The Case of the Missing Star Chart

Grade 7 math · Addition, Subtraction, Multiplication, Multi-step word problems, Two-step equations · Reading level grades 5-6

Detective: _____ **Date:** _____

While sailing high above the Cloud Archipelago, someone broke into the chart room and snatched the ancient Star Chart! The Chief Cartographer needs your help examining evidence to find which suspect aboard the airship is 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 Cloud Rogue is _____

Possible suspects

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

NAME	GADGET TOOL	FLIGHT GEAR	DOMINANT HAND	HAIR STYLE	DISTRACTION TRAP
Toby Draft	Wind Blast	Signal Flares	Left Handed	Copper Curls	Lemon Juice
Leo Zephyr	Echo Pulse	Glider Wings	Right Handed	Copper Curls	Lemon Juice
Jasper Vane	Echo Pulse	Signal Flares	Right Handed	Copper Curls	Lemon Juice
Nico Cirrus	Echo Pulse	Brass Goggles	Right Handed	Copper Curls	Loud Whistle
Piper Trade	Wind Blast	Jet Pack	Right Handed	Raven Spikes	Lemon Juice
Rowan Breeze	Wind Blast	Brass Goggles	Left Handed	Copper Curls	Bright Light
Captain Avery	Echo Pulse	Signal Flares	Right Handed	Copper Curls	Bright Light
Stella Squall	Echo Pulse	Magnetic Boots	Right Handed	Copper Curls	Lemon Juice
Hazel Tempest	Echo Pulse	Magnetic Boots	Right Handed	Copper Curls	Loud Whistle
Kira Skye	Starlight Beam	Magnetic Boots	Right Handed	Copper Curls	Loud Whistle
Drake Vance	Wind Blast	Glider Wings	Right Handed	Copper Curls	Loud Whistle
Flynn Horizon	Starlight Beam	Signal Flares	Left Handed	Copper Curls	Lemon Juice
Barnaby Finch	Wind Blast	Signal Flares	Right Handed	Raven Spikes	Lemon Juice
Quinn Gust	Starlight Beam	Glider Wings	Right Handed	Copper Curls	Lemon Juice
Cora Sterling	Grapple Hook	Glider Wings	Right Handed	Silver Braid	Bright Light
Ignatius Swift	Starlight Beam	Signal Flares	Left Handed	Silver Braid	Loud Whistle
Victor Mist	Smoke Bomb	Signal Flares	Right Handed	Silver Braid	Lemon Juice
Mina Stratus	Wind Blast	Signal Flares	Right Handed	Silver Braid	Loud Whistle
Xander Ridge	Starlight Beam	Glider Wings	Right Handed	Silver Braid	Lemon Juice
Orla Nimbus	Smoke Bomb	Magnetic Boots	Right Handed	Silver Braid	Lemon Juice
Gideon Gale	Smoke Bomb	Signal Flares	Right Handed	Copper Curls	Lemon Juice

CLUE 1 Addition

The navigator adds up all the missing compass shards found on the deck to reveal the first piece of evidence.

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



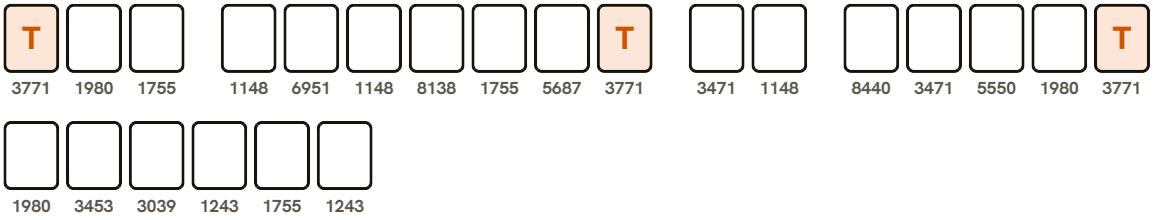
2693 + 3549 = ☐ → T	6199 + 3206 = ☐ → A	2271 + 3974 = ☐ → H
4122 + 1907 = ☐ → R	2047 + 1184 = ☐ → E	4869 + 3381 = ☐ → G
1688 + 2237 = ☐ → O	1818 + 3051 = ☐ → I	2576 + 3560 = ☐ → M
965 + 1411 = ☐ → N	3318 + 1938 = ☐ → B	2722 + 3357 = ☐ → S
1721 + 1353 = ☐ → C	760 + 1396 = ☐ → U	3513 + 2980 = ☐ → D

Scratch space:

CLUE 2 Subtraction

By subtracting the ruined deck log entries from the total pages, the crew pinpoints when the thief struck.

