# The Mystery of the Sunken Compass

Grade 5 math · Fractions of a number, Word problems, Bar models, Order of operations · Reading level grades 5-6

**Detective:** _____ **Date:** _____

During the midnight expedition in Mist Valley Jungle, someone stole the Golden Sun Compass from Head Curator Dr. Aris. Detective, examine the clues to identify 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 Rival Explorer is** _____

## Possible suspects

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

| NAME | EXPLORER GEAR | SPECIAL SKILL | DOMINANT HAND | HAIR STYLE | PHOBIA |
|---|---|---|---|---|---|
| **Freya Stark** | Flashlight Lens | Rope Splicing | Right Handed | Black Crewcut | Scared Of Snakes |
| **Ibn Battuta** | Grappling Hook | Lock Picking | Left Handed | Silver Ponytail | Scared Of Bats |
| **Thor Heyerdahl** | Pocket Compass | Lock Picking | Left Handed | Silver Ponytail | Scared Of Bats |
| **Steve Irwin** | Climbing Axes | Track Identification | Left Handed | Silver Ponytail | Scared Of Spiders |
| **Valerie Taylor** | Climbing Axes | Track Identification | Right Handed | Auburn Braids | Scared Of Snakes |
| **Amelia Earhart** | Decoder Ring | Lock Picking | Left Handed | Black Crewcut | Scared Of Bats |
| **Will Steger** | Climbing Axes | Lock Picking | Right Handed | Auburn Braids | Scared Of Snakes |
| **Nelly Bly** | Pocket Compass | Track Identification | Left Handed | Silver Ponytail | Scared Of Bats |
| **Charles Lindbergh** | Pocket Compass | Signal Flaring | Right Handed | Silver Ponytail | Scared Of Snakes |
| **Gertrude Bell** | Climbing Axes | Track Identification | Right Handed | Silver Ponytail | Scared Of Snakes |
| **Junko Tabei** | Pocket Compass | Map Reading | Right Handed | Black Crewcut | Scared Of Bats |
| **Edmund Hillary** | Decoder Ring | Lock Picking | Right Handed | Auburn Braids | Scared Of Snakes |
| **Ranulph Fiennes** | Pocket Compass | Map Reading | Left Handed | Black Crewcut | Scared Of Bats |
| **Barbara Hillary** | Grappling Hook | Map Reading | Left Handed | Silver Ponytail | Scared Of Snakes |
| **Roald Amundsen** | Climbing Axes | Map Reading | Right Handed | Black Crewcut | Scared Of Snakes |
| **Krystyna Chojnowska** | Climbing Axes | Track Identification | Left Handed | Silver Ponytail | Scared Of Bats |
| **Sacagawea** | Pocket Compass | Rope Splicing | Left Handed | Silver Ponytail | Scared Of Bats |
| **Matthew Henson** | Decoder Ring | Track Identification | Right Handed | Silver Ponytail | Scared Of Bats |
| **Marco Polo** | Grappling Hook | Map Reading | Left Handed | Silver Ponytail | Scared Of Bats |
| **Robin Lee Graham** | Decoder Ring | Signal Flaring | Right Handed | Silver Ponytail | Scared Of Spiders |
| **Ernest Shackleton** | Grappling Hook | Lock Picking | Left Handed | Black Crewcut | Scared Of Snakes |

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## CLUE 1 Fractions of a number

> Dr. Aris calculated a fraction of the total supply crates to figure out which campsite tent held the first hidden note.

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

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T | | | | | | | | | | | | | | | | | | T | | |
| 29 | 14 | 10 | 4 | 28 | 19 | 19 | 18 | 28 | 24 | 5 | 39 | 10 | 32 | 24 | 39 | 29 | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| 2 | 32 | 10 | 19 | 39 | 30 | 34 | 27 | 28 | 30 | 34 | 28 | 24 | 8 | | | | | | | |

1/5 of 145 = ☐ → T

6/10 of 30 = ☐ → A

1/6 of 168 = ☐ → I

3/6 of 8 = ☐ → V

1/4 of 108 = ☐ → P

8/10 of 10 = ☐ → G

2/6 of 117 = ☐ → O

2/10 of 50 = ☐ → E

4/8 of 10 = ☐ → D

2/10 of 170 = ☐ → K

2/3 of 36 = ☐ → N

1/5 of 10 = ☐ → U

7/8 of 16 = ☐ → H

1/10 of 190 = ☐ → L

1/2 of 60 = ☐ → C

2/10 of 160 = ☐ → S

Scratch space:

## CLUE 2 Word problems

A scout solved a word problem about gear weights to narrow down the expedition trail.

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

A witness saw the villain was

| L | | | | | | | D | | D |
|---|---|---|---|---|---|---|---|---|---|
| 114 | 106 | 119 | 84 | 33 | 50 | 91 | | 106 | |

.

