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Have You Seen Any Good Physics Fights Recently?

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What is a Physics Fight? A round-robin physics debate between teams of high school students that comes at the end of a year-long research program for the students and their teachers. The International Young Physicists Tournament (IYPT) is composed of physics students and their teachers who investigate interesting but broadly structured questions, both theoretically and experimentally, and develop detailed oral presentations of their work. Each summer the International Organizing Committee of the IYPT selects seventeen questions, which are distributed to teachers and students throughout the world. The teacher-student groups spend nearly a year working on solutions to these questions, and then come together in July at the IYPT to present and defend their work and critique that of their colleagues from other countries. This learning model is close to the actual process of science: 1) start with an interesting question; 2) make the question suitable for investigation; 3) search the literature to find out what has already been done; 4) develop the theory as far as the group can take it; 5) design, construct, and operate an experiment to examine the theoretical predictions; 6) prepare a report of the work; 7) submit it for peer review; and 8) defend the results. The instructional value of this approach to teaching and learning science is clear. But one of the largest benefits is to the teachers of these students, who for the most part have not had the opportunity to participate in anything like real research before and who come away from this experience with increased confidence in their understanding of the subject and their ability to teach it. We believe that doing research makes better teachers and better students. The IYPT movement was born in Moscow in the 1970s, but is relatively new to the US, our first team having been sent in 1999. Currently about 25 nations send teams to the IYPT each year. The agent for the IYPT in the US is the United States Association for Young Physicists Tournaments (USAYPT), which this year instituted a National Young Physicists Tournament for US high school teams using questions from prior IYPTs. Examples of questions and illustrations of solutions and presentations will be shown. We have found that this concept works well with physics students of varying ability.