



The Mystery of the Golden Astrolabe

Grade 6 math · Multiplication, Percentages, Exponents, Order of operations, Division · Reading level grades 5-6

Detective: _____ Date: _____

Someone has swiped the Golden Astrolabe right off the Harbor Master's desk! Without it, no ships can navigate the dangerous reef. The docks are crawling with suspicious pirate captains, each known for their unique gear and distinct habits. We must solve the clues to unmask the thief before they set sail!

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 pirate captain is _____

Possible suspects

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

NAME	SIGNATURE WEAPON	SAILING GEAR	STEERING HAND	BANDANA COLOR	FEAR
Long John Silver	Iron Cutlass	Brass Lantern	Left Handed	Red Bandana	Fear of Storms
Silver Tongue Sam	Boarding Axe	Megaphone	Left Handed	Red Bandana	Fear of Storms
Stede Bonnet	Iron Cutlass	Spyglass	Left Handed	Red Bandana	Fear of Ghosts
William Kidd	Boarding Axe	Pocket Compass	Right Handed	Red Bandana	Fear of Rats
Pegleg Pete	Brass Hook	Brass Lantern	Left Handed	Black Bandana	Fear of Rats
Bartholomew Roberts	Flintlock Pistol	Silk Map	Right Handed	Red Bandana	Fear of Storms
Mary Read	Iron Cutlass	Pocket Compass	Left Handed	Striped Bandana	Fear of Rats
Anne Bonny	Brass Hook	Megaphone	Right Handed	Red Bandana	Fear of Ghosts
Captain Redbeard	Boarding Axe	Brass Lantern	Left Handed	Striped Bandana	Fear of Storms
Cutlass Carla	Iron Cutlass	Silk Map	Left Handed	Striped Bandana	Fear of Storms
Blackbeard	Brass Hook	Brass Lantern	Right Handed	Red Bandana	Fear of Storms
Calico Jack	Flintlock Pistol	Brass Lantern	Left Handed	Striped Bandana	Fear of Storms
Francis Drake	Brass Hook	Spyglass	Right Handed	Red Bandana	Fear of Storms
Grace O Malley	Iron Cutlass	Brass Lantern	Right Handed	Red Bandana	Fear of Storms
Captain Flint	Brass Hook	Megaphone	Right Handed	Black Bandana	Fear of Ghosts
Salty Barnaby	Brass Hook	Megaphone	Right Handed	Striped Bandana	Fear of Storms
Jolly Roger	Iron Cutlass	Silk Map	Left Handed	Black Bandana	Fear of Rats
Henry Morgan	Flintlock Pistol	Megaphone	Left Handed	Striped Bandana	Fear of Ghosts
Edward Low	Flintlock Pistol	Brass Lantern	Left Handed	Black Bandana	Fear of Rats
Scurvy Dan	Heavy Harpoon	Megaphone	Right Handed	Red Bandana	Fear of Storms
Barnacle Bill	Heavy Harpoon	Spyglass	Right Handed	Black Bandana	Fear of Storms

CLUE 1

Multiplication facts (1-12)

We need to count the rows of heavy barrels on the dock to find where the thief dropped their gear.

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

T																T
72	28	45	15	70	3	3	4	70	2	50	21	45	24	2	21	72

				T									
28	4	15	45	72	28	45	24	70	3	9	88	4	1

$9 \times 8 = \square \rightarrow \text{T}$

$5 \times 3 = \square \rightarrow \text{V}$

$5 \times 10 = \square \rightarrow \text{D}$

$5 \times 9 = \square \rightarrow \text{E}$

$3 \times 1 = \square \rightarrow \text{L}$

$1 \times 1 = \square \rightarrow \text{P}$

$2 \times 1 = \square \rightarrow \text{N}$

$8 \times 11 = \square \rightarrow \text{M}$

$7 \times 10 = \square \rightarrow \text{I}$

$9 \times 1 = \square \rightarrow \text{K}$

$4 \times 1 = \square \rightarrow \text{A}$

$3 \times 7 = \square \rightarrow \text{O}$

$4 \times 7 = \square \rightarrow \text{H}$

$6 \times 4 = \square \rightarrow \text{S}$

Scratch space:

CLUE 2 Percentages

The local tavern keeper says the thief left a tip that was an exact percentage of their golden coin total.

