



# Mystery of the Missing Crystal Horn

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

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

Someone stole the sacred Crystal Horn from Rainbow Valley! Inspect the clues left around the Glade to unmask the rogue unicorn.

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 unicorn is** \_\_\_\_\_

## Possible suspects

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

| NAME        | MAGIC POWER      | ENCHANTED GEAR   | HOOF MARK        | MANE STYLE    | BANISHING GEM |
|-------------|------------------|------------------|------------------|---------------|---------------|
| Prancer     | Rainbow Beams    | Emerald Bell     | Right Hoof Print | Braided Mane  | Sunstone Gem  |
| Buttercup   | Rainbow Beams    | Diamond Bridle   | Right Hoof Print | Braided Mane  | Sunstone Gem  |
| Ember       | Crystal Blast    | Golden Horseshoe | Left Hoof Print  | Glittery Mane | Starstone Gem |
| Breeze      | Starlight Shield | Diamond Bridle   | Right Hoof Print | Braided Mane  | Sunstone Gem  |
| Silverbell  | Rainbow Beams    | Sapphire Tiara   | Left Hoof Print  | Braided Mane  | Sunstone Gem  |
| Radiance    | Cloud Hopping    | Sapphire Tiara   | Right Hoof Print | Braided Mane  | Moonstone Gem |
| Sunburst    | Cloud Hopping    | Golden Horseshoe | Left Hoof Print  | Glittery Mane | Starstone Gem |
| Whisper     | Rainbow Beams    | Ruby Saddle      | Left Hoof Print  | Braided Mane  | Sunstone Gem  |
| Twilight    | Sparkle Teleport | Golden Horseshoe | Right Hoof Print | Floating Mane | Starstone Gem |
| Moonbeam    | Rainbow Beams    | Diamond Bridle   | Left Hoof Print  | Glittery Mane | Moonstone Gem |
| Aura        | Starlight Shield | Diamond Bridle   | Right Hoof Print | Glittery Mane | Sunstone Gem  |
| Velvet      | Crystal Blast    | Sapphire Tiara   | Right Hoof Print | Glittery Mane | Starstone Gem |
| Meadow      | Starlight Shield | Golden Horseshoe | Right Hoof Print | Floating Mane | Moonstone Gem |
| Glimmer     | Sparkle Teleport | Sapphire Tiara   | Right Hoof Print | Floating Mane | Starstone Gem |
| Glitterhorn | Sparkle Teleport | Sapphire Tiara   | Right Hoof Print | Floating Mane | Sunstone Gem  |
| Celestia    | Starlight Shield | Golden Horseshoe | Right Hoof Print | Braided Mane  | Sunstone Gem  |
| Skydancer   | Crystal Blast    | Diamond Bridle   | Left Hoof Print  | Glittery Mane | Starstone Gem |
| Starlight   | Rainbow Beams    | Diamond Bridle   | Left Hoof Print  | Glittery Mane | Sunstone Gem  |
| Sparkle     | Starlight Shield | Emerald Bell     | Right Hoof Print | Glittery Mane | Moonstone Gem |
| Jewel       | Sparkle Teleport | Sapphire Tiara   | Right Hoof Print | Braided Mane  | Sunstone Gem  |
| Frosting    | Rainbow Beams    | Ruby Saddle      | Left Hoof Print  | Braided Mane  | Starstone Gem |

## CLUE 1 Place value

The magical lock on the vault door shows digits glowing in specific place values.

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

|     |     |    |      |     |      |      |    |    |     |     |      |     |      |    |      |      |   |
|-----|-----|----|------|-----|------|------|----|----|-----|-----|------|-----|------|----|------|------|---|
| T   |     |    |      |     |      |      |    |    | T   |     |      |     |      |    |      |      | T |
| 400 | 100 | 30 | 2000 | 300 | 2000 | 9000 | 30 | 80 | 400 | 200 | 10   | 30  | 2000 | 50 | 10   | 400  |   |
|     |     |    |      |     |      |      |    |    |     |     |      |     |      |    |      |      |   |
| 100 | 500 | 70 | 30   | 500 | 50   | 30   | 90 | 30 | 20  | 500 | 5000 | 200 | 60   | 30 | 5000 | 5000 |   |

