

NETWORK

TECHNOLOGY
EDUCATION



The Official Newsletter of T.E.A.M.

EDUCATION FOR THE FUTURE

TECHNOLOGY EDUCATION ASSOCIATION OF MARYLAND

FALL 1992

Volume 4, Number 3

Technology Education— *The Future Is Now!*

by Dr. Gerald F. Day
Chief, Program Enrichment
Maryland State Department of Education

In July, 1992, the Maryland State Board of Education to graduate from high school. This requirement affects the graduating class of 1997 and is being implemented with the entering class of 1993.

It has been a great team effort in getting the Maryland State Board of Education to approve this exciting new requirement. Business, industry, professional organizations, parents, students, teachers, administrators, and others have worked to communicate the importance of Technology Education.

Now, the real challenge begins. We must deliver a high quality instructional program. Over the next year, many important decisions and activities will take place. Staff development, curricular development, and facility modifications need to take place throughout the state.

The following information is being shared with you in the hopes of providing direction for Technology Education program development.

Enclosed is a vision statement, learner outcomes, and a plan of work for Technology Education for the 1992-93 school year.

What is Technology?

Technology is the application of knowledge, tools and skills to solve practical problems and extend human capabilities. ("Technology - Report of the Project 2061. Phase I Technology Panel." American Association for the Advancement of Science, 1989.)

What is Technology Education?

Technology Education is an integrated, experienced-based instructional program designed to prepare a population that is knowledgeable about technology – its evolution, systems, techniques, utilization, and social and cul-

See FUTURE, Pg. 14

University of Maryland **UPDATE** *Technology Education Eliminated*

As of July 1, 1992 the Department of Industrial, Technological, and Occupational Education at the University of Maryland, College Park has been eliminated! This means that programs at all levels in Business Education, Home Economics Education, been eliminated. What was the department is now a PROGRAM AREA in the Department of Curriculum and Instruction within the College of Education. This status will continue until the fall of 1994 in order to provide course offerings for students in the programs. Between now and the fall of 1994 a generic undergraduate degree may be developed if there is a demonstrated need!

The 1992-1993 faculty and staff for the Industrial, Technological, and Occupational Education Program Area in the Department of Curriculum and Instruction, College of Education, University of Maryland, College Park include:

Kenneth Stough – Program Coordinator

Roy Ashley – Instructor, safety

Charles Beatty – Associate Professor,
technology education

Thomas Bell – Instructor, graphics, power

See ELIMINATED, Pg. 13

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Power, Energy & Transportation

Baltimore County's New Tech Program

by Roland A. Phelps
Owings Mills High School

Power, Energy and Transportation (P.E.T.) is a new and innovative technology system program being offered in Baltimore County high schools. Since its introduction as a pilot program at Owings Mills High School two years ago, it has expanded into multiple offerings at 12 of the 20 high schools in the county. Programs are scheduled to be in place at the other schools within two years.

Plans to develop an introductory level technology education system-type program were initiated in a county summer workshop nearly four years ago. Ensuing budget cuts delayed the completion of work on the program for nearly two years. However, this delay allowed time for the field testing and refining of many activities developed to support the new program.

The P.E.T. program is designed to provide a high degree of technological literacy in Power, Energy and Transportation technology to students of all ability levels. It is proving to be a highly successful, action-filled program — full of hands-on, problem solving type activities that find special education students successfully competing against, as well as working with, gifted and talented students. Furthermore, it is proving to be exciting and challenging to the teacher as well as the student.

The program was structured to utilize the facilities used by our dwindling materials-based Metals and Plastics programs — with minimum modifications. However, some of the programs have also been initiated in labs "shared" by our Electronics and Engineering Technology courses. In either case, it is providing Baltimore County students the opportunity to put scientific and mathematic concepts into practical and enjoyable practice.

Some of the unique problem solving activities featured in the program include: designing and building solar powered vehicles, writing computer programs that allow robotic devices built of LEGOS to travel through mazes, constructing wind and turbine powered devices to generate electricity, and modifying a land transportation training vehicle (go-cart) to become more efficient. Also included in the program are time proven activities such as CO₂ racers, mouse trap vehicles, and model rockets.

It is our belief that programs such as this which stress hands-on, problem solving type activities and cross-curricular ties, while fulfilling the Maryland State Department of Education approved learner outcomes for Technology Education, are essential for all students entering into the highly competitive and technological world of today and the 21st century.

Power, Energy, Transportation Technology Instruction Unit Course

I. Orientation

Week Number: 1 Instructional Hours: 3
Unit Instructional Topics:

- Course Overview
- General Laboratory Procedures
- General Laboratory Safety

II. Introduction To Energy Technology

Week Number: 2-3 Instructional Hours: 12

Unit Instructional Topics:

- Terminology of Energy Technology
- Forms of Energy
- Sources of Energy
- Development of Energy Technology
- Contemporary Energy Technology

III. Introduction To Power Technology

Week Number: 4-9 Instructional Hours: 30

Unit Instructional Topics:

- Terminology of Power Technology
- Forms and Sources of Power
- Machine Technology
- Types of Power Systems
- Measuring Power

IV. Power Production and Conversion

Week Number: 10-18 Instructional Hours: 45

Unit Instructional Topics:

- Terminology of Power Production & Conversion
- Methods of Conversion
- Classification of Engines
- Engine Systems

V. Power Transmission and Storage

Week Number: 19-27 Instructional Hours: 45

Unit Instructional Topics:

- Terminology of Power Transmission & Storage
- Types of Power Systems

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Technology Education Association of Maryland

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Published for TEAM members quarterly. Articles and advertisements welcomed.

