MODULE SUMMARIES

BOLDER BUILDERS™

In the **Bolder Builders** module, children join engineer, architect, and builder Archie Tek in the restoration of a town called Unlucky. Children create and test various structures for strength and stability. Children must design and create shelters for the townspeople that are strong enough to withstand the elements of nature. Children are charged with reconstruction and determining the strength of beam, arch, and suspension bridges by building and testing prototypes. Lastly, Archie and the children turn to the animal world for inspiration on building sturdier structures. Children build various animal habitats, including a spider web, burrowing animal tunnel, and bird's nest.

CASTLES, CATAPULTS, AND COATS OF ARMS™

The **Castles, Catapults, and Coats of Arms** module weaves medieval history, basic scientific principles, and hands-on creativity through the challenges presented every session. While assuming the roles of lords, knights, craftspeople, and serfs, children work in cooperative groups to complete each task. The concept of center of gravity is explored when participant groups try to build the tallest tower. Children explore the concept of buoyancy by building boats that float while carrying weight to cross a castle moat. Groups build a weight-bearing drawbridge and design and build catapults that launch a ball at a target after experimenting with levers.

E.Z. SCIENCE™

In the **E.Z. Science** module, the dedicated yet absent-minded manager of the E.Z. Science Journal has enlisted the help of children in the Club Invention program. Children must conduct experiments – such as measuring time with a time glass and inflating balloons with carbon dioxide – to help E.Z Science. Next, children complete the magazine's advice column by solving a knot puzzle, protecting eggs from a 3-foot drop, and creating a game with instructions. Children then create mazes leading to the magazine's distribution centers and restore order at the E.Z. Science Journal by providing inventive science and mathematical solutions to everyday problems.

FLIGHT SIGHT™

In the **Flight Sight** module, children explore how inventions in flight have made it possible to see the world from different perspectives. Children work individually and collaboratively on a variety of activities about flight and the elevations humans have reached. Children experiment with devices that may help them jump higher, create three-dimensional maps, and design and fly huge paper airplanes. Children explore flight from the perspective of fast-moving jets by making a flight craft of the future and cockpit simulator. Children create images of Earth at night and build astronaut suits to protect them from the environment in space.

Club Invention Afterschool®

PASSAGE TO PLANET ROG™

During the **Passage to Planet ROG** module, children travel to distant Planet ROG and develop a number of different devices to help them solve problems in space and on the planet. After landing on Planet ROG, they build an outpost on the planet and create communication, observation, and data-collecting devices. Next, children meet the inhabitants of Planet ROG! They use inquiry methods of classification to identify and name inhabitants and then create sculptures of planet creatures. After a game of washer mining, children identify and sort mineral deposits. Children complete their mission by creating a way to transport themselves and the minerals back to their spacecraft and home to Earth.

PHYS. ED: PHYSICS IN MOTION™

During the **Phys. Ed: Physics in Motion** module, children create games based on the work of scientists who helped answer questions about how and why objects move. They incorporate the laws of gravity, energy, motion, and magnetism into their activities. Children first create games based on the work of Italian physicist Galilei. Next, they use Sir Isaac Newton's concept of center of gravity to balance an irregularly-shaped object. This leads to exploring Newton's First Law of Motion. Children then demonstrate the powerful effects of air pressure, as explained by Daniel Bernoulli. Finally, children investigate the properties of magnets and magnetism described by William Gilbert.

SOS: ENDANGERED EARTH™

In the **SOS: Endangered Earth** module, the Club Invention team has been challenged to save the homes of animals across the country! From roving black bears to birds threatened by oil spills, Club Invention participants think of new, clever ideas for building safe animal spaces. Children use their imaginations to create safe, "bear-proof" inventions to help with the problem of roving black bears, protect the habitats of Indiana Bats, and then participate in a demonstration to clean up a simulated oil spill. Lastly, children sketch and then build new animal habitats for animals in danger of extinction.

TRASH ISLAND: A GARBAGE PATCH JOURNEY™

In the **Trash Island: A Garbage Patch Journey** module, children hear of the extreme build-up of trash in the North Pacific Central Ocean Gyre. Children will be faced with ocean research challenges along the way that will require creative-thinking skills, problem solving, and teamwork. Children make a model of a gyre and play a food web game. Crews collect and test the pH of ocean water, create their own egg-marines that must not sink or float, and design a "robotic arm" for a Remotely Operated Vehicle (ROV). Before heading back to shore to share their findings, children design Trash Island fantasy clean-up machine prototypes.

ECHO AND AXON: A PROTOTYPING ADVENTURE™

Inspired by the comics of real life inventor superheroes from the National Inventors Hall of Fame, children create solutions to STEM-based challenges including creating alternative energy power source prototypes, chasm-crossers and water filters, and apply mathematics to rescue Echo and Axon. Teams are challenged to prototype their own story using an inventor's tool chest to design devices for Echo and Axon, and their little camera-bot, Gidge! Finally, the experience ends with a celebration as participants find the inventors within themselves.