

Name: _____ Date: _____

Answer Key: Your Recipe for Tiny Chemists: A Pre-K Stoichiometry Party

Assemble the perfect snack proportions by analyzing how small parts combine to make a whole masterpiece through ratio-based play.

1. You are making a 'Block Tower Formula.' If every 1 Red Block needs exactly 2 Blue Blocks to be balanced, what happens if you have 1 Red Block and only 1 Blue Block?

Answer: B) You have a 'limiting' blue block and the tower is unfinished.

In stoichiometry, if you don't have enough of one 'ingredient' (reactant), you cannot finish the 'recipe' (product). This introduces the concept of a limiting reactant.

2. If you have a giant bag of 100 cotton balls and a small bag of 5 heavy stones, the heavy stones will always have more 'pieces' inside them than the cotton balls.

Answer: B) False

This evaluates the difference between mass and count. Just because something is 'heavy' (molar mass) doesn't mean it has more 'pieces' (moles/particles).

3. To make a 'Perfect Pair' of socks, you need 2 individual socks. If you find 10 individual socks in your laundry basket, how many 'Perfect Pairs' can you report to the Laundry Boss?

Answer: C) 5 pairs

This requires ratio analysis (2:1). Dividing the total count by the required ratio amount determines the final yield of the product.

4. Imagine you have a 'Mole Box' that always holds exactly 6 invisible magic bells. If you have 2 'Mole Boxes,' how many magic bells do you have in total?

Answer: B) 12 bells

This simplifies Avogadro's number. If a unit (mole) represents a specific count, doubling the units doubles the total count of particles.

5. If your science recipe says '1 Butterfly = 2 Wings + 1 Body,' you can still make a whole Butterfly if you only have the 2 Wings.

Answer: B) False

Name: _____ Date: _____

Chemical reactions (and butterfly assembly) require all parts of the stoichiometric ratio to be present to create the product.

6. You are weighing 'Teddy Bear Atoms' and 'Duckie Atoms.' If one Teddy Bear is much heavier than one Duckie, which one takes fewer pieces to weigh down a scale to 10 pounds?

Answer: B) The Teddy Bears

This targets the relationship between molar mass and moles. Heavier particles (higher molar mass) require fewer 'pieces' to reach a specific total mass.

7. If you have 4 wheels and 1 car body, you make 1 car. If a 'mystery box' gives you 8 wheels and 2 car bodies, how many cars can you assemble?

Answer: D) 2 cars

This tests the ability to scale a stoichiometric ratio (4:1) proportionally to determine the theoretical yield of a reaction.

8. True or False: If you mix Red Paint and Yellow Paint to make Orange, the Red Paint 'disappears' forever and is gone from the universe.

Answer: B) False

This addresses the Law of Conservation of Mass. In stoichiometry, atoms are rearranged into products, not destroyed.

9. You have a 'Mole' of feathers (very light) and a 'Mole' of lead bricks (very heavy). What is the same about both groups?

Answer: C) They have the exact same number of pieces.

A mole always represents the same number of particles, regardless of how heavy those individual particles are.

10. A snack 'molecule' is made of 3 Cheerios and 1 Pretzel. If you have 6 Cheerios and 10 Pretzels, which ingredient will you RUN OUT of first?

Answer: B) Cheerios

Since you need 3 Cheerios per snack, 6 Cheerios only makes 2 snacks. You have plenty of pretzels for 10 snacks, making Cheerios the limiting reactant.