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- Pneumatic Power Transmission and Control
- Robotic Power and Devices
- Laser Power and Application
- Types of Energy Storage

VI. Introduction to Transportation Technology

Week Number: 28 Instructional Hours: 5

Unit Instructional Topics:

- Overview of Transportation Technology
- Historical Development of Transportation Technology
- Societal Needs For Transportation Technology
- Careers In Transportation

VII. Types of Transportation Technology

Week Number: 29-36 Instructional Hours: 40

Unit Instructional Topics:

- Land Transportation Technologies
- Marine Transportation Technologies
- Air Transportation Technologies
- Space Transportation Technologies

VIII. Transportation Technology Sub-Systems

Week Number: 37-38 Instructional Hours: 10

Unit Instructional Topics:

- Terminology of Transportation Sub-Systems
- Types of Transportation Sub-Systems

IX. Transportation, Energy, and Power In The Future

Week Number: 39 Instructional Hours: 5

Unit Instructional Topics:

- Current Advances and Research
- Future Trends
- Environmental Concerns ■



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Power, Energy, Transportation Technology Major Student Course Projects/Activities:

UNIT	WEEK		P.E.T. CODE
I.	1	General Safety Test	SIS-1
II.	2,3	Wind Rotor/Propeller Whirlygig/Power Test Base Pinwheel - (Optional)	SWS-1 SWS-2 SWS-3
III.	4-9	Lego/Dacta Simple Machines Write Logo Computer Programs Lego/Dacta Complex Machines	SWS-4 SWS-5 SWS-6
IV.	10-18	Solar Cell Vehicle Horizontal Axis Wind Turbine Impulse Type Steam Turbine Internal Combustion Engine Maintenance Gasoline Powered Vehicle (Go-Cart) Evaluating	SWS-7 SWS-8 SWS-9 SWS-10 SWS-11
V.	19-27	Gasoline Powered Vehicle (Go-Cart) Evaluating (Optional) Hydraulic System Testing Pneumatic System Testing Robotic Device (Lego/Dacta Turtle) Mouse Trap Vehicle Laser Device Applications - (Optional)	SWS-11 SWS-12 SWS-13 SWS-14 SWS-15 SWS-16
VI.	28	Clothspin Transporter - (Optional)	SWS-17
VII.	29-36	CO2 Powered Vehicle Magnetic Levitation Vehicle Air Cushion Vehicle - (Optional)	SWS-18 SWS-19 SWS-20
		Boat Hull Sail and Mast Submersible/Submarine - (Optional)	SWS-21 SWS-22 SWS-23
		Paper Airplane Balsa Wood/Styrofoam Glider Rubber Band/Prop. Powered Glider - (Optional)	SWS-24 SWS-25 SWS-26
		Model Rocket Reaction Engine Vehicle - (Optional)	SWS-27 SWS-28
VIII.	37-38	Whirlygig Completion	SWS-29
IX.	39	"Futuristic" All Terrain Vehicle Lab Equipment Maintenance/Storage	SWS-30

International Technology Education Association...1997

- Will be held on the East Coast!
- Baltimore is being considered!
- Current negotiations are under way.
- If contract concerns can be resolved final work will be initiated.
- The process no longer necessitates a presentation.

If Baltimore is selected:

- Individuals
- Groups
- Resources

Will be gathered together to begin the planning and delivery process!

Watch for Updates!

Technology Challenges

A Technology Education Showcase In Prince George's County

Reported by: W. Harley Smith



Technology Education teachers in Prince George's County held the second annual "Technology Challenges" events on May 9, 1992, at the Goddard Space Flight Center in Greenbelt, Maryland. "Technology Challenges" is a learning and problem-solving

activity for middle school and high school Technology Education students. A technology systems model and engineering procedures are followed by students for systematic problem solving. Students from grades six through twelve apply ingenuity, processes, tools, materials, science and mathematics in solving problems in their Technology Education classes. Through these experiences students increase their skills, experience first-handedly what engineers and technicians do in their careers, and see relevancy for the study of math and science.

The products of these problem-solving activities are performance tested in class. The outstanding solution in the class for each problem event is entered in performance testing at the county level. The county-wide performance testing at Goddard Space Flight Center had 182 student entrants and total attendance of over 250 parents, teachers, students and community representatives.

The events in "Technology Challenges" each specify a problem to be solved with technology, have design specifications, identify resources which may be used by the students, and indicate how performance testing of solutions will be conducted. The problems for the events this past May are listed by grade level as follows:

Grade 6:

"How Many Marbles?" – Design and construct a container to hold the most marbles. (team of 2 entry)

Grade 7:

"It's A Gas" – Design and construct a vehicle, propelled by compressed gas, that will travel at a great speed. (individual entry)

"Bridging The Gap" – Design and construct a bridge to support the greatest weight. (individual entry)

Grade 8:

"Roll For Distance" – Design and construct a mouse

trap powered vehicle that will travel the greatest distance. (individual entry)

"Mag-Lev Racer" – Design and construct a vehicle, levitated on a track by magnetic force, that will travel the fastest. (individual entry)

"Rubber Band Dragster" – Design and construct a rubber band powered vehicle that will go ten feet in the shortest time. (individual entry)

High School:

"Tractor Pull" – Design and construct a vehicle that will pull the greatest weight. (team of 3 entry)

"Roll For Distance" – Design and construct a mouse trap powered vehicle that will travel the greatest distance. (individual entry)

"Pumping Iron" – Design and construct an electric crane that can pick up and move steel weights to a prescribed location. (team of 3 entry)

"Space Structure" – Design and construct an efficient space structure to be transported inside the "cargo area of the space shuttle." (team of 2 entry)

"Smokie The Bearbot" – Design and construct a robotic arm, operated by a fluid system, that is capable of extinguishing candles in the least time. (team of 2 entry)

Technology Challenges enjoyed the support from several members of the business, industry, government and higher education communities. Capitol College in Laurel, Maryland, provided \$24,000 in scholarships to students selected from nominees who were recognized for demonstrating exceptional ingenuity. Field trips were awarded to all place winners by Digital Equipment Corporation, The Goddard Space Flight Center, The National Oceanic And Atmospheric Administration, and Harry Diamond Laboratories. Several of the field trip sponsors provided judges along with the University of Maryland's (College Park) Department of Industrial, Technological and Occupational Education; and College of Engineering.



