



The Case of the Missing Pearl Scepter

Grade 7 math · Fractions of a number, Bar models, Multiplication, Integers · Reading level grades 7-9

Detective: _____ **Date:** _____

The royal vault of Aquaria has been breached! The ancient Pearl Scepter, which keeps the tides in perfect balance, is gone. The Chief Pearl Guardian was found trapped inside a giant sea anemone, pointing toward the deep trenches. The Coral Council has summoned you to analyze the physical traces left behind and identify the rogue tide-weaver before the great oceanic storm is unleashed.

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 tide-weaver is _____

Possible suspects

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

NAME	MAIN POWER	EXTRA POWER	PHYSICAL TELL	HAIR COLOR	VULNERABILITY
Calypso	tide summoning	glowing scales	right finned drift	coral pink	citrus peel
Naida	tempest song	ice breath	left finned drift	abalone silver	deep sonar
Thallo	marine telepathy	ice breath	left finned drift	kelp green	deep sonar
Rikki	marine telepathy	mimicry	left finned drift	kelp green	citrus peel
Tritonus	coral shaping	shadow camouflage	left finned drift	coral pink	citrus peel
Delphine	tide summoning	shadow camouflage	right finned drift	kelp green	deep sonar
Coralia	tempest song	shadow camouflage	right finned drift	kelp green	warm currents
Oceanus	coral shaping	glowing scales	left finned drift	abalone silver	deep sonar
Sirena	tempest song	glowing scales	left finned drift	coral pink	citrus peel
Madison	hydrokinesis	glowing scales	right finned drift	abalone silver	warm currents
Nerida	coral shaping	ice breath	left finned drift	coral pink	warm currents
Emma	coral shaping	glowing scales	left finned drift	kelp green	warm currents
Undine	marine telepathy	glowing scales	left finned drift	abalone silver	citrus peel
Melusine	marine telepathy	glowing scales	right finned drift	abalone silver	warm currents
Cleo	hydrokinesis	glowing scales	left finned drift	coral pink	warm currents
Glaucus	tempest song	mimicry	left finned drift	coral pink	citrus peel
Chelsea	marine telepathy	mimicry	left finned drift	coral pink	citrus peel
Muriel	hydrokinesis	sonic click	left finned drift	coral pink	citrus peel
Triton	hydrokinesis	mimicry	right finned drift	abalone silver	citrus peel
Ariel	hydrokinesis	glowing scales	right finned drift	kelp green	citrus peel
Marina	tide summoning	mimicry	left finned drift	abalone silver	citrus peel

CLUE 1 Fractions of a number

We recovered a damaged manifest from the royal vault where only a fraction of the total pearl tally remains visible.

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

T			T					T							T			
42	59	5	42	36	50	28	5	42	44	17	5	27	23	17	42	18	27	5
27	59	36	44	17	31	29	36	24	17	18	49	35	36	28	5			

$4/6 \text{ of } 63 = \square \rightarrow \boxed{\text{T}}$

$2/6 \text{ of } 84 = \square \rightarrow \boxed{\text{G}}$

$4/5 \text{ of } 55 = \square \rightarrow \boxed{\text{D}}$

$1/2 \text{ of } 98 = \square \rightarrow \boxed{\text{F}}$

$1/6 \text{ of } 174 = \square \rightarrow \boxed{\text{C}}$

$4/10 \text{ of } 90 = \square \rightarrow \boxed{\text{A}}$

$1/2 \text{ of } 70 = \square \rightarrow \boxed{\text{L}}$

$1/4 \text{ of } 92 = \square \rightarrow \boxed{\text{N}}$

$2/10 \text{ of } 85 = \square \rightarrow \boxed{\text{O}}$

$4/6 \text{ of } 36 = \square \rightarrow \boxed{\text{M}}$

$1/4 \text{ of } 108 = \square \rightarrow \boxed{\text{S}}$

$1/8 \text{ of } 144 = \square \rightarrow \boxed{\text{U}}$

$5/6 \text{ of } 60 = \square \rightarrow \boxed{\text{R}}$

$2/8 \text{ of } 20 = \square \rightarrow \boxed{\text{E}}$

$4/8 \text{ of } 118 = \square \rightarrow \boxed{\text{H}}$

$1/2 \text{ of } 62 = \square \rightarrow \boxed{\text{W}}$

Scratch space:

CLUE 2

Bar model word problems

Our scouts charted the thief's escape velocity using visual grid bars to compare the speed of different ocean currents.

Draw a bar model to solve each word problem, then write its letter in the boxes to fill in the missing word.

