DOE/RL/12929-1

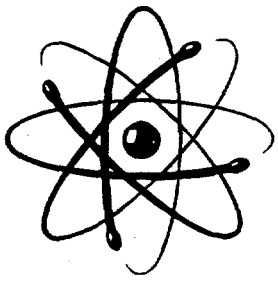
The Institute for Science and Society

presents the

Final Report

for

The Department of Energy



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March 1997

Grant #DE-FG-94RL12929

DISCLAIMER

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The Institute for Science and Society

Final Report

DOE Grant DE-FG06-94RL12929

Science Literacy Programs for K-12 Teachers, Public Officials, News Media and the Public

Summary

On 12 Jul 94, The Institute for Science and Society received the above titled grant for $300,000 with an additional $323,000 awarded 14 Aug 95. The Institute completed the programs provided by the Department of Energy grant on 28 Feb 97. These programs for teachers, public officials, news media and the public will continue through 31 Dec 97 with funding from other sources.

The Institute is a non-profit 501-c-3 corporation. It was organized ". . . to help increase science literacy in all segments of the population and contribute to a more rational atmosphere than now exists for the public consideration of societal issues involving science and technology, both regional and national."

Institute personnel include the Honorable Mike McCormack, Director; Joan Harris, Associate Director; Kim Freier, Ed.D, Program Manager; and Sharon Hunt, Executive Secretary.

A number of projects were carried out during the three years covered by the grant including science literacy courses for hundreds of teachers in Washington State, science lectures for the public, workshops and seminars for legislators, public officials and the news media. Science related lectures were presented to all age groups from kindergarten children to senior citizens. Statistical information on these projects is included in this report.

The most extensive project is science literacy courses for teachers. The flagship course, "Stars, Bugs, Molecules and You" provides teachers with information on the basic earth, physical and life sciences and their relationship to solving societal issues such as global warming, electromagnetic fields, chemophobia, risk and radiation.

A series of short courses are provided teachers covering most science subjects including chemistry, physics, astronomy, geology, biology, mathematics, entomology, and technology.

Samples of the teachers' evaluations forms, letters of encouragement, and evaluation synopses of some of these courses are included in this report.

The Distinguished Lecture series bring scientists from all over the country to speak to the public on such subjects as: earthquakes, comet Shoemaker-Levy, the space program, cancer and health, dinosaurs, technology strategies for the 21st century, chemistry, genetic engineering, and the stars and planets.

Workshops and seminars are designed to help reduce the concerns of the public and public officials about electromagnetic fields, radar guns, global warming, radiation, and other phenomenon widely misunderstood.

A number of presentations are provided small and large groups of both adults and children ranging from chemistry and radiation, to women in science and the importance of science literacy in all segments of the populace.

The Director, Mike McCormack presently serves on the State of Washington's Higher Education Coordinating Board, appointed by the governor, and is helping the state realize the importance of science and science literacy in the education field.

The Institute for Science and Society would like to take this opportunity to thank the Department of Energy; John Wagoner, Manager Richland Operations Office; Marji Parker, Contracting Officer, Procurement Services Division; and Jenise Connerly, Procurement Division for the assistance in obtaining and maintaining this grant.

The Institute will respond to questions or provide any additional information not included in this report that is requested by the Department of Energy.

Appendices

THE INSTITUTE FOR SCIENCE AND SOCIETY

The Institute for Science and Society **offers a variety of programs to enhance the degree of science literacy throughout society.**

- **More than 500 Washington K-12 teachers have completed a comprehensive course in science literacy called *"Stars, Bugs, Molecules and You"* (for 4 graduate credits or 40 clock hours credit). Instructors are drawn from universities, industry, and from among other qualified individuals.**

- **Approximately 300 teachers have completed *short courses in science literacy*, focusing on subjects such as Astronomy, Biology, Chemistry, Entomology, Forest Management, Geology, Industrial Technology, Laser Technology, Math, Physics, Radiation, and Risk. Additional scheduled courses are planned.**

- ***Distinguished Lectures*** **have brought exciting subjects to adults and children, teachers and students; stimulating their interest in good science.**

  ***Lecturers*:**
  Dr. Goetz Oertel, President, Association of Universities for Research in Astronomy
  Dr. Basam Shakishiri, Chemistry Professor, University of Wisconsin
  Dr. Bonnie Dunbar, Astronaut
  Dr. Jack Horner, Curator, Museum of the Rockies
  Dr. Bruce Ames, Chair, Dept. of Biochemistry, University of California, Berkeley
  Dr. Alex Storrs, Astronomer, Space Telescope Science Institute
  Dr. Douglas Olesen, President & CEO, Battelle Memorial Institute, Columbus, Ohio
  Dr. Andrew Michael, Geophysicist, U.S. Geological Survey, California
  Dr. Leroy Hood, Chair, Department of Molecular Biotechnology, University of Washington