Technology Challenges has proven to be great experience. Student participants and attending parents carry high enthusiasm. Student achievement is inspiring for teachers. Board of Education members attending are duly impressed with the potentials and significance of Technology Education. And, the business, industrial, government and higher education communities appreciate the value of Technology Education in our schools. We think we will keep this good thing going. ■

Curriculum Workshop in Step With New State Technology Credit

by George M. Haney, Technology Teacher
Earle B. Wood Middle School, Montgomery County

Watkins Mill High School was the location for a Technology Education Curriculum Workshop, from July 13, to July 24, sponsored by the Division of Career and Technology Education for Montgomery County Public Schools. The purpose of the workshop was the review the proposed MCPS Technology Education Program of Studies 9-12 and develop an "encyclopedia" of activities for integrating mathematics, science and technology into technology education programs for high school students. The activities were designed to assist students to develop critical/creative thinking and to apply problem solving skills. The linking of the Maryland State Department of Education's Technology Education Learner Outcomes and the connection to math/science applications was consistently applied to each of the technology activities.

A unique component of this workshop was that it included not only technology teachers from Montgomery County (along with a science and math teacher) but a number of technology teachers from other school systems in Maryland. James Roberts from Baltimore City, Roland Phelps from Baltimore County, Bruce Bowser from Prince George's County, Cyril Ackerman from St. Mary's County and Patrick Lieb from Wicomico County were among those who contributed their time and expertise that helped make this workshop a success. The teacher participants from Montgomery County included: Mark Curran, George Haney, Ned Johnson, Richard Lenda, Leslie McCarthy (Math), Judith Parsons (Science) and Paul Skellchock. Barry Burke, coordinator of industrial and technology education, was director of the workshop. He and John Antonishak, technology specialist in the Division of Career and Technology Education, provided valuable direction and assistance to the workshop participants. ■

Montgomery County's First Technological Education Recognition Dinner

by George M. Haney, Technology Teacher
Earle B. Wood Middle School, Montgomery County

The place was the Gaithersburg Marriott and the date was May 28, 1992. The event was the "First" Annual Technology Education Awards Dinner sponsored by the Division of Career and Technology Education of the Montgomery County Public Schools. The purpose of the event was to recognize teachers who have developed and implemented strategies and programs to ensure success for every student with a focus on technology education.

Following a delicious dinner, Dr. Walter H. Plosila, President of the Montgomery County High Technology Council, presented the keynote address. His remarks were informative on the changes in society and the work place brought about by technology. Many technology education teachers, from middle high to senior high, were then recognized for their exemplary efforts to bring to fruition the "the new basic" of technology education to the Montgomery County Public School System. Certificates of excellence were presented to individuals for: serving on the

T.E.A.M. Executive Board, presenting technology activities at the T.E.A.M. Technology Fair, contributing to the Maryland State Department of Education's "Maryland of the Move," providing leadership in curriculum development in MCPS and participating in the Maryland State Drafting Contest. Specially engraved plaques representing excellence in teaching and programs were presented to select middle and senior high technology education teachers.

Dr. Donald Maley, professor emeritus of the University of Maryland, was honored with a special recognition for his many years of dedication to the technology education profession and for providing an inspiration to many of those who were in attendance. Barry Burke, coordinator of industrial and technology education, and John Antonishak, technology specialist in the Division of Career and Technology Education, contributed untold hours (more like days) to organize and implement a truly memorable event. It was a "class act" from beginning to end and those who attended appreciated the efforts that made the event so special. One of those in attendance was overheard saying: "It will be difficult to top this next year!" ■

TEAM NEEDS YOUR INPUT!

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Ingenuity Challenges, Competition and Contests

by Dennis Hearn

Last year TEAM started its first Technology Student Association (TSA) competition. It was held at Goddard Space Flight Center. A total of seven schools from different counties across the state attended. Everyone had a great time. This year we are going to attempt to have a much larger competition. We would like to have the competition held during Technology Week (April 25 - May 1) this year. TEAM encourages all teachers that presently have TSA groups to continue, and invites all other interested teachers to call Sandy Honour, TSA membership chairperson collect 1-703-860-9000 for more information on how to start a club. The winners of this year's contest will be eligible to attend the national conference (June 23 - 27) in Nashville, TN. Any teachers that would like to help in the planning of this competition please call Dennis Hearn 410-931-4528.

There are many exciting contests and challenges this year throughout the state. The next available contest is the Final Frontiers on November 14 from 8:30 a.m.-12:30 p.m. held at the National Science and Technology Institute (NIST). It is open to all science and technology teacher sponsored groups in Montgomery and Prince George's county. Contact Wilson Bascom at Wootton High School 301-279-8595 if you are interested. Last year was the first year of the contest and it was very exciting. Only two of the 30 groups that entered last year were Technology groups, but both of those groups won their division. One of those two groups, a pair of 7th grade students, won the overall competition for Prince George's County, beating out all

high school science groups.

Montgomery County Division of Career and Technology Education is holding it's first Technology Challenge December 5 from 8:30 a.m.-12:30 p.m. at Montgomery College Germantown Campus. They are having some very exciting technology challenges. All middle and high school technology students from Montgomery County are invited to compete. Please call John Antonishak 301-279-3354 for more information.