A witness saw the villain was

L												R				.
88	16	25	89	25	126	115	115	16	23	23	126	25	89			

There were 94 sea-glass tokens in all. 6 sea-glass tokens were used. How many sea-glass tokens are left?

draw a bar model

Answer: → **L**

Reef-scout has 8 times as many starfish medals as a teammate. The teammate has 2 starfish medals. How many starfish medals does reef-scout have?

draw a bar model

Answer: → **E**

There were 120 kelp bundles in all. 31 kelp bundles were used. How many kelp bundles are left?

draw a bar model

Answer: → **T**

Reef-scout has 138 clam shells, packed 6 to a bag. How many bags can be filled?

draw a bar model

Answer: → **D**

Reef-scout shares 200 kelp bundles equally among 8 teams. How many kelp bundles does each team get?

draw a bar model

Answer: → **F**

One group collected 29 sea-glass tokens and another group collected 97 sea-glass tokens. How many sea-glass tokens in all?

draw a bar model

Answer: → **I**

There were 146 starfish medals in all. 31 starfish medals were used. How many starfish medals are left?

draw a bar model

Answer: → **N**

CLUE 3
Multiplication facts (1-12)

Deep-sea divers discovered rows of discarded oyster shells stacked in perfect formations outside the reef.

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

T			T					T											
27	49	1	27	48	60	72	1	27	24	1	48	42	1	63	36	63	1	48	60

		T	T								
8	40	27	27	1	60	33	1	45	80	63	36

$3 \times 9 = \square \rightarrow \boxed{\text{T}}$

$11 \times 3 = \square \rightarrow \boxed{\text{L}}$

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

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

$12 \times 4 = \square \rightarrow \boxed{\text{A}}$

$9 \times 7 = \square \rightarrow \boxed{\text{N}}$

$6 \times 12 = \square \rightarrow \boxed{\text{G}}$

$6 \times 10 = \square \rightarrow \boxed{\text{R}}$

$10 \times 8 = \square \rightarrow \boxed{\text{O}}$

$9 \times 5 = \square \rightarrow \boxed{\text{M}}$

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

$4 \times 9 = \square \rightarrow \boxed{\text{S}}$

$10 \times 4 = \square \rightarrow \boxed{\text{I}}$

$1 \times 1 = \square \rightarrow \boxed{\text{E}}$

$6 \times 7 = \square \rightarrow \boxed{\text{K}}$

Scratch space:

CLUE 4 Integers

Thermometer readings from the abyssal plain show rising and falling temperatures as the thief swam past.

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

P																	
26	8	1	23	30	13	8	12	6	13	1	17	10	16	19	27	1	

6	30	16	12	16	16	3	7	27	12	13	10	

$16 - (-10) = \square \rightarrow \text{P}$

$(-10) + 27 = \square \rightarrow \text{G}$

$7 - (-1) = \square \rightarrow \text{I}$

$(-13) + 36 = \square \rightarrow \text{K}$

$(-2) + 3 = \square \rightarrow \text{N}$

$(-11) + 41 = \square \rightarrow \text{H}$

$(-12) + 25 = \square \rightarrow \text{A}$

$21 - (-6) = \square \rightarrow \text{O}$

$(-3) + 6 = \square \rightarrow \text{F}$

$(-15) + 27 = \square \rightarrow \text{R}$

$(-4) + 10 = \square \rightarrow \text{T}$

$(-11) + 27 = \square \rightarrow \text{E}$

$4 - (-6) = \square \rightarrow \text{L}$

$(-8) + 15 = \square \rightarrow \text{C}$

$(-9) + 28 = \square \rightarrow \text{S}$

Scratch space:

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

The local sea turtles gathered scattered prism stones, but we only have a fraction of their original hoard to study.

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:

$1/5 \text{ of } 15 = \boxed{}$

$5/6 \text{ of } 12 = \boxed{}$

$4/6 \text{ of } 3 = \boxed{}$

$2/3 \text{ of } 6 = \boxed{}$

$4/8 \text{ of } 18 = \boxed{}$

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

$4/10 \text{ of } 20 = \boxed{}$

$1/4 \text{ of } 48 = \boxed{}$

$2/10 \text{ of } 25 = \boxed{}$

$1/3 \text{ of } 3 = \boxed{}$

$1/3 \text{ of } 33 = \boxed{}$

Step 2 - cross out the sentence with each answer:

1. The villain commands a school of reef sharks, then freezes the surrounding warm waters.
2. The villain commands a school of reef sharks, then mimics the song of a nearby whale.
3. The villain manipulates the sea currents, then shatters the oyster shells with a click.
4. The villain manipulates the sea currents, then fades away into the deep shadows.
5. The villain summons a swirling ocean gale, then shatters the oyster shells with a click.
6. The villain summons a swirling ocean gale, then leaves a trail of luminescent bubbles.
7. The villain commands a school of reef sharks, then fades away into the deep shadows.
8. The villain grows a massive coral barrier, then shatters the oyster shells with a click.
9. The villain grows a massive coral barrier, then leaves a trail of luminescent bubbles.
10. The villain summons a swirling ocean gale, then mimics the song of a nearby whale.
11. The villain calls upon a high tidal wave, then mimics the song of a nearby whale.
12. The villain commands a school of reef sharks, then shatters the oyster shells with a click.