- ***Workshops and lectures in science and science literacy*** **have been conducted for civic and social organizations, school directors, public and private schools, legislative committees, law enforcement groups, scientific societies and the general public.**

- ***AASTA*** **- The Institute for Science and Society has joined in creating the Alliance for the Advancement of Science through Astronomy. The Alliance has assumed management and operation of the 31" Battelle telescope on Rattlesnake Ridge at Hanford. The telescope will be operated remotely, allowing high school science classes throughout Washington to plan observations and see the results in their classrooms.**

707 North Pearl Street, Suite I • Ellensburg, Washington 98926-2938 • (509) 925-9620 • Fax (509) 925-9621 • e-mail: iss@adsnet.net

The Institute for Science and Society
Statistical Summary
1991 - 1996

"Stars, Bugs, Molecules and You"
4 Quarter Hour Credit Course

530 teachers in 21 courses at 14 sites throughout the State of Washington

Various One Quarter Hour Credit Courses

281 teachers in 16 courses in Ellensburg and Yakima

"Flora, Fauna, Folds and Faults"
4 Quarter Hour Credit Course

29 teachers in two summer sessions in Ellensburg

Special Science Literacy Presentation
6 clock hours

22 teachers in two days
Milton

Distinguished Lecture Series

Approximately 5150 individuals attended 9 lectures

Workshops & Special Presentations

Approximately 2500 public officials and general public

Appendix III

The Institute for Science and Society

"Stars, Bugs, Molecules and You"

Enrollment Statistics - 1991-1996

Quarter	Location	# No Cr	# Clk Hour	# Univ Cr	Total
Summer 1991	Wenatchee		25		25
Fall 1991	Wentachee			41	41
Winter 1992	Ellensburg		1	33	34
Spring 1992	Moses Lake		5	30	35
Winter 1993	Ellensburg			6	6
Spring 1993	Yakima		4	23	27
Spring 1993	Tri-Cities		6	36	42
Summer 1993	Wenatchee		6	25	31
Fall 1993	Renton		8	10	18
Winter 1994	Ellensburg	1	2	9	12
Spring 1994	Tri Cities	2	7	23	32
Spring 1994	West Valley (Yakima)	3	7	17	27
Summer 1994	Manson	1	3	9	13
Summer 1994	Darrington	3	4	14	21
Fall 1994	Tri Cities	1	6	19	26
Spring 1995	Tacoma (UofW)			24	24
Fall 1995	Tacoma (UofW)			26	26
Spring 1996	Sunnyside	2		24	26
Summer 1996	Gig Harbor (UofW)	2	6	8	16
Summer 1996	Spokane (WSU & EW)	1	5	15	21
Fall 1996	Puyallup (UofW)	1	3	22	26
	Total Stars, Bugs...	**17**	**98**	**412**	**529**

Enrollment Statistics continued

"Flora, Fauna, Folds and Faults"

Quarter	Location	# No Cr	# Clk Hour	# Univ Cr	Total
Summer 1996	Ellensburg			18	18
	Ellensburg			11	11
	Total Flora, Fauna, Folds and Faults			29	29
Total Teachers Four Credit Courses		**17**	**98**	**470**	**587**

Special Science Literacy Presentation

Spring 1996	Milton School District	22

Appendix IV

The Institute for Science and Society

one credit courses

Enrollment Statistics

1995-1996

Winter and Spring Quarters 1995	# of Teachers*
Chemistry Without Fear	19
Biology: Understanding More About Life	23
Math: Easy, Useful, and Fun	12
Physics: Observing the Laws of Nature	7
Technology in Society: Putting Knowledge to Use	24
Humanity and the Cosmos	19
Risk, Perception of Risk and Fear	15
Radiation and Hanford	23
Geology: Understanding our Earth	24
Fall Quarter 1995	
Math: Easy, Useful, and Fun	6
Laser Technology: Light Up Your Classroom	8
The Physics of Christmas Toys	19
Forestry: Forests are Not Just Trees	19.
Spring Quarter 1996	
Bugs, Arachnids, and Other Icky Critters (kids love)	23
Magic Chemistry and Raspberry Souffle	27
Radiation and Things Nuclear	13
Total Teachers One Credit Courses	**281**

* Many teachers participated in more than one class.

