



The Mystery of the Shadow Signal

Grade 5 math · Multiplication, Fractions of a number, Order of operations, Rounding, Division · Reading level grades 3-4

Detective: _____ Date: _____

A strange radio signal hijacked the town broadcasting tower! The Hawkins AV Club needs your detective skills to decode the math clues, eliminate suspects, and track down the culprit.

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 Shadow Rogue is _____

Possible suspects

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

NAME	SPECIAL GADGET	SIGNAL BOOST	WATCH WRIST	CAP COLOR	DISRUPTION TOOL
Bob Sinclair	Proximity Radar	Neon Pulse	Left Handed Watch	Blue Cap	Loud Alarm
Argyle Smith	Proximity Radar	Neon Pulse	Right Handed Watch	Yellow Cap	Bright Flash
Murray Bauman	Proximity Radar	Static Blast	Right Handed Watch	Yellow Cap	Bright Flash
Jim Harrington	Walkie Talkie	Laser Beam	Right Handed Watch	Red Cap	Bright Flash
Holly Wheeler	Cassette Player	Radar Jam	Left Handed Watch	Red Cap	Bright Flash
Chrissy Cunningham	Walkie Talkie	Static Blast	Right Handed Watch	Red Cap	Tuning Fork
Lucas Drake	Walkie Talkie	Neon Pulse	Right Handed Watch	Yellow Cap	Bright Flash
Ted Wheeler	Cassette Player	Echo Surge	Right Handed Watch	Blue Cap	Bright Flash
Robin Hayes	Cassette Player	Radar Jam	Right Handed Watch	Blue Cap	Bright Flash
Patrick McKinney	Arcade Decoder	Neon Pulse	Left Handed Watch	Blue Cap	Loud Alarm
Joyce Wheeler	Cassette Player	Static Blast	Right Handed Watch	Red Cap	Loud Alarm
Erika Sinclair	Flashlight Array	Laser Beam	Left Handed Watch	Yellow Cap	Bright Flash
Tommy Flynn	Arcade Decoder	Neon Pulse	Right Handed Watch	Blue Cap	Bright Flash
Will Henderson	Arcade Decoder	Neon Pulse	Right Handed Watch	Blue Cap	Loud Alarm
Fred Benson	Walkie Talkie	Echo Surge	Left Handed Watch	Blue Cap	Bright Flash
Barb Holland	Walkie Talkie	Neon Pulse	Left Handed Watch	Blue Cap	Tuning Fork
Max Vance	Cassette Player	Static Blast	Right Handed Watch	Blue Cap	Tuning Fork
Karen Wheeler	Walkie Talkie	Echo Surge	Right Handed Watch	Blue Cap	Loud Alarm
Nancy Vance	Walkie Talkie	Static Blast	Left Handed Watch	Blue Cap	Bright Flash
Jason Carver	Walkie Talkie	Laser Beam	Right Handed Watch	Blue Cap	Bright Flash
Jane Hopper	Cassette Player	Laser Beam	Right Handed Watch	Blue Cap	Bright Flash

CLUE 1
Multiplication facts (1-12)

You find box loads of radio parts stacked in neat grid rows. Multiply to tally the total gear.

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

T																T
45	56	35	20	21	16	16	54	21	84	108	14	35	27	84	14	45
25	27	35	5	54	108	54	5	1	54	50						

$9 \times 5 = \square \rightarrow$ T	$4 \times 4 = \square \rightarrow$ L	$12 \times 9 = \square \rightarrow$ D	$9 \times 6 = \square \rightarrow$ A
$7 \times 2 = \square \rightarrow$ O	$5 \times 5 = \square \rightarrow$ U	$9 \times 3 = \square \rightarrow$ S	$1 \times 1 = \square \rightarrow$ J
$10 \times 2 = \square \rightarrow$ V	$8 \times 7 = \square \rightarrow$ H	$5 \times 1 = \square \rightarrow$ R	$5 \times 7 = \square \rightarrow$ E
$3 \times 7 = \square \rightarrow$ I	$10 \times 5 = \square \rightarrow$ M	$7 \times 12 = \square \rightarrow$ N	

Scratch space:

CLUE 2

Fractions of a number

The AV Club logs show that only a fraction of the radio towers are sending fake signals.

