



# The Trail of Tears National Historic Trail Mystery

Grade 5 math · Fractions of a number, Order of operations, Multiplication, Rounding, Division · Reading level grades 5-6

**Detective:** \_\_\_\_\_ **Date:** \_\_\_\_\_

An irreplaceable hand-drawn map of the original northern land route from 1838 has gone missing from the Cherokee National Historical Trail Center. As junior rangers, we must piece together the clues to find the thief before the map is lost forever.

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 artifact thief is** \_\_\_\_\_

## Possible suspects

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

| NAME             | HISTORICAL SPECIALTY | RESEARCH TOOL    | DOMINANT HAND       | FIELD HAT        | TRAIL SNACK        |
|------------------|----------------------|------------------|---------------------|------------------|--------------------|
| Archivist Lee    | treaty history       | field notebook   | right handed writer | tan trail hat    | dried hickory nuts |
| Dr Foreman       | native plants        | digital camera   | right handed writer | tan trail hat    | parched corn       |
| Guide John       | cherokee language    | field notebook   | right handed writer | green park cap   | wild blackberries  |
| Archivist Lowery | cherokee language    | field notebook   | right handed writer | green park cap   | parched corn       |
| Ranger Martin    | cherokee language    | uv flashlight    | right handed writer | tan trail hat    | dried hickory nuts |
| Ranger Daniel    | archival maps        | magnifying glass | left handed writer  | green park cap   | dried hickory nuts |
| Dr Cho           | treaty history       | digital camera   | right handed writer | green park cap   | parched corn       |
| Historian Adair  | cherokee language    | digital camera   | left handed writer  | tan trail hat    | parched corn       |
| Historian Ross   | archival maps        | field notebook   | right handed writer | green park cap   | parched corn       |
| Historian Ward   | clan genealogy       | handheld gps     | right handed writer | green park cap   | dried hickory nuts |
| Guide Mary       | treaty history       | magnifying glass | left handed writer  | grey wool beanie | wild blackberries  |
| Guide Gist       | clan genealogy       | uv flashlight    | right handed writer | green park cap   | parched corn       |
| Ranger Walker    | native plants        | magnifying glass | left handed writer  | grey wool beanie | wild blackberries  |
| Guide Bushyhead  | archival maps        | digital camera   | right handed writer | green park cap   | parched corn       |
| Dr Vann          | treaty history       | handheld gps     | right handed writer | tan trail hat    | parched corn       |
| Ranger Clara     | clan genealogy       | field notebook   | right handed writer | tan trail hat    | parched corn       |
| Dr Ridge         | clan genealogy       | field notebook   | right handed writer | grey wool beanie | parched corn       |
| Ranger Evans     | treaty history       | field notebook   | right handed writer | grey wool beanie | wild blackberries  |
| Ranger Davis     | native plants        | field notebook   | right handed writer | tan trail hat    | parched corn       |
| Dr Thomas        | clan genealogy       | handheld gps     | right handed writer | tan trail hat    | wild blackberries  |
| Curator Smith    | cherokee language    | magnifying glass | left handed writer  | green park cap   | parched corn       |

### CLUE 1

We check the logbook of daily visitors to the historical center. The curator says only a fraction of yesterday's group went near the restricted archives.

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

Diagram illustrating the sequence of boxes and their associated numbers:

- Row 1:
  - Box 1 (T) → 34
  - Box 2 (13) → 25
  - Box 3 (11) → 21
  - Box 4 (11) → 8
  - Box 5 (25) → 2
  - Box 6 (T) → 34
  - Box 7 (22) → 33
  - Box 8 (22)
  - Box 9 (19) → 32
  - Box 10 (T) → 34
  - Box 11 (21) → 11
  - Box 12 (25)
- Row 2:
  - Box 13 (16)
  - Box 14 (21) → 9
  - Box 15 (23) → 3
  - Box 16 (16) → 11
  - Box 17 (13) → 3
  - Box 18 (33) → 17
  - Box 19 (13) → 34
  - Box 20 (T)

