Bill as Introduced

2001 SESSION

01-2040
04/10

HOUSE BILL ***1231-FN***

AN ACT implementing a pre-engineering technology curriculum in the public high schools in the state.

SPONSORS: Rep. Leber, Merr 1; Rep. Edwards, Ches 19; Rep. Tahir, Hills 38; Rep. C. Bouchard, Merr 22; Rep. Rausch, Rock 13; Sen. Gordon, Dist 2; Sen. Flanders, Dist 7; Sen. O'Hearn, Dist 12; Sen. Johnson, Dist 3; Sen. Larsen, Dist 15

COMMITTEE: Education

ANALYSIS

This bill establishes a pre-engineering technology curriculum in the public high schools in the state and creates a pre-engineering technology curriculum advisory council to advise the department of education on the implementation of such curriculum. The bill also makes an appropriation of $250,000 for the fiscal year ending June 30, 2003 to implement the pre-engineering technology curriculum in certain high schools in the state.

This bill is a request of the department of education.

Explanation: Matter added to current law appears in ***bold italics.***
Matter removed from current law appears [~~in brackets and struckthrough.~~]
Matter which is either (a) all new or (b) repealed and reenacted appears in regular type.

01-2040
04/10

STATE OF NEW HAMPSHIRE

In the Year of Our Lord Two Thousand One

AN ACT implementing a pre-engineering technology curriculum in the public high schools in the state.

Be it Enacted by the Senate and House of Representatives in General Court convened:

1 New Subdivision; Pre-Engineering Technology Curriculum and Advisory Council. Amend RSA 188-E by inserting after section 13 the following new subdivision:

Pre-Engineering Technology Curriculum and Advisory Council

188-E:14 Pre-Engineering Technology Curriculum.

I. The department of education shall develop and implement a pre-engineering technology curriculum in the public high schools to provide statewide opportunities for high school students interested in careers in engineering, or allied engineering fields, to enroll in a high quality engineering technology curriculum.

II. The state board of education shall adopt rules, pursuant to RSA 541-A, relative to course content, curricular requirements, and general procedures for implementing the pre-engineering technology curriculum. At a minimum, the curriculum shall include the following courses:

(a) Introduction to engineering design

(b) Digital electronics

(c) Principles of engineering

(d) Computer integrated manufacturing

(e) Engineering design and development

III. In developing and implementing a pre-engineering technology curriculum, the efforts of the department of education shall complement existing public and private actions, and shall include the pursuit of innovative public-private partnerships with businesses, nongovernmental organizations, academic institutions, and other appropriate groups.

IV. The department of education shall include in its biennial capital budget request, funding for the planning, construction, renovation, and maintenance of facilities or equipment necessary for the operation of pre-engineering technology curriculum in the regional vocation education centers.

188-E:15 Pre-Engineering Technology Advisory Council. There is established a pre-engineering technology advisory council to advise the department of education in the implementation and expansion of the pre-engineering technology curriculum, to assist the department of education in pursuing public and private funds in order to ensure statewide access for all public high school students to pre-engineering technology curriculum coursework.

188-E:16 Membership and Terms.

I. The members of the advisory council shall be as follows:

(a) One member of the house of representatives, appointed by the speaker of the house.

(b) One member of the senate, appointed by the president of the senate.

(c) The commissioner of the department of education, or designee.

(d) The president of the New Hampshire community technical institute, or designee.

(e) The dean of the university of New Hampshire college of engineering and physical sciences, or designee.

(f) Three superintendents from school administrative units in which at least one school offers a pre-engineering technology curriculum to its students, appointed by the governor and council.

(g) Six members of the public representing businesses or other organizations, firms, or institutions which hire engineers or engineering technologists, appointed by the governor and council.

II.(a) The term of office for each member appointed under subparagraphs I(f) and I(g) shall be 3 years, or until a successor is appointed and qualified in the case of a vacancy. The term of office for all other members shall be coterminous with the term of office for the position that qualifies that member to serve on the advisory council. A vacancy shall be filled in the same manner, but only for the unexpired term.

(b) The advisory council shall meet at least quarterly, and may meet more often at the call of the chair, or at the request of a majority of the members directed to the chair. The council may, by majority vote of the voting members, adopt additional bylaws as deemed necessary by the council.

(c) The council shall, at its annual meeting, elect one voting member to serve as chair for a one-year term, or until a successor is elected and qualified.

(d) No member shall receive any compensation for serving on the council, provided that the legislative members shall receive legislative mileage when in performance of their duties and the public members may receive compensation dependent upon the availability of funds, other than from the general fund.

188-E:17 Duties. The advisory council shall advise the department of education in the following areas relative to the implementation of the pre-engineering technology curriculum:

I. Curriculum expansion and revision.

II. Curriculum eligibility requirements.

III. Curriculum quality.

IV. Fund raising from private and other sources.

V. Allocation of funds necessary for the curriculum.

2 Appropriation. The sum of $250,000 for the fiscal year ending June 30, 2003 is appropriated to the department of education for the implementation of the pre-engineering technology curriculum set forth in RSA 188-E:14. The governor is authorized to draw a warrant for said sum out of any money in the treasury not otherwise appropriated.

3 Effective Date. This act shall take effect July 1, 2002.

LBAO
01-2040
9/17/01

HB 1231-FN - FISCAL NOTE

AN ACT implementing a pre-engineering technology curriculum in the public high schools in the state.

FISCAL IMPACT:

The Department of Education indicates this bill will increase state general fund expenditures by $250,000 and local expenditures by an indeterminable amount in FY 2003 and each year thereafter. There is no fiscal impact to state, county and local revenue or county expenditures.

This bill appropriates $250,000 in state general funds to the Department of Education in FY 2003 for the purposes of this act.

METHODOLOGY:

The Department states this bill will allow the Department to implement Project Lead the Way. This project will be a partnership between the Department and local school districts, and will offer engineering classes at selected high schools and regional vocational education centers across the state.

The Department estimates the cost to equip the program will be approximately $50,000 at the high schools and $100,000 at the regional vocational education centers. The Department intends to share the cost of equipment with the local school districts on a 50-50 basis.

In addition to the equipment costs, the local school districts will be responsible for instruction costs estimated at $32,000, training costs estimated at $2,000, and software fees estimated at $3,500. The districts might be able to use existing equipment, currently employed teachers already trained in Project Lead the Way and could thereby reduce their share of projected costs. The Department is unable to determine to what extent this will occur.

The Department indicates it will spend $250,000 each year on the project for 10 high schools (10 x $25,000) or 5 regional vocation education centers (5 x $50,000) or some combination thereof.

HB 1231-FN – AS AMENDED BY THE HOUSE

14feb02...1955h

2001 SESSION

01-2040
04/10

HOUSE BILL **1231-FN**

AN ACT implementing a pre-engineering technology curriculum in the public high schools in the state.

SPONSORS: Rep. Leber, Merr 1; Rep. Edwards, Ches 19; Rep. Tahir, Hills 38; Rep. C. Bouchard, Merr 22; Rep. Rausch, Rock 13; Sen. Gordon, Dist 2; Sen. Flanders, Dist 7; Sen. O'Hearn, Dist 12; Sen. Johnson, Dist 3; Sen. Larsen, Dist 15

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IV. The department of education shall include in its biennial capital budget request, funding for the planning, construction, renovation of equipment necessary for the operation of pre-engineering technology curriculum in the regional vocation education centers.

V. Public schools which implement the pre-engineering technology curriculum shall be responsible for maintaining the program with funding requests made through the budgetary cycle.

188-E:15 Pre-Engineering Technology Advisory Council. There is established a pre-engineering technology advisory council to advise the department of education in the implementation and

expansion of the pre-engineering technology curriculum, to assist the department of education in pursuing public and private funds in order to ensure statewide access for all public high school students to pre-engineering technology curriculum coursework.

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II.(a) The term of office for each member appointed under subparagraphs I(f) and I(g) shall be 3 years, or until a successor is appointed and qualified in the case of a vacancy. The term of office for all other members shall be coterminous with the term of office for the position that qualifies that member to serve on the advisory council. A vacancy shall be filled in the same manner, but only for the unexpired term.

(b) The advisory council shall meet at least quarterly, and may meet more often at the call of the chair, or at the request of a majority of the members directed to the chair. The council may, by majority vote of the voting members, adopt additional bylaws as deemed necessary by the council.

(c) The council shall, at its annual meeting, elect one voting member to serve as chair for a one-year term, or until a successor is elected and qualified.

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IV. Fund raising from private and other sources.

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2 Appropriation. The sum of $250,000 for the fiscal year ending June 30, 2003 is appropriated to the department of education for the implementation of the pre-engineering technology curriculum set forth in RSA 188-E:14. The governor is authorized to draw a warrant for said sum out of any money in the treasury not otherwise appropriated.

3 Effective Date. This act shall take effect July 1, 2002.

LBAO
01-2040
9/17/01

HB 1231-FN - FISCAL NOTE

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FISCAL IMPACT:

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This bill appropriates $250,000 in state general funds to the Department of Education in FY 2003 for the purposes of this act.

METHODOLOGY:

The Department states this bill will allow the Department to implement Project Lead the Way. This project will be a partnership between the Department and local school districts, and will offer engineering classes at selected high schools and regional vocational education centers across the state.

The Department estimates the cost to equip the program will be approximately $50,000 at the high schools and $100,000 at the regional vocational education centers. The Department intends to share the cost of equipment with the local school districts on a 50-50 basis.

In addition to the equipment costs, the local school districts will be responsible for instruction costs estimated at $32,000, training costs estimated at $2,000, and software fees estimated at $3,500. The districts might be able to use existing equipment, currently employed teachers already trained in Project Lead the Way and could thereby reduce their share of projected costs. The Department is unable to determine to what extent this will occur.

The Department indicates it will spend $250,000 each year on the project for 10 high schools (10 x $25,000) or 5 regional vocation education centers (5 x $50,000) or some combination thereof.

Amendments

Rep. C. Bouchard, Merr 22
November 8, 2001
2001-1955h
04/09

Amendment to HB 1231-FN

Amend RSA 188-E:14 as inserted by section 1 of the bill by replacing it with the following:

188-E:14 Pre-Engineering Technology Curriculum.

I. The department of education shall develop and implement a pre-engineering technology curriculum in the public high schools to provide statewide opportunities for high school students interested in careers in engineering, or allied engineering fields, to enroll in a high quality engineering technology curriculum.

II. The state board of education shall adopt rules, pursuant to RSA 541-A, relative to course content, curricular requirements, and general procedures for implementing the pre-engineering technology curriculum. At a minimum, the curriculum shall include the following courses:

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(d) Computer integrated manufacturing

(e) Engineering design and development

III. In developing and implementing a pre-engineering technology curriculum, the efforts of the department of education shall complement existing public and private actions, and shall include the pursuit of innovative public-private partnerships with businesses, nongovernmental organizations, academic institutions, and other appropriate groups. Such partnerships shall at a minimum consist of a 50/50 match of public and private funds. Teachers teaching in the pre-engineering technology curriculum, shall be certified to teach the course work as required in this curriculum.

IV. The department of education shall include in its biennial capital budget request, funding for the planning, construction, renovation of equipment necessary for the operation of pre-engineering technology curriculum in the regional vocation education centers.

V. Public schools which implement the pre-engineering technology curriculum shall be responsible for maintaining the program with funding requests made through the budgetary cycle.

Rep. Leber, Merr. 1
February 19, 2002
2002-2710h
10/09

Amendment to HB 1231-FN

Amend the bill by replacing section 2 with the following:

2 Capital Appropriation; Bonds Authorized. To provide funds for this act, any remaining sums in the appropriation originally designated in 1973, 567:1 (former RSA 188-E:10), and as amended, for construction appropriation for the state board of education to make grants to regional vocational education centers are hereby transferred for the purposes of this act and appropriated to the department of education. The commissioner is authorized to grant these funds for implementation of the pre-engineering technology curriculum available to all public secondary schools and regional career and technical centers. The state treasurer is hereby authorized to borrow upon the credit of the state not exceeding said sum and for said purpose may issue bonds and notes in the name of and on behalf of the state of New Hampshire in accordance with RSA 6-A. Payments of principal and interest on the bonds and notes shall be made from the general fund of the state. The bonds shall be 5-year bonds. This appropriation shall lapse June 30, 2005.

2002-2710h

AMENDED ANALYSIS

This bill establishes a pre-engineering technology curriculum in the public high schools in the state and creates a pre-engineering technology curriculum advisory council to advise the department of education on the implementation of such curriculum. The bill also transfers a capital appropriation to implement the pre-engineering technology curriculum.

House Finance
February 19, 2002
2002-2752h
10/04

Amendment to HB 1231-FN

Amend the bill by replacing section 2 with the following:

2 Capital Appropriation; Bonds Authorized. To provide funds for this act, any remaining sums in the appropriation originally designated in 1973, 567:1 (former RSA 188-E:10), and as amended, for construction appropriation for the state board of education to make grants to regional vocational education centers are hereby transferred for the purposes of this act and appropriated to the department of education. The commissioner is authorized to grant these funds for implementation of the pre-engineering technology curriculum available to all public secondary schools and regional career and technical centers. The state treasurer is hereby authorized to borrow upon the credit of the state not exceeding said sum and for said purpose may issue bonds and notes in the name of and on behalf of the state of New Hampshire in accordance with RSA 6-A. Payments of principal and interest on the bonds and notes shall be made from the general fund of the state. The bonds shall be 5-year bonds. This appropriation shall lapse June 30, 2005.

2002-2752h

AMENDED ANALYSIS

This bill establishes a pre-engineering technology curriculum in the public high schools in the state and creates a pre-engineering technology curriculum advisory council to advise the department of education on the implementation of such curriculum. The bill also transfers a capital appropriation to implement the pre-engineering technology curriculum.

Committee Minutes

February 13, 2002

HOUSE CALENDAR

DIVISION II – WORK & EXECUTIVE SESSION

TUESDAY, FEBRUARY 19, 2002

FINANCE, Room 212, LOB.

10:00 a.m.	**HB 1231-FN**	implementing a pre-engineering technology curriculum in the public high schools in the state.
10:45 a.m.	**HB 1233-FN-A**	requiring an audit of the department of education and making an appropriation therefor.
11:15 a.m.	**HB 1419-FN-A**	(New Title) increasing the capital appropriation made to the fish and game department for the Barry conservation camp building replacement and increasing a capital appropriation to the New Hampshire veterans' home to design and build a new facility.
1:15 p.m.	**HB 1439-FN-A**	relative to an agreement between state of New Hampshire and city of Laconia and making an appropriation therefor.

Rep. Kenneth L. Weyler
DIVISION II CHAIRMAN

MINUTES
HOUSE FINANCE COMMITTEE
DIVISION II - WORK & EXECUTIVE SESSION
February 19, 2002
Room 212, Legislative Office Building

Rep. Thulander, vice-chairman, opened the division work session at 10:00 a.m.

Members Present: Reps. Thulander and Foster.

****HB 1231-FN, implementing a pre-engineering technology curriculum in the public high schools in the state.**

Rep. William Leber (Merrimack #1): explained bill and amendment. need for engineers is apparent. minimum curricula business partnership – local money/state money. existing appropriation was found to start program. originally for construction, but not needed. capital fund approximation. education funds. **Commissioner Murray:** some federal funds. **Pres. Symington, New Hampshire Technical Institute, Concord:** supports bill.

No action taken. Bill recessed until after discussion of other bills.

Members Present: Reps. Weyler, Thulander, Hager and Foster.

****HB 1233-FN-A, requiring an audit of the department of education and making an appropriation therefor.**

Rep. P. Judith Sullivan (Carroll #2): sponsor. they have no idea about federal grants. **Rep. Weyler:** requested new education audit and single audit of federal funds. **Mike Buckley, LBA Office:** answered questions. RSA 17-N is Performance Audit law. there is a Performance Audit and Oversight Committee which decides the scope of audits. the committee does this by asking a series of questions. bill not specific enough to be effective. **Cathy Provencher and Steve Fox, audit division:** two audits are ongoing at corrections: sexual harassment and inmate medical expenses. audit of staffing at parole and probation on hold by order of Fiscal Committee and Performance Audit Committee. no current requests before Performance Audit Committee about department of education. auditors to provide more information for the committee – current audits in place with dates and requests. **Rep. Steven Winter (Merrimack #2):** supports bill.

No action taken. Bill recessed until after discussion of other bills to allow additional requested information to be gathered.

****HB 1419-FN-A, (New Title) increasing the capital appropriation made to the fish and game department for the Barry conservation camp building replacement and increasing a capital appropriation to the New Hampshire veterans' home to design and build a new facility.**

Commissioner Wayne Vetter, New Hampshire Fish and Game: supports bill. camp is run with 4-H at Berlin Fish Hatchery. 4000 campers since 1984. no accreditation until upgraded. funds were in last year's capital

budget, and were mistakenly removed. Fish and Game fund has sufficient money to pay these bonds.
No action taken. Action recessed until after discussion of other bills.

Rep. Weyler recessed for lunch at 11:45 a.m. to reconvene at 1:15 p.m.
Rep. Weyler called the meeting to order at 1:20 p.m.

****HB 1439-FN-A, relative to an agreement between state of New Hampshire and city of Laconia and making an appropriation therefor.**

Rep. Fran Wendelboe (Belknap #2): answered funding questions. Eileen Cabanel, Laconia City Manager: answered questions. **Rep. Hager** moved, seconded by **Rep. Foster**, to report HB 1439-FN-A as **Ought to Pass**. Motion passed on a **4-0** Roll Call vote.

****HB 1231-FN, implementing a pre-engineering technology curriculum in the public high schools in the state.**

Rep. Thulander moved, seconded by **Rep. Foster**, to amend the bill. amendment adopted. **Rep. Hager** moved, seconded by **Rep. Foster**, to report HB 1231-FN as **Ought to Pass with Amendment**. Motion passed on a 4-0 Roll Call vote.

****HB 1419-FN-A, (New Title) increasing the capital appropriation made to the fish and game department for the Barry conservation camp building replacement and increasing a capital appropriation to the New Hampshire veterans' home to design and build a new facility.**

Rep. Hager moved, seconded by **Rep. Foster**, to amend bill by removing article dealing with veterans' home. **Rep. Thulander** moved, seconded by **Rep. Hager**, to report HB 1419-FN-A as **Ought to Pass with Amendment**. Motion passed on a **4-0** Roll Call vote.

****HB 1233-FN-A, requiring an audit of the department of education and making an appropriation therefor.**

Rep. Foster moved, seconded by **Rep. Hager**, to report HB 1233-FN-A as **Inexpedient to Legislate**. Motion failed on a **2-2** Roll Call vote. Further discussion of bill. **Rep. Kurk** present. **Rep. Foster** moved, seconded by **Rep. Hager**, to report HB 1233-FN-A as **Inexpedient to Legislate**. Motion passed on a **3-2** Roll Call vote.