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



6879 - 3108 = ☐ → T

2426 - 1183 = ☐ → D

3650 - 611 = ☐ → N

2548 - 1400 = ☐ → S

10913 - 3962 = ☐ → U

5411 - 1940 = ☐ → I

7797 - 2110 = ☐ → C

9337 - 1199 = ☐ → P

10852 - 2412 = ☐ → R

5070 - 3090 = ☐ → H

10283 - 4733 = ☐ → G

3902 - 449 = ☐ → A

6238 - 4483 = ☐ → E

Scratch space:

CLUE 3 Multiplication facts (1-12)

The ship engineer multiplies the rows of crate stacks to search every shelf for hidden villain gear.

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

L																			
10	72	2	49	64	120	25	66	8	72	55	36	49	40	55	36	121	72		
108	49	84	25	72	66	64	36	108	77	8	63	55							

$1 \times 10 =$ ☐ → **L**

$2 \times 4 =$ ☐ → **C**

$7 \times 9 =$ ☐ → **K**

$5 \times 11 =$ ☐ → **S**

$12 \times 10 =$ ☐ → **J**

$7 \times 7 =$ ☐ → **O**

$1 \times 2 =$ ☐ → **M**

$7 \times 12 =$ ☐ → **G**

$8 \times 8 =$ ☐ → **N**

$5 \times 5 =$ ☐ → **U**

$7 \times 11 =$ ☐ → **A**

$11 \times 11 =$ ☐ → **H**

$10 \times 4 =$ ☐ → **P**

$12 \times 9 =$ ☐ → **R**

$6 \times 11 =$ ☐ → **I**

$4 \times 9 =$ ☐ → **T**

$8 \times 9 =$ ☐ → **E**

Scratch space:

CLUE 4 Multi-step word problems

The detective solves a multi-step word problem tracking fuel usage and wind speeds to follow the rogue.

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

A strand of

C										S
77	25	38	38	30	73	77	48	73	29	

hair turned up at the scene.

There were 486 compasses in all. 24 compasses were set aside. The rest were shared equally among 6 Airship Crew. How many compasses did each get?

Answer: ☐ → **C**

There were 155 cloud crystals in all. 1 Airship Crew used 39 cloud crystals each. The other 4 Airship Crew shared the rest equally. How many cloud crystals did each of the other Airship Crew get?

Answer: ☐ → **L**

There were 670 brass gears in all. 13 brass gears were set aside. The rest were shared equally among 9 Airship Crew. How many brass gears did each get?

Answer: ☐ → **R**

There were 149 brass gears in all. 29 brass gears were set aside. The rest were shared equally among 4 Airship Crew. How many brass gears did each get?

Answer: ☐ → **E**

Cartographer earned 3 spyglasses in each of 6 rounds, plus 11 bonus spyglasses. Then 4 spyglasses were lost. How many spyglasses are left?

Answer: ☐ → **O**

There were 274 brass gears in all. 34 brass gears were set aside. The rest were shared equally among 5 Airship Crew. How many brass gears did each get?

Answer: ☐ → **U**

Cartographer earned 8 sky maps in each of 2 rounds, plus 30 bonus sky maps. Then 8 sky maps were lost. How many sky maps are left?

Answer: ☐ → **P**

Scratch space:

CLUE 5 Two-step equations - the last clue

> The captain uses a two-step scale equation with brass counterweights to unlock the final secret vault.

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:

2x + 10 = 30, x = ☐	5x + 4 = 64, x = ☐	4x + 3 = 11, x = ☐	3x + 10 = 34, x = ☐
4x + 10 = 30, x = ☐	3x + 1 = 4, x = ☐	2x + 4 = 26, x = ☐	4x + 1 = 17, x = ☐
6x + 12 = 66, x = ☐	2x + 9 = 23, x = ☐	2x + 9 = 15, x = ☐	

Step 2 - cross out the sentence with each answer:

1. The villain vanished behind a thick smoke bomb, then marched up the hull wearing magnetic boots.
2. The villain zapped the compass with a starlight beam, then escaped into the clouds using glider wings.
3. The villain snatched the golden quadrant with a grapple hook, then spied through the fog with brass goggles.
4. The villain snatched the golden quadrant with a grapple hook, then marched up the hull wearing magnetic boots.
5. The villain vanished behind a thick smoke bomb, then spied through the fog with brass goggles.
6. The villain scrambled the radar with an echo pulse, then signaled the fleet with signal flares.
7. The villain scrambled the radar with an echo pulse, then marched up the hull wearing magnetic boots.
8. The villain blew open the chart room with a wind blast, then signaled the fleet with signal flares.
9. The villain snatched the golden quadrant with a grapple hook, then zoomed over the deck using a jet pack.
10. The villain scrambled the radar with an echo pulse, then escaped into the clouds using glider wings.
11. The villain vanished behind a thick smoke bomb, then escaped into the clouds using glider wings.
12. The villain vanished behind a thick smoke bomb, then signaled the fleet with signal flares.

