



## **Waste Reduction & Recycling**

### *Number Sense*

- 1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers.  
Students solve problems involving fractions, ratios, proportions, and percentages:
  - 1.4 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.

### *Statistics, Data Analysis, and Probability*

- 1.0 Students compute and analyze statistical measurements for data sets:
  - 1.1 Compute the range, mean, median, and mode of data sets.
  - 1.2 Understand how additional data added to data sets may affect these computations of measures of central tendency.
  - 1.3 Understand how the inclusion or exclusion of outliers affects measures of central tendency.
  - 1.4 Know why a specific measure of central tendency (mean, median) provides the most useful information in a given context.

### *Mathematical Reasoning*

- 2.0 Students use strategies, skills, and concepts in finding solutions:
  - 2.1 Use estimation to verify the reasonableness of calculated results.
  - 2.2 Apply strategies and results from simpler problems to more complex problems.
  - 2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
  - 2.4 Use a variety of methods, such as words, numbers, symbols, charts, graphs, tables, diagrams, and models, to explain mathematical reasoning.
  - 2.5 Express the solution clearly and logically by using the appropriate mathematical notation and terms and clear language; support solutions with evidence in both verbal and symbolic work.
  - 2.6 Indicate the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.
  - 2.7 Make precise calculations and check the validity of the results from the context of the problem.
- 3.0 Students move beyond a particular problem by generalizing to other situations:
  - 3.1 Evaluate the reasonableness of the solution in the context of the original situation.
  - 3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.



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- 3.3 Develop generalizations of the results obtained and the strategies used and apply them in new problem situations.



## **Composting**

### *Statistics, Data Analysis, and Probability*

1.0 Students compute and analyze statistical measurements for data sets:

- 1.1 Compute the range, mean, median, and mode of data sets.
- 1.2 Understand how additional data added to data sets may affect these computations of measures of central tendency.
- 1.3 Understand how the inclusion or exclusion of outliers affects measures of central tendency.
- 1.4 Know why a specific measure of central tendency (mean, median) provides the most useful information in a given context.

### *Mathematical Reasoning*

2.0 Students use strategies, skills, and concepts in finding solutions:

- 2.1 Use estimation to verify the reasonableness of calculated results.
- 2.2 Apply strategies and results from simpler problems to more complex problems.
- 2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
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3.0 Students move beyond a particular problem by generalizing to other situations:

- 3.1 Evaluate the reasonableness of the solution in the context of the original situation.



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- 3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems.
  
- 3.3 Develop generalizations of the results obtained and the strategies used and apply them in new problem situations.



## **Stormwater Urban Runoff**

### *Number Sense*

1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers. Students solve problems involving fractions, ratios, proportions, and percentages:

- 1.2 Interpret and use ratios in different contexts (e.g., batting averages, miles per hour) to show the relative sizes of two quantities, using appropriate notations ( $a/b$ ,  $a$  to  $b$ ,  $a:b$ ).

### *Algebra and Functions*

2.0 Students analyze and use tables, graphs, and rules to solve problems involving rates and proportions:

- 2.1 Convert one unit of measurement to another (e.g., from feet to miles, from centimeters to inches).
- 2.2 Demonstrate an understanding that rate is a measure of one quantity per unit value of another quantity.
- 2.3 Solve problems involving rates, average speed, distance, and time.

### *Statistics, Data Analysis, and Probability*

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3.0 Students determine theoretical and experimental probabilities and use these to make predictions about events:

- 3.1 Represent all possible outcomes for compound events in an organized way (e.g., tables, grids, tree diagrams) and express the theoretical probability of each outcome.



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- 3.2 Use data to estimate the probability of future events (e.g., batting averages or number of accidents per mile driven).

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- 2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques.
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## **Illegal Dumping**

### *Number Sense*

1.0 Students compare and order positive and negative fractions, decimals, and mixed numbers. Students solve problems involving fractions, ratios, proportions, and percentages:

- 1.3 Use proportions to solve problems (e.g., determine the value of  $N$  if  $4/7 = N/21$ , find the length of a side of a polygon similar to a known polygon). Use cross-multiplication as a method for solving such problems, understanding it as the multiplication of both sides of an equation by a multiplicative inverse.

### *Algebra and Functions*

3.0 Students investigate geometric patterns and describe them algebraically:

- 3.1 Use variables in expressions describing geometric quantities (e.g.,  $P = 2w + 2l$ ,  $A = 1/2bh$ ,  $C = \pi d$  - the formulas for the perimeter of a rectangle, the area of a triangle, and the circumference of a circle, respectively).

### *Measurement and Geometry*

2.0 Students identify and describe the properties of two-dimensional figures:

- 2.2 Use the properties of complementary and supplementary angles and the sum of the angles of a triangle to solve problems involving an unknown angle.
- 2.3 Draw quadrilaterals and triangles from given information about them (e.g., a quadrilateral having equal sides but no right angles, a right isosceles triangle).

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- 1.4 Know why a specific measure of central tendency (mean, median) provides the most useful information in a given context.

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## **Household Hazardous Waste**

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- 1.4 Calculate given percentages of quantities and solve problems involving discounts at sales, interest earned, and tips.

### *Statistics, Data Analysis, and Probability*

1.0 Students compute and analyze statistical measurements for data sets:

- 1.1 Compute the range, mean, median, and mode of data sets.
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  - 1.3 Understand how the inclusion or exclusion of outliers affects measures of central tendency.
  - 1.4 Know why a specific measure of central tendency (mean, median) provides the most useful information in a given context.
- 2.0 Students use data samples of a population and describe the characteristics and limitations of the samples:
- 2.1 Compare different samples of a population with the data from the entire population and identify a situation in which it makes sense to use a sample.
  - 2.2 Identify different ways of selecting a sample (e.g., convenience sampling, responses to a survey, random sampling) and which method makes a sample more representative for a population.
  - 2.3 Analyze data displays and explain why the way in which the question was asked might have influenced the results obtained and why the way in which the results were displayed might have influenced the conclusions reached.
  - 2.4 Identify data that represent sampling errors and explain why the sample and display may be biased.



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- 2.5 Identify claims based on statistical data and, in simple cases, evaluate the validity of the claims.

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