2011-12 Long-Term Problem Synopses

All problems have an 8-minute time limit.

Problem 1: Ooh-Motional Vehicle

The problem requires teams to design, build, and drive a vehicle that will travel a course where it will encounter three different situations. The vehicle will display a different human emotion for each encounter and one will cause it to travel in reverse. The team will create a theme for the presentation that incorporates the vehicle and the different emotions. The emphases will be on the technical risk-taking and creativity of the vehicle's engineering for travel, and change of emotional appearance.

Divisions: I, II & III. Cost limit: $145.

Problem 2: Weird Science

The team will create and present a performance about a team of scientists on an expedition to uncover the cause of mysterious events. The team will select the location of the expedition from NASA Earth Observatory Photographs . The scientists will collect two samples and will report on their findings. The performance will also include a technical representation of the mysterious events, the appearance of actually traveling, and a team-created device that the scientists use on the expedition.

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Divisions: I, II, III & IV. Cost limit: $145.

Problem 3: *Classics* . . . To Be or Not To Be

In this Classics problem, teams will put a musical theatre spin on one of William Shakespeare's most famous lines: "To Be Or Not To Be." Hamlet, the title character, ponders this question and realizes that the easy way out is not always the correct choice. An original "Hamlet" character will face a team-created dilemma. Unlike Shakespeare's Hamlet, the team's character will take the easy way out only to discover that it was the wrong choice. Teams will also incorporate a character that portrays Hamlet's conscience, a creative scene change, a creative costume change, and use of a "trap door." A portion of the performance will include musical theatre elements.

Divisions: I, II, III & IV. Cost limit: $125.

Problem 4: You Make the Call

For this problem, teams will design and build a structure made of only balsa wood and glue that will balance and support as much weight as possible. The structure may have a maximum weight of 9 grams and will receive 2 times the weight held, or 12 grams and receive 1 ½ times the weight held, or 15 grams and receive the actual weight held. The testing of the structure will be presented in a performance that includes mathematics in its theme.

Divisions: I, II, III & IV. Cost limit: $145.

Problem 5: Odyssey Angels

The team will create and present a performance where a group of students travel throughout one or more team-created places where they encounter negative situations. These "Odyssey Angels" change what they find and turn them into positive situations. On their journey, they help two individuals with different problems and help save an entire community from a bad situation. One Odyssey Angel cannot speak, and another has a special team-created power.

Divisions: I, II, III & IV. Cost limit: $125.

Primary Problem: Hide and Peek

The team is to create a device that uncovers three surprise objects by lifting a team-decorated container off of each of them from 5, 8, and 10 feet away. The containers may be raised at any time, in any order, and may be raised simultaneously. The demonstration of the solution will be presented during a performance that integrates raising the containers and the surprise objects in its theme. There will be a narrator character and a setting.

Grades K-2. Cost limit: $125.