No other bills before the division, Rep. Weyler adjourned the work session at 2:00 p.m.

Respectfully Submitted,

Elizabeth S. Hager
Division II Clerk

DIVISION II

2001 SESSION

HB #1231, pre-engineers

PUBLIC HEARING: _____

EXECUTIVE SESSION: _____

Amendment # -- proposed/adopted

Thulander moved/
Foster seconded to amend
passed 4-0.

	YEAS	NAYS	OTHER	ABSENT
WEYLER, KENNETH L., CHM.	✓			
THULANDER, O. ALAN, V. CHM.	✓			
HAGER, ELIZABETH S., CLERK	✓			
MERCER, ROBERT S.	E			✓
FOSTER, LINDA T.	✓			
DWYER, PAUL J., SR.	E			✓
KURK, NEAL M.	E			✓

COMMITTEE REPORT: OTP 4-0

Hager / Foster

MINUTES
HOUSE FINANCE COMMITTEE
EXECUTIVE SESSION - February 20, 2002
Room 210-211, Legislative Office Building

Chairman Kurk called the executive session to order at 10:10 a.m.

Members Present: Reps. Kurk, Weyler, Holbrook, Robert Johnson, Thulander, Stone, LaRose, Anderson, Wendelboe, Hager, Mercer, Emerton, Wheeler, Rodeschin, Rogers Johnson, Wallner, C. Moore, Foster, Blanchard, Coes and Mitchell.

****HB 556-FN-A, making certain appropriations to the department of cultural resources and the department of safety.**

Rep. Wheeler moved, seconded by **Rep. Coes**, to report HB 556-FN-A as **Ought to Pass with Amendment**. Motion passed on a **19-0** Roll Call vote to be placed on the Consent Calendar.

****HB 672, (New Title) relative to insurance coverage for mental and nervous conditions and for treatment for chemical dependency.**

Rep. Blanchard: page 6, coverage. **Rep. Thulander:** cost per person? yes - 50 ¢/$1.40 per person per month. **Rep. Moore:** consultant report (see **ATTACHMENT #1**). alcohol consultants. more costly to not pass bill. **Rep. Rogers Johnson:** explained his judgement in reports to division I. **Rep. Moore:** expressed disagreement. **Rep. Wheeler:** alcohol and drugs – explained coverage. **Rep. Moore:** an amendment to give insurance company options.

Rep. Wheeler moved, seconded by **Rep. Stone**, to report HB 672 as **Inexpedient to Legislate**. Motion passed on a **13-8** Roll Call vote to be placed on the Regular Calendar.

Minority report denoting **Ought to Pass** to be filed.

****HB 1206-FN, (New Title) increasing the annuity paid to a surviving spouse or beneficiary upon the accidental death of a group II permanent firemen member in the performance of duty.**

Rep. Stone: explained need for more information. **Rep. Rodeschin** and **Rep. Kurk** asked questions. **Rep. Coes:** misinformation. **Rep. LaRose:** back to policy committee. **Reps. Mitchell, Hager and Blanchard** commented.

Rep. Stone moved, seconded by **Rep. Coes**, to report HB 1206-FN as **Refer to Interim Study**. Motion passed on a **20-1** Roll Call vote to be placed on the Consent Calendar.

****HB 1279-FN-A, making an appropriation for the purchase of equipment to record committee sessions.**

Rep. Stone moved, seconded by **Rep. Coes**, to report HB 1279-FN-A as **Inexpedient to Legislate**. Motion passed on a **20-0** Roll Call vote to be placed on the Regular Calendar.

****HB 1302-FN, (New Title) relative to the purchase of certain prior service credit by members of the retirement system, relative to legislative review of retirement fund investment practices, and relative to the payment of medical benefits costs for retired state employees.**

Reps. Wheeler, Kurk, Hager and Coes commented.

Rep. Wheeler moved, seconded by **Rep. Holbrook**, to report HB 1302-FN as **Ought to Pass**. Motion passed on a **20-0** Roll Call vote to be placed on the Consent Calendar.

****HB 1409-FN-A-L, relative to payment of autopsy expenses and making an appropriation therefor.**

Reps. Wheeler, Coes and Kurk commented. **Rep. Blanchard:** county liability? **Rep. Kurk, Coes and Weyler** commented. Amendment #2734h adopted.

Rep. Wheeler moved, seconded by **Rep. Blanchard**, to report HB 1409-FN-A-L as **Ought to Pass with Amendment**. Motion passed on an 18-1 Roll Call vote to be placed on the Consent Calendar.

****HB 1437-FN-A, relative to increasing the staff in the consumer protection and antitrust bureau of the department of justice and making an appropriation therefor.**

Reps. Blanchard, Hager and Kurk commented. Amendment #2776h adopted.

Rep. Blanchard moved, seconded by **Rep. Coes**, to report HB 1437-FN-A as **Ought to Pass with Amendment**. Motion passed on an **18-0** Roll Call vote to be placed on the Consent Calendar.

****SB 201-FN, (New Title) relative to the job training program for economic growth.**

Reps. Coes and Kurk commented.

Rep. Coes moved, seconded by **Rep. Anderson**, to report SB 201-FN as **Ought to Pass**. Motion passed on a **20-0** Roll Call vote to be placed on the Consent Calendar.

****HB 557-FN-A, (New Title) relative to victims' assistance programs and the victims' assistance fund.**

Reps. Wheeler, Stone, Wendelboe, Emerton and Kurk commented. <u>Jeff Pattison, Legislative Budget Assisant's Office:</u>

answered questions. **Rep. Emerton** commented. Amendment #2800h adopted.

Rep. Wheeler moved, seconded by **Rep. Coes**, to report HB 557-FN-A as **Ought to Pass with Amendment**. Motion passed on a **19-0** Roll Call vote to be placed on the Consent Calendar.

Rep. Kurk recessed the executive session at 11:45 a.m. for lunch.

Rep. Kurk called the executive session to order at 1:15 p.m. to resume action on remaining legislation.

****HB 1230-FN, (New Title) authorizing the commissioner of the department of education to expend funds for special education advocacy.**

Rep. Foster: advocacy for special education. **Rep. Weyler:** commented. **Rep. Kurk:** federal funds. **Rep. Wheeler:** how to find success? Amendment #2507h adopted.

Rep. Foster moved, seconded by **Rep. Thulander**, to report HB 1230-FN as **Ought to Pass with Amendment**. Motion passed on a **20-0** Roll Call vote to be placed on the Consent Calendar.

****HB 1231-FN, implementing a pre-engineering technology curriculum in the public high schools in the state.**

Reps. Hager, Wheeler and Blanchard commented. **Rep. LaRose:** how much in bond? $750,000.

Rep. Hager moved, seconded by **Rep. Foster**, to report HB 1231-FN as **Ought to Pass**. Motion passed on a **20-0** Roll Call vote to be placed on the Regular Calendar.

****HB 1233-FN-A, requiring an audit of the department of education and making an appropriation therefor.**

Rep. Foster: commented.

Rep. Foster moved, seconded by **Rep. Hager**, to report HB 1233-FN-A as **Inexpedient to Legislate**. Motion passed on a **17-3** Roll Call vote to be placed on the Regular Calendar.

****HB 1324-FN, requiring that budget requests made by the state government be limited by inflationary and population growth indices.**

Rep. Hager: commented.

Rep. Hager moved, seconded by **Rep. Dwyer**, to report HB 1324-FN as **Refer to Interim Study**. Motion passed on a **20-0** Roll Call vote to be placed on the Consent Calendar.

****HB 1419-FN-A, (New Title) increasing the capital appropriation made to the fish and game department for the Barry conservation camp building replacement and increasing a capital appropriation to the New Hampshire veterans' home to design and build a new facility.**

Reps. Thulander, Kurk and Stone commented. Amendment #2748h adopted.

Rep. Thulander moved, seconded by **Rep. Hager**, to report HB 1419-FN-A as **Ought to Pass with Amendment**. Motion passed on a **20-0** Roll Call vote to be placed on the Regular Calendar.

****HB 1439-FN-A, relative to an agreement between state of New Hampshire and city of Laconia and making an appropriation therefor.**

Rep. Hager moved, seconded by **Rep. Foster**, to report HB 1439-FN-A as **Ought to Pass**. Motion passed on a **20-0** Roll Call vote to be placed on the Regular Calendar.

****SB 102-A, (New Title) making a capital appropriation to support affordable housing solutions in the state of New Hampshire and increasing a capital appropriation to the New Hampshire veterans' home to design and build a new facility.**

Reps. Weyler, Kurk and LaRose commented. Amendment #2639h adopted.

Rep. Weyler moved, seconded by **Rep. Mercer**, to report SB 102-A as **Ought to Pass with Amendment**. Motion passed on a **20-0** Roll Call vote to be placed on the Regular Calendar.

****HB 179-FN, (New Title) including 17 year olds under RSA 169-B, the juvenile delinquency statute.**

Reps. Wallner, Weyler, Emerton and Thulander commented.

Rep. Wallner moved, seconded by **Rep. Emerton**, to report HB 179-FN as **Ought to Pass**. Motion passed on a **17-2** Roll Call vote to be placed on the Regular Calendar.

****HB 1376-FN, relative to distribution of tobacco settlement funds.**

Rep. Wendelboe: commented.

Rep. Wendelboe moved, seconded by **Rep. LaRose**, to report HB 1376-FN as **Inexpedient to Legislate**. Motion passed on a **12-7** Roll Call vote to be placed on the Regular Calendar.

****SB 161-FN-A, relative to treatment for individuals with disabilities and making an appropriation therefor.**

Reps. LaRose, Weyler, Kurk, Wallner, Wheeler, Rodeschin and Foster commented. Amendment #2763h adopted.

Rep. LaRose moved, seconded by **Rep. Rodeschin**, to report SB 161-FN-A as **Ought to Pass with Amendment**. Motion passed on a **19-1** Roll Call vote to be placed on the Consent Calendar.

****HB 212-FN, (New Title) providing an alternative method of calculating state education property tax hardship relief.**

Rep. Weyler commented. Amendment #2630h adopted.

Rep. Smith moved, seconded by **Rep. Weyler**, to report HB 212-FN as **Ought to Pass with Amendment**. Motion passed on a **17-0** Roll Call vote to be placed on the Regular Calendar.

****HB 1259-FN-L, relative to the base cost for calculating adequate education grants.**

Reps. Weyler and Foster commented. **Rep. Kurk:** index lower to be used. **Reps. Hager and Wallner** commented. Amendment #2469h adopted.

Rep. Weyler moved, seconded by **Rep. Wendelboe**, to report HB 1259-FN-L as **Ought to Pass with Amendment**. Motion passed on a **12-6** Roll Call vote to be placed on the Regular Calendar. Minority report denoting **Inexpedient to Legislate** to be filed.

No further legislation pending before the Committee, Chairman Kurk adjourned the executive session at 3:00 p.m.

Respectfully submitted:

Rep. Robert G. Holbrook
Clerk for the Committee

Speakers

SIGN UP SHEET

To Register Opinion If Not Speaking

Bill # HB 1231-FN Date 1/16/2002

Committee ED

** Please Print All Information **

Name	Address	Phone	Representing	(check one) Pro	Con
Sen O'Hearn			Dist 18	✓	
Bob Flanders			Dist 7	✓	
Rep. SAGHIR A. TAHIR			DISTRICT 38	✓	
Rep Bob Baxley			" 22	X	
Rep Carol Rowe			Rock Dist 13	X	
Rep Leon			PLTW-NH	X	
Valerie Mahon			NHCTCS		
Richard Ayers (written statement)			Hopkinton Sch. dist	*	
Kim Fuller			Hopkinton Sch Board	✓	
Richard Boyle			Hopkinton Resident	✓	

Hearing Minutes

HOUSE COMMITTEE ON EDUCATION

PUBLIC HEARING ON HB 1231-FN

BILL TITLE: implementing a pre-engineering technology curriculum in the public high schools in the state.

DATE: January 16, 2002

LOB ROOM: 207 **Time Public Hearing Called to Order:** 1:25 p.m.

Time Adjourned: 2:00 p.m.

(please circle if present)

Committee Members: Reps. Henderson, Ward, Dearborn, Flint, P. Davis, Alger, Cox, Sullivan, Carson, Colcord, Sova, Winter, L'Heureux, Yeaton, Snyder, C. Jean, Estabrook, J. White, C. Clarke and Naro.

Bill Sponsors: Rep. Leber, Merr 1; Rep. Edwards, Ches 19; Rep. Tahir, Hills 38; Rep. C. Bouchard, Merr 22; Rep. Rausch, Rock 13; Sen. Gordon, Dist 2; Sen. Flanders, Dist 7; Sen. O'Hearn, Dist 12; Sen. Johnson, Dist 3; Sen. Larsen, Dist 15

TESTIMONY

* Use asterisk if written testimony and/or amendments are submitted.

*Rep. Bill Leber, prime sponsor. Rep. Henderson: Would this be an elective program available to high school? Rep. Estabrook: How would the program be distributed? Answer: We thought we could start with five or six schools. Rep. Cox: This bill relies on non-state funding? Answer: We are looking to other companies to help because they are the ones with the need for engineers.

Carol Murray, Department of Transportation – supports. DOT is the largest employer of civil engineers in the state. In the recent year, we graduated 22 civil engineers.

Jim Leon, NHTI. PLTW students are studying math and science to the state standards – Hopkinton, Lisbon, John Stark. They have had grant money and industry support. Five of eight high schools put in the budget have been taken out. We love the program but the districts don't have the money. 502 students have been involved. Rep. Colcord: What is the cost of the program in high school? Answer: It is $95,000.

Will Renauld. Got this program off the ground in Hopkinton. We talk about cost but the real issue is that it creates a disciplinary approach among teachers. It is an intensive program about students and training. Curriculum development is completely done by teachers in the field and is an ongoing process.

Alex Borges, student. Personally helped with my getting into college because of my PLTW experience.

Bob Butson, Small School, Lisbon School. NE Electric Wire took a risk to start the program. This curriculum entices students to pursue engineering.

Bill Johnson, Chairman, John Stark School Board. I have a daughter. I am an engineer. We built a room to accommodate PLTW. The program works. Money is well spent.

Rosie Walker-Birs, Directors of Technical Education. Let's look at what we have in place to improve science and engineering, and where to provide access. Rep. Alger: We need to get kids turned on. Rep. Dearborn: Why has it been so long in getting? Kids get turned on to a subject. We have been at it a long time. Answer: Teacher attitudes and fast-changing technology. Frankly, I don't think new students are aware of what engineering is about. The department has a program track that puts projects into the high schools and I believe our existing infrastructure exists because of engineers. Our future depends on it.

John O'Donnell, NHCTC System – supports. Community tech colleges. We have done a survey. Project Lead the Way is a definite career pathway and provides students with transferable credits to engineering while in high school.

Rep. Tahir – supports. I am a graduate engineer and believe in this program to let young students know where they want to go. Whenever we need engineers we have to go out of the state. Engineers provide the infrastructure we need to use to begin sooner than later.

Rep. Candace Bouchard: I support and have an amendment. Line 20, 50/50 match. Certification. Concord has a votech high school and some surrounding high schools have this program and they are successful. Rep. Estabrook: Do out-of-district students have access to these programs? (No answer recorded in notes.)

Nicholas Donohue, Department of Education – supports.

Paul Leather, Department of Education. Part of our responsibility is preparing students for the workforce. We know about our workforce demands. We are a technology state and the problem is that there is a higher percentage of dropouts out of the engineering schools. This program is letting potential students have an exposure to engineering. Rep. Cox: Can out-of-area students take these courses at a central or different location? Answer: We anticipated this and have language in the bill to allow this to work. Rep. Winter: Why does it cost twice as much at a tech college than a high school? Answer: Votech is a wider application.

Rep. Ward – supports. This is a progression of existing projects. This is a residual of a third generation program using the best of the foregoing programs. This program will help the northern counties compete with the southern counties that have 92% of the technical jobs.

*Rep. John Alger – supports, as an engineer going to a technical high school 50 years ago. Math program in Plymouth has been successful.

Rep. Cox: One advantage is putting a group together.

Alida Millham – supports. Invited to a tech school meeting where the testimony was supportive with individual students.

*Richard Blais, National Director, Lead the Way Project. Provides access. There was no connection between secondary education and workforce several generations ago. This program will be the connection . Rep. Snyder: Do you have information? Answer: Yes, and videos. Also a website for PLTW. No cost to schools and tuition is free. It is a living document.

Pam Burke, Merrimack Valley High School. We found this to be a perfect way to help our students with science and math. So popular that classes are full. Hired a teacher. 150 enrolled out of 800. Created second lab. These students are very successful in college.

John Ford, Celestica. There is a downturn in the number of United States students applying for engineering. So we import engineers or move manufacturers to other countries. Foreign countries send their best and brightest. The U.S. loses its ninth grade and high school students because of lack of exposure in those grades.

Pink Cards:

- Rep. Bill Leber, prime sponsor. Supports the bill.
- Carol Murray, NHDOT, Hazen Drive, Concord, 271-3734. Supports the bill.
- Jim Leon, NHTI and PLTW – NH, 36 ½ S. Spring Street, Concord, NH, 228-4565. Supports the bill.
- Will Renauld, Project Lead the Way, Hopkinton High School, 111 Borough Road, Penacook, NH, 753-8367. Supports the bill.
- Alex Borges, Project Lead the Way, Hopkinton High School, 1236 Hatfield Road, Hopkinton, NH 03229, 746-3692. Supports the bill.
- Robert Butson, Lisbon School, P.O. Box 103, Lisbon, NH, 838-6672. Supports the bill.
- Bill Johnson, John Stark School Board, 44 Brown Ridge Road, Weare, 529-7603. Supports the bill.
- Rosie Walker-Birs, Directors of Technical Education in NH, 100 West Street, Milford, 673-4201, Ext. 241. Supports the bill.
- John O'Donnell, Comm. Tech. Colleges, NHCTC System, 5 Institute Drive, Concord, 271-2722. Supports the bill.
- Rep. Saghir Tahir. Supports the bill.
- Rep. Candace Bouchard. Supports the bill.
- Nicholas Donahue, Department of Education. No indication of support or opposition.
- Paul Leather, Department of Education. Supports the bill.
- Rep. Brien Ward. Supports the bill.
- Rep.John Alger. Supports the bill.
- Alida Millham. Supports the bill.
- Richard Blais, Project Lead the Way, National Executive Director, 747 Pierce Road, Clifton Park, NY 12065, 518-877-6491, Ext. 315. Supports the bill.
- Pam Burke, Merrimack Valley High School, 106 Village Street, Penacook, NH, 753-4311. Supports the bill.

- John Ford, Celestica, 209 Laurelwood Drive, Hopedale, MA, 508-634-6976. Supports the bill.
- Rep. Dana Edwards. Supports the bill.
- Rep. Jim Rausch. Supports the bill.