$2/5$  of 85 =   $\rightarrow$  **T**

$\frac{1}{10}$  of 20 =   $\rightarrow$  **C**

8/10 of 20 =  → **A**

$2/8$  of 100 =   $\rightarrow$  **E**

$3/6$  of  $18 = \square \rightarrow \boxed{\text{V}}$

$\frac{1}{6}$  of 192 =   $\rightarrow$

$1/6$  of 126 =   $\rightarrow$  **U**

$\frac{1}{8}$  of 152 =   $\rightarrow$  **N**

$\frac{1}{5}$  of 15 =   $\rightarrow$  **L**

$3/6$  of  $34 = \square \rightarrow \boxed{\mathbf{G}}$

$2/8$  of 132 =   $\rightarrow$

$4/8$  of  $16 = \square \rightarrow \boxed{\text{P}}$

2/6 of 39 =  → **H**

$2/4$  of 46 =  → **F**

2/4 of 22 =  → **S**

$1/8$  of 176 =   $\rightarrow$  **D**

Scratch space:

## CLUE 2

## Order of operations

A complicated security passcode was used on the back door. Solving this multi-step equation reveals the terminal code that logged the entry time.

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

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| T  |    |    | T  |    |    |    |    |    |    |    | T  |    |    |    |    |    |    |
| 73 | 48 | 62 | 73 | 48 | 25 | 62 | 74 | 54 | 43 | 28 | 73 | 62 | 35 | 28 | 59 | 23 |    |
|    |    | T  |    | T  |    |    |    |    |    |    |    |    | T  |    |    |    |    |
| 54 | 25 | 73 | 48 | 73 | 48 | 62 | 25 | 43 | 43 | 25 | 59 | 48 | 73 | 48 | 30 | 44 | 33 |

$61 + 2 \times 6 = \square \rightarrow \boxed{\text{T}}$

$6 \times 6 - 3 = \square \rightarrow \boxed{\text{D}}$

$8 + 9 \times 3 = \square \rightarrow \boxed{\text{L}}$

$4 \times 10 - 12 = \square \rightarrow \boxed{\text{O}}$

$6 \times 12 - 10 = \square \rightarrow \boxed{\text{E}}$

$5 + 3 \times 6 = \square \rightarrow \boxed{\text{S}}$

$28 + 5 \times 3 = \square \rightarrow \boxed{\text{R}}$

$10 + 4 \times 5 = \square \rightarrow \boxed{\text{A}}$

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

$11 \times 5 - 1 = \square \rightarrow \boxed{\text{W}}$

$33 + 3 \times 5 = \square \rightarrow \boxed{\text{H}}$

$7 + 2 \times 9 = \square \rightarrow \boxed{\text{I}}$

$11 \times 6 - 7 = \square \rightarrow \boxed{\text{G}}$

$14 + 6 \times 5 = \square \rightarrow \boxed{\text{N}}$

Scratch space:

**CLUE 3**
**Multiplication facts (1-12)**

We inspect the supply shelves in the ranger office. To find the total count of missing field notebooks, we count the rows of empty boxes.

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

|    |    |    |    |    |   |   |   |   |    |    |     |     |     |    |   |    |  |
|----|----|----|----|----|---|---|---|---|----|----|-----|-----|-----|----|---|----|--|
| T  |    |    |    |    |   |   |   |   |    |    |     |     |     |    |   |    |  |
| 42 | 14 | 33 | 12 | 96 | 9 | 1 | 4 | 4 | 33 | 96 | 110 | 144 | 110 | 50 | 1 | 90 |  |

  

|   |     |   |    |    |    |    |    |   |   |    |
|---|-----|---|----|----|----|----|----|---|---|----|
|   |     |   |    |    |    |    |    |   |   |    |
| 4 | 110 | 9 | 45 | 14 | 33 | 96 | 45 | 1 | 9 | 88 |

$7 \times 6 = \square \rightarrow \text{T}$

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

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

$12 \times 8 = \square \rightarrow \text{D}$

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

$3 \times 11 = \square \rightarrow \text{E}$

$12 \times 12 = \square \rightarrow \text{B}$

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

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

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

$10 \times 9 = \square \rightarrow \text{F}$

$2 \times 6 = \square \rightarrow \text{Y}$

$2 \times 7 = \square \rightarrow \text{H}$

$10 \times 11 = \square \rightarrow \text{A}$

Scratch space:

## CLUE 4 Rounding

The historic GPS tracker logged a signal, but the coordinates are fuzzy. We must round the numbers to the nearest tenth to find the trail coordinates.