The Institute for Science and Society

1991 -1996

Public Distinguished Lecture Series

Lecture	Subject	Approx. # in the Audience
Dr. Goetz Oertel	Astronomy	300
Dr. Basam Shakishiri	Chemistry	750
Dr. Bonnie Dunbar	Space	700
Dr. Jack Horner	Dinosaurs	800
Dr. Bruce Ames	Cancer & Health (2 Sites)	550
Dr. Alex Storrs	Shoemaker-Levy Comet	500
Dr. Douglas Olesen	Economy (2 Sites)	700
Dr. Andrew Michael	Earthquakes	250
Dr. Leroy Hood	Genetic Engineering (2 Sites)	650
	Approximate Total Attendance	5150

Appendix XIX

RECEIVED

JUL 16 1996

Mary Farr
8109 66th Avenue
Gig Harbor, WA 98332
July 2, 1996

Mr. Mike McCormack
Director of The Institute for Science and Society
707 N. Pearl St., Suite I
Ellensburg, WA 98926

Dear Mr. McCormack:

I want to start by saying I needed this course twenty years ago. Like many elementary education teachers I had very little science education and when I did take a course it was a very isolated experience.

This class has opened my eyes to the relevancy of science in our every day lives and the wonderful interplay between the sciences. Now when I think of geology I also think about space and chemistry!!

The caliber of guest speakers you brought with you were exciting people who obviously loved their professions. The texts that were used were wonderful in particularly ***Science Matters****(this was my science bible for a quick reference when I got confused which was often.)*

I appreciated the entire organization of this course. It was very clear how our time was going to be spent each day. The field trip was also very well planned.

I will be teaching science as a specialist in the elementary school next year. The materials from this class will give me a great start.

Thank you for sharing your passion and humor. Hopefully we can meet again.

Sincerely,

Mary Farr

Mary Farr

Appendix VI

The Institute for Science and Society
Workshops & Seminars
1991-1994

Workshops on electromagnetic fields, radar guns, and science literacy were held for as diverse groups as the Washington State House of Representatives Energy and Utilities Committee, the Washington School Directors Association, the Washington State Criminal Justice Commission, and the Cle-Elum/Roslyn School District. Approximately 1000 individuals were contacted during these workshops

Lectures and presentations were made to a number of school groups, civic and social organizations on subjects as specific as chemistry and astronomy, and as general as science literacy. No specific attendance figures were compiled, but probably in excess of 1500 individuals were contacted in this manner.

Appendix V

The Institute for Science and Society
Workshops & Seminars
1991-1994

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Appendix VII

The Institute for Science and Society

Activities Report - 1996-97

January 1996

- Parents Night, mathematics presentation - Sunnyside

February 1996

- Alliance for the Advancement of Science Though Astronomy meeting - Richland
- Davis High School Science Advisory Board - Yakima

March 1996

- Science Literacy presentation - Washington Roundtable - Seattle
- "Stars, Bugs, Molecules and You" through May - Sunnyside
- Foss High School (Tacoma) physics students - Hanford trip - Richland
- State Board of Education - science literacy presentation - Olympia
- Davis High School Science Advisory Board - Yakima

April 1996

- Distinguished Lecture - Dr. Leroy Hood, UofWA, two sites - Wenatchee, Ellensburg
- Bugs, Arachnids & Other Pesky Critters (Kids Love) - one credit K-12 course - Ykm
- Magic Chemistry & Raspberry Souffle - one credit K-12 course - Yakima
- CWU Alumni Lecture Series - Science Literacy Presentation - Ellensburg
- Outlook Parents Night - Hands on science demonstrations - Sunnyside

May 1996

- Arbor Day Celebration - tree provided Ellensburg High School
- Radiation and Things Nuclear - one credit K-12 course - Yakima
- Discussion about education with Governor Mike Lowry - Olympia
- Science Hobby Day - Ellensburg

June 1996

- Rock Collecting - Pasco
- Milton School District, Science Literacy presentation - Milton
- "Stars, Bugs, Molecules and You" - Gig Harbor
- "Flora, Fauna, Folds and Faults" - 4 credit K-12 course - Ellensburg

July 1996

- "Stars, Bugs, Molecules and You" - Spokane
- Senior Ventures - science literacy course - 3 weeks - Ellensburg
- "Flora, Fauna, Folds and Faults" - 4 credit K-12 course - Ellensburg

September 1996

- Tour - Woodland Park Zoo
- West Coast National Broadcasters Assn. - Science and the Media - Pullman
- "Stars, Bugs, Molecules and You" - Puyallup through November

October 1996

- Microsoft Higher Education Workshop - Redmond

January 1997

- Senate Higher Education Committee, Testimony on education - Olympia
- Young Author's Conference - Marie Curie presentation - Sunnyside

February 1997

- Young Author's Conference - Marie Curie presentation - Mattawa
- Davis High School Science Advisory Board - Yakima
- Foss High School (Tacoma) physics students, radiation lecture - Ellensburg

THE INSTITUTE FOR SCIENCE AND SOCIETY

1995 Activities

JANUARY 1995

- Ellensburg Kiwanis Club—Presentation on Science Literacy
- Mark Weldon's Third Grade Class—Science Presentation—Valley View Elementary, Ellensburg