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

W									W		W						
38	10	35	18	23	34	34	34	16	38	16	38	16	35	14	7	15	18
									W								
35	7	23	21	10	28	7	35	38	21	10	34	35					

$$5/10 \text{ of } 76 = \boxed{} \rightarrow \boxed{\text{W}}$$

$$3/6 \text{ of } 36 = \boxed{} \rightarrow \boxed{\text{N}}$$

$$1/2 \text{ of } 42 = \boxed{} \rightarrow \boxed{\text{R}}$$

$$3/6 \text{ of } 14 = \boxed{} \rightarrow \boxed{\text{H}}$$

$$5/8 \text{ of } 16 = \boxed{} \rightarrow \boxed{\text{I}}$$

$$1/5 \text{ of } 170 = \boxed{} \rightarrow \boxed{\text{S}}$$

$$8/10 \text{ of } 20 = \boxed{} \rightarrow \boxed{\text{A}}$$

$$2/6 \text{ of } 105 = \boxed{} \rightarrow \boxed{\text{T}}$$

$$2/10 \text{ of } 75 = \boxed{} \rightarrow \boxed{\text{O}}$$

$$1/5 \text{ of } 115 = \boxed{} \rightarrow \boxed{\text{E}}$$

$$1/5 \text{ of } 70 = \boxed{} \rightarrow \boxed{\text{C}}$$

$$7/10 \text{ of } 40 = \boxed{} \rightarrow \boxed{\text{G}}$$

Scratch space:

CLUE 3
Order of operations

To unlock the control console, you must solve this multi-step code sequence in correct order.

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

T																			
28	41	59	29	19	36	36	63	19	74	7	63	18	11	36	19	74	70	59	70
									T										
11	76	63	11	60	19	79	41	28	53	36	63	18	41						

$3 \times 12 - 8 = \square \rightarrow \text{T}$

$7 \times 8 - 27 = \square \rightarrow \text{V}$

$12 \times 3 - 17 = \square \rightarrow \text{I}$

$8 \times 12 - 20 = \square \rightarrow \text{Y}$

$1 + 3 \times 2 = \square \rightarrow \text{W}$

$20 + 5 \times 8 = \square \rightarrow \text{R}$

$5 \times 12 - 7 = \square \rightarrow \text{F}$

$39 + 8 \times 3 = \square \rightarrow \text{A}$

$24 + 2 \times 6 = \square \rightarrow \text{L}$

$10 + 7 \times 7 = \square \rightarrow \text{E}$

$7 \times 4 - 10 = \square \rightarrow \text{S}$

$67 + 4 \times 3 = \square \rightarrow \text{G}$

$6 + 5 \times 7 = \square \rightarrow \text{H}$

$7 \times 11 - 7 = \square \rightarrow \text{D}$

$2 + 3 \times 3 = \square \rightarrow \text{B}$

$68 + 2 \times 3 = \square \rightarrow \text{N}$

Scratch space:

CLUE 4 Rounding

The lab radar monitor only shows rounded frequencies to the nearest hundred.

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

A						A			A								
20	1300	2900	1100	110	900	20	7000	430	20	370	230	9000	290	7000	7000	110	230

A									
20	170	170	70	110	370	900	110	130	110

Round 19 to the nearest ten → **A**

Round 107 to the nearest ten → **E**

Round 374 to the nearest ten → **S**

Round 929 to the nearest hundred → **C**

Round 2,852 to the nearest hundred → **L**

Round 127 to the nearest ten → **N**

Round 432 to the nearest ten → **W**

Round 9,170 to the nearest thousand → **R**

Round 173 to the nearest ten → **T**

Round 73 to the nearest ten → **H**

Round 226 to the nearest ten → **D**

Round 293 to the nearest ten → **O**

Round 1,081 to the nearest hundred → **U**

Round 1,314 to the nearest hundred → **B**

Round 7,356 to the nearest thousand → **P**

Scratch space:

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

Divide the remaining walkie talkie channels equally among the team to isolate the culprit.

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:

$22 \div 11 = \boxed{}$

$11 \div 1 = \boxed{}$

$18 \div 2 = \boxed{}$

$40 \div 10 = \boxed{}$

$24 \div 4 = \boxed{}$

$21 \div 7 = \boxed{}$

$96 \div 12 = \boxed{}$

$42 \div 6 = \boxed{}$

$5 \div 1 = \boxed{}$

$144 \div 12 = \boxed{}$

$100 \div 10 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain cranked the cassette player, then triggered an echo surge.
2. The villain cranked the cassette player, then shot a laser beam.
3. The villain scanned with the proximity radar, then shot a laser beam.
4. The villain cracked the arcade decoder, then triggered an echo surge.
5. The villain switched on the walkie talkie, then unleashed a static blast.
6. The villain flashed the flashlight array, then fired a neon pulse.
7. The villain scanned with the proximity radar, then fired a neon pulse.
8. The villain flashed the flashlight array, then shot a laser beam.
9. The villain switched on the walkie talkie, then shot a laser beam.
10. The villain flashed the flashlight array, then triggered an echo surge.
11. The villain cracked the arcade decoder, then fired a neon pulse.
12. The villain scanned with the proximity radar, then activated the radar jam.