What is the value of the 4 in 863,477?  → **T**

What is the value of the 9 in 524,796?  → **M**

What is the value of the 3 in 50,639?  → **E**

What is the value of the 6 in 817,062?  → **B**

What is the value of the 8 in 11,281?  → **C**

What is the value of the 2 in 52,759?  → **S**

What is the value of the 2 in 441,205?  → **D**

What is the value of the 9 in 79,183?  → **P**

What is the value of the 5 in 125,776?  → **L**

What is the value of the 1 in 462,915?  → **O**

What is the value of the 7 in 804,370?  → **V**

What is the value of the 2 in 86,520?  → **R**

What is the value of the 5 in 941,456?  → **N**

What is the value of the 1 in 777,129?  → **H**

What is the value of the 3 in 876,394?  → **U**

What is the value of the 5 in 371,528?  → **A**

Scratch space:

## CLUE 2

## Percentages

A glittering potion flask marks the percentage of magic remaining in the glade.

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

|    |    |    |    |    |   |   |    |    |    |   |    |    |    |    |   |    |    |    |
|----|----|----|----|----|---|---|----|----|----|---|----|----|----|----|---|----|----|----|
| D  |    |    |    | D  |   |   |    |    |    |   |    |    |    |    |   |    |    |    |
| 24 | 20 | 20 | 22 | 24 | 7 | 3 | 41 | 30 | 20 | 5 | 34 | 41 | 17 | 20 | 1 | 5  | 41 | 20 |
|    |    | D  |    |    |   |   |    |    |    |   |    |    |    |    |   |    |    |    |
| 17 | 5  | 24 | 5  | 34 | 4 | 1 | 17 | 41 | 17 | 8 | 8  | 40 | 22 | 34 | 4 | 30 | 41 |    |

$25\% \text{ of } 96 = \square \rightarrow \text{D}$

$25\% \text{ of } 164 = \square \rightarrow \text{T}$

$20\% \text{ of } 150 = \square \rightarrow \text{N}$

$5\% \text{ of } 340 = \square \rightarrow \text{H}$

$5\% \text{ of } 60 = \square \rightarrow \text{S}$

$20\% \text{ of } 25 = \square \rightarrow \text{A}$

$50\% \text{ of } 8 = \square \rightarrow \text{I}$

$10\% \text{ of } 80 = \square \rightarrow \text{O}$

$10\% \text{ of } 340 = \square \rightarrow \text{R}$

$25\% \text{ of } 80 = \square \rightarrow \text{E}$

$25\% \text{ of } 88 = \square \rightarrow \text{P}$

$5\% \text{ of } 20 = \square \rightarrow \text{G}$

$5\% \text{ of } 800 = \square \rightarrow \text{F}$

$20\% \text{ of } 35 = \square \rightarrow \text{U}$

Scratch space:

## CLUE 3 Exponents

An enchanted stone temple multiplies power levels exponentially across its ancient seals.

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

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |     |   |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|---|-----|
| T   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |     |   |     |
| 27  | 9   | 64  | 125 | 49  | 36  | 36  | 400 | 49  | 243 | 216 | 9   | 256 | 400 | 243 | 144 | 81 | 400 | 4 | 144 |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |     |   |     |
| 225 | 256 | 361 | 343 | 400 | 216 | 100 | 243 | 216 | 27  | 361 | 243 | 64  | 169 | 64  | 343 |    |     |   |     |

|                               |                                |                                |                                |
|-------------------------------|--------------------------------|--------------------------------|--------------------------------|
| $3^3 = \square \rightarrow$ T | $6^2 = \square \rightarrow$ L  | $15^2 = \square \rightarrow$ F | $20^2 = \square \rightarrow$ A |
| $3^4 = \square \rightarrow$ B | $7^3 = \square \rightarrow$ M  | $19^2 = \square \rightarrow$ O | $12^2 = \square \rightarrow$ K |
| $6^3 = \square \rightarrow$ S | $10^2 = \square \rightarrow$ U | $2^6 = \square \rightarrow$ E  | $13^2 = \square \rightarrow$ G |
| $7^2 = \square \rightarrow$ I | $3^5 = \square \rightarrow$ N  | $2^2 = \square \rightarrow$ C  | $3^2 = \square \rightarrow$ H  |
| $5^3 = \square \rightarrow$ V | $4^4 = \square \rightarrow$ R  |                                |                                |