Respectfully submitted,

Rep. Bruce L. Dearborn
Committee Clerk

Sub-Committee Minutes

HOUSE COMMITTEE ON FINANCE

SUBCOMMITTEE WORK SESSION ON HB 1231-FN

BILL TITLE: implementing a pre-engineering technology curriculum in the public high schools in the state.

DATE: February 19, 2002

Subcommittee Members: Reps. Weyler, Thulander, Hager, Mercer, Foster, Dwyer and Kurk.

Comments and Recommendations:

Amendments:

Sponsor: Rep. _____ OLS Document #: _____ _____

Sponsor: Rep. _____ OLS Document #: _____ _____

Sponsor: Rep. _____ OLS Document #: _____ _____

Motions: OTP, OTP/A, ITL, Re-Refer, Interim Study (Please circle one.)

Moved by Rep. _____

Seconded by Rep. _____

Vote: _____

Motions: OTP, OTP/A, ITL, Re-Refer, Interim Study (Please circle one.)

Moved by Rep. _____

Seconded by Rep. _____

Vote: _____

Respectfully submitted,

Rep. Elizabeth S. Hager
Subcommittee Chairman/Clerk

Testimony

Nicholas Donohue
COMMISSIONER



Paul K. Leather, Director
DIVISION OF ADULT LEARNING
AND REHABILITATION
TDD Access: Relay NH 1-800-735-2964

STATE OF NEW HAMPSHIRE
DEPARTMENT OF EDUCATION
VOCATIONAL REHABILITATION
DEPT. OF EDUCATION CITIZENS SERVICES 1-800-339-9900
BUREAU OF VOCATIONAL REHABILITATION CLIENT SERVICES 1-800-299-1647

HB-1231 PRE-ENGINEERING PROGRAM
LIST OF SCHOOLS

REGIONAL TECHNICAL CENTERS READY TO GO, WAITING FOR FUNDING:

CONCORD
HUOT (LACONIA)
KINGSWOOD (WOLFEBORO)
NEWPORT (SUGAR RIVER REGIONAL)
PALMER (ALVIRNE – HUDSON)

COMPREHENSIVE HIGH SCHOOLS READY TO GO, WAITING FOR FUNDING:

MASCENIC HIGH SCHOOL

REGIONAL TECHNICAL CENTERS IN PLANNING STAGES, WAITING FOR FUNDING AUTHORIZATION:

EXETER
LITTLETON
PINKERTON

REGIONAL TECHNICAL CENTERS CURRENTLY IN PROCESS OF IMPLEMENTING:

NASHUA
MILFORD
KEENE

COMPREHENSIVE HIGH SCHOOLS CURRENTLY IMPLEMENTING:

HOPKINTON
BOW
JOHN STARK
MERRIMACK VALLEY
LISBON
KEARSARGE
HILLSBORO-DEERING

House Finance Committee, Division II
HB 1231, implementing a pre-engineering technology curriculum in public high schools
February 19, 2002

Statement of Rep. William E. Leber, of Andover, Merrimack County District One

In recent years our committee, the Public Works and Highway, has had proposals before it to fund the renovations of the high school regional vocational centers that were constructed beginning some 25 years ago. During that process we heard of the shortage of engineers and technicians by employers in NH. We heard of the relatively high dropout rates of high school students and how some students were more interested in hands–on projects rather than some academics. Also, we received testimony of youngsters who found a use for academics in the vocational area, which turned them around and they improved in all their studies.

Last year as we were processing the capital improvement budget, we were bombarded with information about the shortage of engineers and technicians in NH and that the University System needed the engineering and science buildings renovated in order to remain accredited. It was stated that it was difficult to compete for students because of the condition of the facilities.

With that information still fresh in my mind, I was invited to a meeting of Project Lead the Way and heard about the program that was working in the high schools that were fortunate to have a teacher who was motivated enough to get such a program started. It has been an outstanding success. After speaking and meeting with those involved, including teachers, students, administrators, and the engineering – technology companies that support the program, **I thought all New Hampshire students should have an opportunity to participate in pre-engineering and technology programs.**

This legislation would do several things. It would

- Establish in statute the minimum program curriculum,
- Provide a matching public-private partnership with business to fund the program,
- Establish the authority for the department to include the initial capital improvements for each site in its capital budget request to fund the state share,
- Establish an advisory committee to oversee and promote the program,
- With a proposed amendment, **provide use of a previous appropriation to grant matching funds to get the first year projects started.**

(A list of high schools that are ready to get started if state matching grants become available is included).

The sponsors have submitted an amendment of minor, but important, changes to section 1 of the bill that was introduced by Rep. Candace White-Bouchard in the House Education Committee.

I propose an amendment relative funding this project. Recognizing the fiscal difficulty of securing new general fund appropriation for this project, I was advised to find an existing appropriation to fund it. **I have found a previous appropriation for regional high schools that seems very appropriate for this project and is provided in the amendment.**

I will be pleased to answer your questions about the funding amendment. For questions relative the program itself, however, there are some experts here who are working the program and certainly more qualified to answer any of the technical or statistical questions.

I respectfully ask for your support for this legislation and the young people who will benefit by its passage by getting a head start on preparation for college and careers.

I ask for your vote of ought to pass. Thank you

Project Lead the Way-New Hampshire
Summary

- Nine NH high schools are offering the PLTW curriculum (Hopkinton, John Stark Regional, Milford, Merrimack Valley, Kearsarge Regional, Bow, Nashua, Lisbon, Hillsboro-Deering).
- Over 500 students took PLTW courses during the 2000-01 school year. Projected student enrollment for the 2001-02 school year is at least 600.
- Twenty-seven teachers hold PLTW credentials, with approximately one-half of those credentialed to teach at least two courses.
- New Hampshire Technical Institute President Bill Simonton chairs the PLTW-NH Leadership Team and serves on the PLTW National Oversight Committee.
- The day-to-day operations of PLTW-NH are managed by the Educational Partnership of Central New Hampshire.
- NHTI is an affiliate training center providing teacher training during the months of July and August.
- Two NHTI faculty members, Steve Ryan and Bob Arrendondo, are PLTW master teachers, manage the PLTW lab at NHTI, and teach during the PLTW Summer Training Institute. In addition, Professor Ryan serves as a technical consultant to schools considering implementing PLTW-NH.
- PLTW students have three possible options for achieving dual credit for PLTW courses, including

    1. A Memorandum of Understanding between NHTI and participating high schools that includes an escrow account up to six credits
    2. Transcript credit at RIT for accredited schools up to an equivalent of six credits
    3. Transcript credit at NHTI through Project Running Start for a maximum of twelve credits.

- The PLTW Leadership Team is in the final stages of forming a 501c(3) corporation.

Project Lead the Way
Summary of National Initiative

In four years PLTW has grown to involve:

- Thirty-three states
- Three hundred forty schools
- Five hundred teachers
- thirty-five thousand students

The national training network is headquartered at Rochester Institute of Technology and includes the following affiliate training centers:

- New Hampshire Technical Institute
- University of Houston
- Purdue University
- Ferris State University
- Colorado School of Mines

The attrition rate of PLTW participants who pursue post-secondary degrees in engineering and engineering technology is less than 10%

"In all the years that I have been at Merrimack Valley, no other single program has had such an impact. Students who were not connected to academics have become connected through this program."

Pamela Burke, Principal of the Year, 1999-2000

Project Lead the Way New Hampshire
Approximate Cost by Course

Introduction to Engineering Design

Computers	$25,220	
Design Jet Printer	$4,931	
Laser Printer	$1,908	
In Focus Projector	$2668	
	Total	$45,000

Digital Electronics

Equipment and Supplies	$6,000	
	Total	$6,000

Principles of Engineering

Fischertechnik POE kits	$4,200	
Fischertechnik related materials	$1,300	
Discovery Pneumatic w/SW	$1,825	
Discovery Hydraulic w/SW	$1,775	
Discovery Mechanism w/SW	$1,413	
Stress Analyzer	$2,800	
Relataed Equipment $ Materials	$2,647	
	Total	$15,000

Computer Integrated Manufacturing

Fischertechnik Supplemental kits	$2,100	
Automated Manufacturing Package	$31,000	
Related Equipment and Materials	$1,900	
	Total	$35,000

Engineering Design and Development 0

TOTAL $101,000

PROJECT LEAD THE WAY®

NEW HAMPSHIRE

Project Lead The Way® - New Hampshire (PLTW - NH) is a cooperative, statewide initiative involving the New Hampshire Community Technical College System, New Hampshire Department of Education, University of New Hampshire, businesses and New Hampshire school districts. The goal of PLTW - NH is to prepare students for post-secondary education and work in engineering and engineering/technology fields.

National Alliance For Pre-Engineering Programs

Project Lead The Way®

www.pltw.org

Benefits to Students

- Exposure to vigorous pre-engineering coursework
- Awareness of high-demand, high-wage careers
- Relevant application of mathematical and scientific principles
- Opportunity to express creativity through project-based learning
- Opportunity to solve real-world problems
- In-depth application of knowledge
- Exposure to latest computer software andequipment used by industry, colleges and universities
- Hands-on activities that utilize team effort
- Skills required for jobs and post-secondary education
- Improved performance in academic work
- Improved communications skills
- Articulated credit arrangement with New Hampshire Technical Institute

Benefits to Schools

- Efficiency in program planning, purchasing, training and curriculum development
- Free, regularly updated best practices curriculum
- Free, regularly updated resource guides for students
- Student assessment rubrics and other materials
- Consistent curriculum and training that help to sustain the program over time
- Partnership with PLTW that supports the program's implementation and continued use
- A plan for selecting appropriate equipment, software and materials that incorporates a highly cost-effective bidding system
- An organizational structure that offers program support at the local, regional, state and national levels
- Curriculum coordinated with NH Curriculum Frameworks for Mathematics and Science

Benefits to Business, Industry, and Colleges and Universities

- A program that addresses a national shortage of highly skilled engineers and technicians
- A program that will enhance economic and work-force development
- An opportunity to work with and support the local educational systems through local and regional partnership teams
- High school graduates who are prepared for college programs in engineering and technical fields.

Training and Support for Teachers

Teacher training is a critical component of any new instructional program. Project Lead The Way® has developed an intensive, comprehensive training program for teachers. This training model consists of three parts:

Pre-assessment

Significant attention is paid to gauging staff readiness for training through self- assessment. PLTW teachers analyze the results and recommend work, if necessary, to prepare them for the summer institute.

Summer Training Institute

The institute, an intensive two-week training program, prepares teachers to teach the course scheduled for the fall term. New Hampshire teachers receive training at New Hampshire Technical Institute. Graduate credit is available through Rochester Institute of Technology for an extra fee.

Ongoing Training

Teachers receive continuous support for skill improvement as they implement the program. PLTW manages electronic communication among teachers and staff at all PLTW sites to encourage them to work together to solve problems.

Training and Support for Counselors

PLTW understands that another key to success is awareness. The Counselor Conference is designed to inform school counselors about the program's benefits and about the various careers in technology and engineering that are available to students who pursue this training. Counselors receive PLTW materials, including brochures and videos to use with students and their parents.

Many opportunities await young people who complete an upgraded academic core and a career/technical concentration, such as pre-engineering technology. The Project Lead The Way (PLTW) pre-engineering program of study helps achieve this goal.

High-Demand, High-Wage Careers

The United States is suffering from a severe shortage of engineers and well-educated technical workers. The nation has more than one million jobs available in these fields with few qualified candidates to fill them. One reason for this problem is that more than half of the students who enroll in post-secondary engineering and engineering/technology programs drop out because they were not adequately prepared.

> "U.S. students generally do not get the comprehensive math and science courses in grades K-12 they need to succeed in an engineering program."
>
> (Travis Engen, chairman and chief executive of ITT Industries Inc., in USA Today)

Introducing students in middle and high school to engineering and engineering technology will attract more of them to these fields and will allow them to determine (before college) whether they are interested in pursuing an engineering-related career. The PLTW graduate will be better prepared for engineering programs in college or technical school and will be more likely to succeed.

Rigorous and Relevant Curriculum
Project Lead The Way®
Pre-engineering Program

- Meets national standards for mathematics, science and technology education
- Offers a complete career/technical concentration with an emphasis on both mathematics and science
- Links demanding mathematics and science courses with quality career/technical courses

Middle School Technology Program
Gateway to Technology

The middle school curriculum is designed to give students a broad overview of technology-related fields and processes. Because engineers use technology to solve problems, the course is 'activity-oriented'. It incorporates four 10-week units, each of which is developed specifically for grades six through eight. It is recommended that these units be taught in the following order:

- Design and Modeling
- The Magic of Electrons
- The Science of Technology
- Automation and Robotics

High School Sequential Program of Study

The high school curriculum is a rigorous four-year sequence of courses that, when combined with college preparatory mathematics and science, allows students to explore careers in engineering and engineering technology. This exposure helps students prepare to enter a two- or four- year college or technical school; however, even students who do not intend to pursue further formal education will benefit greatly from the knowledge and logical thought processes taught in these courses.

High School Courses

- Introduction to Engineering Design is an introductory course that develops student problem-solving skills,with emphasis on visualization and communication skills using a computer and 3-D solid modeling software.

- Digital Electronics is a course of study in applied digital logic, using electronic logic circuits that first are designed and then tested using the latest computer digital-logic modeling technology.

- Principles of Engineering is a broad-based survey course to help students understand engineering and engineering technology and identify career possibilities. Theoretical and hands-on problem-solving activities are emphasized.

- Computer Integrated Manufacturing builds on skills in computer modeling design and exposes students to the fundamentals of computerized manufacturing technology. The course covers prototyping, CNC equipment, CAM software, robotics, and flexible manufacturing systems.

- Engineering Design and Development involves two- to-four person teams that research an open-ended problem and then design and construct a solution to it. Each team must submit progress reports and a final research paper. The team members then defend the solution with an oral presentation before an outside review panel.

Standards-Driven: New Hampshire and National Mathematics, Science and Technology Education

The project-based curriculum challenges students of all ability levels to use mathematical, scientific and technological principles in solving real-world problems. Students who complete the program will:

- understand technology as a tool for problem-solving;
- understand the scientific process, problem-solving in engineering, and the application of technology in engineering;
- be prepared for the rigor of college-level programs in engineering or engineering technology;
- understand technological systems and how they interact with other systems;
- apply appropriate technological systems in analyzing and solving problems;
- use mathematical principles to solve problems;
- communicate effectively through reading, writing, listening and speaking;
- work well in teams.

Expenses and Commitments - A Partnership

Project Lead The Way®provides:

- free curriculum (regularly updated);
- free resource guides for students (regularly updated);
- curriculum review, revision and distribution;
- teacher assessment;
- ongoing teacher training (instruction only);
- Counselor Conferences-professional development and career awareness (accommodations, materials and facilities);
- electronic communication among teachers and staff;
- Increased purchasing power, coordinated bidding and purchasing of furniture, hardware, software and supplies;
- management personnel (supports nationwide implementation);
- public relations materials for students and parents;
- systematic program evaluation;
- information and support for schools and teachers;
- technical support;
- national and state leadership, Board of Directors and PLTW-NH Leadership Team.

Schools provide:

- equipment and software;
- each PLTW teacher with a laptop and software;
- pre-core training prior to Summer Training Institute (if necessary);
- Summer Training Institute - teacher tuition and expenses(stipends, room/board/incidentals, travel);
- travel costs for Counselor Conference;
- future lab expansion when needed;
- annual budget for supplies and materials;
- implementation of the entire five-unit, PLTW curriculum of high school courses in four years or less and/or implementation of Gateway to Technology in three years or less;
- participation on local leadership and partnership teams;
- participation in evaluation of the program.

National Alliance For Pre-Engineering Programs

Project Lead The Way®

www.pltw.org

Project Lead The Way ®(PLTW) is a 501 (c) (3) not-for- profit national corporation that forms partnerships among public schools, higher education institutions and the private sector to increase the quantity and quality of engineers graduating from our educational system..

Support for Project Lead The Way® activities is provided by a not-for-profit charitable foundation.

For more information on the PLTW pre-engineering initiative contact:

Dr. William Simonton
President
New Hampshire Technical Institute
11 Institute Drive
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(603) 271-7737
wsimonton@tec.nh.us

Dr. James Leon
Project Lead The Way®
New Hampshire Technical Institute
11 Institute Drive
Concord, New Hampshire 03301
(603) 271-6954
jleon@tec.nh.us

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SREB

HSTW Presents a Pre-engineering Program of Study

in partnership with

National Alliance For Pre-Engineering Programs℠

Project Lead The Way®
www.pltw.org

Southern
Regional
Education
Board

592 10th St. N.W.
Atlanta, GA 30318
(404) 875-9211
www.sreb.org

The Southern Regional Education Board's *High Schools That Work* is a national school-improvement initiative. More than 1,100 schools in 26 states are using the *HSTW* framework of goals and key practices to make whole-school changes aimed at raising students' academic, technical and intellectual achievement.

Support for Project Lead The Way is provided by a not-for-profit charitable foundation.

High Schools That Work Presents a Pre-engineering Program of Study

The need for engineers and engineering technologists

Engineering is a part of everything around us. Engineers and engineering technologists create the systems that purify our water, protect our environment and monitor our food and drugs. They develop medical instruments and artificial organs that save and improve lives. They design robotic components, space stations, cellular phones and high-speed trains.

The work of engineers and engineering technologists is vital, stimulating, profitable, creative and abundant. U.S. Department of Labor statistics reveal that 20 percent more engineers will be needed by the end of this decade. Many positions in engineering and related technology are vacant because of the lack of qualified candidates. Why? The number of students enrolled in engineering programs hit a 17-year low in 1999, according to the National Society of Professional Engineers. Enrollment in engineering technology programs in 2000 was about half what it was in 1990. The problem is compounded further by the fact that more than half of the students in postsecondary engineering and engineering technology programs drop out or change majors.

The world of technology requires strong mathematics and science skills, plus the abilities to read and write well, to think and reason, and to explain complex concepts. Sadly, too many students lack the rigorous academic background or the reasoning and problem-solving skills to pursue further study or to work in engineering and engineering-related fields. As a result, technical industries suffer, even though the job opportunities, salaries and benefits in these fields are very desirable.

"It is disconcerting to see technical jobs, particularly in manufacturing, migrating out of the country. This phenomenon will ultimately undermine our standard of living in the United States. Project Lead The Way is proving to be a program which addresses the causes of that migration at their base: the motivation of our talented youth and the quality of their education in technology."

Frank D. Zaffino, Senior Vice President (retired)
Worldwide Manufacturing Division
Eastman Kodak

The Southern Regional Education Board recognizes that many opportunities await young people who complete an upgraded academic core and a career/technical concentration. For this reason, SREB's *High Schools That Work* has formed a partnership with Project Lead The Way to connect challenging academic courses with a pre-engineering program of study.

