

Eve's Ratio Adventures!

Unicorns, Monsters & Very Good Snacks — a 6th-grade ratio quest, made especially for Eve

Name: **Eve** (obviously) Date: _____ Sparkle Level: _____

*"Pure mathematics is, in its way, the poetry of logical ideas."
— Albert Einstein*

PART 1: Warm-Up at the Unicorn Stable (Regular Ratios)

1. The Rainbow Stable has 6 unicorns and 4 dragons. Write the ratio of unicorns to dragons three ways (with a colon, with the word "to", and as a fraction). Then simplify it!
_____ : _____ to _____ fraction: _____ simplest form: _____
2. Simplify each ratio (these are the ratios of glitter to glue at the unicorn craft table):
a) $12 : 18 =$ _____ b) $25 : 10 =$ _____ c) $9 : 27 =$ _____ d) $40 : 16 =$ _____
3. Fill in the missing number to make equivalent ratios (a monster keeps stealing numbers and Eve must recover them!):
a) $3 : 5 = 12 : \underline{\hspace{1cm}}$ b) $2 : 7 = \underline{\hspace{1cm}} : 21$ c) $5 : 4 = 35 : \underline{\hspace{1cm}}$ d) $8 : 12 = 2 : \underline{\hspace{1cm}}$
4. Gorblax the Monster has 3 eyes for every 2 horns. If Gorblax's whole family has 15 eyes altogether, how many horns do they have? _____

PART 2: The Pizza Monster's Fraction Feast (Fractions)

5. Chompy the Pizza Monster ate $\frac{3}{4}$ of a pizza. Sprinkles the Unicorn only ate $\frac{1}{4}$ (she was saving room for cupcakes). What is the ratio of Chompy's pizza to Sprinkles' pizza, in simplest whole-number form? _____
6. A rainbow cupcake recipe uses $\frac{1}{2}$ cup of sprinkles for every 3 cupcakes. Eve and Sprinkles the Unicorn want 12 cupcakes. How many cups of sprinkles does she need?

7. Write the ratio $\frac{2}{3} : \frac{1}{6}$ as a ratio of whole numbers in simplest form. _____
(Hint: how many sixths are in $\frac{2}{3}$?)
8. In a bag of gummy worms, $\frac{2}{5}$ of the worms are sour and the rest are sweet. What is the ratio of sour worms to sweet worms? _____
9. Sprinkles' mane is $\frac{5}{8}$ pink and $\frac{3}{8}$ purple. a) Ratio of purple hair to pink hair: _____
b) If Eve patiently counts 40 hairs, how many are pink? _____

*"Without mathematics, there's nothing you can do. Everything around you is mathematics."
— Shakuntala Devi, the "Human Computer"*

PART 3: The Monster Snack Shop (Decimals)

10. At the Monster Snack Shop, Slime Juice costs \$2.50 for 2 cups. a) How much is 1 cup? _____ b) How much would 6 cups cost? _____
11. Bloopy the Swamp Monster waddled 4.5 miles in 1.5 hours to get to the snack shop. How many miles per hour is that? _____
12. Write the ratio 1.5 : 4.5 as a ratio of whole numbers in simplest form. _____
13. It takes 0.75 kg of glitter to make 3 unicorns extra shiny. a) Glitter per unicorn: _____ kg
b) Glitter for 10 unicorns: _____ kg
14. A monster is 2.4 meters tall. Its pet slug is 0.6 meters tall. What is the ratio of the monster's height to the slug's height? _____

*"Like what you do, and then you will do your best."
— Katherine Johnson, NASA mathematician*

PART 4: The Dragon's Kitchen (Measurements)