FEBRUARY 1995

- Science Literacy One Credit Chemistry Class—Ellensburg
- Address to the Waste Management '95 Conference—Tucson, Arizona—*The Imperative Societal Need For Scientific Literacy* - 2400 attending

MARCH 1995

- Science Literacy One Credit Biology Class—Ellensburg
- Science Literacy One Credit Physics Class—Yakima
- Science Literacy One Credit Math Class—Yakima
- "Stars, Bugs, Molecules and You" —UW/Tacoma Astronomy Class (continues through May)
- Science Literacy One Credit Technology Class—Ellensburg

APRIL 1995

- Doug Olesen Distinguished Lecture, 6 & 7 Apr 95—Richland and Wenatchee
- Science Literacy One Credit Class—Humanity and the Cosmos—Ellensburg
- Science Literacy One Credit Class—Risk, Perception of Risk, and Fear—Ellensburg

MAY 1995

- U.S. Department of Energy Arid Lands Ecology Reserve hearing—Richland Mike McCormack testified on behalf of The Alliance for the Advancement of Science Through Astronomy
- Science Literacy One Credit Class—Geology—Columbia Basin—Teachers

SEPTEMBER 1995

- "Stars, Bugs, Molecules and You"—UW/Tacoma—(continues through Nov)
- Science Literacy One Credit Class—Math—Yakima
- Presentation on The Institute for Science and Society,Gallina Club—Ellensburg

OCTOBER 1995

- Two-Credit Laser Class for Science Teachers—Ellensburg
- Distinguished Lecture, 5 & 6 Oct 95—Dr. Andrew Michael, Geophysicist—"Earthquakes"—Richland & Ellensburg

NOVEMBER 1995

- Radiation Lecture—Washington Science Teachers Association—Pullman
- Science Literacy One Credit Class—Forestry—Yakima—Teachers
- Presentation to Washington Roundtable Education Working Group

DECEMBER 1995

- Science Literacy One Credit Class—Physics—Yakima

Appendix IX

1994 Activities Report

(In addition to courses for K-12 teachers)

Two hour presentations to Kittitas County gifted children (Penta Program) one each on astronomy, chemistry and radiation.

Science Literacy presentation to the International Conference for the Public Understanding of Science and Technology (The Chicago Academy of Sciences) in Chicago.

Radiation and energy presentations to undergraduate geography students at CWU

Radiation lecture to students from Wahluke High School at CWU

Science Literacy workshop for the Washington State School Directors Association (annual convention in Spokane)

Astronomy lecture to first and second grade students at Mt. Stuart Elementary School in Ellensburg

KXLE talk show discussing science literacy and "Stars, Bugs, Molecules and You"

Science Literacy presentation to Ellensburg Lions Club

Science Literacy presentation to Kamiakin Kiwanis Club in Yakima

Science Literacy presentation to League of Women Voters in Ellensburg

Address: "Why Science Literacy is Important for You," Society of Professional Journalists, Wm. O. Douglas Chapter, Tri-Cities

Pace of Change - Washington State Credit Women's Assn. state convention in Ellensburg

Radiation Lecture - Expanding Your Horizons (middle school girls) in Tri-Cities

Other activities:

Mike McCormack was appointed by Governor Mike Lowery to a four year term on the Higher Education Coordinating Board, and serves on the Washington State Science Teachers Assn. Board of Directors.

Mike and Joan Harris serve on the Technical Advisory Committee for Davis and Eisenhower High Schools in Yakima.

Appendix X

Institute for Science and Society

Activities Report 1993

(not including "Stars, Bugs, Molecules and You" or Distinguished Lectures)

National Management Association - Yakima - Science Literacy

CWU Geography Students - Energy Lecture

Washington State School Director's Assn. - Seattle - EMF Workshop

Evan Hobbs - Ellensburg 4th Grader - Radiation Lecture

Testimony for Senate Hearing on WISS legislation - Olympia

Testimony for House Hearing on WISS legislation - Olympia

PEO - Yakima - ISS information session

Washington State Criminal Justice Training Commission - Seattle - Police Radar Guns Workshop

Cle Elum School District Patrons - Cle Elum - EMF Workshop

TriDek Assn. - Tri-Cities - ISS presentation

CWU McNair Undergrad Students - "Stars, Bugs, Molecules and You" - 40 hrs (8 weeks)

Star Viewing session for tachers and public - Yakima

Star Viewing session for teachers and public- Richland

Seattle Alternate School on CWU campus - Radiation Lecture

CWU Science Club - Star Viewing - campus

WISS Legislation Signing Ceremony - Olympia

Star Viewing for community - Royal City

Partnership for Environmental Technology Education NW - Richland - Science Literacy Lecture

Washington State Community Colleges Workshop on Environment - Pasco - Environment Lecture

CWU Senior Ventures Program - Energy Lecture

Phil Garrison - CWU English Faculty - radiation tutorial

At-Risk Yakima Middle School students - three presentations over three days - Astronomy, Radiation, Chemistry Lectures

Women's Club - Wenatchee - Astronomy Lecture

PENTA (program for gifted children in Kittitas Co.) - CWU campus - Four two hour sessions including political science, chemistry, astronomy and radiation

Panelist at the International Conference for the Public Understanding of Science and Technology - Chicago - 150 scientists from throughout the world attended.