Project Lead The Way Inc. is a not-for-profit organization that works with public schools, the private sector and higher education to increase the quantity and quality of engineers and engineering technologists by providing high school students with engaging pre-engineering studies. The program complements the major goals of the *High Schools That Work* school-improvement design:

- to increase the percentage of high school students who complete college-preparatory studies and perform at the proficient level in reading, mathematics and science; and
- to blend the essential content of traditional college-preparatory studies with challenging career and technical studies.

Increasing opportunities for students

Students who are introduced to engineering and engineering technology in the middle grades and high school can decide — prior to college — whether they are interested in engineering-related careers. A challenging academic and pre-engineering program of study equips students to move easily from high school into high-tech jobs, further training at community or technical colleges, or programs of study at four-year colleges. Students who have been well-prepared in high school are less likely to drop out of college programs.

The goal of Project Lead The Way is to increase the number and quality of engineers and engineering technologists by providing:

- a fully developed curriculum for high schools;
- a middle grades technology curriculum;
- extensive training for teachers;
- training for school counselors;
- access to affordable equipment; and
- college-level certification and course credit.

"Project Lead The Way represents what new high school career/technical programs must become. The pre-engineering curriculum is to high school career/technical studies what Advanced Placement courses are to academic studies. It provides instructional materials for teachers, a professional development program to prepare them to teach and end-of-course exams to determine if students mastered the content."

James R. (Bob) Couch, Director
Office of Career and Technology Education
South Carolina Department of Education

The middle grades program

Project Lead The Way offers a middle grades curriculum — Gateway to Technology. This project-based, cutting-edge program introduces students in grades six through eight to the broad field of technology. It is "activity-oriented" to show students how technology is used in engineering to solve everyday problems.

Gateway to Technology consists of four independent units that should be taught in conjunction with a rigorous academic curriculum. The units are designed to challenge and engage the exploratory minds of middle grades students. Each 10-week unit contains performance objectives and suggested assessment methods. In sequence, the units are:

- **Design and Modeling** — This unit uses solid modeling (a very sophisticated mathematical technique for representing solid objects) to introduce students to the design process and to show them how this technology has influenced their lives. Using design briefs or abstracts, students create models and documentation to solve problems.
- **The Magic of Electrons** — Students see the wonders of electricity and electronics, design simple circuits and explore the impact of electricity on our lives.
- **The Science of Technology** — This unit traces how science has affected technology throughout history. Students learn about the mechanics of motion, the conversion of energy and the use of science to improve communication.
- **Automation and Robotics** — Students trace the history and development of automation and robotics. They learn about structures, energy transfer and machine automation. They also find out what they need to study in high school and beyond to prepare for careers in engineering.

Each school district decides how to schedule these units into the curriculum. Schools are encouraged to offer the first unit to sixth-graders, but they may decide to teach all four units in the eighth grade. For maximum impact on student achievement, the Gateway to Technology curriculum should be combined with a challenging academic curriculum in which:

- students complete Algebra I successfully or pass a pre-algebra proficiency test and use algebra concepts to reason and solve problems;
- students use laboratory and technology experiences to learn scientific concepts in physical, life and earth/space sciences;
- reading instruction is included in the academic core curriculum through grade eight;
- students use language correctly and effectively to find, organize and report on information through reading, writing, speaking and listening; and
- students describe their heritage, their government, their world and economic principles through the study of key issues of the past, present and future.

The high school program

The PLTW standards-based pre-engineering curriculum challenges students to solve real-world engineering problems by applying their knowledge and skills in mathematics, science and technology. Students who complete the curriculum and challenging academic studies:

- understand technology as a problem-solving tool;
- understand the scientific process, engineering problem-solving and the application of technology;
- understand how technological systems work with other systems;
- use mathematics knowledge and skills in solving problems;
- communicate effectively through reading, writing, listening and speaking; and
- work effectively with others.

The four-year pre-engineering sequence consists of five hands-on courses:

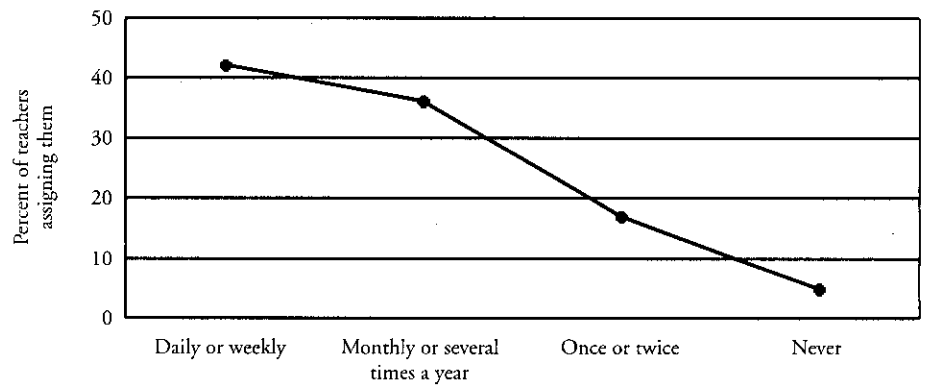
- **Principles of Engineering** provides an overview of engineering and engineering technology. Students develop problem-solving skills by tackling real-world engineering problems. Through theory and practical hands-on experiences, students address the emerging social and political consequences of technological change. The course outline includes:
  - *Overview and Perspective of Engineering.* Students learn about engineers' contributions to society and examine careers in engineering.
  - *Communications in Engineering.* Students make written and oral presentations, graphic representations and computer-aided designs.
  - *The Process of Engineering.* Students learn to solve problems, work in teams and explore career opportunities in engineering and engineering technology.
  - *Engineering Systems.* Students learn about mechanical, electrical/mechanical, hydraulic, pneumatic and control systems, motors and generators.
  - *Quality-control systems.* Students learn about quality-control systems, including precision measurement, quality assurance and process control, production processes and computer-aided manufacturing.
  - *Materials and Materials Testing in Engineering.* Students learn the categories and properties of materials, the materials testing process and the suitability and applications of different materials.

■ **Introduction to Engineering Design** emphasizes the development of a design. Students use 3-D computer software to produce, analyze and evaluate models of project solutions. They study the design concepts of form and function, then use state-of-the-art technology to translate conceptual designs into reproducible products. This course teaches students to:

- understand and apply the design process to solve various problems in a team setting;
- apply adaptive design concepts in developing sketches, features, parts and assemblies;
- interpret their own sketches in using computer software to design models;
- understand mass property calculations — such as volume, density, mass, surface area, moment of inertia, products of inertia, radii of gyration, principal axes and principal moments — and how they are used to elevate a parametric model;
- understand cost analysis, quality control, staffing needs, packaging and product marketing;
- explore career opportunities in design engineering and understand what skills and education these jobs require; and
- develop portfolios to display their designs and present them properly to peers, instructors and professionals.

Students in the *High Schools That Work* network have higher achievement when their career/technical teachers frequently make assignments that require advanced skills in reading, mathematics and science. Students in the Project Lead The Way Year Two Evaluation said most PLTW teachers emphasize technical assignments that involve mathematics.

Frequency of Technical Assignments That Require Mathematics



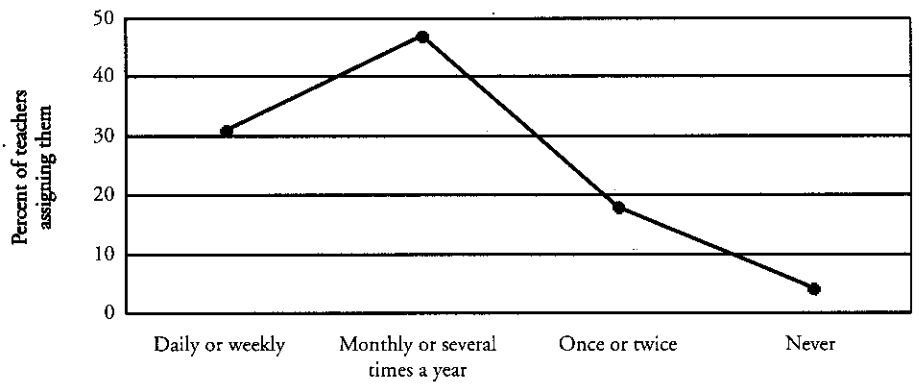
Source: Project Lead The Way Year Two (2000-2001) Evaluation Report prepared by Hezel Associates

- **Digital Electronics** introduces students to applied digital logic, a key element of careers in engineering and engineering technology. This course explores the smart circuits found in watches, calculators, video games and computers. Students use industry-standard computer software in testing and analyzing digital circuitry. They design circuits to solve problems, export their designs to a printed circuit auto-routing program that generates printed circuit boards, and use appropriate components to build their designs. Students use mathematics and science in solving real-world engineering problems. This course covers several topics, including analog and digital fundamentals; number systems and binary addition; logic gates and functions; Boolean algebra and circuit design; and decoders, multiplexers and de-multiplexers.

- **Engineering Design and Development** lets students apply what they have learned in academic and pre-engineering courses as they complete challenging, self-directed projects. Students work in teams to design and build solutions to authentic engineering problems. Their projects may include a robotic mascot for the school, a remote-controlled hovercraft or a solar-powered device. Students keep journals of notes, sketches, mathematical calculations and scientific research. Student teams make progress reports to their peers and the instructor and exchange constructive criticism and consultation. At the end of the course, teams defend their projects to a panel of engineers, business leaders and educators for professional review and feedback. This course equips students with the independent study skills that they will need in postsecondary education and careers in engineering and engineering technology.

Forty percent of students in the PLTW Year Two Evaluation said high school classes in general were not challenging. Yet, according to these same students, PLTW teachers frequently challenged them to work hard.

Frequency of Challenging Assignments in PLTW Classes
(as reported by students)



Source: Project Lead The Way Year Two (2000-2001) Evaluation Report prepared by Hezel Associates

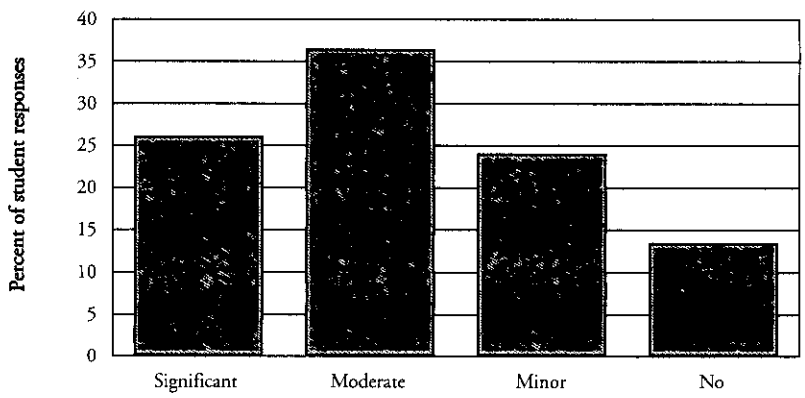
- **Computer Integrated Manufacturing** teaches the fundamentals of computerized manufacturing technology. It builds on the solid-modeling skills developed in the Introduction to Engineering Design unit. Students use 3-D computer software to solve design problems. They assess their solutions through mass property analysis (the relationships of design, function and materials), modify their designs, and use prototyping equipment to produce 3-D models. The course includes these integrated concepts:

  - ***Computer Modeling.*** Students use 3-D software for mass property analysis.
  - ***Computer Numerical Control (CNC) Equipment.*** Students develop an understanding of the operating procedures and programming capabilities of machine tools.
  - ***Computer-aided Manufacturing (CAM) Software.*** Students convert computer-generated geometry into a program to direct the operation of CNC machine tools.
  - ***Robotics.*** Students program robots to handle materials in assembly-line operations.
  - ***Flexible Manufacturing Systems.*** Teams of students design manufacturing work cells and tabletop factories to solve complex problems that arise in integrating multiple pieces of computer-controlled equipment.

While Project Lead The Way raised students' confidence in science, engineering and technology, more than half of the students in the PLTW Year Two Evaluation said the program also improved their confidence in other academic areas and increased their overall academic performance.

Extent of PLTW's Effect on Overall Academic Achievement

(as reported by students)



Source: Project Lead The Way Year Two (2000-2001) Evaluation Report prepared by Hezel Associates

Recommended academic sequence

The *High Schools That Work* Assessment shows that students who combine challenging academic studies with quality career/technical studies achieve at higher levels. Students in the PLTW pre-engineering program complete:

- four credits in college-preparatory English;
- four credits in college-preparatory mathematics (Algebra I, geometry, Algebra II and a higher-level mathematics course);
- four credits in lab-based college-preparatory science (physical science, biology, chemistry, and physics or applied physics); and
- three credits in college-preparatory social studies.

Aligning academic courses with pre-engineering courses

The pre-engineering sequence and the academic courses in the PLTW curriculum provide many opportunities for students to practice academic skills in the context of technical studies. Both academic and career/technical teachers can use this natural alignment of content to integrate the curriculum. For example, teachers can integrate geometry with Introduction to Engineering Design and physical science with Principles of Engineering. School leaders can support teachers in integrating curricula by:

- getting teachers to work in teams or pairs to align the curriculum by identifying key concepts taught in each course and determining when these concepts will be introduced;
- asking teachers to work together to develop instructional plans that integrate specific content with the key concepts;

Recommended Pre-engineering Program of Study

PLTW unit	English	Mathematics	Science	Social Studies
Principles of Engineering	Academic/Honors English I	Algebra I	Physical Science	
Introduction to Engineering Design	Academic/Honors English II	Geometry	Biology	World History
Digital Electronics; Engineering Design and Development	Academic/Honors English III	Algebra II	Chemistry	American History
Computer Integrated Manufacturing	Academic/Honors English IV	Trigonometry or Pre-calculus	Physics	Government/ Economics

- scheduling back-to-back courses so that teachers can plan together, teach in teams and conduct joint activities; and
- offering professional development on applied learning, integrated academic and technical learning, and other effective instructional practices.

Receiving college credit

Students who take pre-engineering courses in high school can receive college credit from Rochester Institute of Technology[1] in New York. After RIT reviews a program and certifies that it meets standards (curriculum, teacher training, equipment, guidance, etc.), students in that program can earn college credit if they make grades of 85 percent or higher in Introduction to Engineering Design,[2] Digital Electronics or Computer Integrated Manufacturing and if they score at least 70 percent on the RIT final exams for these courses.

There are many reasons to take RIT exams. These exams are open to any qualifying student in the program and indicate how students will perform on college tests. Students who meet the grade requirements may apply for RIT college credit at a charge of $200 per course — substantially less than regular college tuition. The student's grade is the one he or she received on the RIT exam. Students who attend RIT receive full credit for their high school pre-engineering courses.

Other colleges may accept RIT credit if it meets their requirements. Many parents have praised the PLTW pre-engineering program for helping their children gain admission to other postsecondary institutions. RIT college credit clearly is an asset to any student's admissions portfolio.

Professional development for teachers and counselors

Teachers — Teacher preparation is an essential component of any new instructional program. Project Lead The Way has developed a comprehensive, intensive training program to prepare teachers to use the cutting-edge technology that is integral to the curriculum. This training consists of three phases:

- **Pre-assessment** — Teachers use an online assessment instrument to measure their readiness for training. They analyze the results and, if needed, engage in activities to gear up for the summer institute.
- **Summer training institute** — Teachers attend a two-week institute to earn certification for each new course they will teach in the fall. Rochester Institute of Technology offers graduate credit.

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1 Rochester Institute of Technology is a coeducational, privately endowed institution with more than 14,600 undergraduate and graduate students preparing for technical and professional careers. Located in Rochester, New York, the school was founded in 1829. It is accredited by the Middle States Association of Colleges and Schools.

2 In New York, Introduction to Engineering Design is called Design and Drawing for Production.

- **Ongoing training** — Teachers receive ongoing support and instruction as they implement the program. Instruction may be conducted face-to-face or through a variety of distance-learning options. A strong support network is in place to share information and solve problems via electronic communication.

Any middle grades or high school teacher who plans to teach the courses must complete the 75-hour, two-week summer institute, which meets college standards. Teachers may earn graduate credit from Rochester Institute of Technology by demonstrating that they have met the standards and by developing portfolios, passing written exams or writing papers.

The institutes are offered at several national training centers: Rochester Institute of Technology (New York), Colorado Institute of Technology, Ferris State University (Michigan), New Hampshire Technical Institute, Purdue University (Indiana), the University of Houston (Texas) and the University of South Florida. Travel, room/board and other costs vary by location. Additional centers are expected to open soon in other parts of the country. For more information, visit the PLTW Web site at www.pltw.org or contact Guy Johnson, director of the National Technology Training Center at Rochester Institute of Technology, 137 Lomb Memorial Drive, Rochester, NY 14623. He can be reached by phone at (585) 475-2161 or by e-mail at gnjics@rit.edu.

Counselors — School counselors are vital to the pre-engineering program's success. PLTW makes a concerted effort to inform school counselors about the benefits of the program and the various careers available in the field. Participating school districts are invited to send middle grades and high school counselors to an annual conference. By sending different counselors each year, schools can ensure that all counselors have the opportunity to attend a conference. All counselors need to understand the program and its sequence of academic and pre-engineering courses so that they can help students and parents make important decisions about high school programs of study. Each counselor receives brochures, videotapes and other items to introduce PLTW to students and their parents.

Building local, state and industry partnerships

Project Lead The Way leaders work closely with business, education and professional organizations nationwide. These partnerships have resulted in a model curriculum, teacher training and development, and a national network of consultants. In addition, leaders from many state departments of education work with PLTW and with local school districts to support the program.

Schools that participate in PLTW are required to establish teams of postsecondary educators, parents and representatives of the private sector who will focus on implementing and sustaining a quality pre-engineering program. School leaders and teachers ask team members to:

- organize field trips to support classroom instruction;
- serve as mentors for students;
- provide guest speakers;

- handle public relations;
- provide expertise in specific engineering areas;
- suggest real-world projects that will engage students;
- consult with students working on projects;
- serve on panels to evaluate students' work; and
- provide advice and support for program implementation.

The partnership team also can support the program by arranging summer internships for high school juniors. A well-planned summer internship can improve academic, intellectual, technical and personal skills. The *High Schools That Work* guide *Planning and Conducting Student Summer Internship Experiences* contains step-by-step procedures, fact sheets and forms for use by students, parents, teachers, school coordinators and employers. The 76-page booklet is available from SREB for $7.50 — or $5 each for 10 or more copies.

Starting a new technical program

Although each district or school has its own procedure for implementing a new program, there are certain uniform requirements for Project Lead The Way. For example, the program must have the support of the district, the school, parents and the business community. A district or school can designate one or two people on the partnership team to help develop the awareness plan.