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

T								T						T				
39	29	16	35	11	21	23	39	8	25	21	44	28	39	16	11	22	16	22

T									T				
39	29	16	21	44	44	21	35	29	39	29	28	38	17

$20\% \text{ of } 195 = \boxed{} \rightarrow \boxed{\text{T}}$

$5\% \text{ of } 440 = \boxed{} \rightarrow \boxed{\text{S}}$

$50\% \text{ of } 70 = \boxed{} \rightarrow \boxed{\text{G}}$

$25\% \text{ of } 176 = \boxed{} \rightarrow \boxed{\text{R}}$

$10\% \text{ of } 230 = \boxed{} \rightarrow \boxed{\text{L}}$

$10\% \text{ of } 380 = \boxed{} \rightarrow \boxed{\text{N}}$

$50\% \text{ of } 58 = \boxed{} \rightarrow \boxed{\text{H}}$

$40\% \text{ of } 20 = \boxed{} \rightarrow \boxed{\text{Y}}$

$25\% \text{ of } 100 = \boxed{} \rightarrow \boxed{\text{P}}$

$20\% \text{ of } 140 = \boxed{} \rightarrow \boxed{\text{A}}$

$5\% \text{ of } 420 = \boxed{} \rightarrow \boxed{\text{I}}$

$10\% \text{ of } 110 = \boxed{} \rightarrow \boxed{\text{U}}$

$20\% \text{ of } 85 = \boxed{} \rightarrow \boxed{\text{D}}$

$10\% \text{ of } 160 = \boxed{} \rightarrow \boxed{\text{E}}$

Scratch space:

CLUE 3 Exponents

The shipping crates in the cargo hold grow in size by powers, hiding a scrap of paper underneath.

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

T														
256	4	169	361	49	225	225	9	49	100	4	9	256	169	289

T																		
256	4	400	100	81	169	216	9	100	81	225	49	8	4	256	100	49	100	8

$2^8 = \square \rightarrow$ T	$3^2 = \square \rightarrow$ A	$2^2 = \square \rightarrow$ H	$17^2 = \square \rightarrow$ S
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$20^2 = \square \rightarrow$ U	$2^3 = \square \rightarrow$ G	$15^2 = \square \rightarrow$ L	$6^3 = \square \rightarrow$ R
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$13^2 = \square \rightarrow$ E	$19^2 = \square \rightarrow$ V	$7^2 = \square \rightarrow$ I	$10^2 = \square \rightarrow$ N
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$9^2 = \square \rightarrow$ D

Scratch space:

CLUE 4

Order of operations

To unlock the Harbor Master's heavy safe, we must solve a multi-step code on the dial in the correct order.

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

W															
13	8	57	49	67	74	59	21	8	59	57	64	63	21	55	70

62	74	64	77	77	8	59	49	74	64	74	64	55	47

$8 \times 2 - 3 = \square \rightarrow \boxed{\text{W}}$

$58 + 2 \times 2 = \square \rightarrow \boxed{\text{S}}$

$11 \times 7 - 18 = \square \rightarrow \boxed{\text{D}}$

$8 \times 11 - 24 = \square \rightarrow \boxed{\text{A}}$

$10 \times 5 - 1 = \square \rightarrow \boxed{\text{O}}$

$9 \times 8 - 15 = \square \rightarrow \boxed{\text{F}}$

$8 \times 9 - 5 = \square \rightarrow \boxed{\text{U}}$

$8 \times 8 - 1 = \square \rightarrow \boxed{\text{B}}$

$9 \times 3 - 19 = \square \rightarrow \boxed{\text{E}}$

$12 \times 8 - 26 = \square \rightarrow \boxed{\text{C}}$

$9 \times 9 - 26 = \square \rightarrow \boxed{\text{I}}$

$11 \times 7 - 3 = \square \rightarrow \boxed{\text{N}}$

$35 + 6 \times 2 = \square \rightarrow \boxed{\text{L}}$

$12 \times 3 - 15 = \square \rightarrow \boxed{\text{R}}$

$53 + 3 \times 8 = \square \rightarrow \boxed{\text{G}}$

Scratch space:

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

The deckhands are dividing the pile of stolen doubloons equally, leaving a clue in the leftover remainder.

