



Middle School Tenacity Challenge Quiz Bowl Subject Matter Concepts

Questions for the quiz bowl will be drawn from the subjects of the number system, ratios and proportional relationships, geometry, statistics and probability, and expressions and equations. Questions will generally be drawn *primarily* from the subject matter concepts listed below. **However, some questions may be drawn from outside of the subject matter concepts.**

Number System Concepts

1. Properties of integers (even, odd, prime numbers, divisibility, and so forth)
2. Apply order of operations to expressions containing integers, decimals and fractions.
3. Use the Distributive Property to evaluate expressions.
4. Conversions: scientific notation and standard form, metric measurements.

Ratio and Proportional Relationship Concepts

1. Find ratios, unit rates, and equivalent rates.
2. Convert decimals, fractions and percent.
3. Solve percent problems using proportions, using the percent equation, and with percent increase/decrease.
4. Consumer math: calculate discount, markup, tax, and simple interest.
5. Apply scale factor appropriately to different dimensions (length, area, volume).
6. Find the equation of a line from a graph, table, point and slope or 2 points. Calculate slope. Use slope to calculate unknown coordinate points on a graph.

Geometry Concepts

1. Surface area and volume of right prisms with any shape base, cylinders, pyramids, cones, and spheres.
2. Use formulas to find perimeter and area of triangles, rectangles and other polygons.
3. Angles and Triangles: classify by measure, identify special pairs of angles, classify by side length.
4. Use Pythagorean Theorem.
5. Classify prisms, pyramids, cylinders, and cones.
6. Use properties of similar and congruent polygons to find unknown values.
7. Solve equations to find angle measurements.
8. Determine two-dimensional figures resulting from slicing three-dimensional figures.
9. Identify and graph transformations and symmetry in figures. Recognize tessellations.

Statistics and Probability

1. Data interpretation (tables and graphs)
2. Descriptive statistics (mean, median, and mode)
3. Probability

Expressions and Equations

1. Apply PEMDAS to evaluate numerical expressions.
2. Write and evaluate variable expressions.
3. Evaluate expressions with powers.
4. Solve single step and multi-step equations.
5. Manipulate variables in multi-step equations to solve for a given variable.
6. Solve and graph linear inequalities.
7. Analyze lines to describe real world relationships