Key Dates in Implementing PLTW

March 1	First day to order from the PLTW national equipment bid list
March 15	Deadline for districts and schools to apply to offer the curriculum
May 1	Teacher self-assessment deadline
May 15	Last day to register for summer training institutes (online at www.pltw.org)
June 1	Deadline to submit the PLTW and School Agreement
June - August	Summer training institutes
Sept. 30	Last day to order from the PLTW national equipment bid list.
October	Annual conference for guidance counselors, Location A (online registration at www.pltw.org)
November	Annual conference for guidance counselors, Location B (online registration at www.pltw.org)

To implement the PLTW pre-engineering curriculum, each district must complete a district application and each school must complete a school application. These applications, which must be completed by March 15, are available online at www.pltw.org. When both applications are received, PLTW staff will send out a written agreement that must be appoved by the school board and signed by the superintendent.

The PLTW and School Agreement

Effective long-term partnerships require clear expectations, open communication and loyalty to obligations. To facilitate strong partnerships with schools and districts, the PLTW and School Agreement outlines what each entity will provide.

PLTW provides:

- curriculum and resource guides for students;
- lesson plans, resources and teaching tools;
- curriculum review, revision and distribution;
- an online self-assessment for teachers;
- summer institutes for teachers (including classrooms, instructors, a curriculum and learning materials);
- ongoing teacher training (instruction only);
- a conference for guidance counselors (including facilities, materials and accommodations);
- increased purchasing power (coordinated bidding on and purchasing of furniture, hardware, software and supplies);
- information and support for schools and teachers;
- public relations materials for students and parents;
- national leadership (a board of directors and a national oversight committee); and
- independent evaluation of the national program.

Schools provide:

- equipment and software (must meet PLTW specifications);
- a laptop computer and software for each teacher in the program (must meet PLTW specifications);
- readiness training (as needed) before the summer institute;
- support for teachers to attend summer training institutes (stipends, travel, room/board and incidentals — these costs vary, depending on the training center);

- travel costs for guidance counselors to attend conferences;
- lab expansion when needed;
- annual budgets for materials and supplies;
- support to implement all five PLTW high school courses in four years or less and/or all four units of the Gateway to Technology program in three years or less; and
- community-based partnership teams.

High school programs must earn certification from Rochester Institute of Technology by the end of the second year of implementation, and all schools must participate in the evaluation component of the program.

Estimating program costs

Each participating school will develop a budget that includes the cost of equipment as each new course is introduced. Most schools add one or two courses per year and distribute the equipment costs over four years. During the first year, a school must purchase equipment for both the Principles of Engineering and the Introduction to Engineering Design courses. The budget also needs to include supplies and renewal fees for software licenses.

PLTW offers the program to schools at a low cost through a negotiated, national bid process. Schools may purchase equipment, furniture, tools and supplies from the bid list. They may use other suppliers, as long as the equipment meets PLTW specifications.

The following cost estimates are based on the 2001-2002 PLTW purchasing manual. Actual costs may vary. For up-to-date prices, check the PLTW Web site at www.pltw.org.

Middle School Costs

Computers	Equipment	Supplies	Furniture	Additional software	Consumables	Total
$31,239	$11,050	$3,057	$6,347	$1,952	$502	$54,147

Notes: The costs are based on 26 students per class.
The furniture costs are based on a "bare-walls" lab.
Consumables are based on a class size of 26 students and should be multiplied by the number of sections taught.
Resource materials (textbooks, laboratory manuals, instructional software, etc.) are not included.

The total cost for one middle grades Gateway to Technology lab with 26 student stations is about $54,000. The cost will be less if the school already has equipment and/or computers that meet PLTW specifications.

High School Costs

Course	Computers	Equipment	Supplies	Furniture	Additional software	Consumables	Total
Principles of Engineering	$0	$15,045	$458	$0	$0	$139	$15,642
Introduction to Engineering Design	$24,117	$8,943	$167	$5,420	$1,251	$567	$40,465
Digital Electronics	$0	$1,961	$2,975	$0	$0	$120	$5,056
Computer Integrated Manufacturing	$0	$32,810	$212	$1,323	$0	$0	$34,345
Total	$24,117	$58,759	$3,812	$6,743	$1,251	$826	$95,508

Notes: The costs are based on 20 students per class.
The furniture costs are based on a "bare-walls" lab.
Consumables are based on a class size of 20 students and should be multiplied by the number of sections taught.
Resource marerials (textbooks, laboratory manuals, instructional software, etc.) are not included.
There are no specified items for Engineering Design and Development.

The total cost for one high school lab with 20 student stations — equipped for all five courses — is approximately $95,500. The cost will be less if the school already has equipment and/or computers that meet PLTW specifications.

Annual Software Leases

Software description	Course	Seats	Annual cost
High school software:			$3,500
Autodesk Inventor R4	Introduction to Engineering Design; Computer Integrated Manufacturing	100	
Circuit Maker	Digital Electronics	25	
Mastercam	Computer Integrated Manufacturing	100	
Eshed Robotec Robocell	Computer Integrated Manufacturing	30	
Middle school software:			$1,800
Autodesk Inventor R4		100	

Software licenses (or seats) are districtwide. A district that has a high school and a middle school will need to purchase only the high school bundle unless it plans to load Autodesk Inventor on more than 100 seats.

What Students Say About PLTW Pre-engineering Classes

"I've learned engineering strategies, and my math and science skills have improved."

"I had been struggling in math, and now I understand math better — especially geometry."

"I have learned to budget my time better and solve problems accurately and cooperatively."

"It has given me a head start on college to get my computer science degree."

"Project Lead The Way exposed me to engineering. I learned about research, oral presentations and real-life business proposals."

For more information on the Project Lead The Way pre-engineering programs, contact:

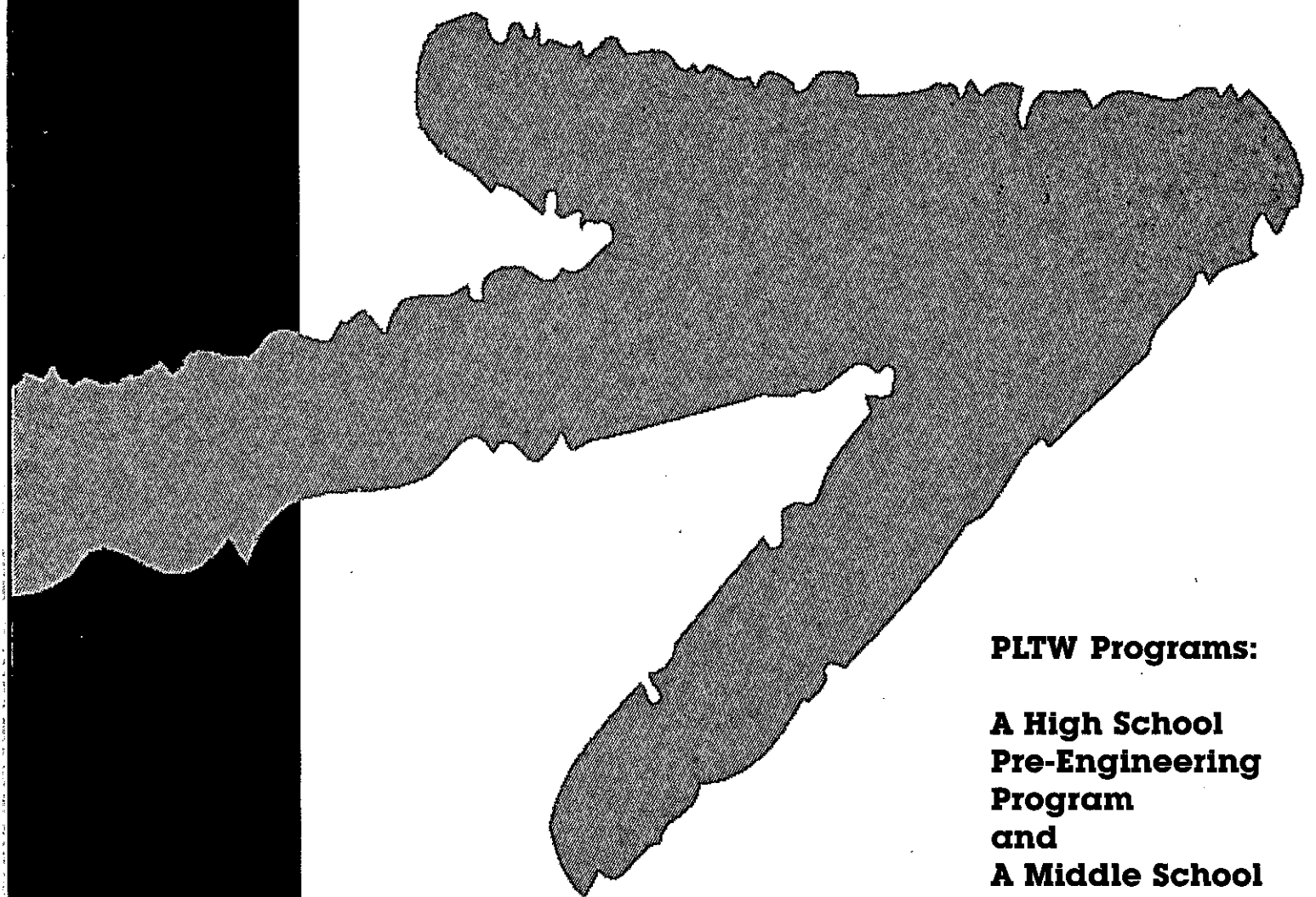
Northern Region	Western and Southwestern Regions	Southern Region
Richard Blais Executive Director Project Lead The Way 747 Pierce Road Clifton Park, NY 12065 Phone: (518) 877-6491, Ext. 315 Fax: (518) 877-6260 E-mail: blaisrr@worldnet.att.net	Richard Grimsley Director of PLTW Southwestern States 7806 Epping Lane Austin, TX 78745 Phone: (512) 442-5450 Fax: (512) 442-5450 E-mail: rgrimsley@pltw.org	Carolyn Helm, Director PLTW Pre-engineering Curriculum Southern Regional Education Board 592 10th St. N.W. Atlanta, GA 30318-5790 Phone: (404) 879-5598 E-mail: carolyn.helm@sreb.org

Or visit these Web sites: www.sreb.org and www.pltw.org

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National Alliance
For
Pre-Engineering
Programs℠

Project Lead The Way®
www.pltw.org



PLTW Programs:

A High School Pre-Engineering Program and A Middle School Gateway To Technology Program

An Invitation to Join Us

Project Lead The Way, Inc. invites you to learn about our dynamic, rapidly expanding pre-engineering and engineering technology program in middle and high schools. In this booklet, you will learn about the severe shortage of engineers and engineering technologists, about the commitment and financial support of the Charitable Venture Foundation, and about our mission, goals, courses, training, and support for teachers and counselors. Discover the benefits of our program to students, schools, and the business and educational communities. Consider future participation in our High School Certification and Exemplary Student Programs. Finally, find out how easy it is to enroll in our program, following a clear timeline and using our comprehensive website.

—Richard Blais, Executive Director

High-Demand, High Wage Careers

The United States is suffering from a severe shortage of engineers and well-educated technical workers. The nation has more than 1 million jobs available in these fields but no qualified candidates to fill them. One reason for this problem is that more than half of the students who enroll in postsecondary engineering and engineering-technology programs drop out because they were not adequately prepared in high school. In addition, according to *Design News* (May 1, 2000), experienced professionals will soon be retiring. Data show that 32% of engineers and scientists are between the ages of 50 – 59 and 20% are over 60.

As a result, U.S. technical industries are suffering, and salaries and benefits for those who do complete their education are very desirable. Job growth in America is increasing faster in the best paying occupations. Computer/information sciences, engineering and technology related occupations pay an average of 57% more than jobs in education, philosophy and social work, according to *Workforce 2020.*

Introducing students in middle school and high school to engineering and engineering technology will attract more of them to these fields and will allow them to determine (before college) whether they are interested in pursuing an engineering-related career. The PLTW graduate will be better prepared for engineering programs in college or technical school and will be more likely to succeed.

It is disconcerting to see technical jobs, particularly in manufacturing, migrating out of many states. This phenomenon, mirrored on a national level, will ultimately undermine our standard of living in the United States. Project Lead The Way® is proving to be a program, which addresses the causes of that migration, at their base, the motivation of our talented youth and the quality of their education in technology.

Frank D. Zaffino, President and CEO
Paragon Corporate Holdings
PLTW Board of Director

Rigorous and Relevant Curriculum

Project Lead The Way® *pre-engineering program*

- Meets national standards for mathematics, science, and technology education
- Offers a complete career/technical concentration with an emphasis on both mathematics and science
- Links demanding mathematics and science courses with quality academic/technical courses

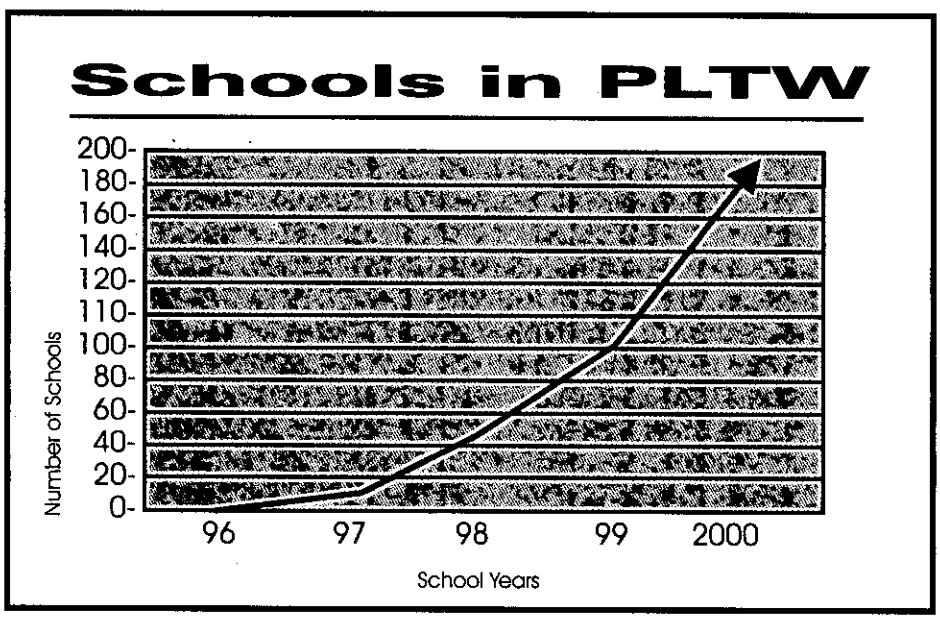
PLTW and National Standards

PLTW is a standards-driven program that continually requires students to reach higher standards in math, science, and technology in each of its courses. To establish these requirements, PLTW chose to incorporate the national standards of the following professional organizations in its program:

- The National Academy of Sciences
- The National Council of Teachers of Mathematics
- International Technology Education Association

Project Lead The Way® provides a tremendous opportunity for schools in the HSTW network to offer students a rigorous program of study that is relevant and timely in today's economy. The curriculum gives students many occasions to apply principles from mathematics, science and communication to solve real-world engineering problems. Our schools have proven that they can elicit greater effort and higher achievement from all students when expectations are raised, standards are used, and student work is meaningful and challenging.

Dr. Gene Bottoms
High Schools That Work
Southern Regional Education Board



STATES:

AL, AR, CA, CO,
CT, DE, FL, GA, IN,
KY, MA, MI, NH,
NJ, NY, NC, OH,
OK, PA, SC, TN, TX,
UT, VA, VT, WA, WI

Overview

Project Lead The Way, Inc. (PLTW) is a not-for-profit organization partnering with public schools, organizations in the private sector, and higher education institutions to increase the number and quality of engineers graduating from our educational system. The program is partially funded by Charitable Venture Foundation, a private foundation located in Albany, New York. PLTW has a support staff of experienced technology educators and college and university partners to support schools as they implement PLTW curricula.

PLTW has developed a four year sequence of courses which, when combined with college preparatory mathematics and science courses in high school, introduces students to the scope, rigor and discipline of engineering and engineering technology prior to entering college. The courses are

- Introduction to Engineering Design
  (Design and Drawing for Production in New York State)
- Digital Electronics
- Principles of Engineering
- Computer Integrated Manufacturing
- Engineering Design and Development

Introduction at this level will attract more students to engineering, and will allow students, while still in high school, to determine if engineering is the career they desire. Students participating in PTLW courses are better prepared for college engineering programs and more likely to be successful, thus reducing the attrition rate in these college programs, which currently exceeds 50% nationally..

PLTW has a comprehensive organizational structure in place to ensure continued participation and success. Key elements provide support at every level of the program. PLTW provides local, state and national organization for leadership and support, a model curriculum, teacher training and development, and consultant services. The participating School Districts implement the 5 course sequence based on a plan developed in partnership with colleges and universities, operate a Partnership Team with members drawn from higher education and the private sector, and serve as models for other school districts. Colleges and universities provide strategic regional leadership, involve industry, and assist school districts to establish partnership teams. Private Sector members provide advisors, supporters, mentors and financial support, and assist the colleges and school districts to achieve the goals of the program. School Partnering Teams advise and support the school districts in their operational plans.

There aren't that many Technology Education innovative programs out there. They don't take the kids to the next step, as PLTW does. Its five-course pre-engineering curriculum is challenging and requires students to apply what they have learned to real-world engineering problems.

Richard Grimsley,
Director of Technology Education,
Texas Education Agency

A critical component of the Project Lead The Way® program is its teacher training model. It was developed to provide the most intensive and comprehensive training to teachers becoming part of Project Lead The Way, Inc. The curriculum these teachers are required to teach utilizes cutting edge technology and software requiring specialized training. Significant attention is paid to assessing the teachers' readiness for training. Teachers then receive readiness training, if necessary, to prepare them for the intensive core training provided during a Summer Training Institute at Rochester Institute of Technology, PLTW's National Training Center. Ongoing training supports the teachers as they implement the program and provides for continuous improvement of skills.

Any person who is not aware of the implications of technology in his/her personal or business life is at disadvantage in today's rapidly changing world. Fortunately, some schools in our educational system have pioneered a new curriculum to better prepare our young people for this exciting and demanding environment. Project Lead The Way® is a thoughtful, dynamic, challenging secondary school initiative that is remarkably easy for schools to implement while enhancing educational opportunities in pre-engineering and engineering technology. I would like to see this curriculum innovation expanded to schools throughout our nation.

Dr. Ronald Sega, Dean
College of Engineering and
Applied Science, UCCS (CO)
Former Astronaut

Understanding that another key to success is awareness, PLTW makes a concerted effort to inform school counselors about the benefits of the program, as well as the wide array of technology jobs and careers available to students who enter the field upon graduation from high school and college. Counselors are supplied with PLTW materials, (available at www.pltw.org) including brochures and a video, to use with students and their parents.

In addition, PLTW has developed an exciting Middle School Technology Curriculum: *Gateway to Technology*. This project-based, cutting-edge curriculum is 40 weeks in length and is divided into four 10-week units: Design and Modeling; The Magic of Electrons; The Science of Technology; Automation and Robotics. Designed for all students, the units address national standards in math, science and technology. One of the goals is to increase interest and awareness of females and minority students in technology and related careers. *Gateway to Technology* will also encourage increasing numbers of students to elect the high school program.

