Operation Lifeline

Geometry

- Measuring Characteristics of 3-D Figures 6.G.A.1, 6.G.A.4, 7.G.B.6, 8.G.C.9 (depending on the shape of the container)
  - o Apply the formula for surface area to determine which material to use when considering the material's weight and cost.
  - o Apply the formula for volume to determine the size/capacity of the container.

Algebra

- Evaluate expressions for the replacement of variables in a formula. 6.EE.A.2.C

Power Me Up

Algebra

- Equations and Inequalities 6.EE.B.5, 6.EE.B.8
  - o Write and solve equations and inequalities to position charging stations to meet the refueling needs of a typical elective vehicle

Statistics

- Collect and Analyze data 6.SP.A.2, 7.SP.A.2
  - o Collect and analyze data on electric vehicle usage

Number Sense and Computation

- Ratios 6.RP.A.1, 6.RP.A.2, 6.RP.3.B, 6.RP.3.D
  - o Use unit rates to compare the cost to charge an electric vehicle and the cost to refuel a gas vehicle (for example, students may compare miles per recharge/refuel or cost per mile)

Keep It Real

Statistics

- Displaying Univariate Data 6.SP.B.4, 6.SP.B.5, 7.SP.A.1, 7.SP.A.2
  - o Analyze data and present a convincing argument with statistics
  - o Create a histogram (or other appropriate representation for numerical data) to represent collected data.

Building Algorithms

Algebra

- Representing and Manipulating Algebraic Expressions
    - Translate an algorithm into an algebraic expression. 6.EE.A.2.A
    - Simplify algebraic expressions. 6.EE.A.2.B
- Create and solve equations and inequalities. 7.EE.B.4

Number Sense and Computation

- Understand and use percentages to apply weight to responses. 6.RP.A.3.C, 7.RP.A.3

Prototype to Profit

Algebra

- Representing and Manipulating Algebraic Expressions
    - Translate a business plan into an algebraic expression. 6.EE.A.2.A
    - Simplify algebraic expressions. 6.EE.A.2.B
- Representing and Using Linear Functions
    - Create and graph an equation to represent profit over time 7.EE.B.4
    - Analyze a graph. 8.F.B.5
- Solve Simultaneous Linear Equations
    - Determine the "break even" point above which they will begin to make a profit. 8.EE.C.8.A, 8.EE.C.8.B, 8.EE.C.8.C

Erase Food Waste

Number Sense and Computation

- Finding Key Percent Relationships 6.RP.A.3.C, 7.RP.A.3
    - Use percent change to build a sliding price scale.
    - Operate with percentages to apply the sliding price scale and demonstrate its benefits.

Algebra

- Representing and Manipulating Algebraic Expressions 6.EE.A.2.A, 7.EE.A.2, 7.EE.B.3
    - Create and analyze an algebraic expression that represents the quality of food over time
    - Create an algebraic expression to represent the amount of money made in a month, taking the age of the food item and percent off of the original price into consideration.

Erase Food Waste (cont.)

Statistics

- Random Sampling and Inferences 7.SP.A.2
  - o Analyze market research
  - o Create and conduct surveys
  - o Analyze data from surveys

Fix It: Design for Community Impact

Number Sense and Computation

- Proportional Reasoning 6.RP.A.1, 6.RP.A.2, 6.RP.A.3.D
  - o Apply proportional reasoning to convert units of measurement.
  - o Apply proportional reasoning to create scale drawings/models.

Geometry

- Investigating Transformations and Scale 8.G.A.4
  - o Use similarity and proportionality to create scale drawings/models.
- Measuring Characteristics of 3-D Figures 6.G.A.1, 6.G.A.4, 7.G.B.6, 8.G.C.9
  - o Apply the formula for surface area to determine which material to use when creating a shipping container.
  - o Apply the formula for volume to determine the size/capacity of the container.

Algebra

- Representing and Manipulating Algebraic Expressions 6.EE.A.2.A, 7.EE.A.2

Flashy Fashion

Algebra

- Cartesian Coordinate plane graphing 5.G.A.1, 6.NS.C.6.B, 6.G.A.3
- Linear equations with domain and range restrictions 8.F.A.1

Geometry

- Transformations of Geometric Shapes 8.G.A.1, 8.G.A.3

Pollution Solution

Geometry

- Measuring Characteristics of 3-D Figures 6.G.A.1, 6.G.A.4, 7.G.B.6, 8.G.C.9
  - o Apply the formula for surface area to determine how much material to use when considering the size and shape of your product.
  - o Apply the formula for surface area to determine the optimal shipping container.
  - o Apply the formula for volume to determine the size/capacity of the product.
  - o Apply the formula for volume to determine the optimal shipping container.