Wahluke High School Students - Radiation Lecture

Science Literacy Workshop - Washinton State School Directors Assn. - Spokane

First and Second Grade Students at Mt. Stuart Elementary School - astronomy presentation

Appendix XI

Representative comments from the course evaluations by K-12 teachers who have completed "Stars, Bugs, Molecules and You" follow:

Thank you for the wonderful intellectual kick in the pants.

This course was an eye-opener. It made me realize how many things in life that I've just taken for granted.

We've shared our excitement, some of our new books, and new scientific information with our children, both at school and at home

The enthusiasm of the speakers was contagious. It made you want to run out to the library and read more.

I will treasure the experience.

We're eager to learn more in an area many of us had previously avoided!

It renewed my enthusiasm for science.

More science needs to be taught in elementary grades.

My biggest gripe is that I was allowed to graduate with a B.A. in education and a major in history and a minor in political science, and I did not have to take one math class. I didn't even have to have biology -- they let me take a soft botany class to fulfill that requirement.

My mind is truly being awakened for the first time. With all the fun involved in science now, I wonder why my schooling for science was "Read the chapter and answer the questions at the end."

I looked forward with relish to each week's class.

It . . . helped me understand the misconceptions found in our society related to science.

There was so much presented it boggled my mind. It was all so stimulating I couldn't unwind until about 2 a.m. . . . Super class!

How unfortunate that after six years of college, many of the basic facts of the universe were unknown to me until now!

Fantastic course -- every grade school teacher should take it.

This is a very creative method of making people aware of the consequences of scientific ignorance.

Perhaps I am just at a time in my life where this course had a lot of meaning for me.

The course was very balanced . . . each week's topic was well connected to the previous week's lesson."

I do feel that my level of awareness has been vastly increased.

Thank you for a wonderful learning experience. I would be enthusiastic about recommending this unit of study to my family, friends, and colleagues.

I'm definitely planning to study more science.

I still marvel that I could be comfortable working with such large numbers. Better still was being able to actually sense the proportions of these numbers as well as using the scientific notation to make them manageable.

As you kept telling us . . . science doesn't have to be frightening and I think my kids are seeing just how fun it can be.

It was rewarding, intense and very worthwhile.

The class was extremely intellectually rewarding.

The science of the every day world provides us myriad opportunities to challenge our students to think, to create, to solve. It's so obvious, why didn't I see it before?

Thank you for the children's books. They are much appreciated and much enjoyed by the children.

Personally the field trips were wonderful for those of us who learn by doing and seeing.

I'll certainly recommend Stars . . . to all my colleagues. Those at my building already covet my new books.

Appendix XII

Institute for Science and Society

Funded by the Department of Energy

Books provided free of charge to teachers enrolled in "Stars, Bugs, Molecules & You."

Total retail value - $160.29

Science Matters, Robert M. Hazen and James Trefil, Doubleday, $12.95

Innumeracy, John Allen Paulos, Vintage Books, $8.95

Discover Stars & Planets, Toni Eugene, Publications International, Ltd., $10.95

My First Science Book, Angela Wilkes, Random House, Inc., $13.95

How To Build A Habitable Planet, by Wallace S. Broecker, El Digio Press, $19.95

Seven Clues to the Origin of Life, by A.G.Cairns-Smith, Cambridge University Press, $ 8.95

The Cartoon Guide to Physics, by Gonick and Wheelis, Harper Perennial Div. of Harper Publishing, $12.00

The Cartoon Guide to Genetics, by Gonick and Wheelis, Harper Perennial, Div. of Harper Publishing, $12.00

175 Science Experiments, by Brenda Walpole, Random House, $13.99

Agents of Chaos, by Stephen L. Harris, Mountain Press, $12.95

Roadside Guide of Washington, by Alt & Hyndman, Mountain Press, $15.00

How Clean is Clean, How Safe is Safe, by Merril Eisenbud, Cogito Books, $7.00

Good News About Radiation, by John Lenihan, Cogito Books, $9.00

How Come? by Kathy Wollard, Workman Publishing Co., $11.95

National Geographic, Volume 178, No. 2, August 1990, $2.65

StarDate, Guide to the Solar System, U of Texas @ Austin

Pamphlets:

Low Level Radioactive Waste

The Teachers Guide to Nuclear Energy

Reports to the Nation - Our Changing Planet

American Chemical Society pamphlets:

Global Change

Questions and Answers about EMF

Appendix XIII

The Institute for Science and Society

Brief Staff Resumes

The Honorable Mike McCormack is the Director of the Institute for Science and Society. He is a member of the Washington State Higher Education Coordinating Board and is a former member of the United States Congress from 1970-1980, where he was the Chair of the House Committee on Energy Research and Production. He has authored many scientific articles and is noted for his research and development programs in solar and geothermal energy, electric vehicles, energy conservation, photovoltaics, nuclear energy, and magnetic fusion. Mr. McCormack is a fellow of the American Association for the Advancement of Science, the American Nuclear Society, and the American Institute of Chemists. He holds both a Bachelor of Science and a Master of Science in Chemistry.

Ms. Joan Harris is the Associate Director of the Institute for Science and Society. Ms. Harris acts as the Financial Officer for the Institute, assists in the organization of courses, acts as liaison between the Institute and credit awarding organizations, and edits ISS publications. A former reporter for the *Yakima Herald Republic, Sunnyside Daily News,* and *Texas City Sun*, she also served as the Public Relations Director for Providence Central Memorial Hospital and Health Services Director for Valley Memorial Hospital. Her numerous civic activities involved higher education as a trustee of Yakima Valley Community College and as President of the State Community College Trustee Association.

Dr. Freier, Project Director, plans, teaches and organizes literacy courses. She is a university faculty member, formerly in continuing education administration, and currently working with Washington State's Commission on Student Learning. She received her doctorate in Educational Leadership and has been actively engaged in educational roles and public service. As Subject Area Committee Chair of the Commission on Student Learning, she has been influential in K-12 educational reform. Her work has also included membership on numerous boards, committees, and organizations including the Board of Directors of the Environmental Education Association of Washington and the Office of the Superintendent of Public Instruction Environmental Education Advisory Council. She has a special interest in environmental literacy and organizational change and has extensive experience in educational program administration and management.

The Institute for Science and Society

Appendix XV

presents

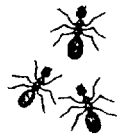
Special Spring and Summer Courses

One Credit Spring Quarter Short Courses

(one credit Central Washington University -$29 per credit hour)
(10 clock hours ESD 105 - $2 per clock hour)

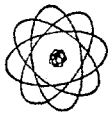
"Magic Chemistry and Raspberry Souffle"

Learn the magic of chemical processes in our daily lives using demonstrations and experiments easily duplicated in the classroom for most grade levels, using common ingredients found around the house. Get acquainted with the periodic table as a logical easily understood chart.
April 19 - 4:30 to 7:30 p.m. and April 20 - 8 a.m. to 4 p.m. at Yakima Valley Community College



"Bugs, Arachnids and Other Icky Critters" -- that kids love

Make insects your friends. A biology course for teachers whose students want to explore the world of insects. Take a look at what insects are, explore insect habitats, start insect collections. Make simple insect collection equipment.
April 12 - 4:30 to 7:30 p.m. and April 13 - 8 a.m. to 4 p.m.at Yakima Valley Community College



"Radiation and Things Nuclear"

Discover some realities about radiation, nuclear medicine, power and waste management. Use a Geiger counter to find a radioactive sample. See for yourself the difference between alpha, beta and gamma radiation. Learn about the benefits and risks of radiation and nuclear technology. Calculate your own radiation exposure history. This course is designed for any adult who delights in learning as a way to dispel misconceptions and overcome fears. It is especially recommended, but not limited to, middle and high school science teachers.
May 3 - 4:30 to 7:30, May 4 - 8 a.m. to 4 p.m. at Yakima Valley Community College

** ** *** ** **

Four Credit Summer Course

"Flora, Fauna, Folds and Faults"
(four Central Washington University credits or 40 clock hours from ESD 105)

This is a two week hands-on course in biology and geology with field trips daily from Central Washington University in Ellensburg, taught by husband and wife team Liz and Nick Zentner. With Liz, explore desert, and sub-alpine botany, stream ecology and old growth forests, and with Nick, the lavas, folds, faults and scours of Eastern Washington.
Weekdays 9 a.m. to 1 p.m. Two sessions: June 17 - 28 and July 8 - 19 from CWU

Class enrollment is limited to 25 teachers. For registration information: Call, write, fax, or e-mail:
The Institute for Science and Society, 707 N. Pearl St., Suite I, Ellensburg, WA 98926
(509) 925-9620 FAX (509) 925-9621 e-mail iss@adsnet.net

The Institute for Science and Society

707 N. Pearl St., Suite I, Ellensburg, WA 98926 (509) 925-9620 or FAX (509) 925-9621

One and Two Credit Courses in Science Literacy for Teachers

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29 Sep 4:30 - 7:30 pm
30 Sep 9 am - noon
1 Oct 1 pm - 5 pm
Ruth Ann Stacy
One Credit

Science Literacy for Educators IV: Math: Easy, Useful & Fun
Room A216 Anthon Hall - Yakima Valley Community College
Overcome nervousness or fear of math. Enjoy a fascinating session with Ruth Ann Stacy, an instructor who speaks your language and who can show you how to enjoy handling very large and very small numbers, doing mental math, making estimates, reading graphs, and having fun with spatial concepts.

