



The Echo Canyon Astrolabe Heist

Grade 10 math · Place value, Addition, Subtraction, Multiplication, Division · Reading level grades 7-9

Detective: _____ Date: _____

The golden astrolabe has been stolen from the expedition camp deep inside Echo Canyon! A thief disguised as a camp member took the artifact and fled into the ruins. We must examine the clues left behind to unmask the Phantom Raider before they escape the canyon canyon.

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 Phantom Raider is _____

Possible suspects

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

NAME	PRIMARY GEAR	SPECIAL SKILL	HANDEDNESS	HAIR STYLE	HIDDEN FLAW
Sallie Chipman	laser cutter	climbing spikes	right-handed	blonde ponytail	ticklish feet
Lewis Clark	drone scout	zip line pulley	right-handed	blonde ponytail	allergic to pollen
Percy Fawcett	smoke bombs	jetpack boots	right-handed	shaved head	allergic to pollen
Amelia Earhart	grappling hook	night vision goggles	right-handed	shaved head	allergic to pollen
Ibn Battuta	drone scout	night vision goggles	right-handed	shaved head	allergic to pollen
Matthew Henson	smoke bombs	night vision goggles	right-handed	blonde ponytail	fear of heights
Sacagawea	drone scout	jetpack boots	left-handed	blonde ponytail	ticklish feet
Jeanne Baret	grappling hook	sonar radar	left-handed	blonde ponytail	fear of heights
Steve Irwin	decoy hologram	sonar radar	right-handed	spiky black hair	fear of heights
Gertrude Bell	decoy hologram	jetpack boots	right-handed	blonde ponytail	allergic to pollen
Marco Polo	smoke bombs	sonar radar	left-handed	shaved head	ticklish feet
Mary Kingsley	smoke bombs	night vision goggles	right-handed	blonde ponytail	allergic to pollen
Lara Croft	decoy hologram	climbing spikes	left-handed	blonde ponytail	allergic to pollen
Nathan Drake	drone scout	climbing spikes	left-handed	spiky black hair	ticklish feet
Harriet Quimby	grappling hook	sonar radar	right-handed	blonde ponytail	allergic to pollen
Charles Lindbergh	laser cutter	night vision goggles	right-handed	blonde ponytail	allergic to pollen
Freya Stark	smoke bombs	zip line pulley	left-handed	spiky black hair	fear of heights
Evander Yale	smoke bombs	climbing spikes	right-handed	shaved head	allergic to pollen
Robert Peary	decoy hologram	night vision goggles	right-handed	blonde ponytail	ticklish feet
Jacques Cousteau	laser cutter	jetpack boots	right-handed	blonde ponytail	ticklish feet
Roald Amundsen	smoke bombs	jetpack boots	left-handed	blonde ponytail	ticklish feet

CLUE 1

An ancient combination lock blocks the vault door. By studying the digit positions of the passcode, you reveal a major secret about the Raider's gear.

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

What is the value of the 5 in 189,054? → **T**

What is the value of the 2 in 42,511? → **A**

What is the value of the 7 in 54,762? → **D**

What is the value of the 3 in 710,370? → **S**

What is the value of the 9 in 28,497? → ☐

What is the value of the 8 in 538,596? →

What is the value of the 6 in 14,068? → **R**

What is the value of the 2 in 575,829? → **E**

What is the value of the 2 in 39,297? → **U**

What is the value of the 4 in 54,135? → **V**

What is the value of the 5 in 61,546? → **H**

What is the value of the 1 in 56,145? → **L**

What is the value of the 1 in 98,919? → **N**

Scratch space:

CLUE 2 Addition

To track the suspect's movements, you add up the total weight of the discarded supplies found near the rope bridge.

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

T			T															T
2366	7969	6552	2366	7969	5856	6552	8713	8037	6552	9136	4315	6552	3600	5218	5856	7592	7969	2366
7969	9136	9248	3298	6552	3298	3600	9709	4021	3298	7592	6552	3600						

$987 + 1379 = \square \rightarrow \mathbf{T}$	$1607 + 1691 = \square \rightarrow \mathbf{D}$	$2298 + 1723 = \square \rightarrow \mathbf{U}$
$2487 + 1828 = \square \rightarrow \mathbf{V}$	$2448 + 3408 = \square \rightarrow \mathbf{I}$	$5327 + 3809 = \square \rightarrow \mathbf{A}$
$2980 + 6729 = \square \rightarrow \mathbf{M}$	$2524 + 5068 = \square \rightarrow \mathbf{G}$	$3910 + 5338 = \square \rightarrow \mathbf{N}$
$2474 + 5563 = \square \rightarrow \mathbf{L}$	$1929 + 3289 = \square \rightarrow \mathbf{R}$	$4125 + 2427 = \square \rightarrow \mathbf{E}$
$2256 + 1344 = \square \rightarrow \mathbf{S}$	$3340 + 4629 = \square \rightarrow \mathbf{H}$	$4050 + 4663 = \square \rightarrow \mathbf{F}$

Scratch space:

CLUE 3

Subtraction

You calculate the missing fuel units from the generator to figure out exactly how long the suspect had to hide.