There were 149 canteen cups. 35 were used up. How many canteen cups are left?

Answer: ☐ → L

Lead Trail Scout lined up 10 rows of 5 brass compasses. How many brass compasses in all?

Answer: ☐ → A

There were 88 torch beams. 4 were used up. How many torch beams are left?

Answer: ☐ → T

Lead Trail Scout found 87 map scrolls yesterday and 19 more today. How many map scrolls in all?

Answer: ☐ → E

There were 105 canteen cups. 14 were used up. How many canteen cups are left?

Answer: ☐ → N

Lead Trail Scout found 92 brass compasses yesterday and 27 more today. How many brass compasses in all?

Answer: ☐ → F

Lead Trail Scout found 26 torch beams yesterday and 7 more today. How many torch beams in all?

Answer: ☐ → H

Scratch space:

## CLUE 3 Bar model word problems

The team drew a bar model comparing rope lengths to reveal a secret compartment in the supply wagon.

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

Someone scared the villain off with

| S | | | | | | | F | B | | T | S |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 106 | 9 | 6 | 110 | 19 | 79 | 25 | | 6 | | | 106 |

.

There were 122 torch beams in all. 16 torch beams were used. How many torch beams are left?

draw a bar model

Answer: ☐ → S

Lead Trail Scout shares 158 torch beams equally among 2 teams. How many torch beams does each team get?

draw a bar model

Answer: ☐ → D

Lead Trail Scout shares 125 torch beams equally among 5 teams. How many torch beams does each team get?

draw a bar model

Answer: ☐ → O

Lead Trail Scout used 1/3 of the brass compasses on the first day. The other 6 brass compasses were used the next day. How many brass compasses were there in all?

draw a bar model

Answer: ☐ → C

There were 45 brass compasses in all. 39 brass compasses were used. How many brass compasses are left?

draw a bar model

Answer: ☐ → A

The red team has 56 brass compasses and the blue team has 37 brass compasses. How many more brass compasses does the red team have?

draw a bar model

Answer: ☐ → E

There were 137 brass compasses in all. 27 brass compasses were used. How many brass compasses are left?

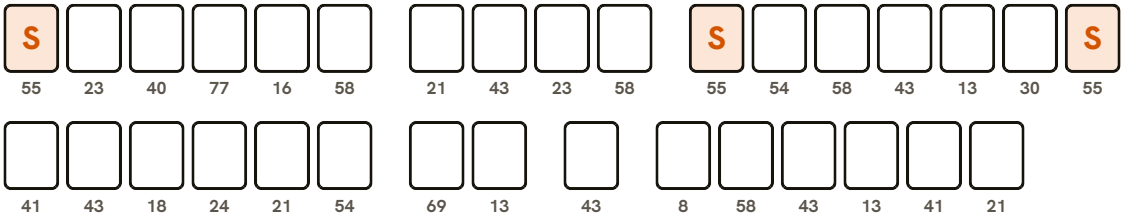
draw a bar model

Answer: ☐ → R

## CLUE 4 Order of operations

Solving a multi-step order of operations code on the temple doorway unlocked a locked journal.

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




6 × 10 - 5 = ☐ → S

37 + 2 × 2 = ☐ → C

6 × 5 - 14 = ☐ → E

5 + 9 × 8 = ☐ → V

12 × 6 - 3 = ☐ → O

6 × 9 - 30 = ☐ → G

9 × 7 - 5 = ☐ → R

9 × 3 - 4 = ☐ → I

7 × 7 - 9 = ☐ → L

15 + 5 × 3 = ☐ → D

29 + 7 × 2 = ☐ → A

10 × 8 - 26 = ☐ → T

2 + 8 × 2 = ☐ → U

9 + 4 × 3 = ☐ → H

6 × 5 - 22 = ☐ → B

10 × 4 - 27 = ☐ → N

Scratch space:

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

> The detective measured a fraction of the map grid to pin down the exact location of the stolen compass.

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:**

| | | | |
|---|---|---|---|
| 2/4 of 18 = ☐ | 1/8 of 8 = ☐ | 1/8 of 48 = ☐ | 2/6 of 12 = ☐ |
| 1/3 of 33 = ☐ | 4/8 of 24 = ☐ | 1/6 of 42 = ☐ | 1/2 of 4 = ☐ |
| 4/8 of 10 = ☐ | 2/5 of 25 = ☐ | 1/2 of 16 = ☐ | |

**Step 2 - cross out the sentence with each answer:**

1. The villain navigated the foggy path, then tied off the anchor rope.
2. The villain scaled the stone cliff, then traced the secret map.
3. The villain navigated the foggy path, then followed the wild tracks.
4. The villain decoded the ancient runes, then tied off the anchor rope.
5. The villain decoded the ancient runes, then followed the wild tracks.
6. The villain scaled the stone cliff, then followed the wild tracks.
7. The villain swung across the chasm, then lit up the dark passage.
8. The villain swung across the chasm, then tied off the anchor rope.
9. The villain swung across the chasm, then traced the secret map.
10. The villain navigated the foggy path, then bypassed the simple latch.
11. The villain flashed a bright beam, then bypassed the simple latch.
12. The villain swung across the chasm, then followed the wild tracks.