Answer Key

The Mystery of the Shadow Signal

Culprit: Ted Wheeler

Cassette Player · Echo Surge · Right Handed Watch · Blue Cap · Bright Flash

Trail: Start 21 → Clue 1 19 → Clue 2 13 → Clue 3 8 → Clue 4 4 → Clue 5 1

Clue 1 (Multiplication facts (1-12)): "THE VILLAIN DOES NOT USE RADAR JAM"

$9 \times 5 = 45$ (T) · $4 \times 4 = 16$ (L) · $12 \times 9 = 108$ (D) · $9 \times 6 = 54$ (A) · $7 \times 2 = 14$ (O) · $5 \times 5 = 25$ (U) · $9 \times 3 = 27$ (S) · $1 \times 1 = 1$ (J) · $10 \times 2 = 20$ (V) · $8 \times 7 = 56$ (H) · $5 \times 1 = 5$ (R) · $5 \times 7 = 35$ (E) · $3 \times 7 = 21$ (I) · $10 \times 5 = 50$ (M) · $7 \times 12 = 84$ (N)

Clue 2 (Fractions of a number): "WITNESS SAW A WATCH ON THE RIGHT WRIST"

$5/10$ of 76 = 38 (W) · $3/6$ of 36 = 18 (N) · $1/2$ of 42 = 21 (R) · $3/6$ of 14 = 7 (H) · $5/8$ of 16 = 10 (I) · $1/5$ of 170 = 34 (S) · $8/10$ of 20 = 16 (A) · $2/6$ of 105 = 35 (T) · $2/10$ of 75 = 15 (O) · $1/5$ of 115 = 23 (E) · $1/5$ of 70 = 14 (C) · $7/10$ of 40 = 28 (G)

Clue 3 (Order of operations): "THE VILLAIN WAS BLINDED BY A BRIGHT FLASH"

$3 \times 12 - 8 = 28$ (T) · $7 \times 8 - 27 = 29$ (V) · $12 \times 3 - 17 = 19$ (I) · $8 \times 12 - 20 = 76$ (Y) · $1 + 3 \times 2 = 7$ (W) · $20 + 5 \times 8 = 60$ (R) · $5 \times 12 - 7 = 53$ (F) · $39 + 8 \times 3 = 63$ (A) · $24 + 2 \times 6 = 36$ (L) · $10 + 7 \times 7 = 59$ (E) · $7 \times 4 - 10 = 18$ (S) · $67 + 4 \times 3 = 79$ (G) · $6 + 5 \times 7 = 41$ (H) · $7 \times 11 - 7 = 70$ (D) · $2 + 3 \times 3 = 11$ (B) · $68 + 2 \times 3 = 74$ (N)

Clue 4 (Rounding): "A BLUE CAP WAS DROPPED AT THE SCENE"

Round 19 to the nearest ten = 20 (A) · Round 107 to the nearest ten = 110 (E) · Round 374 to the nearest ten = 370 (S) · Round 929 to the nearest hundred = 900 (C) · Round 2,852 to the nearest hundred = 2900 (L) · Round 127 to the nearest ten = 130 (N) · Round 432 to the nearest ten = 430 (W) · Round 9,170 to the nearest thousand = 9000 (R) · Round 173 to the nearest ten = 170 (T) · Round 73 to the nearest ten = 70 (H) · Round 226 to the nearest ten = 230 (D) · Round 293 to the nearest ten = 290 (O) · Round 1,081 to the nearest hundred = 1100 (U) · Round 1,314 to the nearest hundred = 1300 (B) · Round 7,356 to the nearest thousand = 7000 (P)

Clue 5 (Division facts (1-12)): surviving statement is box 1 → Ted Wheeler

$22 \div 11 = 2$ · $11 \div 1 = 11$ · $18 \div 2 = 9$ · $40 \div 10 = 4$ · $24 \div 4 = 6$ · $21 \div 7 = 3$ · $96 \div 12 = 8$ · $42 \div 6 = 7$ · $5 \div 1 = 5$ · $144 \div 12 = 12$ · $100 \div 10 = 10$