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

T																			
5017	6829	6360	2455	3170	8864	1422	6360	2455	8191	1717	6360	6360	7585	6360	8191	1717	6360	3170	2455

8191	8869	2455	8864	1717	1243	1776	1557	1181	5339	6360	2455	8191

$9200 - 4183 = \square \rightarrow \boxed{\text{T}}$

$1562 - 381 = \square \rightarrow \boxed{\text{O}}$

$5312 - 3755 = \square \rightarrow \boxed{\text{L}}$

$6279 - 3109 = \square \rightarrow \boxed{\text{A}}$

$12375 - 4790 = \square \rightarrow \boxed{\text{Z}}$

$3087 - 1370 = \square \rightarrow \boxed{\text{N}}$

$12083 - 3214 = \square \rightarrow \boxed{\text{P}}$

$7143 - 4688 = \square \rightarrow \boxed{\text{R}}$

$10517 - 1653 = \square \rightarrow \boxed{\text{I}}$

$8359 - 168 = \square \rightarrow \boxed{\text{S}}$

$3295 - 2052 = \square \rightarrow \boxed{\text{G}}$

$9250 - 3911 = \square \rightarrow \boxed{\text{W}}$

$3054 - 1632 = \square \rightarrow \boxed{\text{D}}$

$4041 - 2265 = \square \rightarrow \boxed{\text{F}}$

$8362 - 1533 = \square \rightarrow \boxed{\text{H}}$

$10261 - 3901 = \square \rightarrow \boxed{\text{E}}$

Scratch space:

Multiplication facts (1-12)

By multiplying the rows of ancient floor tiles that were stepped on, you map out the suspect's path through the pressure-plate room.

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

$2 \times 7 = \boxed{} \rightarrow \boxed{\mathbf{G}}$

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

$1 \times 9 = \square \rightarrow \boxed{\mathbf{W}}$

$4 \times 8 = \boxed{} \rightarrow \boxed{\text{N}}$

$7 \times 4 =$ $\rightarrow$ **F**

$11 \times 12 = \boxed{} \rightarrow \boxed{\mathbf{A}}$

$1 \times 7 = \boxed{} \rightarrow \boxed{\text{L}}$

$$11 \times 10 = \boxed{} \rightarrow \boxed{\text{S}}$$

$$10 \times 10 = \boxed{} \rightarrow \boxed{\mathbf{T}}$$

$$5 \times 8 = \boxed{} \rightarrow \boxed{\mathbf{D}}$$

$1 \times 10 = \boxed{} \rightarrow \boxed{0}$

$3 \times 9 = \boxed{} \rightarrow \boxed{\text{R}}$

$6 \times 9 =$ $\rightarrow$

$11 \times 8 = \boxed{} \rightarrow \boxed{\text{E}}$

$1 \times 5 = \boxed{} \rightarrow \boxed{\text{H}}$

Scratch space:

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

To find the escape route, you divide the map coordinates equally among your scout team to search the canyon grid.

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:

$48 \div 12 = \boxed{}$

$24 \div 2 = \boxed{}$

$6 \div 6 = \boxed{}$

$10 \div 1 = \boxed{}$

$56 \div 8 = \boxed{}$

$4 \div 2 = \boxed{}$

$55 \div 11 = \boxed{}$

$72 \div 8 = \boxed{}$

$54 \div 9 = \boxed{}$

$24 \div 3 = \boxed{}$

$30 \div 10 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain vanishes in a puff of silver smoke, then navigates the dark tunnels with ease.
2. The villain swings across the canyon vault, then navigates the dark tunnels with ease.
3. The villain slices open the reinforced metal door, then scales the sheer cliffside.
4. The villain creates a flickering double of themselves, then hovers safely over the spike pits.
5. The villain slices open the reinforced metal door, then slides down the steel cables.
6. The villain swings across the canyon vault, then slides down the steel cables.
7. The villain slices open the reinforced metal door, then hovers safely over the spike pits.
8. The villain vanishes in a puff of silver smoke, then slides down the steel cables.
9. The villain creates a flickering double of themselves, then pings the entire cavern for loot.
10. The villain swings across the canyon vault, then scales the sheer cliffside.
11. The villain slices open the reinforced metal door, then navigates the dark tunnels with ease.
12. The villain sends a tiny quadcopter to scout ahead, then slides down the steel cables.

