Elementary Science Units for Kindergarten Through Grade 5

Qtr*	Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
1	Checkerspot Challenge (#KCheckerspot) Students work with the Baltimore Checkerspot Recovery Team to find a place to plant the White Turtlehead and keep it safe by building a deer proof structure.	X Marks the Spot ☾ (#1XMarks) Students work with the Maryland Historical Society to find Captain Kidd's treasure by using the apparent motion of the moon and stars.	Whack-a-Wall (#2WhackWall) Students work for WRA as civil engineers. They are challenged with designing a new wall and mortar for Charles Village. Their structure is tested by trying to knock it down with a wrecking ball.	Mayfly Mayhem (#3Mayfly) Students learn about Murray and his other aquatic friends. They design and construct a device to keep sediment from washing into the stream.	Geologic Journeys (#4Geologic) Students learn about Earth Systems with a brief examination of waves. In Geologic Journeys, students take inspiration from journalist Nellie Bly and travel around the world to study geologic phenomena and learn about natural disasters. They then design and test methods to best protect Marylanders from a potential disaster.	BioBlitz Part 1♦ (#5Bioblitz) Students identify as many living things as they can in order to develop a local food web model. This data is later used to develop a primary research question around the issue "Can people effectively manage Baltimore County's ecosystem?" This unit will satisfy the environmental literacy requirement.
2	Weather Wonders (#KWeather) Students build a structure to protect everyone from the sun while on the playground. In part 2, they act as meteorologists with the National Weather Service in order to predict severe weather so the principal knows when to take down the structure.	Creeper and Creature Features (#1Biomimicry) Students work for Under Armour © to design a new piece of outerwear that is inspired by how plants and animals protect themselves.	Sandy Situation (#2SandySit) Students work for KCI as environmental engineers to construct a way to reduce the amount of erosion occurring at Miami Beach.	Safe Racer 🛠 (#3SafeRacer) Students design and build a car to keep an egg safe by understanding the physical forces working on it. In part 2, students will explain the electromagnetic release system attached to the ramp.	Rubbish Rescue 🛠 (#4RubbishRescue) Students examine the Baltimore Trash Wheel and design their own method of collecting trash to understand how energy is transferred through a system.	Blast Off (#5BlastOff) Students work as NASA chemists on Wallops Island to design rocket fuel and a sub-orbital launch vehicle to test it.
3	Push and Pull (#KPushPull) Students learn about pushes and pulls in order to build a windmill which pulls up a bucket of water. (Follows the story The Boy Who Harnessed the Wind)	Making Waves (#1Waves) Students design an alarm system that warns everyone (blind and deaf) of danger.	Bee an Engineer (#2BeeEngineer) Students learn about the relationship between plants and animals by studying a problem Mariana had. At the end, students work as agricultural engineers to build and test hand pollination tools.	Extreme Weather (#3ExtremeWeather) Students learn to predict severe weather events around the world. At the end, students work closer to home as architectural engineers to design a structure which will withstand the weight of a heavy snow and/or hurricane force winds.		Where's the Water? (#5WheresWater) Students work as hydrogeologist and civil engineers to solve Kent Island's freshwater problem. Along the way, they learn about the limited supply and distribution of water on Earth.
4				Let-us Grow (#3LetUsGrow) Students use a simple hydroponic system to grow lettuce and study how the environment influences its growth. At the end, students get to eat what they grow.	Turtle Trouble (#4TurtleTrouble) Students work as marine biologists with the Baltimore Aquarium to diagnose and treat a variety of vertebrates including Logger Head Sea Turtles, Bottle Nose Dolphins, Harbor Seals, and Pelicans.	Becoming Banneker ☾ (#5BenBanneker) Students learn about Benjamin Banneker and his work surveying in the 18th century. At the end of the unit, students use their knowledge of the stars and sun to build a sundial. Maryland Integrated Science Assessment (MISA) BioBlitz Part 2♦ (#5Bioblitz) The fifth grade year ends with students taking action on the proposals they created in quarter one. This mini unit meets the Maryland Environmental Literacy Standards.

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* Order of implementation may vary by school. ☾ Starlab Experience ♦ Meaningful Watershed Educational Experience (MWEE) 🛠 STEM Fair Event

"The world doesn't care what you know. What the world cares about is what you do with what you know."

Tony Wagner, Author
Creating Innovators

Office of Science PreK-12
Baltimore County Public Schools
Jefferson Building, 3rd Floor
105 West Chesapeake Ave.
Towson, MD 21204
443-809-2063

Science for the Next Generation:

Developing a Sense of Wonder about the Universe

Office of Science PreK-12
Baltimore County Public Schools

In 2012, Maryland became the fourth state in the nation to adopt the Next Generation Science Standards. These standards represent a fundamental shift in how science curriculum is designed and taught. More than ever before, science standards are based on a sequential progression starting at the earliest ages. The standards or performance expectations are organized into a series of topics. These topic pages form the basis for curricular units in Baltimore County.

Each unit focuses students on solving a real-world, locally relevant problem. Early in each unit, students are given the opportunity to develop a solution to the problem. This is followed by a pre-assessment of their content knowledge. This information combines to form a starting point for teachers to meet students' instructional needs. Each lesson helps students to refine their initial solution to the problem. At the end of the unit, students are given the opportunity to fully revise their solution. This process models the work of scientist and engineers and encourages students to iterate their work by constantly looking for ways to improve.

Another central component to the curriculum is the development of argumentation. Students are exposed to a variety of scientific phenomena during the course of instruction. To make sense of this, students will be asked to make an initial claim about the phenomena. This may draw on their background knowledge and assist the teacher in understanding any misconceptions that students harbor. Through experimentation, observation, and analysis, students will develop the evidence necessary to revise their claims. This revision, based on evidence, is supported by reasoning. To assist teachers in using this claims, evidence, and reasoning (CER) framework, teachers will utilize a special anchor chart, outlined below:

K	What do you **K**now (or think you know)?
L	What have you **L**earned?
E	What **E**vidence do you have to support that you learned something?
W	What do you **W**onder?
S	What new ideas about **S**cience do we now understand?

SOLVING REAL-WORLD AND LOCALLY RELEVANT PROBLEMS