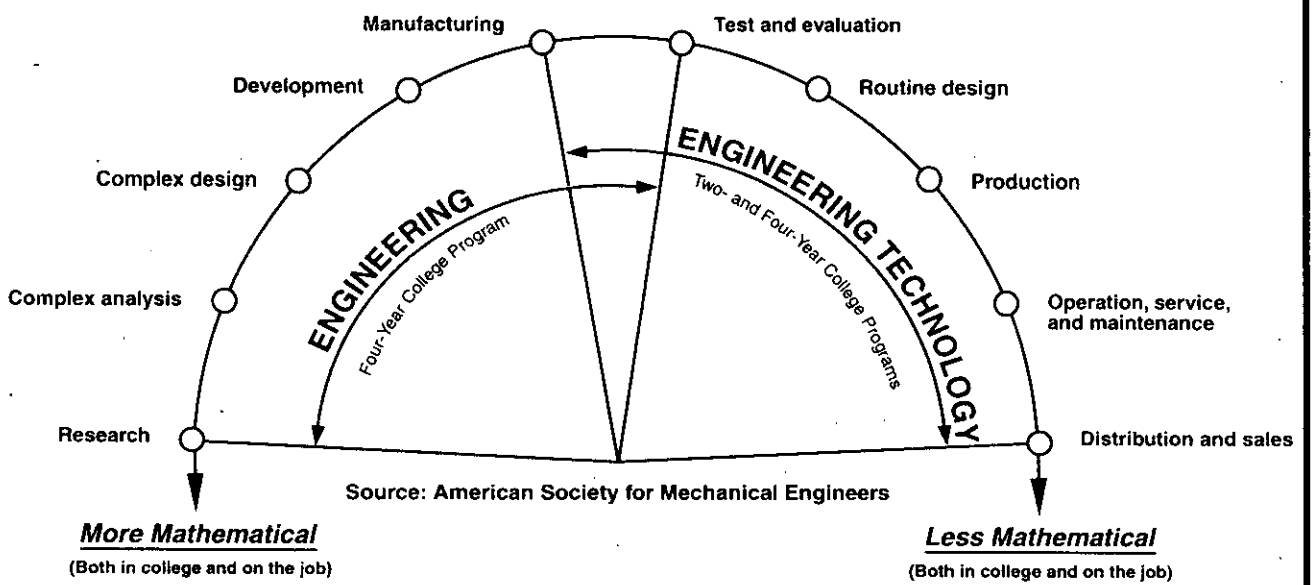
Mission Statement

Project Lead The Way® is a dynamic partnership between schools, colleges and universities, and the private sector, that seeks to increase the number of qualified high school students who complete a two or four-year college engineering or engineering technology program. The mission is achieved by providing:

- An innovative and relevant high school pre-engineering curriculum
- An interactive, project-based middle school technology curriculum
- A comprehensive teacher training program
- Continuous improvement in both the curriculum and in training
- Quality assurance through systematic program evaluation, and
- Leadership and support to PLTW schools and students on the national and state/regional level.

Goals

- Increase the number of young people who pursue engineering and engineering technology programs requiring a four or two-year college degree.
- Provide clear standards and expectations for student success in the program.
- Provide leadership and support that will produce continuous improvement and innovation in the program.
- Provide equitable and inclusive opportunities for all academically qualified students without regard to gender or ethnic origin.
- Reduce the future college attrition rate within two and four-year engineering and engineering technology programs.
- Contribute to the continuance of America's national prosperity.



Students planning to pursue a career path in engineering or engineering technology will find that mathematics plays an important part in every activity. Therefore, students must take the highest level of college preparatory mathematics they are capable of successfully handling in all four years of high school. This will help them develop a solid background in math skills and concepts, prepare them to take each level of the PLTW program, prepare them to succeed in the entry level mathematics course in college, and avoid regression between high school and college by taking math each year of high school.

Project Lead The Way® is an exciting high school pre-engineering program that combines high level academics and technical education to prepare students for careers in the engineering/technical industry. This is a model program for high schools who are focused on improving student achievement and successful placement in highly skilled occupations.

Rodney Kelly, Director
Kentucky Department of Education
Division of Secondary
Vocational Education

Math Requirements

PLTW provides the following samples of college preparatory mathematics sequences for students enrolled in the PLTW program. Schools may have other appropriate examples.

Level	Math Preparation for 2-year College	Math Preparation for 2 or 4-year College	Math Preparation for 4-year College
In Grade 8			Algebra 1
In Grade 9	Applied Algebra 1	Algebra 1	Geometry
In Grade 10	Applied Geometry	Geometry	Algebra 2
In Grade 11	Applied Algebra 2	Algebra 2 with Trigonometry	Pre-Calculus
In Grade 12	Applied Trigonometry	Pre-Calculus	Calculus
In College (2 or 4 yr)	Pre-Calculus	Calculus	Advanced Calculus

In a few states, an integrated math curriculum is utilized. Instead of Algebra 1, Geometry, and Algebra 2 with Trigonometry, students in these states would take Integrated Math Course 1, Integrated Math Course 2, Integrated Math Course 3.

The unique and wonderful features of Project Lead The Way® are that the curriculum, resource guides and teacher up front and ongoing training are provided free of charge to participating schools and instructors. The curriculum is continuously up-graded. Counselors are oriented to the program so they understand the curriculum needs of middle school and high school students. Project Lead The Way® needs to be considered by anyone looking to institute an Engineering Technology program.

Dennis Turner, Consultant
Academic and Curriculum
Integration Unit
California Department of Education

PLTW MIDDLE SCHOOL PROGRAM

Gateway to Technology (Grades 6 – 8) introduces students to the exciting world of real technology. Students use computers to transform solutions to problems that they visualize in their minds into real 3-D images. They make projects that explain the magic of the science that occurs naturally in our world. Students even work with automation and robotics. The course helps students understand technology as well as help them decide whether they want to continue in the PLTW high school pre-engineering program. [40 weeks divided into 4, 10-week units] The four units are as follows:

DESIGN AND MODELING

The goal of this unit is to introduce students to the design process using solid modeling. Students will understand how this technology has influenced our society and our lives. Using design briefs, students will create models and documentation that represent solutions to problems.

THE MAGIC OF ELECTRONS

The goal of this unit is to introduce students to the magic of electricity and electronics. Students will learn how electrons produce electromotive force and move from one atom to the next. They will design simple circuits to sense real world conditions and explore the implications of electricity on our lives.

THE SCIENCE OF TECHNOLOGY

The goal of this unit is to introduce students to the science of technology, tracing how science has effected technology throughout history. Students will learn about the mechanics of motion, about the conversion of energy from one form to another, and about the use of science to improve communication.

AUTOMATION AND ROBOTICS

The goal of this unit is to introduce students to automation and robotics, tracing their history and development. Students will learn about structures, energy transfer, and machine automation made possible by the introduction of control systems driven by computer programs. Students will identify the educational pathways necessary to be prepared for careers in engineering.

Gateway to Technology is a stimulating, eye-opening, hands-on introduction to the exciting new world of technology and to the PLTW integrated math, science, and technology program.

Dr. Patricia Hansen, Assistant Superintendent
North Shore Long Island, NY

INTRODUCTION TO ENGINEERING DESIGN

Introduction to Engineering Design is an introductory course, which develops student problem solving skills, with emphasis placed upon the concept of developing a 3-D model or solid rendering of an object. Students focus on the application of visualization processes and tools provided by modern, state-of-the-art computer hardware and software, Inventor This modern computer-based process replaces the traditional hand drawing methods. The course will emphasize the design development process of a product and how a model of that product is produced, analyzed and evaluated, using a Computer Aided Design System. Various design applications will be explored with discussion of possible career opportunities.
[1 Carnegie Unit] (In New York: Design and Drawing for Production and follow the NYS syllabus)

Requisite: Concurrent enrollment in college preparatory mathematics

DIGITAL ELECTRONICS

Digital Electronics is a course of study in applied digital logic. The course is patterned after the first semester course in Digital Electronics taught in two and four year colleges. Students will study the application of electronic logic circuits and devices and apply Boolean logic to the solution of problems. Such circuits are found in watches, calculators, video games, computers and thousands of other devices. The use of smart circuits is present in virtually all aspects of our lives and its use is increasing rapidly, making digital electronics an important course of study for a student exploring a career in engineering/engineering technology. Using Circuit Maker, the industry standard, students will test and analyze simple and complex digital circuitry. Students will design circuits using Circuit Maker, export their designs to a printed circuit autorouting program that generates printed circuit boards, and construct the design using chips and other components. [1 Carnegie Unit]

Requisite: Concurrent enrollment in college preparatory mathematics

The best years of my teaching began three years ago when I began Project Lead The Way.

Ken McDermith, Teacher
Mohonasen Central School
Rotterdam, NY

PRINCIPLES OF ENGINEERING

Principles of Engineering is a broad-based survey course designed to help students understand the field of engineering and engineering technology and its career possibilities. Students will develop engineering problem solving skills that are involved in post-secondary education programs and engineering careers. They will explore various engineering systems and manufacturing processes. They will also learn how engineers address concerns about the social and political consequences of technological change. The main purpose of this course is to experience through theory and hands-on problem-solving activities what engineering is all about and to answer the question, "Is a career in engineering or engineering technology for me?

Prerequisite: Introduction to Engineering Design
Requisite: Concurrent enrollment in college preparatory mathematics

COMPUTER INTEGRATED MANUFACTURING

This course builds upon the computer solid modeling design skills developed in *Introduction to Engineering Design.* Students will be presented with design problems that require the use of Inventor to develop solutions to the problems. They will evaluate the solutions using mass property analysis (study of the relationship among the design, function and materials used), make appropriate modifications and use prototyping equipment to produce three-dimensional models of the solutions. Students will be expected to communicate the process and results of their work through oral and written reports.

Prerequisite: Introduction to Engineering Design
Requisite: Concurrent enrollment in college preparatory mathematics

ENGINEERING DESIGN AND DEVELOPMENT

In this course, students will work in teams of two to four to design and construct the solution to an engineering problem, applying the principles developed in the preceding four courses. The problem may be selected from a database of engineering problems, be a recognized national challenge or be an original engineering problem identified by the team and approved by the teacher. The problems will involve a wide range of engineering applications (e.g. a school robo-mascot, automated solar water heater, remote control hover craft). Students will maintain a journal as part of a portfolio of their work. Each team will be responsible for delivering progress reports and making final presentations of their project for an outside review panel. The completed portfolio will be invaluable as students apply to college.

Prerequisites: All previous courses
Requisite: Concurrent enrollment in college preparatory mathematics

Because Project Lead The Way® is a national program, it was imperative that we apply a consistent set of standards to all of our pre-engineering courses. Local, state, regional, and national educators can find our math, science and technology goals and skills at the beginning of each course outline or unit in our Course Samplers on our website or soon on our CDs. We are committed to continually updating our curricula and reflecting the latest national standards.

Ken Ford, National Director
Curriculum and Training
Project Lead The Way, Inc.

A Sample Four-Year Student Schedule

Grade 9	Grade 10	Grade 11	Grade 12
English	English	English	English
Social Studies	Social Studies	Social Studies	Social Studies
Mathematics	Mathematics	Mathematics	Mathematics
Science	Science	Science	Science
Introduction to Engineering Design	**Digital Electronics**	**Principles of Engineering**	**Engineering Design and Development**
Foreign Language	Foreign Language	**Computer Integrated Manufacturing**	
Phys. Ed./SH	Phys. Ed./ SH	Phys.Ed./Health	Phys.Ed.
Music/Art/Business	Music/Art/Business	Music/Art/Business	Music/Art/Business

- All courses listed are for 1 Carnegie unit each, except health and physical education: .5 unit each.
- Some students may wish to retain a daily study hall and will have to forego other electives.
- Many high schools are implementing block schedules which appear to make more efficient use of time to schedule classes, permitting all of the courses shown to be scheduled without placing students under excessive pressure.
- Students will benefit significantly by enrolling in one or two PLTW courses if they are not able to take the whole sequence.

We feel extremely fortunate to have become involved in the early days of PLTW's fantastic program. Students in their 3rd and 4th years have gone well beyond what we could have imagined when we started the program.

Richard Cavallaro, Principal
Westhill High School
Syracuse, NY

In noting the depth of the Project Lead The Way® pre-engineering program at our high school, the Dean of Engineering at my son's first choice college remarked on the distinct advantage my son had over other applicants in understanding the technical and academic demands associated with electrical engineering study. Given the complexity surrounding a decision to pursue an engineering career, Project Lead The Way, Inc. and the National Alliance for Pre-Engineering Programs are not only uniquely supporting interested students but ultimately serving our nation's needs.

Stephen Lauko, Director,
Center Operations, Albany Medical Center
Albany, NY

GRADUATION EXPECTATIONS

1. Understand technology as a tool for problem solving and how it applies to the economy, individual lifestyles, standards of living, and career choices.
2. Have a broad-based understanding of the underly ing methodology of scientific processes, engineer ing problem solving and the applications of technology.
3. Be well prepared for the rigorous college curriculum that is part of an Engineering and Engineering Technology program.
4. Understand, apply, analyze and design technological systems as they interface with other systems and humans.
5. Select an appropriate technology system for a task and apply it, using the correct procedures, tools, equipment and methods of analysis.
6. Demonstrate an understanding of the principles of mathematics and their applications to problem solving.
7. Demonstrate effective communication of information and solutions in a variety of contexts, including the preparation and presentation of information in different settings.
8. Demonstrate the skills necessary to work in teams effectively.

In this context, technology is defined as the application of mathematically based scientific principles, that occur naturally in the world, to solve problems. Technology includes, but is not limited to, the use of the computer in problem solving.

PLTW'S exciting, hands-on program prepares students for technical careers in high skill, high wage areas. Our students enjoy this program so much they voluntarily stay after school and come in on weekends to work on their projects.

Laurie Maxson, Director of Career and Technical Education
School District #11
Colorado Springs, CO

The PLTW program is a great way for students to find out if engineering is right for them before entering college. It is also a great way to get a head start in the field of engineering. I would recommend the program to anyone who is considering engineering as a future occupation.

Kris Barnett, Senior
Morgan County
High School, KY

Benefits of the PLTW Program to Students

- Awareness of high-demand, high-wage careers
- Relevant application of mathematical and scientific principles
- Opportunity to express creativity through project-based learning
- Opportunity to solve real-world problems
- In-depth application of knowledge
- Exposure to the latest computer software and equipment used by industry, colleges and universities
- Hands-on activities that utilize team effort
- Skills required for jobs and postsecondary education
- Improved performance in academic work
- Increased communication skills
- Opportunity to receive transcripted, college credit

Benefits to Schools

- Efficiency in program planning, purchasing, training and curriculum development
- Free, regularly updated curriculum
- Free, regularly updated resource guides for students
- Student assessment rubrics and other materials
- Consistent curriculum and training that help to sustain the program over time
- Partnership with the Southern Regional Education Board and PLTW that supports the program's implementation and continued use
- A plan for selecting appropriate equipment, software and materials that incorporates a highly cost effective bidding system
- An organizational structure that offers program support at the local, regional, state and national levels

The PLTW bid process saved thousands of dollars in purchasing computers and other hardware for the PLTW courses and other programs in our school.

Donald Jones, Superintendent
SAU #24
Henniker, NH

Benefits to Business, Industry, and Colleges and Universities

Project Lead The Way® is one of the best national workforce development initiatives at the high school level that I have ever seen.

Dr. Karen Hitchcock, President
University at Albany
Albany, NY

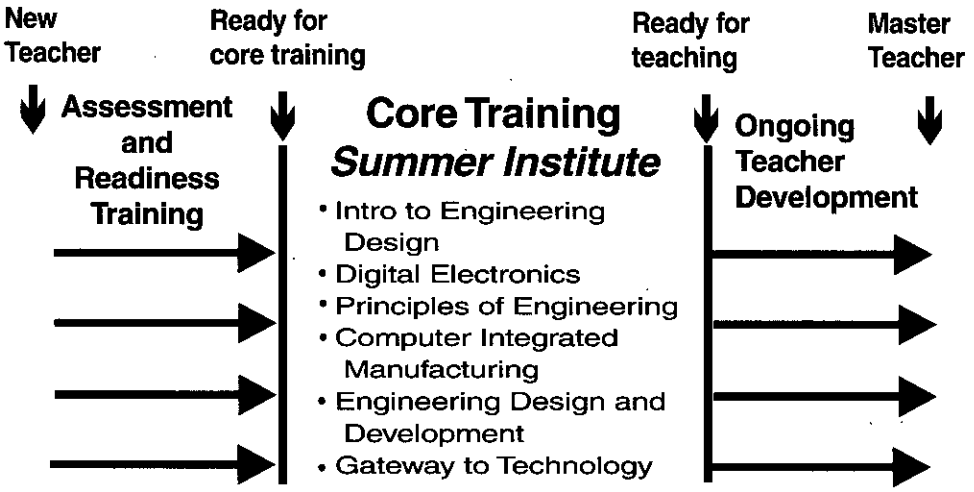
- A program that addresses a national shortage of highly skilled engineers and technicians
- A program that will enhance economic and work-force development for the local area
- Improved local education for employees' children
- An opportunity to work with and influence the local educational system through local and regional partnership teams
- Well-educated graduates of high school who are prepared for postsecondary education and technical work

Society of Manufacturing Engineers

Project Lead The Way® is one of four national programs to be recognized by the Society of Manufacturing Engineers for innovative curricula development directly related to manufacturing and engineering. (www.sme.org/toolbox)

The PLTW Teacher Training Model

Provides Initial and Continuous Improvement of Instructional Skills



The Principles of Engineering was without doubt the best run and executed seminar I have ever attended. My instructors were well prepared and delivered the content in a professional manner. All of the members of the PLTW team should give themselves a big hand - - you all did a great job. We will indeed be the envy of the educational field.

Bill Lehman, PLTW Instructor
Coronado HS
Colorado Springs, CO

TRAINING AND SUPPORT FOR TEACHERS

Teacher training is a critical component of any new instructional program. That is why Project Lead The Way, Inc. developed an intensive, comprehensive training program for teachers who receive special training in the cutting-edge technology that is part of the student curriculum. This training model consists of four parts:

Pre-Assessment

Significant attention is paid to gauging teachers' readiness for training through a self-assessment. Teachers will be able to analyze the result of their self-assessment and plan readiness training activities, if necessary, to prepare for the summer institute.

Readiness Training

School districts have the option of selecting a one-week course, prior to the Summer Training Institute, for teachers who need significant readiness training to establish a baseline of pre-requisite skills in mathematics and/or computers.

Summer Training Institute

The Summer Training Institute, an intensive two-week training program, prepares teachers to teach the specific courses which they will be teaching in the fall term. This "just in time training" program enables schools and teachers to initiate new courses each year, following the core-training during the Summer Institute. Graduate credit is available through Rochester Institute of Technology.