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:

$72 \div 8 = \boxed{}$

$16 \div 4 = \boxed{}$

$64 \div 8 = \boxed{}$

$108 \div 9 = \boxed{}$

$121 \div 11 = \boxed{}$

$18 \div 6 = \boxed{}$

$2 \div 1 = \boxed{}$

$54 \div 9 = \boxed{}$

$4 \div 4 = \boxed{}$

$14 \div 2 = \boxed{}$

$30 \div 3 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain fired a flintlock pistol into the air, then shouted orders through a megaphone.
2. The villain splintered the wooden door with a boarding axe, then lit up the dark alleys with a brass lantern.
3. The villain fired a flintlock pistol into the air, then scanned a silk map for the hidden exit.
4. The villain slashed open the canvas with a brass hook, then lit up the dark alleys with a brass lantern.
5. The villain brandished an iron cutlass to clear the path, then lit up the dark alleys with a brass lantern.
6. The villain hurled a heavy harpoon through the window, then lit up the dark alleys with a brass lantern.
7. The villain slashed open the canvas with a brass hook, then checked a pocket compass to find north.
8. The villain hurled a heavy harpoon through the window, then shouted orders through a megaphone.
9. The villain slashed open the canvas with a brass hook, then escaped by peering through a spyglass.
10. The villain hurled a heavy harpoon through the window, then scanned a silk map for the hidden exit.
11. The villain splintered the wooden door with a boarding axe, then shouted orders through a megaphone.
12. The villain brandished an iron cutlass to clear the path, then checked a pocket compass to find north.

Answer Key

The Mystery of the Golden Astrolabe

Culprit: Grace O Malley

Iron Cutlass · Brass Lantern · Right Handed · Red Bandana · Fear of Storms

Trail: Start 21 → Clue 1 18 → Clue 2 9 → Clue 3 6 → Clue 4 4 → Clue 5 1

Clue 1 (Multiplication facts (1-12)): "THE VILLAIN DOES NOT HAVE THE SILK MAP"

$9 \times 8 = 72$ (T) · $5 \times 3 = 15$ (V) · $5 \times 10 = 50$ (D) · $5 \times 9 = 45$ (E) · $3 \times 1 = 3$ (L) · $1 \times 1 = 1$ (P) · $2 \times 1 = 2$ (N) · $8 \times 11 = 88$ (M) · $7 \times 10 = 70$ (I) · $9 \times 1 = 9$ (K) · $4 \times 1 = 4$ (A) · $3 \times 7 = 21$ (O) · $4 \times 7 = 28$ (H) · $6 \times 4 = 24$ (S)

Clue 2 (Percentages): "THE GUILTY PIRATE USES THEIR RIGHT HAND"

20% of 195 = 39 (T) · 5% of 440 = 22 (S) · 50% of 70 = 35 (G) · 25% of 176 = 44 (R) · 10% of 230 = 23 (L) · 10% of 380 = 38 (N) · 50% of 58 = 29 (H) · 40% of 20 = 8 (Y) · 25% of 100 = 25 (P) · 20% of 140 = 28 (A) · 5% of 420 = 21 (I) · 10% of 110 = 11 (U) · 20% of 85 = 17 (D) · 10% of 160 = 16 (E)

Clue 3 (Exponents): "THE VILLAIN HATES THUNDER AND LIGHTNING"

$2^8 = 256$ (T) · $3^2 = 9$ (A) · $2^2 = 4$ (H) · $17^2 = 289$ (S) · $20^2 = 400$ (U) · $2^3 = 8$ (G) · $15^2 = 225$ (L) · $6^3 = 216$ (R) · $13^2 = 169$ (E) · $19^2 = 361$ (V) · $7^2 = 49$ (I) · $10^2 = 100$ (N) · $9^2 = 81$ (D)

Clue 4 (Order of operations): "WE FOUND RED FABRIC SNAGGED ON A NAIL"

$8 \times 2 - 3 = 13$ (W) · $58 + 2 \times 2 = 62$ (S) · $11 \times 7 - 18 = 59$ (D) · $8 \times 11 - 24 = 64$ (A) · $10 \times 5 - 1 = 49$ (O) · $9 \times 8 - 15 = 57$ (F) · $8 \times 9 - 5 = 67$ (U) · $8 \times 8 - 1 = 63$ (B) · $9 \times 3 - 19 = 8$ (E) · $12 \times 8 - 26 = 70$ (C) · $9 \times 9 - 26 = 55$ (I) · $11 \times 7 - 3 = 74$ (N) · $35 + 6 \times 2 = 47$ (L) · $12 \times 3 - 15 = 21$ (R) · $53 + 3 \times 8 = 77$ (G)

Clue 5 (Division facts (1-12)): surviving statement is box 5 → Grace O Malley

$72 \div 8 = 9$ · $16 \div 4 = 4$ · $64 \div 8 = 8$ · $108 \div 9 = 12$ · $121 \div 11 = 11$ · $18 \div 6 = 3$ · $2 \div 1 = 2$ · $54 \div 9 = 6$ · $4 \div 4 = 1$ · $14 \div 2 = 7$ · $30 \div 3 = 10$