The biggest state competition over the last three years has been the Maryland Engineering Challenge. It is co-operative effort between the Baltimore Museum of Industry and The Engineering Society of Baltimore. The challenge will take place on February 20 and 21. Each school in the state recently received the challenge activities. If you didn't receive it ask your science teacher or call the Baltimore Museum of Industry 301-727-4808 for information. They have workshops for teachers and will provide a mentor for each school.

Prince George's County's Technology Education department will continue its very successful Technology Challenges in the spring for elementary, middle, and high school technology students. The last two years it has been at Goddard Space Flight Center and has been outstanding in demonstrating the creative problem solving capabilities of students. Contact Harley Smith 301-336-3402 for more information.

If you would like to have a contest in your county feel free to contact any of the above mentioned people for assistance. ■

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Membership dues include a \$30 The Technology Teacher subscription.

Profile

General Position

☐ Classroom Teacher CT

☐ Supervisor SP

☐ Teacher Educator TE

☐ College Students CS

☐ Retired RT

☐ Male

☐ Female

Age Range

☐ 18-25 A

☐ 26-40 B

☐ 41-55 C

☐ Over 55 D

Please send me more information on

☐ Teacher educator association CTTE

☐ Supervisor association ITEA-CS

☐ State association officers association CTEA

☐ Elementary level technology education TECC

☐ College level student clubs TECA

☐ Secondary school student clubs TSA

ITEA UPDATE

by Josh Barbati
Affiliate Representative

Since the unveiling of the International Technology Education Association banner in 1985, considerable rhetoric was published describing the mission of Technology Education and the new role of the technology teacher. In terms of rationale, program orientation, content, and student activities, most professionals in our field have accepted the systems approach to an analysis and study of contemporary technology. The Technology professional, on the other hand, has been identified as a manager, role model, and resource person who strives diligently to assist students to acquire appropriate literacy, technical skills, and strategies. These are essential elements that will enable them to plan, be creative, and solve though-provoking problems and to also live as responsible and productive citizens in a complex society.

Obviously, the Technology Education has a tremendous responsibility to upgrade his professionalism constantly. It is imperative that he engages in curriculum workshops, inservice courses, symposia, and professional conferences at the local, state, and international levels. Such activities will provide opportunities for him to interact with many professional leaders and to share ideas that will contribute toward promoting the profession. In addition, numerous fine publications such as: the Phi Delta Kappan, The Technology Teacher, School Shop, and Ties cover a wide range of topics pertinent to contemporary technology and its impact on general education. Such publications should be reviewed and also be made available in our schools for both students and faculty. Bulletin board and showcase displays throughout the school are also an excellent mean of promoting our mission in technology education.

Now more than ever before, educators in every discipline have become dependent on each other to insure effectiveness in imparting knowledge and providing students with meaningful learning experiences. Needless to say, participation in professional organizations is a must. The many outstanding professional benefits rendered by TEAM clearly substantiate this point. However, it is imperative that we extend our horizons beyond the State level and become a part of the international initiative for Technology Education.

ITEA continues demonstrate unparalleled leadership in our field. Numerous publications covering a wide range of topics such as project activities, classroom materials, curriculum guides, controversial issues, etc. are available to members at a significant discount. In addition, the ITEA provides a strong voice and represents our interests to educational groups, government and Congress. Needless to say, many professionals amongst us are to be commended for their professionalism and the distinguished programs they provide. Outstanding professionals and their programs are honored and publicized through ITEA's awards programs.

The ITEA annual conference is the largest gathering of technology education professionals in the country. Participants can select from many special interest sessions

covering a wide range of topics regarding technology education. Many industrial tours are also included. The trade show is unquestionably the largest in the technology field and the exhibits include materials, equipment, and a wide range of resources significant to our field.

Several money-saving programs are also available for ITEA members. These include: professional liability, major and minor medical insurance, substantial discounts on car rental, lodging, airline tickets, phone services, travel, and other leisure activities.

Doesn't the ITEA package for members sound appealing to you? If you agree, then I have some good news for you. ITEA is featuring a special offer in its current membership campaign. If you will join now, you will receive 18 months worth of membership for the cost of 12 months. That's right! For \$50.00 you will become a member of one of the finest professional associations in the world for 18 months. **DON'T DELAY, JOIN ITEA TODAY!**

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NO/RO

☐ New ☐ Renew

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Profile

General Position

☐ Elementary Teacher **ET**

Male

Age range

☐ Secondary Teacher **ST**

Female

18-25 **A**

☐ Supervisor/Administrator **SP**

26-35 **B**

☐ Junior/Community College **JC**

36-45 **C**

☐ College Professor **CP**

46-55 **D**

☐ College Student **CS**

over 55 **E**

☐ Retired **RT**

☐ Professional Member **\$50**

Undergraduate Student **\$25**

☐ Sustaining Technical Representative **\$50**

Retired **\$25**

☐ ITEA Council of Supervisors **\$15** (must be an ITEA member to join)

Payment must be in U.S. currency and accompany this form

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Technology Education: Preparation for High Tech Jobs

by Bob Gray

The High School Technology Education laboratory is the ideal environment for the comprehensive personal growth of all students. It is a "work-like" environment rather than a "school-like" environment. The characteristics of this "work-like" environment include teams of people working together to solve problems, a tool rich environment, and the use of "mental models" to represent systems. In contrast, schools have traditionally evaluated students on individual performance standards, limited the number and quality of tools available to students, and have presented information in disconnected units that discouraged an systematic understanding of the world we live and work in.

