

## CONSTRUCTIVE COMPETITION

# NATIONAL MATHEMATICS PENTATHLON ACADEMIC TOURNAMENTS

Students who have become proficient at the games may wish to test their problem-solving abilities with students from other schools at a **National Mathematics Pentathlon® Academic Tournament**. Teachers and parents can help these students gain leadership skills by preparing them for this optional level of involvement. If students intend to participate in a national tournament, they need to be very knowledgeable of the procedures and rules which apply to such competition.



Teachers, coaches, and parents prepare students for tournaments by: refining their game strategies, orienting them to the procedural and challenge rules within each game, and having them practice the games one-on-one. All opportunities for practice should be utilized. Students must formally register and make arrangements to attend one of the **National Mathematics Pentathlon® Academic Tournaments**. At a national tournament each participant is matched with a different player at the same grade level from different schools for each of the five games.

Adult volunteers serve as officials at each of the national tournaments hosted by school districts, systems or a university. Each two-person game is officiated by one adult Game Monitor. National tournaments are organized and regulated by the Pentathlon Institute's staff. Fall orientation sessions are conducted in areas where National Academic Tournaments are held to help parents, teachers, and administrators become familiar with the games and the basics of implementing a **National Mathematics Pentathlon® Academic Tournament**. In addition, Spring Volunteer Orientation Sessions (VOSs) are conducted by **Pentathlon** representatives to assist prospective tournament officials in the details of running a national tournament. The Institute's trademarks, copyrights,

and service mark insure that each national tournament provides the same standards of competition experienced in all other **Pentathlon** tournaments. Preparation and assistance in conducting these national tournaments is a year-round responsibility of the Institute's staff.

Many other mathematics competitions are designed with local, state, regional, and national run-offs to determine "the best" student within a particular category. Such competitions rarely attract students from a broad-ability range. The **Mathematics Pentathlon® Program** does not organize nor recommend any run-offs. Any prepared student is welcome to register for any national competition. Awards at a tournament are based on a point system rather than a run-off. Each participant is awarded three (3) points for a win, two (2) points for a tie, and one (1) point for a loss. School teams of thirty (30) students across five (5) grade levels also compete for first, second, and third place trophies. Most important, all individual participants receive formal recognition and applause for their efforts at an Awards Ceremony. All participants at a national tournament are considered winners based on the spirit of constructive competition.



National and international studies continue to report that most students lack an understanding of mathematics on a higher problem-solving level. This level involves the use of critical thinking skills, logical and hypothetical reasoning, articulating patterns, and discerning relationships among mathematical topics and ideas. Yet paper and pencil assessments are often ineffective at evaluating these important thought processes. In order to maintain test reliability, most standardized test items only assess lower cognitive abilities such as knowledge and comprehension of specific information. A more dynamic index is needed to assess students' strategic thinking skills. Evidence suggests that the **National Mathematics Pentathlon® Academic Tournaments** provide such a necessary index. District representatives may wish to examine the active problem-solving performance of their individual students or teams that compete in a national tournament. Such analysis will provide new insight into the challenges that exist in reconstructing the assessment of higher-order thinking.



# MATHEMATICAL DISPOSITION, BEING A PENTATHLETE™, AND MATHPEACE™

How students learn mathematics and think mathematically depends to a large extent on their mathematical disposition. This spirit goes far beyond a positive attitude about mathematics. It involves how students approach problems. Characteristics of a positive mathematical disposition include persistence, flexibility in investigating different options, self-confidence, and inventiveness. The **Pentathlon** games were designed for developing students' positive mathematical dispositions.

The term **Pentathlete™** refers to a student who is knowledgeable in playing all 5 games within a Division and strives to learn a variety of Math Pentathlon game strategies. Another key attribute of being a **Pentathlete™** is the development of a positive mathematical disposition. In addition, Pentathletes work cooperatively to help others improve their game strategies. In doing so, these learners begin to appreciate the many talents of others. One observable sign of a **Pentathlete's** development of a positive mathematical disposition is the ability to wish an opponent good luck before a game and congratulate an opponent on a game well played after a game regardless of the outcome.



The Pentathlon Institute is dedicated to providing students with rich mathematical experiences based on current research and best educational practices. In this effort we wish to help people recognize the importance of higher-level mathematical thinking. These individuals may then promote **Mathpeace™**. **Mathpeace™** is a term coined by the Pentathlon Institute. It is defined as the thought processes and positive mathematical disposition that enables an individual to: 1) accept the challenges of higher-level problems without fear; 2) have the confidence to try

several different strategies to resolve problems; 3) feel comfortable in cooperating with others to resolve or formulate problems; 4) have the serenity of mind to know that if a solution for a problem does not readily appear, the problem may help us observe other critical attributes of the problem, investigate new problem-solving strategies, or generally help in altering the way we think about solving problems; and 5) invent or create new problem-solving experiences. The **Mathematics Pentathlon® Program** was designed to attain these goals.