15. The dragon's soup recipe uses 250 mL of Dragon-Fire Hot Sauce for every 1 liter of soup.
a) Ratio of hot sauce to soup, simplified (same units!): _____
b) How much hot sauce for 3 liters of soup? _____ mL
16. At sunset, a 5-foot-tall unicorn casts a 15-foot shadow. a) Ratio of height to shadow: _____
b) How long is the shadow of an 8-foot monster standing next to her? _____ feet
17. Write 12 inches : 2 feet as a ratio in simplest form. (Careful — convert to the same units first!) _____
18. A troll bridge is 90 cm wide. A giant's foot is 30 cm wide. a) Ratio of bridge width to foot width: _____ b) How many giant feet fit side by side on the bridge? _____
19. At the dessert contest, a pixie eats 300 grams of cake for every 1.2 kilograms the ogre eats. What is the ratio of pixie-cake to ogre-cake in simplest form? _____

*"It is impossible to be a mathematician without being a poet in soul."
— Sofia Kovalevskaya*

PART 5: Word Problems from the Enchanted Bakery

20. The Unicorn Bakery bakes cupcakes and cookies in a ratio of 3 : 5. Today they baked 40 treats in total. How many cupcakes? _____ How many cookies? _____
21. At a monster birthday party there are 7 monsters. Each monster has 4 eyes and 2 tails. What is the ratio of eyes to tails at the party, in simplest form? _____
22. Sparkle Punch is made with 2 parts rainbow juice to 3 parts fizzy cloud water. To make 20 cups of punch, how many cups of rainbow juice? _____ fizzy cloud water? _____
23. Ember the Dragon hoards gold coins and lost socks in a ratio of 5 : 2 (she likes socks). If Ember has 35 gold coins, how many socks are in her hoard? _____
24. A 5-story marshmallow tower uses 45 marshmallows. a) Marshmallows per story: _____
b) How many marshmallows for a 12-story tower? _____
25. Unicorn race! Sparkles runs 12 km in 2 hours. Glitterhoof runs 15 km in 3 hours. Eve is the judge. Who is faster, and by how many km per hour? _____

BONUS: The Mystery Monster (Challenge!)

- *. A mystery monster has purple spots and green spots in a ratio of 3 : 4. It has 63 spots altogether. a) Purple spots: _____ b) Green spots: _____ c) How many MORE green spots than purple? _____
d) Draw the mystery monster below (spots optional, silliness required):

*"Mistakes are proof that you are trying."
— Unknown (but very wise)*

Answer Key (for grown-ups, honest unicorns, and Eve when she's done)

Part 1

1. 6:4, 6 to 4, $\frac{6}{4}$; simplest form 3:2
2. a) 2:3 b) 5:2 c) 1:3 d) 5:2
3. a) 20 b) 6 c) 28 d) 3
4. 10 horns ($15 \div 3 = 5$ groups; $5 \times 2 = 10$)

Part 2

5. 3:1
6. 2 cups ($12 \div 3 = 4$ batches; $4 \times \frac{1}{2} = 2$)
7. 4:1 ($\frac{2}{3} = \frac{4}{6}$, so $\frac{4}{6} : \frac{1}{6} = 4:1$)
8. 2:3 ($\frac{2}{5}$ sour, $\frac{3}{5}$ sweet)
9. a) 3:5 b) 25 pink hairs ($\frac{5}{8}$ of 40)

Part 3

10. a) \$1.25 b) \$7.50
11. 3 miles per hour
12. 1:3
13. a) 0.25 kg b) 2.5 kg
14. 4:1

Part 4

15. a) 1:4 (250 mL : 1000 mL) b) 750 mL
16. a) 1:3 b) 24 feet
17. 1:2 (12 in : 24 in)
18. a) 3:1 b) 3 giant feet
19. 1:4 (300 g : 1200 g)

Part 5

20. 15 cupcakes, 25 cookies (8 groups of 5; 3×5 and 5×5)
21. 2:1 (28 eyes : 14 tails)
22. 8 cups rainbow juice, 12 cups fizzy cloud water
23. 14 socks
24. a) 9 b) 108 marshmallows
25. Sparkles, by 1 km/h (6 km/h vs 5 km/h)

Bonus

- a) 27 purple b) 36 green c) 9 more green ($63 \div 7 = 9$ per part) d) any monster is correct!