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

|          |      |     |      |      |     |     |     |      |      |      |      |      |     |    |     |      |
|----------|------|-----|------|------|-----|-----|-----|------|------|------|------|------|-----|----|-----|------|
| <b>W</b> |      |     |      |      |     |     |     |      |      |      |      |      |     |    |     |      |
| 700      | 3000 | 130 | 4300 | 30   | 430 | 230 | 50  | 900  | 500  | 3000 | 3000 | 430  | 300 | 50 | 500 | 2300 |
|          |      |     |      |      |     |     |     |      |      |      |      |      |     |    |     |      |
| 170      | 50   | 300 | 430  | 3000 | 50  | 500 | 200 | 2900 | 3000 | 230  | 4300 | 4300 | 500 |    |     |      |

Round 677 to the nearest hundred  → **W**

Round 189 to the nearest hundred  → **T**

Round 2,647 to the nearest thousand  → **E**

Round 493 to the nearest hundred  → **R**

Round 2,923 to the nearest hundred  → **H**

Round 48 to the nearest ten  → **A**

Round 228 to the nearest ten  → **D**

Round 323 to the nearest hundred  → **P**

Round 28 to the nearest ten  → **U**

Round 128 to the nearest ten  → **F**

Round 429 to the nearest ten  → **N**

Round 4,256 to the nearest hundred  → **O**

Round 943 to the nearest hundred  → **G**

Round 172 to the nearest ten  → **C**

Round 2,341 to the nearest hundred  → **K**

Scratch space:

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

The ranger team shares a stack of old route maps. Dividing the maps equally among the search teams reveals the final clue about the suspect.

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:**

$6 \div 2 = \boxed{\phantom{00}}$

$72 \div 12 = \boxed{\phantom{00}}$

$22 \div 11 = \boxed{\phantom{00}}$

$2 \div 2 = \boxed{\phantom{00}}$

$56 \div 7 = \boxed{\phantom{00}}$

$49 \div 7 = \boxed{\phantom{00}}$

$88 \div 8 = \boxed{\phantom{00}}$

$5 \div 1 = \boxed{\phantom{00}}$

$16 \div 4 = \boxed{\phantom{00}}$

$120 \div 12 = \boxed{\phantom{00}}$

$27 \div 3 = \boxed{\phantom{00}}$

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

1. The villain inspects the historic ledger, then takes a photo of the document.
2. The villain inspects the historic ledger, then grabs the archival letters.
3. The villain searches the treaty archives, then takes a photo of the document.
4. The villain scans the trail marker, then hides the vintage compass.
5. The villain unlocks the display case, then takes a photo of the document.
6. The villain examines the old map cabinet, then grabs the archival letters.
7. The villain unlocks the display case, then pockets the replica coin.
8. The villain searches the treaty archives, then pockets the replica coin.
9. The villain unlocks the display case, then slips the diary into a backpack.
10. The villain examines the old map cabinet, then pockets the replica coin.
11. The villain inspects the historic ledger, then hides the vintage compass.
12. The villain examines the old map cabinet, then takes a photo of the document.

