



MEDMATHMINDSET PROVIDER MATH ATLAS

Respiratory Therapy (RT) math, one domain at a time.

A focused, printable reference built from MedMathMindset's current provider-specific quantitative blueprint.

BLUEPRINT SNAPSHOT

15 domains | 100% total instructional weight

Domains are ordered from highest to lowest MedMathMindset instructional weight. These are MedMathMindset training weights, not official credentialing-body exam percentages unless an official source explicitly states otherwise.

USE IT THREE WAYS

Teach | Review | Print

Use the worked examples as a quick class reference, learner review sheet, or printable teaching aid.

WHAT THE ATLAS ADDS

Example + reasoning + check

Each domain pairs one worked example with the setup, answer, and a reasonableness check.

DOMAINS IN THIS ATLAS

1. Oxygen Delivery 12%

3. ABG / Gas Compensation 10%

5. Oxygen Cylinder Duration 10%

7. Unit Conversions 8%

9. Percentages 5%

11. Lab Interpretation Math 4%

13. Provider Operations Math 3%

2. Ventilator / Tidal Volume 12%

4. Alveolar Ventilation 10%

6. Dimensional Analysis 8%

8. Ratios / Proportions 6%

10. Cardiac Output / Hemodynamics 4%

12. Clinical Index / Score Interpretation 3%

14. Whole Number Operations 3%

IMPORTANT SCOPE NOTE

Educational examples only. This atlas does not replace local protocols, medication references, device instructions, scope-of-practice requirements, official credentialing test plans, or clinical judgment.



DOMAIN 1 OF 15

Oxygen Delivery

12%
MMM weight

Oxygen Delivery is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

Using the common nasal-cannula estimate of about 24% at 1 L/min plus about 4 percentage points per additional L/min, estimate FiO₂ at 3 L/min.

SETUP / REASONING

$24\% + 2 \times 4\% = 32\%$. This is an approximation, not a measured FiO₂.

ANSWER**32 %****QUICK CHECK**

Make sure the oxygen quantity and flow use compatible units before dividing.

DOMAIN 2 OF 15

Ventilator / Tidal Volume

12%
MMM weight

Ventilator / Tidal Volume is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

A target tidal volume is 6 mL/kg for a 70 kg patient. What tidal volume does that equal?

SETUP / REASONING

$6 \times 70 = 420 \text{ mL}$.

ANSWER**420 mL****QUICK CHECK**

Confirm whether the requested value is per breath, per kilogram, or per minute before calculating.



DOMAIN 3 OF 15

ABG / Gas Compensation

10%
MMM weight

ABG / Gas Compensation is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

Using Winter's formula, expected $\text{PaCO}_2 = 1.5 \times \text{HCO}_3 + 8$. If HCO_3 is 16 mEq/L, what is the center of the expected PaCO_2 range?

SETUP / REASONING

$1.5 \times 16 + 8 = 32$ mmHg (the usual 2 range is considered separately).

ANSWER**32 mmHg****QUICK CHECK**

Use the stated compensation relationship exactly and interpret the result as an expected comparison value, not a diagnosis by itself.

DOMAIN 4 OF 15

Alveolar Ventilation

10%
MMM weight

Alveolar Ventilation is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

Use alveolar ventilation = (tidal volume - dead space) x respiratory rate. If $\text{VT}=500$ mL, dead space=150 mL, and $\text{RR}=12/\text{min}$, what is alveolar ventilation?

SETUP / REASONING

$(500 - 150) \times 12 = 4200$ mL/min = 4.2 L/min.

ANSWER**4.2 L/min****QUICK CHECK**

Keep respiratory rate, tidal volume, and dead-space units consistent; the result should represent effective ventilation.



DOMAIN 5 OF 15

Oxygen Cylinder Duration

10%
MMM weight

Oxygen Cylinder Duration is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

An E cylinder reads 1800 psi. Use a 200 psi reserve and a factor of 0.28. At 4 L/min, approximately how many minutes remain? Round to the nearest minute.

SETUP / REASONING

$(1800 - 200) \times 0.28 / 4 = 112$, about 112 min.

ANSWER**112 min****QUICK CHECK**

Subtract the intended reserve before applying the cylinder factor and flow rate.