Ongoing Training

Teachers receive continuous support in improving their skills as they implement the program. PLTW manages electronic communication among teachers and staff at all PLTW sites to encourage them to work together to solve problems.

TRAINING AND SUPPORT FOR COUNSELORS

I found the PLTW Counselor sessions to be very informative: a first rate operation with excellent accommodations.

David Kliem, Counselor
McKinley Senior High School
Canton, OH

PLTW understands that another key to success is awareness. The annual Counselor Conference is designed to inform school counselors about the program's benefits and about the various careers in technology and engineering that are available to students who pursue this training. Counselors receive PLTW materials, including brochures and videotapes, to use with students and their parents. In addition, there is a Counselor section on the website which provides answers to frequently asked questions and feedback/suggestions from other counselors.

I liked the entire Counselor Conference!! Anything that can help students and society is a plus. PLTW fills the bill.

Patrick Stemas, Counselor
Dondero High School
Royal Oak, MI

ONLINE APPLICATION

Schools are encouraged to have the following information available before completing the online registration for the PLTW program:

- District name, superintendent, addresses and telephone/fax/email numbers
- Primary school district contact person for PLTW, address and numbers
- District purchasing agent, address and numbers
- High school name(s), principal(s), address and numbers
- Primary high school/middle school contact person(s), address and numbers
- Numbers of students taking college prep math, of graduates, of students taking the SAT and the ACT, the average SAT scores, the average ACT and composite ACT scores, and the number of graduates who plan to attend 2 and 4 year colleges.

PLTW is the best approach that I have seen to developing the future technology workforce. PLTW is expanding the pipeline of students entering technology career preparation programs and is clearly giving me a strategic advantage in recruiting technology companies to my region.

Kenneth Green, President
Saratoga Economic Development Corporation (NY)

EXPENSES AND COMMITMENTS – A PARTNERSHIP

Project Lead The Way, Inc. *provides:*

- Free curriculum and free resource guides for students (both regularly updated)
- Curriculum review, revision and distribution
- Teacher assessment
- Summer teacher institutes (classrooms, instructors, curriculum, learning materials)
- Ongoing teacher training (instruction only)
- Counselor Conference (accommodations, materials and facilities)
- Electronic communication among teachers and staff
- Increased purchasing power (coordinated bidding and purchasing of furniture, hardware, software and supplies)
- Management personnel (supports nationwide implementation)
- Public relations materials for students and parents
- Program systematic evaluation
- Information and technical support for schools and teachers
- National leadership (Board of Directors and National Oversight Committee)

Schools *provide:*

- Equipment and software
- Laptops – provide each teacher teaching PLTW courses with a laptop and software that meet or exceed PLTW specifications
- Pre-core training – prior to Summer Training Institute (if necessary)
- Summer Training Institute – teacher expenses (stipends, room/board/incidentals, travel)
- Travel costs for Counselor Conference
- Future lab expansion when needed
- Annual budget for supplies and materials
- Implementation of the entire five-unit, PLTW curriculum of high school courses in four years or less and/or implementation of *Gateway to Technology* (middle school program) in three years or less
- Participation on local leadership and partnership teams
- Participation in evaluation of the program

ESTIMATED PROGRAM EXPENSES

PLTW offers the lowest cost to schools through its negotiated, national bid process. Schools may participate in the bid list to purchase equipment, furniture, tools and supplies at minimal cost, including shipping to schools within the 48 contiguous states, or may purchase them from other suppliers if they meet or exceed the specifications to support the curriculum. A variable in the cost is the number of computers needed in the school lab. The $95,000 and $60,000 represent a list of items including all hardware and furniture needed to teach all five high school courses; included in these prices are 20 computers for the high school program and 26 computers for the middle school program. Existing equipment that meets or exceeds the PLTW specifications will reduce the cost of the program for schools. In addition, schools can purchase new equipment over a four-year period to match their implementation plan. Schools with larger class sizes would need to add approximately $1200 for each additional computer beyond 20 (high school) and 26 (middle school). PLTW will supply a purchasing manual in the spring to all registered schools.

Training Costs *

- Readiness Training (optional)
  - Tuition (per week)
  - Room & Board & Incidentals
  - Travel
  - Teacher Stipend
- Summer Training Institute
  - Tuition (per two weeks)
  - Room & Board & Incidentals
  - Travel
  - Teacher Stipend

* Training costs will vary depending on the levels of support within each state in partnership with the PLTW National Training Center. Consult your PLTW state contact person and our website (www.pltw.org).

Equipment Costs **

- High School Program
  - Equipment $95,000
- Middle School Program
  - Equipment $60,000

** Existing school equipment that meets or exceeds the PLTW specifications will reduce the cost of the program for schools.

Ongoing Supplies & Software

- Supplies (Dependent on number of sections)
- Software Lease .....
  - High School Software $3,500
  - Middle School Software $1,800

Prices may change in subsequent years. Consult our website for the latest information on costs and procedures for ordering: www.pltw.org

NATIONAL TRAINING CENTER AT RIT

Rochester Institute of Technology, recognized as a major Engineering and Engineering Technology training institution in the United States, plays a significant role in the development and implementation of the Project Lead The Way® program. With RIT as its National Training Center, PLTW continues to enjoy an excellent, unique teaming relationship with RIT as hundreds of teachers are trained during the Summer Training Institute to teach the *Gateway to Technology* and *Pre-Engineering* curricula and pedagogy. Teachers may also elect to receive graduate credit for the summer courses. In addition, RIT oversees the program's quality standards through the High School Certification and the Exemplary Student Recognition programs. Other colleges/universities through an affiliation with RIT can provide similar services and programs to middle and high schools in their region.

I am most impressed with the PLTW teacher training component which is key to the success of a pre-engineering program.

Dr. John Hansen
College of Technology
University of Houston (TX)

National Certification and College Credit

The Rochester Institute of Technology National Technology Training Center, home of the Project Lead The Way® Summer Institute, and Project Lead The Way, Inc. have created two new programs: High School Certification and Exemplary Student Recognition.

The RIT/PLTW High School Certification program will recognize schools which have successfully implemented the PLTW curriculum and will provide an opportunity for students to receive RIT college credit. The process includes four steps: self-assessment, a site visit, classroom/ portfolio review, and RIT/PLTW certification.

PLTW's unique, challenging pre-engineering and engineering technology program has paved the way for present and future generations to meet the engineering needs of our country. RIT is proud to be PLTW's National Training Center which brings classroom teachers from across the country and RIT professors together in a stimulating learning environment. In addition, our graduate credit for PLTW teachers and our transcripted credit for exemplary PLTW students demonstrate our confidence in the teaching staff and the standards they have established for PLTW students.

Dr. Albert J. Simone, President
Rochester Institute of Technology (NY)

The RIT/PLTW Exemplary Student Recognition program will provide an opportunity for students in an RIT/PLTW certified school who have excelled in selected PLTW courses to receive transcripted, college credit for Introduction to Engineering Design (in NY called Design and Drawing for Production) and Digital Electronics. For more details, consult our website:

www.pltw.org.

BENEFITS OF JOINING PLTW

- An introduction for students to careers in engineering and engineering technology
- A coordinated national program linking schools, colleges, universities and the private sector to address a critical national need
- An established, dynamic curriculum for both the Middle School and the High School
- A curriculum (available on CD) and pedagogy which will be used throughout the country
- Standards in the end-of-course examinations
- An opportunity to buy equipment, the latest software, and supplies used in the program through an annual bid process
- A unified website which provides the latest information for students, parents, teachers, counselors, colleges, business and others
- A teacher training program that provides pre-assessment and optional readiness training, core training in the Summer Training Institute, and continuous ongoing training each year
- Distance learning with scheduled events and tutorials available on CD for guided practice for teachers on their own or in groups (2001)
- Evaluation to determine the success of the training, instructional procedures, and mission
- National Training Center at Rochester Institute of Technology to provide summer training programs
- A process by which high schools may become Nationally Certified
- A process by which qualified high school students may receive transcripted college credit for PLTW courses

Project Lead The Way® (PLTW) is the best solution that I have found for encouraging high school students to take more math and science courses and to reach the level of understanding needed to be successful in engineering and engineering technology programs. PLTW gets to the heart of the problem - the curriculum. If the United States is to meet the demand for engineers and engineering technologists, our colleges and universities must support programs like PLTW.

Dr. Michael T. O'Hair
Director
Purdue University
School of Technology at
Kokomo (IN)

- A process by which high school teachers may receive college credit for PLTW course work
- A unique team-teaching approach involving a PLTW-trained teacher and a PLTW-trained college professor

Key Dates to Remember

March 1:	First Day to Order from PLTW National Bid List
March 15:	School Application Deadline
May 1:	Teacher Self-Assessment Deadline
May 15:	Registration Deadline: Summer Training Institute
May 15:	Registration Deadline: Readiness Training
June 1:	*Contract Submission Deadline*
July 15:	Fischertechnik and Software Ordering Deadline
July (wk 1 and/or 2):	Readiness Training at RIT
July (wks 1 & 2):	Summer Training Institute (Session 1)
July (wks 3 & 4):	Summer Training Institute (Session 2)
September 30:	Last Day to Order from the PLTW National Bid List

Project Lead The Way, Inc. (PLTW) is a 501 (c)(3) not-for-profit national corporation that forms partnerships among public schools, higher education institutions and the private sector to increase the number and quality of engineers graduating from our educational system. Currently operating in 26 states from New York to California, PLTW recently became a partner with the Southern Regional Education Board's *High Schools That Work* initiative, which works with schools in 23 states.

Project Lead The Way, Inc. Board of Directors

Richard Liebich, Chair

Richard Blais, Executive Director

Dr. Gene Bottoms, Senior Vice President
Southern Regional Education Board

Dr. Stanley McKenzie, Provost and VP
for Academic Affairs
Rochester Institute of Technology

Dr. Dale Parnell, Emeritus

Frank Zaffino, President and CEO
Paragon Corporate Holdings

Project Lead The Way National Oversight Committee

Richard Blais, Chair
PLTW National Oversight Comm. (NY)

Dr. Gary Adelson, Director
Research & Evaluation, Newsletter
Counselor Conferences, PLTW (NY)

Bryan Albrecht, Division Director
Department of Public Instruction (WI)

George Gonzalez, Director of Technology
Bergen County Technical Institute
State Director, PLTW (NJ)

Scott Griffith, Dean
Engineering Technology Center
American River College (CA)

Richard Grimsley, Director
Technology Education
State Education Agency (TX)

Carolyn Helm, Director, PLTW
Southern Regional Education Board
High Schools That Work (GA)

Guy Johnson, Director
PLTW National Training Center
Rochester Institute of Technology (NY)

Gregory Kane, State Supervisor
Technology Education
Department of Education (CT)

Rodney Kelly, Director
Division of Secondary Vocational Education
Department of Education (KY)

Kenneth Ford, National Director
Curriculum & Training, PLTW (NY)

Patrick Leaveck, Program Coordinator
Genesee Area Skill Center
State Director, PLTW (MI)

Dr. Thomas Coseo, Superintendent
Clarence CSD (NY)

Dr. Joseph Oakey, President Emeritus
Autodesk Foundation
Director, PLTW (Pacific Coast)

Carol O'Leary, VP for Education
United States Space Foundation
State Director, PLTW (CO)

Dr. William Simonton, President
New Hampshire Technical Institute
State Director, PLTW (NH)

Dr. Kendall Starkweather
Executive Director
Intl. Technology Education Association (VA)

Dr. Leonard Sterry, Graduate Program Director
University of Wisconsin – Stout
State Director, PLTW (WI, MN)

Dr. Franklin Wilbur, Associate VP
Syracuse University
Coordinator, PLTW (NY)

Support for Project Lead The Way® activities is provided by a not-for-profit charitable foundation.

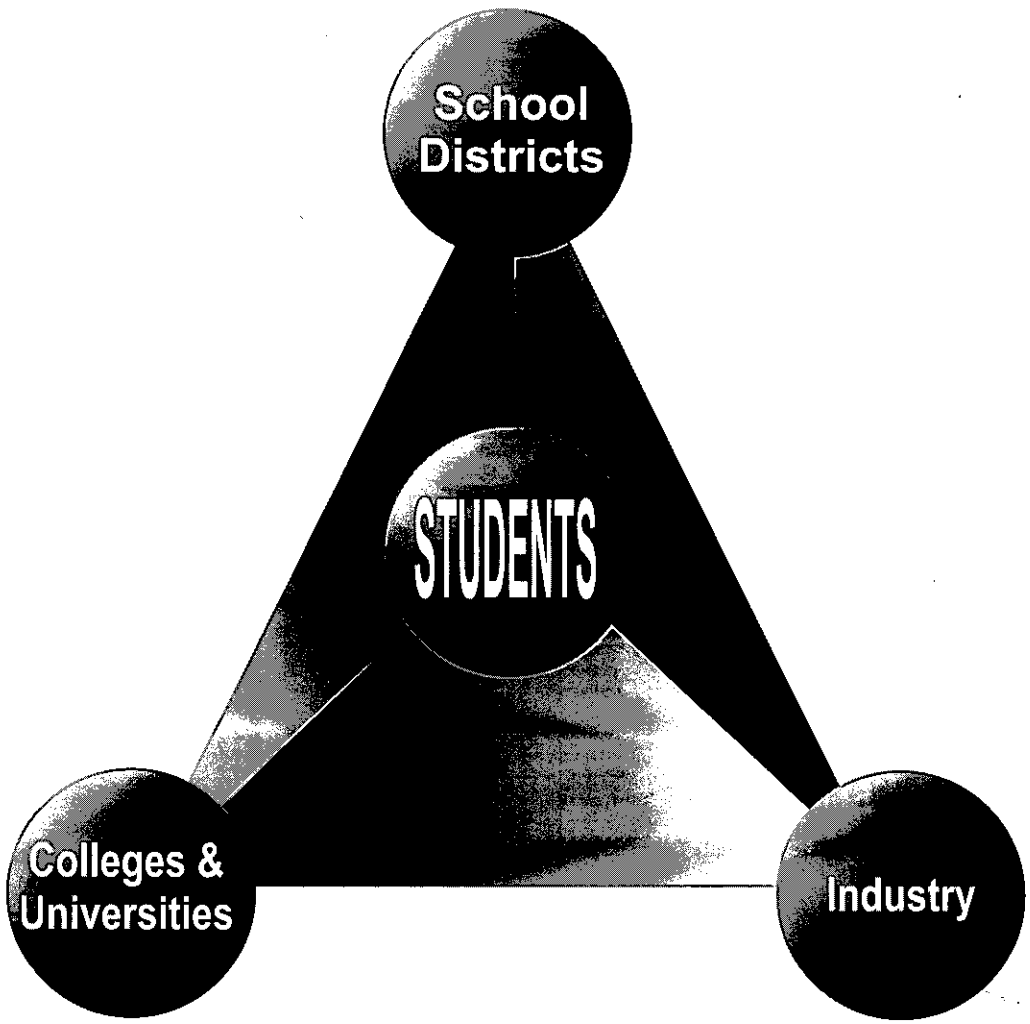
Partners

Rochester Institute of Technology
Southern Regional Education Board
Society of Manufacturing Engineers
For Inspiration and Recognition of Science and Technology (FIRST)

For more information on the PLTW pre-engineering initiative, contact:

www.pltw.org

Project Lead The Way®
-Partnership Model-



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Project Lead The Way®
Albany, NY

UNIVERSITY OF NEW HAMPSHIRE

Department of Electrical and Computer Engineering
College of Engineering and Physical Sciences
Kingsbury Hall
33 College Road
Durham, New Hampshire 03824-3591
(603) 862-1357

January 14, 2002

Honorable William Leber
Legislative Office Building
Concord, NH 03301

Dear Bill:

I'm writing in support of HB1231-FN, an Act implementing a pre-engineering technology curriculum in public high schools in the state.

I am a Professor Emeritus of Electrical Engineering and also an Adjunct Professor of Engineering Technology at UNH. I begin teaching at UNH in January, 1952, and I continue to teach my illumination engineering course in the fall semester each year. Thus I have just completed my 50th year of teaching at UNH. I also served for 18 years on the Oyster River school board.

For sometime, I have been concerned that youngsters in our school systems who show an excitement for math and science in the early grades, do not continue that excitement through high school. As the Governor and others have noted, there is a pressing need for more technically-trained people to enter the New Hampshire workforce. HB1231-FN is a positive step in the direction of getting kids involved in engineering and technology in time for them to think about careers in those areas. (I do hope that in Section 188-E:14 you can insert .... careers in engineering and engineering technology, or allied ... UNH offers a BS in Engineering Technology. This program will move to UNH Manchester in the summer of 2002).

One very positive aspect of HB 1231-FN is that the program is project-oriented. Thus students will get hands-on technical experience, which is so important in introducing young people to engineering and engineering technology.

Thank you for being a sponsor of this bill. If I can help in any way toward its implementation, I would be delighted to do so.

Sincerely,

Joe

Joseph B. Murdoch
Professor Emeritus of EE

Good afternoon Mr. Chairmen and member of the committee. Thank you for time today on this critical issue.

I am John Ford, Global Manager for Technical Vitality at Celestica, Inc.

We are here today to talk about the funding of Project Lead the Way. A program designed to increase the number of young people entering into the engineering and hi-tech world.

A world that has continued to see enormous growth world-wide, but continues to see a down-turn in US Students with engineering and engineering technology degrees entering the workforce.

The trend in engineering degrees awarded since 1988 has been a 10 – 15 % decline in all areas, but over a 40% decline in Electrical and Computer Engineering degrees.

Engineering Technology Associate degrees has experienced a 15% decline in that same period and a 33% decline in Bachelor's Degrees.

This trend forces many industries that rely on engineers and engineering technologists to do one of two things: send the work to areas of the world where the talent is available or bring the talent to where the work is.

The result is a continued rise in the demand for H1B Visas and/or more jobs being lost due to the relocation of work to off-shore locations.

Most high tech companies agree that the manufacturing jobs that are high-volume low-technology will continue to move to locations where labor costs are low – this is a result of competition and demands for lower costs from the customer world wide.

However, these same companies also agree that the need for talented engineers will still be strong in the US due to the complexity of the new technology.

Other countries, including Japan, Thailand, China, and the European communities continue to send their best and brightest students to our academic institutions such as MIT, RIT, Boston University, Northeastern University, Cal Tech, etc.

Why are our students not going into these same schools and professions? One of the biggest reasons is that they are not exposed to engineering as a career when career choices are made - from the middle and high school grades.

Project Lead the Way has shown itself to be a highly regarded academic program with sound educational principles and content.

Many of the schools that have launched the Project Lead the Way program have not only seen a rise in the number of students pursing engineering programs at the college level, but have also seen a rise in the overall grade average of students enrolled in the program.