Scratch space:

**CLUE 4**
**Order of operations**

A mysterious spell scroll requires solving operations in a strict step by step order.

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

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| A  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| 77 | 26 | 14 | 43 | 80 | 41 | 15 | 26 | 14 | 41 | 78 | 26 | 38 | 62 | 77 | 43 | 60 |

  

|    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
|    | A  |    |    |    |    |    | A  |    |    | A  |    |    |    |    |    | A  |    |    |
| 29 | 77 | 38 | 76 | 53 | 15 | 60 | 77 | 19 | 62 | 77 | 14 | 60 | 15 | 60 | 29 | 77 | 43 | 15 |

$8 \times 12 - 19 = \square \rightarrow \text{A}$

$7 \times 9 - 10 = \square \rightarrow \text{H}$

$6 \times 4 - 5 = \square \rightarrow \text{B}$

$9 \times 10 - 14 = \square \rightarrow \text{C}$

$7 \times 6 - 13 = \square \rightarrow \text{M}$

$12 \times 8 - 16 = \square \rightarrow \text{G}$

$12 \times 8 - 18 = \square \rightarrow \text{K}$

$7 \times 12 - 22 = \square \rightarrow \text{R}$

$5 + 2 \times 5 = \square \rightarrow \text{E}$

$5 \times 3 - 1 = \square \rightarrow \text{I}$

$3 \times 12 - 10 = \square \rightarrow \text{S}$

$10 \times 5 - 7 = \square \rightarrow \text{N}$

$9 \times 7 - 3 = \square \rightarrow \text{D}$

$9 \times 7 - 22 = \square \rightarrow \text{L}$

$5 \times 9 - 7 = \square \rightarrow \text{T}$

Scratch space:

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

A chest of star crystals must be shared equally among the glade guardians to reveal the clue.

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:**

$15 \div 3 = \boxed{\phantom{00}}$

$72 \div 9 = \boxed{\phantom{00}}$

$90 \div 9 = \boxed{\phantom{00}}$

$14 \div 7 = \boxed{\phantom{00}}$

$33 \div 11 = \boxed{\phantom{00}}$

$9 \div 1 = \boxed{\phantom{00}}$

$84 \div 7 = \boxed{\phantom{00}}$

$110 \div 10 = \boxed{\phantom{00}}$

$36 \div 9 = \boxed{\phantom{00}}$

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

$60 \div 10 = \boxed{\phantom{00}}$

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

1. The villain used sparkle teleport, then polished a golden horseshoe.
2. The villain started cloud hopping, then rang an emerald bell.
3. The villain fired a crystal blast, then buckled a diamond bridle.
4. The villain shot rainbow beams, then adjusted a sapphire tiara.
5. The villain used sparkle teleport, then adjusted a sapphire tiara.
6. The villain used sparkle teleport, then rang an emerald bell.
7. The villain shot rainbow beams, then buckled a diamond bridle.
8. The villain raised a starlight shield, then buckled a diamond bridle.
9. The villain shot rainbow beams, then polished a golden horseshoe.
10. The villain raised a starlight shield, then polished a golden horseshoe.
11. The villain raised a starlight shield, then adjusted their ruby saddle.
12. The villain started cloud hopping, then buckled a diamond bridle.

