}}$

$2/8 \text{ of } 4 = \boxed{\phantom{00}}$

$1/8 \text{ of } 40 = \boxed{\phantom{00}}$

$6/10 \text{ of } 15 = \boxed{\phantom{00}}$

$3/8 \text{ of } 32 = \boxed{\phantom{00}}$

$2/4 \text{ of } 6 = \boxed{\phantom{00}}$

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

1. The villain bends the steel rails out of shape, then welds the emergency brakes shut.
2. The villain releases a massive burst of hot steam, then fades into a ghostly shadow.
3. The villain lifts the minecart clean off the tracks, then pulls metal parts off with magnets.
4. The villain releases a massive burst of hot steam, then turns the gravity upside down.
5. The villain releases a massive burst of hot steam, then spawns giant blocks onto the pathway.
6. The villain injects a speed boosting glitch code, then welds the emergency brakes shut.
7. The villain injects a speed boosting glitch code, then fades into a ghostly shadow.
8. The villain scrambles the railway signal lights, then spawns giant blocks onto the pathway.
9. The villain lifts the minecart clean off the tracks, then spawns giant blocks onto the pathway.
10. The villain scrambles the railway signal lights, then welds the emergency brakes shut.
11. The villain scrambles the railway signal lights, then turns the gravity upside down.
12. The villain scrambles the railway signal lights, then pulls metal parts off with magnets.

# Answer Key

## The Dead Rails Derailer

### Culprit: CartCrasher

Speed Glitching · Ghost Speeding · Wears Light Goggles · Neon Green Hair · Super Bloxi Cola

Trail: Start 21 → Clue 1 15 → Clue 2 8 → Clue 3 6 → Clue 4 4 → Clue 5 1

#### Clue 1 (Addition): "THE VILLAIN DOES NOT USE BLOCK SPAWNING"

$3130 + 2669 = 5799$  (T) ·  $4945 + 3882 = 8827$  (P) ·  $4887 + 2339 = 7226$  (E) ·  $3816 + 2175 = 5991$  (U) ·  $3082 + 2509 = 5591$  (S) ·  $1796 + 3845 = 5641$  (N) ·  $6633 + 3110 = 9743$  (V) ·  $4656 + 3902 = 8558$  (C) ·  $3271 + 3281 = 6552$  (D) ·  $1569 + 1660 = 3229$  (O) ·  $1646 + 2648 = 4294$  (G) ·  $1068 + 1076 = 2144$  (I) ·  $4553 + 2147 = 6700$  (L) ·  $4882 + 2595 = 7477$  (B) ·  $4126 + 5297 = 9423$  (K) ·  $4141 + 1812 = 5953$  (H) ·  $3049 + 4523 = 7572$  (A) ·  $5629 + 3210 = 8839$  (W)

#### Clue 2 (Subtraction): "THE VILLAIN WEARS LIGHT GOGGLES"

$12092 - 4929 = 7163$  (T) ·  $5649 - 4166 = 1483$  (E) ·  $6375 - 4061 = 2314$  (G) ·  $7435 - 66 = 7369$  (W) ·  $1462 - 132 = 1330$  (O) ·  $8574 - 1435 = 7139$  (A) ·  $3753 - 1555 = 2198$  (S) ·  $6044 - 2602 = 3442$  (H) ·  $10339 - 4368 = 5971$  (R) ·  $11450 - 2480 = 8970$  (I) ·  $9328 - 3354 = 5974$  (N) ·  $8520 - 4038 = 4482$  (L) ·  $9893 - 1430 = 8463$  (V)

#### Clue 3 (Multiplication facts (1-12)): "THE VILLAIN COWERS AT SUPER BLOXI COLA"

$12 \times 10 = 120$  (T) ·  $10 \times 5 = 50$  (S) ·  $8 \times 11 = 88$  (U) ·  $6 \times 2 = 12$  (E) ·  $10 \times 4 = 40$  (H) ·  $10 \times 10 = 100$  (L) ·  $1 \times 10 = 10$  (I) ·  $9 \times 3 = 27$  (R) ·  $9 \times 12 = 108$  (N) ·  $4 \times 11 = 44$  (B) ·  $2 \times 9 = 18$  (X) ·  $7 \times 9 = 63$  (C) ·  $3 \times 5 = 15$  (P) ·  $7 \times 7 = 49$  (W) ·  $11 \times 6 = 66$  (O) ·  $7 \times 6 = 42$  (V) ·  $3 \times 7 = 21$  (A)

#### Clue 4 (Place value): "NEON GREEN HAIR CLIPPINGS WERE FOUND"

What is the value of the 8 in 15,844? = 800 (N) · What is the value of the 3 in 63,585? = 3000 (L) · What is the value of the 4 in 15,147? = 40 (E) · What is the value of the 1 in 657,128? = 100 (I) · What is the value of the 9 in 49,615? = 9000 (H) · What is the value of the 4 in 753,406? = 400 (W) · What is the value of the 5 in 230,956? = 50 (F) · What is the value of the 9 in 150,494? = 90 (C) · What is the value of the 7 in 556,795? = 700 (G) · What is the value of the 9 in 51,988? = 900 (R) · What is the value of the 5 in 21,534? = 500 (O) · What is the value of the 4 in 24,113? = 4000 (U) · What is the value of the 6 in 346,427? = 6000 (S) · What is the value of the 7 in 61,275? = 70 (P) · What is the value of the 7 in 437,558? = 7000 (A) · What is the value of the 2 in 52,313? = 2000 (D)

#### Clue 5 (Fractions of a number): surviving statement is box 7 → CartCrasher

$\frac{1}{4}$  of 24 = 6 ·  $\frac{2}{4}$  of 22 = 11 ·  $\frac{1}{4}$  of 8 = 2 ·  $\frac{8}{10}$  of 10 = 8 ·  $\frac{2}{8}$  of 16 = 4 ·  $\frac{4}{10}$  of 25 = 10 ·  $\frac{2}{8}$  of 4 = 1 ·  $\frac{1}{8}$  of 40 = 5 ·  $\frac{6}{10}$  of 15 = 9 ·  $\frac{3}{8}$  of 32 = 12 ·  $\frac{2}{4}$  of 6 = 3