Technology Education is capable of addressing the wide-range of skills and competencies needed in the high tech work environment? Let's review what we have to offer. We are tool rich. We have the facilities to solve problems by designing and fabricating devices. Fundamental understanding of technology can be achieved in laboratories that provide access to mechanical, electrical, structural, thermal, optical, hydraulic, and pneumatic systems. When knowledge of these systems is combined with human ingenuity, we are able to meet our needs in the areas of transportation, communication and production.

To accomplish this, students must have laboratory experiences which require them to use the processes of high tech enterprises. They will allocate resources by making schedules, budgets, and personnel assignments. They will select, use and evaluate technologies. They will monitor and refine solutions to problems. They will develop the interpersonal behaviors needed to work with others in the solution of a problem. They will find, evaluate and communicate information. These competencies are best achieved in the context of student selected problems.

The success of the problem solving teaching strategy is enhanced when the students, themselves, identify a need or problem that needs a solution. Advanced high school technology education courses may be the best place to do this because students will have already developed a basis of technological knowledge and skills. The self-selection process is critical if students are to pursue a long-term problem solving activity. The topic they selected should be related to their interests and relevant to their lives. The solution to the problem may even qualify as a community service project. As they proceed through the process, they will encounter numerous opportunities to apply and develop other skills.

Reading, writing, speaking, and listening skills are inherent in working with a team. The problem solving activity draws on students' creativity and ingenuity. The students' ability to think through unfamiliar problems will

constantly be tested. Finally, the personal qualities of responsibility and self-management are rewarded as students seek solutions to problems that the teacher is not familiar with. These elements are required of all workers today. This kind of comprehensive personal development is what technology education must strive for. A check list to see if we are accomplishing this might include:

- Are students becoming aware of the systematic nature of technology?
- Are students using mathematics to analyze, measure, describe, and predict the performance of problem solutions?
- Are students applying their knowledge of science to the solution of practical problems?
- Are students solving problems by designing and constructing things?
- Are students extending their understanding of scientific concepts through the study of the basic building blocks of modern technology?
(mechanical systems, electrical systems, thermal systems, structural systems, hydraulic systems, pneumatic systems and optical systems)
- Are students applying their skills and knowledge of the basic building blocks of technology to the solution of problems related to communications, production and transportation?
- Are students learning about technology and its impact on our lives?
- Are students using their writing and speaking skills to share ideas and solve problems?
- Are students developing an awareness of the contributions of different cultures to technological advancement?
- Are students developing the work habits and attitudes needed for success in the work place? ■



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Technology Education Contributes To A Successful Middle School Colloquium in MCPS

by George M. Haney, Technology Teacher
Earle B. Wood Middle School
Montgomery County

"Imagineering, The Process of Inventing" was a one-day workshop that was part of Montgomery County's Middle School Interdisciplinary Colloquium that occurred in early July. In this workshop a select number of school principals, assistant principals and resource teachers learned about Dimensions of Learning and the Heidi Jacobs Interdisciplinary Concept Model through a process of "learn by doing". Technology teachers Clarence Brown, George Haney and Steve Mikulski along with science teacher Kay Fulcomer and elementary teacher Jo Anne Fink teamed up to show the audience ways science, math, social studies and language arts could be integrated in a technology setting to form interdisciplinary instruction. John Antonishak, technology specialist in the Division of Career and Technology Education, along with assistance from Walt Kearney in the Division of Academic Skills provided the thrust to organize and coordinate an event that impressed everyone in the workshop.

Rube Goldberg was alive and well as the participants were formed into teams and then challenged with "One Thing Leads To Another." Each team had to design and create a contraption that used several simple machines to set off a chain reaction of events and burst a balloon. Several other "SPARKS" or technology challenges were employed to help the participants learn about the process of inventing through imagination, innovation and creativity as well as through the application of higher level thinking, problem solving and decision making skills.

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INGENUITY CHALLENGE

Program Assignment Specifications for "SPEEDEE"

Challenge Problem:

Design and construct a vehicle, powered by an electric motor which will travel a twenty-five foot course and break a balloon at the end, in the least amount of time.

Rules:

1. The vehicle may not exceed 12 inches in length.
2. The vehicle may not be wider than 7 inches at any point (outer wheel to outer wheel).
3. The vehicle may not weigh more than 500 grams.
4. Voltage may not exceed 9 volts D-C.
5. The vehicle must travel the twenty-five foot course in a straight line.
6. The vehicle must travel the course without any external guidance.
7. The balloon will be approximately 9 inches in diameter and will be tethered to the floor at the end of the course.
8. An isometric or two-view drawing, dimensioned will be due at time of testing.

Resources:

People: Team limit of three people.

Information

Facts and knowledge the team members possess or obtain. Instructions from the teacher.

Materials:

- 1/2" x 1/2" wood strips
- 1/4" dowel rod
- 1/8" welding rod
- 1 motor
- 9-volt battery strap
- 1/8" plastic sheet
- rubber bands
- pine, 1/2" and 3/4" thick
- 1/8", 1/4" washers
- pins
- mechanical fasteners
- other materials available to the students

Tools and Machines:

Students will use the tools and equipment available in the lab and authorized by the teacher.

Time: Due by _____

Energy:

Human muscle power and electricity.

Capital:

Provided by school.

