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## CREATIVE COOPERATION THROUGH COMPETITION

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"All right!"

"Ohhhhhhhhhhh....."

"It works!"

"Oh well, maybe next year."

"We did it!"

Our students have been making these exclamations as the result of participation in our problem solving competition. We would like to share our ideas with you and have your students shout "We did it!"

Originally, we modeled our program after the national "Olympics of the Mind" competition, but a legal fuss over use of the word "Olympics" caused us to call our competition "Mind Over Matter" or "MOM" for short. Judges wear official MOM visors and sweatshirts on the Big Day to make them easily recognizable. Officials include organizing teachers and members of the high school science club that helps sponsor this activity.

The competition includes a division for fourth through sixth grades and a division for seventh and eighth grades. Our district contains nine elementary schools and one junior high. With such a large district, we have over 400 contestants. The competition takes place in the afternoons of two school days, which releases teachers to help in supervision and allows students to be dismissed at the regular time. This helps ensure large attendance and avoids after-school transportation problems.

We reserve a gym/stage area and a large room for the event. To enhance the spirit of the event, the science club decorates the contest areas. The large number of students led us to schedule the elementary school competition on one day and the junior high school on the next. Contestants are released from their schools at noon and competition starts at 12:30. The district fully supports our endeavors, providing substitutes for the teachers, thereby enabling them to attend with their students.

Students form teams of five members each. A class or school may enter as many teams as desired if sufficient supervision is provided. Team entry forms must be filed with the officials at least two weeks before the contest.

Each team competes on three problems. One of the problems is presented to the teams one month in advance, along with any standardized materials that they will need. They may work on this problem as much as they want prior to competition. The other two problems, one of which is a computer problem, are given on site.

The problems require both inductive and deductive reasoning. Students are required to analyze problem situations, and more importantly, to synthesize an answer. Because the problems are presented and solved with actual materials, the students are *doing* problem solving, rather than just figuring solutions with pencil and paper. Competition of this type certainly generates lots of excitement!

Participants are instructed to investigate *on their own* the problem given in advance. They are *not* to seek ideas for solving the problem from their teachers or parents. Adults may help facilitate procurement of materials, but they may *not* help design solutions to the problem.

Examples of the problems given in advance appear at the end of this article. Idea sources include national problem-solving competitions and problem-solving books written for talented and gifted programs. We make a concerted effort to keep rules to a minimum so that as many solutions as possible are open to the contestants.

Examples of on-site tasks include an egg drop, foil boats or paper airplanes. Computer problems might take the form of a maze or secret code. Materials are always supplied for these activities. We move computers to the competition site with the help of our school van, but participating teams could be asked to bring their own computers.

The scoring is divided equally between the three problems. Because students have time to prepare ahead, the scoring of the first problem includes points for costumes, make-up, skits and music. This definitely requires creative talent and makes watching the competition more entertaining.

Because we believe all participants should receive recognition for their efforts, we award everyone a participation ribbon. Winners of the elementary and junior high divisions each receive ribbons, MOM T-shirts and a travelling trophy, as well as newspaper coverage. Prizes such as kites are given for second place.

Our budget runs about \$400. This includes ribbons, trophies, prizes, hats for judges, decorations and materials needed for problem solving. Support comes from our school district curriculum budget. Phase III monies support preparation time. To cut costs, materials and prizes may be solicited from local industries. A large portion of the budget is used for awards. If your district has another means of recognizing winners, the budget could be reduced considerably.

To get started, survey teachers and principals as to their willingness to promote student participation. You may want to investigate the possibility of sending students to regional competitions and use it as a part of your promotion for the project.

Whatever it takes to get started, we recommend that you do it! Our project has gained great support and participation from the students and faculty in our school district. The team concept promotes creative group problem-solving and decision making. It also calls for higher order thinking and reasoning skills.

Watching the students compete is a bonus. They take ownership and have pride in their creations and ideas. Give yourself this bonus by establishing a problem-solving competition in your district! You'll be saying, "We did it!"

## Examples of Problems Given in Advance

### Task: Air-Powered Cars

*The problem:* To build, from a styrofoam hamburger carton, an air-powered car that will travel the greatest distance.

*Materials:* The following are provided:

- one styrofoam hamburger carton
- four styrofoam cups (bottoms only) for wheels
- three jumbo straws (two for axles, one to power car)
- one balloon

Extra materials are provided for practice.

*Any design* may be used as long as only the listed materials are used. Additional glue or tape may be used. Cars may be decorated, but the decoration must not influence the propelling mechanism of the car.

*Competition:* Cars will compete for the greatest distance with one inflation of the balloon. Each group may enter only one car, but each car will have two trials. If the balloon breaks while being inflated, the contestant will lose one trial. Distance will be measured along a straight line from the starting point to the stopping point. The longest trial will be used for scoring purposes. One point will be awarded per meter of distance covered. No fractions will be counted.

### Task: Shoe Box Marble Roll

*The problem:* To construct, inside a shoe box, a series of ramps which will take a marble the longest time to go from the top edge of the box to the bottom exit hole.

*Materials:* Provided by participant:

- one shoe box not larger than 40 cm x 20 cm x 15 cm
- construction paper
- white glue and/or tape

*Design rules*

1. The ramp must start in any top corner of the shoe box, accessed by

- a hole in the top of the box.
2. All ramps must be constructed only of construction paper and white glue and/or tape.
  3. The lid of the box must be able to be removed so that the contents can be checked by the judges.
  4. The box may be decorated on the outside only.
  5. One box is permitted for each group of students.

**Competition:** The marble will be placed in the hole in the top of the box and should roll unimpeded until it reaches the exit hole at the bottom of the box. The time from entry to exit or until the marble stops moving will be measured. Two trials will be given to each group. One point will be given per whole second of the longest marble run.

### Task: Bucketball

**The problem:** To get ten tennis balls into a bucket from a distance of 10 feet.

#### Rules:

1. The tennis balls may not be touched by a human hand immediately prior to entering the 10-foot area around the bucket.
2. No part of any body or apparatus may cross the boundary line encircling the bucket.
3. Tennis balls are provided for competition.
4. The bucket is a metal school wastebasket which has a 13 1/2 inch diameter and stands 14 1/4 inches high.

#### Scoring:

Seven points will be awarded for each tennis ball that enters and remains in the bucket.

Ten points may be earned by the team for originality of device design.

Ten points may be earned by the team for costumes and make-up; ten points can be earned for the 30-second commercial associated with the bucketball attempt.

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