14 Oct 9 am - 4 pm
15 Oct 1 pm - 5 pm
21 Oct 9 am - 4 pm
22 Oct 1 pm - 5pm
Dr. Walt Kaminski
Two Credits

"Light up your Classroom" - IET 500 Laser Fundamentals
(For Science Teachers Only) - Hogue Hall 211, CWU, Ellensburg
This course provides an overview of laser fundamentals and applications. It will include demonstrations, experiments and hands-on experience. It will provide current information on laser technology appropriate for the classroom. **Note:** enrollment will be limited to the first 12 science teachers who register. A waiting list will be established.
Tuition $58

17 Nov 4:30 - 7:30 pm
18 Nov 8 am - 4:15 pm
Phil Hess, Tom Brannon
Ken Bevis & Deb Davis
Pete Heidi, Dena Pinard
Rich Everett
One Credit

Forestry for Teachers - "Forests Are Not Just Trees"
Room A216, Anthon Hall, Yakima Valley Community College
Hear "the story of the forest." Gain an understanding of forest management, ecology, economics and tax base, wildlife and habitat relationships; the effect climate, watershed, timber harvest, fire, and insects have on the forest; and learn how to make paper in your classroom.

8 Dec 4:30 - 7:30 pm
9 Dec 8 am - 4 pm
Dr. Kelly Casey
One Credit

Science Literacy for Educators VI: Technology and the Physics of Christmas Toys **- Room 324B - Davis H.S. - Yakima**
Learn about the simple laws of the Universe that cannot be violated - even by Christmas toys. Study the laws of motion,energy, and gravity with experiments and demonstrations. With hands on, work out the relationship of electricity and magnetism and why an electric motor works, hopefully at Christmas time.

These courses are designed for K-12 teachers who have little or no knowledge of science, to enhance their level of science literacy and confidence. Be prepared for a fun-filled adventure into the realm of Science. Tuition is $29 for one credit through Central Washington University or $20 for ten clock hours credit. **To register or for more information** call, fax, or write the Institute at the address/phone above. Class size is limited to 30 except Laser Technology which is limited to 12 *science* teachers.

The Institute for Science & Society

Appendix XV, page 3

707 N. Pearl St., Ellensburg, WA 98926 (509) 925-9620

Announces
One credit courses in Science Literacy for Teachers

These courses are designed for K-12 teachers who have little or no knowledge of science, to enhance their level of science literacy and confidence. Be prepared for a fun-filled adventure into the realm of Science. Classes will be held in Yakima or Ellensburg. Tuition is $27 for graduate credit through Central Washington University or $20 for ten clock hours credit. For information or registration call or write the Institute at the address/phone above. Class size is limited to 20.

---

10 Feb 4:30-7:30 pm 11 Feb 8:30 am-4:30 pm	Science Literacy for Educators II: Chemistry Without Fear Central Washington University - Ellensburg
10 Mar 4:30-7:30 pm 11 Mar 9 am - 5 pm	Science Literacy for Educators X: Biology: Understanding More About Life - Central Washington University - Ellensburg
17 Mar 9 am - 1 pm 18 Mar 9 am - noon 19 Mar 1 am - 4 pm	Science Literacy for Educators IV: Math: Easy, Useful & Fun Davis High School - Yakima
17 Mar 9 am - 5 pm 18 Mar 9 am - noon	Science Literacy for Educators VI: Physics: Observing the Laws of Nature - Davis High School - Yakima
31 Mar 4:30-7:30 pm 1 Apr 9 am - 5 pm	Science Literacy for Educators IX: Technology in our Society: Putting Knowledge to Use - CWU - Ellensburg
21 Apr 4:30-7:30 pm 22 Apr 9 am - 5 pm (Saturday field trip)	Science Literacy for Educators V: Humanity and the Cosmos Central Washington University - Ellensburg
28 Apr 4:30-7:30 pm 29 Apr 9 am - 5 pm	Science Literacy for Educators VII: Risk, Perception, & Fear Central Washington University - Ellensburg
5 May 4:30-7:30 pm 6 May 8 am - 6 pm (Saturday field trip)	Science Literacy for Educators VIII: Radiation and Hanford Yakima and Richland
12 May 4:30-7:30 pm 13 May 9 am - 5 pm (Saturday field trip)	Science Literacy for Educators III: Geology: Understanding Our Earth - Central Washington University - Ellensburg