Evaluation:

The vehicle which travels the twenty-five feet the fastest and breaks the balloon will be the winner. ■



TEAM _____

DATE _____
PERIOD _____

"SPEEDEE" EVALUATION

A.	500 grams or less	30	_____
B.	Length 12" or less	30	_____
C.	Width 7" or less	30	_____
D.	Travels 25'	30	_____
E.	Construction	0----	40 _____
F.	Design	0----	35 _____
G.	Overall appearance	0----	35 _____
H.	Class rank _____	0----	30 _____
I.	Drawing	0----	30 _____
J.	Breaks balloon	10	_____

Calculation of mph: $\frac{25'}{x \text{ sec}} = \text{_____ mph}$

25 ft	mi	3600 sec
x sec	5280 ft	hr

INGENUITY CHALLENGE

Program Assignment Specifications for "MECHANICAL MICHAEL"

Challenge Problem:

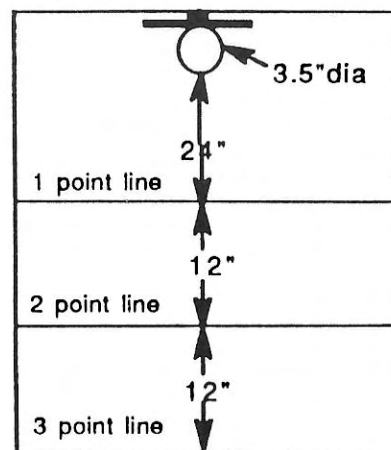
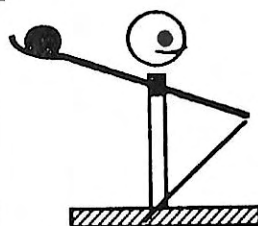
Design and construct two devices that will shoot simulated basketballs.

Rules:

1. A team will have two members. Each team will construct two devices.
2. Each team member will operate one of the devices. Each team member will attempt three (3) shots from each line.
3. The ball may not be propelled by a launcher that is separate from the device.
4. The energy source (rubber bands) must be attached to the device.
5. Team members may retrieve and supply balls to the shooter.
6. Four (4) rubber bands provided by the teacher are the only energy source to be used.
7. The device may extend in front of the shooting line but the ball must be released from behind the line.

Resources:

People: Two students per team.



Information: Facts and knowledge you already possess or get from other people and specific information from the teacher.

Materials:

- Rubber bands
- Any materials available in the technology lab.
- Any materials brought from home which are not considered unsafe by the teacher.

Tools and Machines: Tools and machines available in the laboratory and authorized by the teacher.

Time: Six class periods.

Energy: Human muscle power.

Capital: Not limited to any specific value.

Evaluation:

The team that scores the most points will be the winner.

TEAM MEMBERSHIP APPLICATION

Haven't joined TEAM yet? TEAM memberships run one year from the nearest quarter of the year in which you pay your dues. So you can join anytime you want! Remember, membership is the backbone of any organization. Without YOU there is no TEAM.

Legislator and policy makers want to know who an organization represents! Let it be known that we represent you in issues of Technology Education. Your membership today is a commitment to Technology Education in this state!

TEAM DUES: \$12.00 Professional, \$4.00 Student, \$120.00 Life

Joining is easy. Just fill out the application, enclosed a check made payable to TEAM, and mail it to:

Tom Milans
Wheaton High School
12601 Dalewood Drive
Wheaton, MD 20906

*Already a member? Get a Colleague to join!
We can't make it without YOU!!*

Last Name _____ First _____ M.I. _____

Home Address _____

City _____ State _____ Zip Code _____

Home Phone _____ Business _____

Work Address _____

County _____ Title _____

Subject(s) Taught _____

Would you be interested in helping on a committee this year?

Do you have anything you would like to present to a Special Interest Group?

Technology Teacher of the Year 1991

**MARTIN BRUCE BOWSER
HIGH POINT SCHOOL,
PRINCE GEORGE'S COUNTY**

PRINCIPAL: **RONALD G. CUNNINGHAM**
SUPERVISOR: **W. HARLEY SMITH**



Bruce Bowser developed a creative curriculum and laboratory environment packed with robots, motors, controllers, etc. which excited students about Technology Education. His teaching has been marked by more than two decades of enthusiastic caring. He envelopes his students with opportunities presented by the world of technology, opportunities for every student to be successful.

He stretches and challenges student performance within a multicultural classroom/laboratory.

Beyond his duties in the laboratory he is a varsity sport coach, sponsor of an "Odyssey of the Mind" team and sponsor of a project for a Space Shuttle Launch. He has taken on a major developmental role in the county competitions called technology challenges.

His educational expertise and initiative reach beyond the laboratory of High Point School to community workshops for parents and annual holiday season activities to construct "Toys for Tots."

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Technology Program of the Year 1991

Gwynn Park, Prince George's County
Technology Teachers:
**Michael Callaway, Byron Yarbrough
and Ronald Sperlbaum**

PRINCIPAL: **JOHN E. FLYNN**
SUPERVISOR: **W. HARLEY SMITH**



Michael Callaway, Byron Yarbrough and Ronald Sperlbaum's teaching and leadership provide a contemporary and futuristic view of technology for middle school students at Gwynn Park Middle School in Prince George's County.

The breadth of this program's exciting hands-on experience for middle school students builds a creative reality with the tools of science, mathematics and technology. The Way things work; People, Technology and the environment; light sound and telecommunications form the basis for the interdisciplinary link that makes technology the means and method of integrating and facilitating a model educational program.

Simple and complex science and mathematics applications allow technology students to design, develop and demonstrate solutions to real problems. This model initiative is supported by an emerging Technology Student Association. Interdisciplinary involvement in Science and Consumer Fairs, Environmental projects with the Weather, Acid Rain, Recycling and Pollution along with invention and technology challenges provide opportunities for diverse achievements. ■

Congratulations Dr. Beatty!

On March 22, at the International Technology Education Association's 54th Annual Conference held in Minneapolis, MN, **Dr. Beatty** was awarded the ITEA's coveted and distinguished **Lockette Humanitarian Award**! The Lockette Award is described as follows:

"This award is given to an individual who has put forth an outstanding effort to promote humanistic values while serving as a technology education professional at the national, state, or local level in one or more of the following areas: developing social awareness, preserving democratic and human dignity processes, and/or maximizing the potential of individuals."