# Answer Key

## The Trail of Tears National Historic Trail Mystery

### Culprit: Historian Ross

archival maps · field notebook · right handed writer · green park cap · parched corn

Trail: Start 21 → Clue 1 19 → Clue 2 14 → Clue 3 9 → Clue 4 4 → Clue 5 1

### Clue 1 (Fractions of a number): "THE SUSPECT DID NOT USE A UV FLASHLIGHT"

$\frac{2}{5}$  of 85 = 34 (T) ·  $\frac{1}{10}$  of 20 = 2 (C) ·  $\frac{8}{10}$  of 20 = 16 (A) ·  $\frac{2}{8}$  of 100 = 25 (E) ·  $\frac{3}{6}$  of 18 = 9 (V) ·  $\frac{1}{6}$  of 192 = 32 (O) ·  $\frac{1}{6}$  of 126 = 21 (U) ·  $\frac{1}{8}$  of 152 = 19 (N) ·  $\frac{1}{5}$  of 15 = 3 (L) ·  $\frac{3}{6}$  of 34 = 17 (G) ·  $\frac{2}{8}$  of 132 = 33 (I) ·  $\frac{4}{8}$  of 16 = 8 (P) ·  $\frac{2}{6}$  of 39 = 13 (H) ·  $\frac{2}{4}$  of 46 = 23 (F) ·  $\frac{2}{4}$  of 22 = 11 (S) ·  $\frac{1}{8}$  of 176 = 22 (D)

### Clue 2 (Order of operations): "THE THIEF WROTE LOGS WITH THEIR RIGHT HAND"

$61 + 2 \times 6 = 73$  (T) ·  $6 \times 6 - 3 = 33$  (D) ·  $8 + 9 \times 3 = 35$  (L) ·  $4 \times 10 - 12 = 28$  (O) ·  $6 \times 12 - 10 = 62$  (E) ·  $5 + 3 \times 6 = 23$  (S) ·  $28 + 5 \times 3 = 43$  (R) ·  $10 + 4 \times 5 = 30$  (A) ·  $9 \times 9 - 7 = 74$  (F) ·  $11 \times 5 - 1 = 54$  (W) ·  $33 + 3 \times 5 = 48$  (H) ·  $7 + 2 \times 9 = 25$  (I) ·  $11 \times 6 - 7 = 59$  (G) ·  $14 + 6 \times 5 = 44$  (N)

### Clue 3 (Multiplication facts (1-12)): "THEY DROPPED A BAG OF PARCHED CORN"

$7 \times 6 = 42$  (T) ·  $5 \times 9 = 45$  (C) ·  $4 \times 1 = 4$  (P) ·  $12 \times 8 = 96$  (D) ·  $5 \times 10 = 50$  (G) ·  $3 \times 11 = 33$  (E) ·  $12 \times 12 = 144$  (B) ·  $1 \times 1 = 1$  (O) ·  $1 \times 9 = 9$  (R) ·  $11 \times 8 = 88$  (N) ·  $10 \times 9 = 90$  (F) ·  $2 \times 6 = 12$  (Y) ·  $2 \times 7 = 14$  (H) ·  $10 \times 11 = 110$  (A)

### Clue 4 (Rounding): "WE FOUND A GREEN PARK CAP NEAR THE DOOR"

Round 677 to the nearest hundred = 700 (W) · Round 189 to the nearest hundred = 200 (T) · Round 2,647 to the nearest thousand = 3000 (E) · Round 493 to the nearest hundred = 500 (R) · Round 2,923 to the nearest hundred = 2900 (H) · Round 48 to the nearest ten = 50 (A) · Round 228 to the nearest ten = 230 (D) · Round 323 to the nearest hundred = 300 (P) · Round 28 to the nearest ten = 30 (U) · Round 128 to the nearest ten = 130 (F) · Round 429 to the nearest ten = 430 (N) · Round 4,256 to the nearest hundred = 4300 (O) · Round 943 to the nearest hundred = 900 (G) · Round 172 to the nearest ten = 170 (C) · Round 2,341 to the nearest hundred = 2300 (K)

### Clue 5 (Division facts (1-12)): surviving statement is box 12 → Historian Ross

$6 \div 2 = 3$  ·  $72 \div 12 = 6$  ·  $22 \div 11 = 2$  ·  $2 \div 2 = 1$  ·  $56 \div 7 = 8$  ·  $49 \div 7 = 7$  ·  $88 \div 8 = 11$  ·  $5 \div 1 = 5$  ·  $16 \div 4 = 4$  ·  $120 \div 12 = 10$  ·  $27 \div 3 = 9$