Answer Key

The Case of the Missing Pearl Scepter

Culprit: Sirena

tempest song · glowing scales · left finned drift · coral pink · citrus peel

Trail: Start 21 → Clue 1 18 → Clue 2 13 → Clue 3 7 → Clue 4 4 → Clue 5 1

Clue 1 (Fractions of a number): "THE TARGET DOES NOT USE SHADOW CAMOUFLAGE"

$\frac{4}{6}$ of 63 = 42 (T) · $\frac{2}{6}$ of 84 = 28 (G) · $\frac{4}{5}$ of 55 = 44 (D) · $\frac{1}{2}$ of 98 = 49 (F) · $\frac{1}{6}$ of 174 = 29 (C) · $\frac{4}{10}$ of 90 = 36 (A) · $\frac{1}{2}$ of 70 = 35 (L) · $\frac{1}{4}$ of 92 = 23 (N) · $\frac{2}{10}$ of 85 = 17 (O) · $\frac{4}{6}$ of 36 = 24 (M) · $\frac{1}{4}$ of 108 = 27 (S) · $\frac{1}{8}$ of 144 = 18 (U) · $\frac{5}{6}$ of 60 = 50 (R) · $\frac{2}{8}$ of 20 = 5 (E) · $\frac{4}{8}$ of 118 = 59 (H) · $\frac{1}{2}$ of 62 = 31 (W)

Clue 2 (Bar model word problems): "LEFT FINNED DRIFT"

There were 94 sea-glass tokens in all. 6 sea-glass tokens were used. How many sea-glass tokens are left? = 88 (L) · Reef-scout has 8 times as many starfish medals as a teammate. The teammate has 2 starfish medals. How many starfish medals does reef-scout have? = 16 (E) · There were 120 kelp bundles in all. 31 kelp bundles were used. How many kelp bundles are left? = 89 (T) · Reef-scout has 138 clam shells, packed 6 to a bag. How many bags can be filled? = 23 (D) · Reef-scout shares 200 kelp bundles equally among 8 teams. How many kelp bundles does each team get? = 25 (F) · One group collected 29 sea-glass tokens and another group collected 97 sea-glass tokens. How many sea-glass tokens in all? = 126 (I) · There were 146 starfish medals in all. 31 starfish medals were used. How many starfish medals are left? = 115 (N)

Clue 3 (Multiplication facts (1-12)): "THE TARGET WEAKENS NEAR BITTER LEMONS"

$3 \times 9 = 27$ (T) · $11 \times 3 = 33$ (L) · $7 \times 7 = 49$ (H) · $8 \times 3 = 24$ (W) · $12 \times 4 = 48$ (A) · $9 \times 7 = 63$ (N) · $6 \times 12 = 72$ (G) · $6 \times 10 = 60$ (R) · $10 \times 8 = 80$ (O) · $9 \times 5 = 45$ (M) · $1 \times 8 = 8$ (B) · $4 \times 9 = 36$ (S) · $10 \times 4 = 40$ (I) · $1 \times 1 = 1$ (E) · $6 \times 7 = 42$ (K)

Clue 4 (Integers): "PINK HAIR TANGLES ON THE REEF CORAL"

$16 - (-10) = 26$ (P) · $(-10) + 27 = 17$ (G) · $7 - (-1) = 8$ (I) · $(-13) + 36 = 23$ (K) · $(-2) + 3 = 1$ (N) · $(-11) + 41 = 30$ (H) · $(-12) + 25 = 13$ (A) · $21 - (-6) = 27$ (O) · $(-3) + 6 = 3$ (F) · $(-15) + 27 = 12$ (R) · $(-4) + 10 = 6$ (T) · $(-11) + 27 = 16$ (E) · $4 - (-6) = 10$ (L) · $(-8) + 15 = 7$ (C) · $(-9) + 28 = 19$ (S)

Clue 5 (Fractions of a number): surviving statement is box 6 → Sirena

$\frac{1}{5}$ of 15 = 3 · $\frac{5}{6}$ of 12 = 10 · $\frac{4}{6}$ of 3 = 2 · $\frac{2}{3}$ of 6 = 4 · $\frac{4}{8}$ of 18 = 9 · $\frac{3}{6}$ of 14 = 7 · $\frac{4}{10}$ of 20 = 8 · $\frac{1}{4}$ of 48 = 12 · $\frac{2}{10}$ of 25 = 5 · $\frac{1}{3}$ of 3 = 1 · $\frac{1}{3}$ of 33 = 11