TEACHER / PARENT

Answer Key

The Case of the Missing Star Chart

Culprit: Jasper Vane

Echo Pulse · Signal Flares · Right Handed · Copper Curls · Lemon Juice

Trail: Start 21 → Clue 1 17 → Clue 2 13 → Clue 3 8 → Clue 4 4 → Clue 5 1

Clue 1 (Addition): "THE ROGUE DOES NOT USE MAGNETIC BOOTS"

2693 + 3549 = 6242 (T) · 6199 + 3206 = 9405 (A) · 2271 + 3974 = 6245 (H) · 4122 + 1907 = 6029 (R) · 2047 + 1184 = 3231 (E) · 4869 + 3381 = 8250 (G) · 1688 + 2237 = 3925 (O) · 1818 + 3051 = 4869 (I) · 2576 + 3560 = 6136 (M) · 965 + 1411 = 2376 (N) · 3318 + 1938 = 5256 (B) · 2722 + 3357 = 6079 (S) · 1721 + 1353 = 3074 (C) · 760 + 1396 = 2156 (U) · 3513 + 2980 = 6493 (D)

Clue 2 (Subtraction): "THE SUSPECT IS RIGHT HANDED"

6879 - 3108 = 3771 (T) · 2426 - 1183 = 1243 (D) · 3650 - 611 = 3039 (N) · 2548 - 1400 = 1148 (S) · 10913 - 3962 = 6951 (U) · 5411 - 1940 = 3471 (I) · 7797 - 2110 = 5687 (C) · 9337 - 1199 = 8138 (P) · 10852 - 2412 = 8440 (R) · 5070 - 3090 = 1980 (H) · 10283 - 4733 = 5550 (G) · 3902 - 449 = 3453 (A) · 6238 - 4483 = 1755 (E)

Clue 3 (Multiplication facts (1-12)): "LEMON JUICE STOPS THE ROGUE IN TRACKS"

1 × 10 = 10 (L) · 2 × 4 = 8 (C) · 7 × 9 = 63 (K) · 5 × 11 = 55 (S) · 12 × 10 = 120 (J) · 7 × 7 = 49 (O) · 1 × 2 = 2 (M) · 7 × 12 = 84 (G) · 8 × 8 = 64 (N) · 5 × 5 = 25 (U) · 7 × 11 = 77 (A) · 11 × 11 = 121 (H) · 10 × 4 = 40 (P) · 12 × 9 = 108 (R) · 6 × 11 = 66 (I) · 4 × 9 = 36 (T) · 8 × 9 = 72 (E)

Clue 4 (Multi-step word problems): "COPPER CURLS"

There were 486 compasses in all. 24 compasses were set aside. The rest were shared equally among 6 Airship Crew. How many compasses did each get? = 77 (C) · There were 155 cloud crystals in all. 1 Airship Crew used 39 cloud crystals each. The other 4 Airship Crew shared the rest equally. How many cloud crystals did each of the other Airship Crew get? = 29 (L) · There were 670 brass gears in all. 13 brass gears were set aside. The rest were shared equally among 9 Airship Crew. How many brass gears did each get? = 73 (R) · There were 149 brass gears in all. 29 brass gears were set aside. The rest were shared equally among 4 Airship Crew. How many brass gears did each get? = 30 (E) · Cartographer earned 3 spyglasses in each of 6 rounds, plus 11 bonus spyglasses. Then 4 spyglasses were lost. How many spyglasses are left? = 25 (O) · There were 274 brass gears in all. 34 brass gears were set aside. The rest were shared equally among 5 Airship Crew. How many brass gears did each get? = 48 (U) · Cartographer earned 8 sky maps in each of 2 rounds, plus 30 bonus sky maps. Then 8 sky maps were lost. How many sky maps are left? = 38 (P)

Clue 5 (Two-step equations): surviving statement is box 6 → Jasper Vane

2x + 10 = 30, x = 10 · 5x + 4 = 64, x = 12 · 4x + 3 = 11, x = 2 · 3x + 10 = 34, x = 8 · 4x + 10 = 30, x = 5 · 3x + 1 = 4, x = 1 · 2x + 4 = 26, x = 11 · 4x + 1 = 17, x = 4 · 6x + 12 = 66, x = 9 · 2x + 9 = 23, x = 7 · 2x + 9 = 15, x = 3