DOMAIN 6 OF 15

Dimensional Analysis

8%
MMM weight

Dimensional Analysis is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

Available: 10 mg in 2 mL. The ordered dose is 30 mg. How many mL will deliver the ordered dose?

SETUP / REASONING

$$? \text{ mL} = \frac{2 \text{ mL}}{10 \text{ mg}} \times \frac{30 \text{ mg}}{1} = 6 \text{ mL}$$

ANSWER**6 mL****QUICK CHECK**

Unwanted units should cancel cleanly, leaving only the requested final unit.



DOMAIN 7 OF 15

Unit Conversions

8%
MMM weight

Unit Conversions is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

Convert 750 mg to g.

SETUP / REASONING

Use the 1000:1 metric relationship; the result is 0.75 g.

ANSWER

0.75 g

QUICK CHECK

Confirm the direction of the conversion and that the final unit is exactly the requested unit.

DOMAIN 8 OF 15

Ratios / Proportions

6%
MMM weight

Ratios / Proportions is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

A 2:5 relationship is maintained. If the second quantity becomes 20, what is the first quantity?

SETUP / REASONING

$2/5 = x/20$; $x = 8$.

ANSWER

8

QUICK CHECK

Cross-products should agree when the two ratios are truly equivalent.



DOMAIN 9 OF 15

Percentages

5%

MMM weight

Percentages is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

What is 25% of 80?

SETUP / REASONING

$25\% \times 80 = 20.$

ANSWER

20

QUICK CHECK

The result should be the stated fraction of the whole; compare its magnitude with 0% and 100%.

DOMAIN 10 OF 15

Cardiac Output / Hemodynamics

4%

MMM weight

Cardiac Output / Hemodynamics is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

Heart rate is 70/min and stroke volume is 70 mL. What is cardiac output in L/min?

SETUP / REASONING

$70 \times 70 = 4900 \text{ mL/min} = 4.9 \text{ L/min}.$

ANSWER

4.9 L/min

QUICK CHECK

Heart rate x stroke volume yields mL/min first; convert to L/min only after multiplying.



DOMAIN 11 OF 15

Lab Interpretation Math

4%
MMM weight

Lab Interpretation Math is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

A measured value is 6 and the comparison/reference value is 4. By what percentage is the measured value higher?

SETUP / REASONING

$$(6 - 4) / 4 \times 100 = 50\%.$$

ANSWER**50 %****QUICK CHECK**

Use the correct reference value in the denominator when computing percentage change.

DOMAIN 12 OF 15

Clinical Index / Score Interpretation

3%
MMM weight

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EXAMPLE

24 events occur during 6 hours. What is the event index per hour?

SETUP / REASONING

$$24 / 6 = 4 \text{ events/hr.}$$

ANSWER**4 events/hr****QUICK CHECK**

An index is a rate: confirm both the numerator and the time/exposure denominator.



DOMAIN 13 OF 15

Provider Operations Math

3%
MMM weight

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EXAMPLE

A device has 600 usable units and consumes 10 units each minute. Ignoring reserve, how many minutes will it run?

SETUP / REASONING

$600 / 10 = 60$ minutes.

ANSWER

60 min

QUICK CHECK

A quantity divided by a consumption rate should produce a time or capacity that fits the operating context.

DOMAIN 14 OF 15

Whole Number Operations

3%
MMM weight

Whole Number Operations is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

A supply area starts with 24 counted items, adds 18, then uses 11. How many remain?

SETUP / REASONING

$24 + 18 - 11 = 31$.

ANSWER

31 items

QUICK CHECK

Reconcile the starting quantity, additions, and use; the ending count should fit the story.



DOMAIN 15 OF 15

2%
MMM weight

Fractions / Decimals

Fractions / Decimals is included because it matches expected quantitative work for this provider level. Respiratory therapy scope emphasizes oxygen, ventilation, ABG/gas-exchange, cardiopulmonary indices, and respiratory equipment-not IV infusion management.

EXAMPLE

Write $\frac{3}{4}$ as a decimal.

SETUP / REASONING

$\frac{3}{4} = 0.75$.

ANSWER

0.75

QUICK CHECK

For a proper fraction, the decimal should fall between 0 and 1.

REFRESH PRINTED COPIES PERIODICALLY

Provider scope and MedMathMindset instructional weighting may change as the canonical provider-domain layer is updated.