As is clear to all of us, Dr. Beatty's humanitarian record has been developed through a deep concern for human dignity and democratic values. And as we all know from our everyday personal experiences with Dr. Beatty, no one is more deserving! ■

1992-1993 TEAM Awards

Nominations have been received and the award winners will be presented at the Conference Series '92 on the Friday, 6th of November. Two "Teacher-of-the-Year" and two "Program-of-the-Year" Awards as well as a number of special awards will be made. The nominees were:

TEACHER EXCELLENCE AWARD

MIDDLE SCHOOL

- **STEVE CRESCENZE** - Charles County
- **GEORGE HANEY** - Montgomery County
- **RICHARD RULAPAUGH** - Calvert County

HIGH SCHOOL

- **LEE HASTINGS** - Charles County
- **DOUGLAS PRUETT** - Prince George's Co.
- **BRIGITTE VALESEY**

PROGRAM EXCELLENCE AWARD

MIDDLE SCHOOL

- **LORD BALTIMORE** - Prince George's Co.
- **MELVIN CHASE**
- **SLIGO** - Montgomery County
- **STEVEN MIKULSKI**
- **MICHAEL SIMS**

HIGH SCHOOL

- **WATKINS MILL** - Montgomery County
- **BENJAMIN ACTON**
- **DANIEL JAYJOCK**
- **J. PAUL SKELLCHOCK**

One Teacher Excellence awardee will be selected to represent Maryland at the International Technology Educational Association's Conference at Charlotte, North Carolina (April 18 through 21, 1993.) **Both one middle school and one high school Program of Excellence** will represent Maryland at the International Technology Education Association's Conference. ■

ELIMINATION, from Pg. 1

- Lorna Browne - Graduate Assistant, home economics
- Harold Craven - Graduate Assistant, drafting/design
- Yvonne Gentzler - Assistant Professor, home economics
- Dennis Herschback - Associate Professor, T & I
- Maryann Hewitt - Instructor, business education
- Francine Hultgren - Associate Professor, home economics
- Donald Maley - Professor Emeritus, technology education
- Sabrina Marschall - Instructor, business education
- Brian McAlister - Instructor Professor-retired, industrial tech.
- Charles Pozonsky - Instructor, metals
- Marilyn Spear - Instructor, business education
- Denis Sullivan - Associate Professor, industrial tech.
- Steve Wolfe - Instructor, wood, plastics, electronics
- Qing Xie - Graduate Assistant, home economics

If you have questions about course offerings, or programs write or call:

Dr. Kenneth Stough - Program Coordinator
Industrial, Technological, & Occupational
Education Programs
J.M. Patterson Bldg., University of Maryland
College Park, Maryland 20742-2211
phone: 301-405-4549 ■

FUTURE, from Pg. 1

tural significance. It results in the application of math and science concepts in technological systems. Students discover, create, solve problems and construct by using a variety of tools, machines, materials, processes, and computer systems.

Vision for Technology Education

An integral part of the program of studies in Maryland's high schools, technology education is a new basic for all students. It is experience-based and involves the application of math and science concepts in such technological systems as, but not limited to, construction, manufacturing, communications, transportation, biotechnology, and power and energy. Students work in teams to solve problems related to technology—its evolution, systems, techniques, utilization, and social and cultural significance.

Technology Education programs are among the first to demonstrate an integrated approach to learning in high school. Facilities and equipment are state-of-the-art as a result of partnerships with business and industry. Interdisciplinary teams of teachers train and work together for cross-curriculum planning and integrated delivery of instruction. Technology education is taught using a collaborative approach in which groups of students interact with teachers of math, science, social studies, language arts, technology education, and other disciplines. Cooperative learning, ingenuity challenges, modules, dimensions of learning, and computer-assisted instruction are some of the approaches used to provide students with hands-on learning experiences in which they can demonstrate established learning outcomes.

Students take at least one credit of technology education, but often enroll in several related courses. Technology education is an integral part of each tech prep course of study and is sequenced with academic instruction to prepare students for employment, further study, or both.

As a result, students graduate from high school with the understanding of how technology affects daily decision making; with the ability to use processes and systems, along with a variety of tools and resources to solve problems; and with the ability to apply and interrelate concepts in mathematics, science, language arts, and social studies to address practical issues in a technological society.

Technology Education Learner Outcomes

The technology education learner outcomes listed below describe what students should be able to do, think and feel as the result of a technology education experience.

Technology Education should be taught in an active laboratory setting rich with hands-on multi-sensory experiences. Such a laboratory setting has abundant opportunities for varied and multiple methods of student assessment. Therefore, student assessment in technology education should provide for a variety of ways in which students demonstrate achievement of learner outcomes.

1. Application of Technological Systems – Students will apply knowledge and skills of the function and application regarding diverse technological systems.

2. Relationships of Technological Achievements – Students will demonstrate knowledge of the relationships of technological achievements and their impact on the environment, the advance of science, the individual, and society. The context for this awareness shall be historical, current and futuristic.

3. Problem Solving Using Technology – Students will demonstrate the ability to solve problems with technology using a systems approach, higher order thinking skills, individual and collaborative ingenuity, and a variety of resources including information, tools and materials.

4. Informed Decisions about Technology Resources – Students will make ethical decisions about technology-related issues, including the development and use of technology and technology resources in terms of economics and consumer practices.

5. Use of Technology Resources – Students will demonstrate in an experiential setting the safe, effective and creative use of technological resources – including tools, machines and materials – performing technological processes.