# Answer Key

## Mystery of the Missing Crystal Horn

### Culprit: Buttercup

Rainbow Beams · Diamond Bridle · Right Hoof Print · Braided Mane · Sunstone Gem

Trail: Start 21 → Clue 1 19 → Clue 2 11 → Clue 3 6 → Clue 4 4 → Clue 5 1

#### Clue 1 (Place value): "THE SUSPECT DOES NOT HAVE AN EMERALD BELL"

What is the value of the 4 in 863,477? = 400 (T) · What is the value of the 9 in 524,796? = 90 (M) · What is the value of the 3 in 50,639? = 30 (E) · What is the value of the 6 in 817,062? = 60 (B) · What is the value of the 8 in 11,281? = 80 (C) · What is the value of the 2 in 52,759? = 2000 (S) · What is the value of the 2 in 441,205? = 200 (D) · What is the value of the 9 in 79,183? = 9000 (P) · What is the value of the 5 in 125,776? = 5000 (L) · What is the value of the 1 in 462,915? = 10 (O) · What is the value of the 7 in 804,370? = 70 (V) · What is the value of the 2 in 86,520? = 20 (R) · What is the value of the 5 in 941,456? = 50 (N) · What is the value of the 1 in 777,129? = 100 (H) · What is the value of the 3 in 876,394? = 300 (U) · What is the value of the 5 in 371,528? = 500 (A)

#### Clue 2 (Percentages): "DEEP DUST NEAR THE GATE HAD A RIGHT HOOF PRINT"

25% of 96 = 24 (D) · 25% of 164 = 41 (T) · 20% of 150 = 30 (N) · 5% of 340 = 17 (H) · 5% of 60 = 3 (S) · 20% of 25 = 5 (A) · 50% of 8 = 4 (I) · 10% of 80 = 8 (O) · 10% of 340 = 34 (R) · 25% of 80 = 20 (E) · 25% of 88 = 22 (P) · 5% of 20 = 1 (G) · 5% of 800 = 40 (F) · 20% of 35 = 7 (U)

#### Clue 3 (Exponents): "THE VILLAIN SHRANK BACK FROM A SUNSTONE GEM"

$3^3 = 27$  (T) ·  $6^2 = 36$  (L) ·  $15^2 = 225$  (F) ·  $20^2 = 400$  (A) ·  $3^4 = 81$  (B) ·  $7^3 = 343$  (M) ·  $19^2 = 361$  (O) ·  $12^2 = 144$  (K) ·  $6^3 = 216$  (S) ·  $10^2 = 100$  (U) ·  $2^6 = 64$  (E) ·  $13^2 = 169$  (G) ·  $7^2 = 49$  (I) ·  $3^5 = 243$  (N) ·  $2^2 = 4$  (C) ·  $3^2 = 9$  (H) ·  $5^3 = 125$  (V) ·  $4^4 = 256$  (R)

#### Clue 4 (Order of operations): "A SINGLE SILK STRAND MATCHED A BRAIDED MANE"

$8 \times 12 - 19 = 77$  (A) ·  $7 \times 9 - 10 = 53$  (H) ·  $6 \times 4 - 5 = 19$  (B) ·  $9 \times 10 - 14 = 76$  (C) ·  $7 \times 6 - 13 = 29$  (M) ·  $12 \times 8 - 16 = 80$  (G) ·  $12 \times 8 - 18 = 78$  (K) ·  $7 \times 12 - 22 = 62$  (R) ·  $5 + 2 \times 5 = 15$  (E) ·  $5 \times 3 - 1 = 14$  (I) ·  $3 \times 12 - 10 = 26$  (S) ·  $10 \times 5 - 7 = 43$  (N) ·  $9 \times 7 - 3 = 60$  (D) ·  $9 \times 7 - 22 = 41$  (L) ·  $5 \times 9 - 7 = 38$  (T)

#### Clue 5 (Division facts (1-12)): surviving statement is box 7 → Buttercup

$15 \div 3 = 5$  ·  $72 \div 9 = 8$  ·  $90 \div 9 = 10$  ·  $14 \div 7 = 2$  ·  $33 \div 11 = 3$  ·  $9 \div 1 = 9$  ·  $84 \div 7 = 12$  ·  $110 \div 10 = 11$  ·  $36 \div 9 = 4$  ·  $11 \div 11 = 1$  ·  $60 \div 10 = 6$