**OUT-OF-SCHOOL SETTINGS | GRADES 3-5** 

# Bubble Bonanza: Engineering Bubble Wands

#### **Unit Overview**

In this unit, India and Jacob; a fictional, world-traveling brother and sister duo; have won a contest! They get to help create a stage show about bubbles for an amusement park. Kids will explore how bubbles behave and investigate the properties of different materials as India and Jacob guide them through the engineering activities. The unit wraps up with a Bubble Bonanza Showcase where kids demonstrate the bubble wands they engineered.

#### **Engineering Application/Unit Goals**

Kids will use each step of the Engineering Design Process as they become materials engineers. Materials engineers are people who use their understanding of different materials (such as metals, plastics, or wood) to make things that solve problems. In this unit, kids experiment with materials that can be used to make bubble wands, consider which materials are best for making different kinds of bubbles, and determine which combination of materials they will use to create their own unique bubble wands.

**Engineering Adventures** engages learners in grades 3-5 in fun, creative problem solving. Eleven hands-on units are low-cost and flexible to meet the time and budget constraints of outof-school settings, including afterschool and summer camp. Each unit centers on meaningful, open-ended problems with a global context. Learners find out more about the role engineering plays in their lives and the world around them as they're introduced to real engineering challenges and asked to design solutions with an engineering design process. Throughout each unit, kids learn to collaborate, communicate, solve problems, and share their solutions with their peers.





# **Unit Map**

# Prep Adventure 1: What is Engineering?

Kids engineer a tower and are introduced to the Engineering Design Process as a problem-solving tool.

# Prep Adventure 2: What is Technology?

Kids explore the idea that they, as engineers, can design and improve technology.

#### Adventure 1: Bubble Brainstorm

Kids will use the Ask step of the Engineering Design Process as they experiment with bubbles, keeping track of what bubbles can and cannot do.

# Adventure 1a: Stop the Pop (Optional)

Kids explore ways to prevent bubbles from popping.

# Adventure 2: Better Shape Up

Kids continue using the Ask step as they explore whether the shape of bubble wands affects the shape of resulting bubbles.

# Adventure 3: Best of Bubbles

Kids try out several different wand materials and see how well each works to perform specific tasks.

# Adventure 4: Creating a Bubble Wand

Kids use all they have learned about bubbles to imagine, plan, and create a bubble wand that will meet a goal their group set. The wands must use at least three materials.

# Adventure 5: Improving a Bubble Wand

Groups focus on the Improve step of the Engineering Design Process as they continue engineering their bubble wands.

# Adventure 6: Engineering Showcase: Bubble Bonanza

Groups present their bubble wands and knowledge of the Engineering Design Process in a Bubble Bonanza performance.

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