6. Application of Science, Math and other Areas – Students will apply science, mathematics, language arts, social studies, and technological concepts to solve practical problems and extend human capabilities.

7. Career Information – Students will apply knowledge of technology-based careers in terms of: personal interests and abilities; educational opportunities and requirements; career opportunities, trends and requirements; and other factors for employability and advancement.

8. Multicultural and Gender Diversity – Students will recognize the multicultural and gender diversity included in past, present and future uses of technology.

Technology Education Plan of Work

Identified Needs

Our modern information age requires people to interact with technology daily. Technology so impacts our decisions in the areas of career, home, personal affairs, and government that technological literacy has been called the new basic in education. Technological literacy is the ability to interact successfully with technology, to assess the impact of technology on everyday life and make appropriate decisions, and to apply conceptual knowledge in order to solve problems.

For the last five years, the Maryland State Department of Education, Division of Career and Technology Education has provided leadership, coordination, and technical assistance to implement Technology Education across Maryland. Much has been done and much more needs to

See PLAN, Pg. 15

Support Problem Solving Skills by Utilizing "Odyssey of the Mind" in Your School

What is Odyssey of the Mind?

An annual international creative problem solving competition among students in kindergarten through high school. The purpose is to foster the development of creative thinking and creative problem solving skills among young people. Participants compete in a variety of areas - from building mechanical devices such as spring-driven cars to giving their own interpretations of famous poems. Students learn to work with others as a team, developing self-confidence by creating solutions, evaluating their ideas and making final decisions. They develop their creative skills through problem-solving and independent thinking. Hence the Odyssey of the Mind Program makes learning fun.

To participate in the Odyssey of the Mind Program, the school must be a member of OM Association. Members come from throughout the United States, Canada, China, Japan, Mexico, Poland, and the ex-Soviet Republics and the U.S. Department

of Defense Schools located in several different countries.

In addition to the problems and rules for competition, OM members receive curriculum materials containing creative problem-solving activities at the elementary, and secondary levels for science, mathematics, technology education, social studies and language arts. These materials are made possible by IBM, the sole corporate sponsor of OM and its student competitions.

Odyssey of the Mind teams consist of five to seven members. An OM Association member may have several teams in the same problem and run intramural competitions to determine the best team to enter in sanctioned competition. Each team entering sanctioned competition must have a teacher, parent or other adult designated as its coach.

Competition is by division. The divisions are as follows:

- Division I, kindergarten through fifth grade;
- Division II, grades six through eight;
- Division III, grades nine through twelve;
- Division IV, college and university students.

Competing teams are judged in three areas: the long-term problem where teams prepare solutions and bring them to competition; style or the enhancement of the long-term solution; and the spontaneous problem given to the team on the day of competition. The long-term solution is worth a maximum of 200 points, style is worth a maximum of 50 points and spontaneous is worth a maximum of 100 points. The total of these three scores determines a team's rank in competition.

Teams in most locations compete on a regional and/or state level. Teams advancing from competition become eligible to attend the annual World Finals.

For more information, write OM Association, Inc., P.O. Box 27, Glassboro, NJ 08028. ■

PLAN, from Pg. 14

be accomplished to implement Technology Education in every middle school and high school in Maryland. The need for Technology Education is based on the following:

1. All students need to be technologically literate in order to interact successfully with technology, assess the impact of technology, and solve technical problems.

2. New and emerging technologies need to be reflected in the educational system.

3. Higher order competencies, such as critical thinking, problem solving, leadership, organizational effectiveness, and technological literacy should be incorporated into the curriculum.

4. The integration and coordination of academic and career competencies should be promoted.

Objective

Implement Technology Education programs in all local education agencies that develop technological literacy in all students.

Planned Activities

Three areas need to be addressed in implementing Technology Education statewide: curriculum, staff development, and facilities.

Curriculum – New curriculum needs to be developed and disseminated throughout Maryland. There is a wealth of Technology Education curriculum that has been developed locally in Maryland and nationwide. Curriculum labs, such as Oklahoma, Missouri, and Texas, have developed new materials that need to be disseminated and diffused in Maryland. The following action steps need to be done:

1. Determine what curriculum guides, materials and resources each local has and is using.

2. Determine what the curriculum needs are for each local.

3. Conduct a national search for exemplary curriculum materials, and disseminated to all locals.

See PLAN, Back Page

PLAN, from Pg. 15

4. Develop a curricular framework, including learner outcomes, for Technology Education.

5. Develop a module for the Maryland Instructional Framework Project on Technology Education.

6. Assist with local curriculum workshops at the local level.

Staff Development – Staff development has been identified as the area of greatest need by the locals in Maryland. A variety of activities need to be planned and implemented over the next five years. The following are action steps that need to be done:

1. Develop a staff development plan that includes a variety of options, including workshops, conferences, formal teacher training, videotapes, site visitations, teleconferences, business-industry shadowing, and coaching.

2. Coordinate and/or conduct regional or statewide staff development activities.

3. Assist and participate in local staff development activities that are planned at the local level.

4. Conduct internal staff development activities for members of the Division and Department.

Facilities – Facilities for Technology Education in Maryland need to be renovated. There are many outdated facilities that need to be modernized and new labs need to be designed. The following are action steps that need to be completed:

1. Maintain a file of sample floor layouts of Technology Education labs.

2. Maintain a list of equipment needed (by technology area).

3. Act as a resource for locals in renovating and designing technology Education laboratories.

4. Work with the Maryland State Department of Education's School Facilities Office in designing specifications for Technology Education labs.

In Summary

For Technology Education, the future is now. Through collaboration and cooperation, the State of Maryland is on the verge of offering a new and exciting course of study for all students. ■

RICK AVONDET

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Alexandria, VA 22309