Many have experienced waiting lists of students who want to get into the program but cannot due to budget constraints and seat limitations.

These same schools have seen corporations provide support in terms of donations of engineers as mentors to student teams, cash to purchase equipment, etc. They have also seen many of their teachers anxious to become certified to teach Project Lead the Way Programs.

The states that have had the most success, are ones where state and local governments make it easier for the schools to bring Project Lead the Way into their curriculum by using matching grant programs, or in some cases, funding the program entirely.

Companies like Celestica, Intel, Osram – Sylvania, and others are supporting these types of programs at National and State levels. Bringing one or two high schools on-line does meet the workforce development goals of any high-tech company. It is just not enough.

Many companies need talented workers with complex skills and knowledge bases. We work diligently with colleges and universities world-wide to ensure that the academic programs being delivered today, will meet the industries needs of the next decade, not tomorrow!

Project Lead the Way ensures that our country will have the pipeline of talented, capable and motivated students that will flow into our colleges and universities.

These students will eventually become the teachers that continue to support our technical superiority as an industrial leader; the technical leaders that keep our companies competitive and profitable and lead the way in emerging technology; and the individuals who will lead the way to invest in programs that continue to challenge our youth to be the best and brightest in the world.

Please don't let another moment go by where schools, who have students and teachers who want to, and are capable of, participating in one of the most successful programs in the country, a program dedicated to meeting our economic and workforce development needs of our industrial base, can't do it because there is no funding model to help them succeed.

Thank you.

House Education Committee
HB 1231 implementing a pre-engineering technology curriculum in public high schools
January 15th 2002

Statement of Rep. Dana A. Edwards, of Keene, Cheshire County District 19

As Representative Leber stated, also being a member of the Public Works Highway Committee I to heard clearly the need for increased engineers and technicians coming into the pipeline to meet current and future needs of business currently in or planning on re-locating to NH.

I spent five years on the Keene Planning Board and heard testimony from many businesses that were looking to locate in the area. Out of informal discussion about business needs in general, one theme that came up often was that there is a shortage of engineers and technicians. Being that Keene has a high school regional vocational center and several other schools of higher learning there was a hope that partnerships could be developed that might encourage young people to enter the engineering field and remain in the area to fill positions with these companies as they grow.

Having attended a vocational technical college I know first hand how important it is to be prepared for both academics as well as hand on projects in maintaining interest of young people in the engineering field. Implementing a pre- engineering curriculum would go a long way in doing this.

Having also served on the Keene board of Education and being a liaison to the Cheshire Center (the regional vocational center) I feel there is strong support from teachers, students, administrators and business for a program like Project Lead the Way.

I would be willing to answer any questions but would prefer the more qualified speakers that will follow to answer your questions.

I do respectfully ask for your support of this legislation and those who will benefit from getting an early start on preparation for higher education and careers in the field of engineering.

New Hampshire Society of Professional Engineers

A state society of the National Society of Professional Engineers

January 11, 2002

Mr. John Alger:
State Representative
935 East Rumney Road
Rumney, NH 13226

Dear John:

The New Hampshire Society of Professional Engineers (NHSPE) strongly supports HB 1231, which seeks to implement a pre-engineering technology curriculum into the public high schools.

New Hampshire's viability is dependent on technology and requires a technically competent population to maintain our growing infrastructure. The State of New Hampshire currently faces a shortage of technically competent students graduating from our educational institutions. Many of our in-state engineering and technology companies struggle as they search for qualified individuals to fill the technical roles necessary to make them competitive. Often this task occurs out-of-state where there are greater educational opportunities for students. Therefore, it is critical for New Hampshire to provide our high school students the opportunity to develop sound engineering principles.

The other critical segment of this bill is to insure that the State of New Hampshire allocate sufficient funds to support the program. This assures that any high school student interested in pursuing a career in engineering has the opportunity to be involved.

Again, we believe it is essential for New Hampshire to provide and fund a pre-engineering curriculum in our High Schools. This program facilitates the protection of its citizen's health and safety, and insures the viability and future of our economy..

Sincerely,

Matthew R Purcell, P.E.
President
NHSPE

Cc: Warren Henderson, Chairman Education Committee

P.O.Box 1343 • Concord • NH 03302-1343

House Education Committee
HB 1231, implementing a pre-engineering technology curriculum in public high schools
January 16, 2002

Statement of Rep. William E. Leber, of Andover, Merrimack County District One

In recent years our committee, the Public Works and Highway, has had proposals before it to fund the renovations of the high school regional vocational centers that were constructed beginning some 25 years ago. During that process we heard of the shortage of engineers and technicians by employers in NH. We heard of the relatively high dropout rates of the students and how some students were more interested in hands–on projects rather than academics. And stories of youngsters that found a use for academics in the vocational area, which turned them around in all their studies.

Last year as we were processing the capital improvement budget, we were bombarded with information about the shortage of engineers and technicians in NH and that the University System needed the engineering and science buildings renovated in order to remain accredited. It was stated that it was difficult to compete for students because of the condition of the facilities.

With that information still fresh in my mind, I was invited to a meeting of Project Lead the Way and heard about the program that was working in the high schools that were fortunate to have a teacher who was motivated enough to get such a program started. It has been a outstanding success and after speaking and meeting with those involved, including teachers, students, administrators and most impressive, the engineering –technology companies that support the program, **I thought all students should have an opportunity to participate in pre-engineering and technology programs.**

This legislation would do several things. It would

- Establish in statute the minimum program curriculum ,
- Provide a matching partnership with business to fund the program,
- Establish the authority for the department to include the initial capital improvements for each site in its capital request to fund the state share.
- Establish an advisory committee to oversee and promote the program.
- Appropriate $250,000 matching funds to get the first year projects in motion

The sponsors have met and reviewed the bill again and have prepared an amendment of minor, but important, changes to section 1 of the bill that will be introduced by Rep. Candace White-Bouchard.

I would be pleased to answer your questions. However, there are some experts who are working the program prepared to testify and certainly more qualified to answer any of the technical or statistical questions.

I respectfully ask for your support for this legislation and the young people who will benefit by its passage by getting a head start on preparation for college and careers.

I ask for your vote of ought to pass. Thank you

Education Committee
HB 1231
January 16, 2002

Statement of Rep. James B. Rausch, Rockingham County, District 13

I am a co-sponsor of HB1231 because I support this effort to initiate a program that will produce more high school graduates prepared for college technical programs. Ultimately this program will help ensure that the State of NH has the workforce necessary to continue to attract businesses that are vital to the States economic prosperity and to give our citizens the opportunity to be gainfully employed in high paying technical careers. This legislation helps create a synergism between our educational system, the business community and the states economic interests.

I hope you will support this initiative of our business community and our educators so we can excite our young students into pursuing these technical careers. Your support will also help ensure our educational infrastructure keeps pace with the technologically challenging needs of our society.

Thank You,

Voting Sheets

HOUSE COMMITTEE ON EDUCATION

EXECUTIVE SESSION on HB 1231-FN

BILL TITLE: **implementing a pre-engineering technology curriculum in the public high schools in the state.**

DATE: 1/30/02

LOB ROOM: 207

Amendments:

Sponsor: Rep. Alger	OLS Document #:	2002	1955h
Sponsor: Rep. Cox	OLS Document #:		
Sponsor: Rep.	OLS Document #:		

Motions: (OTP) OTP/A, ITL, Interim Study (Please circle one.) **AMENDMENT ONLY**

Moved by Rep. Alger

Seconded by Rep. Cox

Vote: 16-1 (Please attach record of roll call vote.)

Motions: OTP (OTP/A) ITL, Interim Study (Please circle one.)

Moved by Rep. Alger

Seconded by Rep. Cox

Vote: 16-1 (Please attach record of roll call vote.)

CONSENT CALENDAR VOTE:

(Vote to place on Consent Calendar must be unanimous.)

Statement of Intent: Refer to Committee Report

Respectfully submitted,

Rep. Bruce L. Dearborn, Clerk

OFFICE OF THE HOUSE CLERK

2002 SESSION

EDUCATION

Bill #: 1231 Title: Implementing a pre-engineering technology curr. in public high schools in state

PH Date: OTP/A 1/16/02 Exec Session Date: 1/30/02

Motion: OTPA Amendment #:

MEMBER	YEAS	NAYS
Henderson. Warren C. Chairman	✓	
Ward. Brien L. V Chairman	X	
Dearborn. Bruce L. Clerk	✓	
Flint. Gordon B	✓	
Davis. Perlev E	✓	
Alger. John R M	✓	
Cox. Russell N	✓	
Sullivan. P Judith		✓
Carson. Sharon M	✓	
Colcord. J D	✓	
Sova. Charles E	✓	
Winter. Steven J	✓	
L'Heureux. Stephen R	✓	
Yeaton. Charles B	✓	
Snyder. Clair A	✓	
Jean. Claudette R	X	
Estabrook. Iris W	✓	
White. John M	✓	
Clarke. Claire D	✓	
Naro. Debra A	✓	
	16	4 — 1 N

TOTAL VOTE:

Printed: 12/19/2001

OFFICE OF THE HOUSE CLERK 2002 SESSION

EDUCATION

Bill #: HB 1231-FN **Title:** Implementing a pre-engineering/tech. curr. in public high schools in state

~~Public~~ Exec Date: 1/30/2002 1955h **Exec Session** Date: 1/16/02 & public hear.

Motion: Adopt Amendment **Amendment #:**

MEMBER	YEAS	NAYS
Henderson, Warren C. Chairman	✓	
Ward, Brien L. V Chairman	X	
Dearborn, Bruce L. Clerk	✓	
Flint, Gordon B	X	
Davis, Perlev E	✓	
Alger, John R M	✓	
Cox, Russell N	✓	
Sullivan, P Judith		✓
Carson, Sharon M	✓	
Colcord, J D	✓	
Sova, Charles E	✓	
Winter, Steven J	✓	
L'Heureux, Stephen R	✓	
Yeaton, Charles B	✓	
Snyder, Clair A	✓	
Jean, Claudette R	X	
Estabrook, Iris W	✓	
White, John M	✓	
Clarke, Claire D	✓	
Naro, Debra A	✓	
	16 Y	1 Nay

TOTAL VOTE:
Printed: 12/19/2001

Committee Report

COMMITTEE REPORT

COMMITTEE: **Education**

BILL NUMBER: **HB 1231-FN**

TITLE: implementing a pre-engineering technology curriculum in the public high schools in the state.

DATE: 1/30/02 CONSENT CALENDAR YES ☐ NO ☒

☐ OUGHT TO PASS

☒ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

This is a proven program in New Hampshire and elsewhere. Testimony by two New Hampshire schools having the program was very enthusiastic as to interest by students and performance improvements. All testimony favored the bill which requires the Department of Education to develop and implement a pre-engineering curriculum in selected high schools that wish to participate. An advisory committee is included to assist in expanding the program and include private funding also as illustrated in one of the schools that has adopted the curriculum. No school would be required to implement a pre-engineering curriculum; but, those that choose to do so would be greatly aided by this initiative.

Vote 16-1.

Rep. John R. M. Alger
FOR THE COMMITTEE

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT

Education

HB 1231-FN, implementing a pre-engineering technology curriculum in the public high schools in the state. **OUGHT TO PASS WITH AMENDMENT**

Rep. John R. M. Alger for Education: This is a proven program in New Hampshire and elsewhere. Testimony by two New Hampshire schools having the program was very enthusiastic as to interest by students and performance improvements. All testimony favored the bill which requires the Department of Education to develop and implement a pre-engineering curriculum in selected high schools that wish to participate. An advisory committee is included to assist in expanding the program and include private funding also as illustrated in one of the schools that has adopted the curriculum. No school would be required to implement a pre-engineering curriculum; but, those that choose to do so would be greatly aided by this initiative. **Vote 16-1.**

Rep Alger

COMMITTEE REPORT

COMMITTEE: **Education**

BILL NUMBER: **HB 1231-FN**

TITLE: implementing a pre-engineering technology curriculum in the public high schools in the state.

DATE: CONSENT CALENDAR YES ☐ NO ☒

☐ OUGHT TO PASS

☒ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

Vote 16 Y 1 N

Rep. JOHN ALGER
FOR THE COMMITTEE

OK Wentworth

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT

This is a proven program in New Hampshire and elsewhere. Testimony by two NH schools how the program was very enthusiastic as to ~~interest~~ interest by students and performance improvements. All testimony favored the bill which requires the Dept. of Education to develop and implement a pre-engineering curriculum in selected high schools that wish to participate. An advisory committee is included to assist in expanding the program and include private funding also as ~~presented~~ illustrated in one of the schools that has adopted the ~~program~~ curriculum. NO SCHOOL WOULD BE ~~NOT~~ REQUIRED TO IMPLEMENT A PRE-ENGINEERING CURRICULUM, BUT ~~FOR~~ THOSE THAT CHOOSE TO DO SO WOULD BE GREATLY AIDED BY THIS INITIATIVE.

COMMITTEE REPORT

COMMITTEE: Finance

BILL NUMBER: **HB 1231-FN**

TITLE: implementing a pre-engineering technology curriculum in the public high schools in the state.

DATE: February 20, 2002 CONSENT CALENDAR YES ☐ NO ☒

☐ OUGHT TO PASS

☒ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ RE-REFER

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

An optional pre-engineering technology curriculum in our public schools will prepare our young people for more successful careers and provide the staff for economic development of high-tech business in our state. The amendment takes $250,000 of bonded funds previously appropriated for regional vocational schools, but not used, to pay for a portion of classroom equipment necessary to get the programs started. Operating expenses will be the responsibility of the participating school districts.

Vote 20-0.

Rep. Elizabeth S. Hager
FOR THE COMMITTEE

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT

Finance

HB 1231-FN, implementing a pre-engineering technology curriculum in the public high schools in the state. **OUGHT TO PASS WITH AMENDMENT**

Rep. Elizabeth S. Hager for Finance: An optional pre-engineering technology curriculum in our public schools will prepare our young people for more successful careers and provide the staff for economic development of high-tech business in our state. The amendment takes $250,000 of bonded funds previously appropriated for regional vocational schools, but not used, to pay for a portion of classroom equipment necessary to get the programs started. Operating expenses will be the responsibility of the participating school districts. **Vote 20-0.**

FINANCE

Bill #: HB1231 Title: Pre-Engineering

PH Date: ___/___/___ Exec Session Date: 2/20/02

Motion: OTP/A Amendment #: 2752

MEMBER	YEAS	NAYS
Kurk, Neal M, Chairman	20	
Weyler, Kenneth L, Vice Chairman	1	
Holbrook, Robert G	2	
Johnson, Robert A	3	
Thulander, O Alan	4	
Stone, Joseph E	5	
LaRose, Richard J	6	
Anderson, Eric	7	
Wendelboe, Fran	8	
Hager, Elizabeth S	9	
Mercer, Robert S	10	
Emerton, Lawrence A	11	
Wheeler, Robert L	12	
Rodeschin, Beverly T	13	
Johnson, Rogers J		
Wallner, Mary Jane	14	
Smith, Marjorie K		
Moore, Carol	15	
Foster, Linda T	16	
Dwyer, Paul J		
Blanchard, MaryAnn N	17	
Coes, Betsy A	18	
Mitchell, McKim W	19	
	20-0	

TOTAL VOTE:
Printed: 12/27/2000

COMMITTEE REPORT

COMMITTEE: Finance

BILL NUMBER: **HB 1231-FN**

TITLE: implementing a pre-engineering technology curriculum in the public high schools in the state.

DATE: February 20, 2002 CONSENT CALENDAR YES ☐ NO ☒

☐ OUGHT TO PASS

☒ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ RE-REFER

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

A pre-engineering technology curriculum in our public schools will prepare our young people for more successful careers and provide the staff for economic development of high-tech business in our state. The amendment takes $250,000 of bonded funds previously appropriated for regional vocational schools but not used to pay for a portion of classroom equipment necessary to get the programs started. Operating expenses will be the responsibility of the participating school districts.

Vote 20-0.

Rep. Elizabeth S. Hager
FOR THE COMMITTEE

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT

COMMITTEE REPORT

COMMITTEE: Finance

BILL NUMBER: **HB 1231-FN**

TITLE: implementing a pre-engineering technology curriculum in the public high schools in the state.

DATE: February 20, 2002 CONSENT CALENDAR YES ☐ NO ☒

☐ OUGHT TO PASS

☒ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ RE-REFER

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

A pre-engineering technology curriculum in ~~the~~ our public schools will prepare our young people for more successful careers and provide the ~~vital people for~~ economic development of high-tech business in our state. The amendment takes $250,000 previously appropriated for regional vocational schools but not used to pay for a portion of ~~a~~ classroom equipment ~~to~~ to get the programs started. Operating expenses will be the responsibility of ~~the~~ participating school districts.

Vote 20-0.

Rep. Elizabeth S. Hager
FOR THE COMMITTEE

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT

HB 1231-FN, **Ought to Pass with Amendment**

A pre-engineering technology curriculum in the public schools will prepare our young people for more successful careers and provide the vital people for economic development of high-tech business in our state. The amendment takes $250,000 previously appropriated for regional vocational schools but not used.

Rep. Elizabeth S. Hager
For Division II

HB 1231-FN, **Ought to Pass with Amendment**

A pre-engineering technology curriculum in the public schools will prepare our young people for more successful careers and provide the vital people for economic development of high-tech business in our state. The amendment takes $250,000 previously appropriated for schools but not used.

Rep. Elizabeth S. Hager
~~For Division II~~

~~district~~ regional vocational

rewrite

HB 1231

A pre-engineering technology curriculum in the public schools will prepare our young people for more successful careers and provide the vital people for economic development of high tech business in our state. The amendment takes #250,000 previously appropriated for schools but not used.

Rep Hager.

Draft 1

HB 1231

This is important bill ~~and~~ ~~funding for it~~ for our young people, ~~and~~ for economic development and for businesses in the state.

Money ~~is~~ available ~~for it~~ ~~in~~ ~~to fund~~ for program the ~~bill~~ from ~~as unexpended~~ funds not previously expended in the same area.

E. Hor

COMMITTEE REPORT

COMMITTEE: Finance

BILL NUMBER: **HB 1231-FN**

TITLE: implementing a pre-engineering technology curriculum in the public high schools in the state.

DATE: February 20, 2002 CONSENT CALENDAR YES ☐ NO ☐

☐ OUGHT TO PASS

☑ OUGHT TO PASS WITH AMENDMENT

☐ INEXPEDIENT TO LEGISLATE

☐ RE-REFER

☐ REFER TO COMMITTEE FOR INTERIM STUDY
(Available only in second year of biennium.)

STATEMENT OF INTENT
(Include Committee Vote)

Moved: Rep Hager.

Seconded: Rep. Foster.

Vote 20-0

Rep. Roberta Hallbrook
FOR THE COMMITTEE

Original: House Clerk
cc: Committee Bill file

USE ANOTHER REPORT FOR MINORITY REPORT