Answer Key

The Echo Canyon Astrolabe Heist

Culprit: Charles Lindbergh

laser cutter · night vision goggles · right-handed · blonde ponytail · allergic to pollen

Trail: Start 21 → Clue 1 17 → Clue 2 12 → Clue 3 8 → Clue 4 4 → Clue 5 1

Clue 1 (Place value): "THE VILLAIN DOES NOT USE SONAR RADAR"

What is the value of the 5 in 189,054? = 50 (T) · What is the value of the 2 in 42,511? = 2000 (A) · What is the value of the 7 in 54,762? = 700 (D) · What is the value of the 3 in 710,370? = 300 (S) · What is the value of the 9 in 28,497? = 90 (O) · What is the value of the 8 in 538,596? = 8000 (I) · What is the value of the 6 in 14,068? = 60 (R) · What is the value of the 2 in 575,829? = 20 (E) · What is the value of the 2 in 39,297? = 200 (U) · What is the value of the 4 in 54,135? = 4000 (V) · What is the value of the 5 in 61,546? = 500 (H) · What is the value of the 1 in 56,145? = 100 (L) · What is the value of the 1 in 98,919? = 10 (N)

Clue 2 (Addition): "THE THIEF LEAVES RIGHT HANDED SMUDGES"

$987 + 1379 = 2366$ (T) · $1607 + 1691 = 3298$ (D) · $2298 + 1723 = 4021$ (U) · $2487 + 1828 = 4315$ (V) · $2448 + 3408 = 5856$ (I) · $5327 + 3809 = 9136$ (A) · $2980 + 6729 = 9709$ (M) · $2524 + 5068 = 7592$ (G) · $3910 + 5338 = 9248$ (N) · $2474 + 5563 = 8037$ (L) · $1929 + 3289 = 5218$ (R) · $4125 + 2427 = 6552$ (E) · $2256 + 1344 = 3600$ (S) · $3340 + 4629 = 7969$ (H) · $4050 + 4663 = 8713$ (F)

Clue 3 (Subtraction): "THE RAIDER SNEEZES NEAR SPRING FLOWERS"

$9200 - 4183 = 5017$ (T) · $1562 - 381 = 1181$ (O) · $5312 - 3755 = 1557$ (L) · $6279 - 3109 = 3170$ (A) · $12375 - 4790 = 7585$ (Z) · $3087 - 1370 = 1717$ (N) · $12083 - 3214 = 8869$ (P) · $7143 - 4688 = 2455$ (R) · $10517 - 1653 = 8864$ (I) · $8359 - 168 = 8191$ (S) · $3295 - 2052 = 1243$ (G) · $9250 - 3911 = 5339$ (W) · $3054 - 1632 = 1422$ (D) · $4041 - 2265 = 1776$ (F) · $8362 - 1533 = 6829$ (H) · $10261 - 3901 = 6360$ (E)

Clue 4 (Multiplication facts (1-12)): "GOLDEN STRANDS OF HAIR WERE LEFT BEHIND"

$2 \times 7 = 14$ (G) · $5 \times 3 = 15$ (B) · $1 \times 9 = 9$ (W) · $4 \times 8 = 32$ (N) · $7 \times 4 = 28$ (F) · $11 \times 12 = 132$ (A) · $1 \times 7 = 7$ (L) · $11 \times 10 = 110$ (S) · $10 \times 10 = 100$ (T) · $5 \times 8 = 40$ (D) · $1 \times 10 = 10$ (O) · $3 \times 9 = 27$ (R) · $6 \times 9 = 54$ (I) · $11 \times 8 = 88$ (E) · $1 \times 5 = 5$ (H)

Clue 5 (Division facts (1-12)): surviving statement is box 11 → Charles Lindbergh

$48 \div 12 = 4$ · $24 \div 2 = 12$ · $6 \div 6 = 1$ · $10 \div 1 = 10$ · $56 \div 8 = 7$ · $4 \div 2 = 2$ · $55 \div 11 = 5$ · $72 \div 8 = 9$ · $54 \div 9 = 6$ · $24 \div 3 = 8$ · $30 \div 10 = 3$