ELEMENTARY
INVESTIGATION 4
HOW CAN YOU DETECT THE INVISIBLE?

CCS 3.2   (Writing) All students will write in clear, concise, organized language that varies in content and form for different audiences and purposes.

B.2 Grade 4   Create narrative pieces, such as memoir or personal narrative that contain description and relate ideas, observations, or recollections of an event or experience.

CCS 4.1   (Number and numerical operations) All students will develop number sense and will perform standard numerical operations and estimations on all types of numbers in a variety of ways.

C.2 Grade 4   Construct and use a variety of estimation strategies (e.g., rounding and mental math) for estimating both quantities and the results of computations.

C.2 Grade 6   Recognize when an estimate is appropriate, and understand the usefulness of an estimate as distinct from an exact answer.

CCS 4.2   (Geometry and measurement) All students will develop spatial sense and the ability to use geometric properties, relationships, and measurement to model, describe and analyze phenomena.

D.2 Grade 4   Select and use appropriate standard units of measure and measurement tools to solve real-life problems
· Length – fractions of an inch (1/8, 1/4, 1/2),
   mile, decimeter, kilometer
· Area – square inch, square centimeter
· Volume – cubic inch, cubic centimeter
· Weight – ounce
· Capacity – fluid ounce, cup, gallon, milliliter

D.5 Grade 6   Use measurements and estimates to describe and compare phenomena.

CCS 4.4   (Data analysis, probability, and discrete mathematics) All students will develop an understanding of the concepts and techniques of data analysis, probability, and discrete mathematics, and will use them to model situations, solve problems, and analyze and draw appropriate inferences from data.

B.3 Grade 4   Predict probabilities in a variety of situations (e.g., given the number of items of each color in a bag, what is the probability that an item picked will have a particular color).
· What students think will happen (intuitive)
· Collect data and use that data to predict the probability (experimental)
· Analyze all possible outcomes to find the probability (theoretical)

CCS 4.5   (Mathematical processes) All students will use mathematical processes of problem solving, communication, connections, reasoning, representations, and technology to solve problems and communicate mathematical ideas.

A.1 Grade All   Learn mathematics through problem solving, inquiry, and discovery.

A.2 Grade All   Solve problems that arise in mathematics and in other contexts (cf. workplace readiness standard 8.3).
· Open-ended problems
· Non-routine problems
· Problems with multiple solutions
· Problems that can be solved in several ways

B.1 Grade All   Use communication to organize and clarify their mathematical thinking.
· Reading and writing
· Discussion, listening, and questioning

B.2 Grade All   Communicate their mathematical thinking coherently and clearly to peers, teachers, and others, both orally and in writing.

D.1 Grade All   Recognize that mathematical facts, procedures, and claims must be justified.

E.1 Grade All   Create and use representations to organize, record, and communicate mathematical ideas.
· Concrete representations (e.g., base-ten blocks or algebra tiles)
· Pictorial representations (e.g., diagrams, charts, or tables)
· Symbolic representations (e.g., a formula)
· Graphical representations (e.g., a line graph)

CCS 5.6   (Chemistry) All students will gain an understanding of the structure and behavior of matter.

A.1 Grade 2   Sort objects according to the materials from which they are made or their physical properties, and give a rationale for sorting.