TEACHER / PARENT

# Answer Key

The Mystery of the Sunken Compass

## Culprit: Nelly Bly

Pocket Compass · Track Identification · Left Handed · Silver Ponytail · Scared Of Bats

Trail: Start 21 → Clue 1 15 → Clue 2 7 → Clue 3 5 → Clue 4 4 → Clue 5 1

### Clue 1 (Fractions of a number): "THE VILLAIN DOES NOT USE LOCK PICKING"

1/5 of 145 = 29 (T) · 6/10 of 30 = 18 (A) · 1/6 of 168 = 28 (I) · 3/6 of 8 = 4 (V) · 1/4 of 108 = 27 (P) · 8/10 of 10 = 8 (G) · 2/6 of 117 = 39 (O) · 2/10 of 50 = 10 (E) · 4/8 of 10 = 5 (D) · 2/10 of 170 = 34 (K) · 2/3 of 36 = 24 (N) · 1/5 of 10 = 2 (U) · 7/8 of 16 = 14 (H) · 1/10 of 190 = 19 (L) · 1/2 of 60 = 30 (C) · 2/10 of 160 = 32 (S)

### Clue 2 (Word problems): "LEFT HANDED"

There were 149 canteen cups. 35 were used up. How many canteen cups are left? = 114 (L) · Lead Trail Scout lined up 10 rows of 5 brass compasses. How many brass compasses in all? = 50 (A) · There were 88 torch beams. 4 were used up. How many torch beams are left? = 84 (T) · Lead Trail Scout found 87 map scrolls yesterday and 19 more today. How many map scrolls in all? = 106 (E) · There were 105 canteen cups. 14 were used up. How many canteen cups are left? = 91 (N) · Lead Trail Scout found 92 brass compasses yesterday and 27 more today. How many brass compasses in all? = 119 (F) · Lead Trail Scout found 26 torch beams yesterday and 7 more today. How many torch beams in all? = 33 (H)

### Clue 3 (Bar model word problems): "SCARED OF BATS"

There were 122 torch beams in all. 16 torch beams were used. How many torch beams are left? = 106 (S) · Lead Trail Scout shares 158 torch beams equally among 2 teams. How many torch beams does each team get? = 79 (D) · Lead Trail Scout shares 125 torch beams equally among 5 teams. How many torch beams does each team get? = 25 (O) · Lead Trail Scout used 1/3 of the brass compasses on the first day. The other 6 brass compasses were used the next day. How many brass compasses were there in all? = 9 (C) · There were 45 brass compasses in all. 39 brass compasses were used. How many brass compasses are left? = 6 (A) · The red team has 56 brass compasses and the blue team has 37 brass compasses. How many more brass compasses does the red team have? = 19 (E) · There were 137 brass compasses in all. 27 brass compasses were used. How many brass compasses are left? = 110 (R)

### Clue 4 (Order of operations): "SILVER HAIR STRANDS CAUGHT ON A BRANCH"

6 × 10 - 5 = 55 (S) · 37 + 2 × 2 = 41 (C) · 6 × 5 - 14 = 16 (E) · 5 + 9 × 8 = 77 (V) · 12 × 6 - 3 = 69 (O) · 6 × 9 - 30 = 24 (G) · 9 × 7 - 5 = 58 (R) · 9 × 3 - 4 = 23 (I) · 7 × 7 - 9 = 40 (L) · 15 + 5 × 3 = 30 (D) · 29 + 7 × 2 = 43 (A) · 10 × 8 - 26 = 54 (T) · 2 + 8 × 2 = 18 (U) · 9 + 4 × 3 = 21 (H) · 6 × 5 - 22 = 8 (B) · 10 × 4 - 27 = 13 (N)

### Clue 5 (Fractions of a number): surviving statement is box 3 → Nelly Bly

2/4 of 18 = 9 · 1/8 of 8 = 1 · 1/8 of 48 = 6 · 2/6 of 12 = 4 · 1/3 of 33 = 11 · 4/8 of 24 = 12 · 1/6 of 42 = 7 · 1/2 of 4 = 2 · 4/8 of 10 = 5 · 2/5 of 25 = 10 · 1/2 of 16 = 8