Non Educators may take any of the courses for $50 each

Sciences — STUDENT EVALUATION OF INSTRUCTION

Science Ed 5 SIDE "STARS BUGS . . ." SPRING 96

Appendix XVI FORM A

SCED500.52 MCCORMACK M — Number of Surveys: 20 — LECTURE/DISCUSSION

RECEIVED

GENERAL EVALUATION	*Excellent* (5)	(4)	(3)	(2)	*Poor* (1)	Mean/Std. Dev. Class		College		CWU	
1. Course as a whole was:	11	8	1	0	0	4.50	.61	4.00	.90	4.02	.89
2. Instructor's teaching effectiveness was:	13	4	2	0	0	4.58	.69	4.04	.99	4.05	.97
DIAGNOSTIC FEEDBACK FOR THE INSTRUCTOR	*Always* (5)	(4)	(3)	(2)	*Never* (1)						
3. Instructor met class regularly and on time	20	0	0	0	0	5.00	.00	4.62	.75	4.61	.74
4. Class sessions were well organized.	19	1	0	0	0	4.95	.22	4.28	.90	4.27	.89
5. The instructor provided useful feedback	16	3	0	0	0	4.84	.37	3.90	1.06	3.94	1.05
6. I was confident in instructor's knowledge	19	1	0	0	0	4.95	.22	4.54	.80	4.54	.79
7. The instructor was enthusiastic	18	0	0	0	0	5.00	.00	4.39	.88	4.39	.87
8. Students encouraged to express themselves	16	4	0	0	0	4.80	.41	4.21	.99	4.22	.97
9. Extra help was available when needed	18	2	0	0	0	4.90	.31	4.15	.99	4.15	.99
10. Course objectives were clearly stated	19	1	0	0	0	4.95	.22	4.28	.94	4.29	.93
11. The instructor gave clear explanations	17	2	0	0	0	4.89	.32	4.12	1.01	4.12	1.00
12. The instructor presented alternative explanations	14	4	1	0	0	4.68	.58	4.18	.95	4.17	.95
13. Answers to student questions were clear	20	0	0	0	0	5.00	.00	4.14	.98	4.14	.97
14. Instructor raised important questions	20	0	0	0	0	5.00	.00	4.28	.89	4.25	.89
15. Appropriate examples were used	19	1	0	0	0	4.95	.22	4.36	.87	4.33	.87
16. The instructor's speech was clear	18	2	0	0	0	4.90	.31	4.46	.87	4.45	.86
INFORMATION ABOUT THE COURSE	*Always* (5)	(4)	(3)	(2)	*Never* (1)						
17. Class time was used efficiently	15	3	2	0	0	4.65	.67	4.25	.91	4.22	.92
18. Instructor was interested in student learning	16	4	0	0	0	4.80	.41	4.23	.94	4.24	.94
19. Helped develop an appreciation for the field	18	2	0	0	0	4.90	.31	4.12	1.04	4.14	1.03
20. Applied course material to real world issues	17	3	0	0	0	4.85	.37	4.30	.93	4.33	.91
21. Course objectives were met	18	2	0	0	0	4.90	.31	4.34	.88	4.35	.86
22. Assigned readings and work were useful	12	5	3	0	0	4.45	.76	4.06	1.05	4.05	1.04
23. Evaluative and grading techniques were fair	19	0	0	0	0	5.00	.00	4.18	1.05	4.16	1.05
24. Amount of work was appropriate	19	1	0	0	0	4.95	.22	4.20	1.03	4.18	1.02
25. Student responsibilities were clearly stated	20	0	0	0	0	5.00	.00	4.35	.90	4.34	.90
26. Instructor treated students with respect	19	0	1	0	0	4.90	.45	4.68	.75	4.66	.77
HOW WOULD YOU DESCRIBE?	*High* (5)	(4)	(3)	(2)	*Low* (1)						
27. The intellectual challenge presented to you	19	1	0	0	0	4.95	.22	4.16	.91	4.14	.93
28. The amount of your effort needed to succeed	7	7	5	1	0	4.00	.92	4.14	.91	4.16	.91
29. Your involvement	13	7	0	0	0	4.65	.49	4.23	.89	4.30	.86

GENERAL INFORMATION

Reasons for Taking Course

Major	0	Time	3
Minor	0	Curiosity	9
General Ed	0	Advisor	0
Elective	9	Friend	4
Instructor	6	Availability	0

Class Standing

Freshmen	0
Sophomore	0
Junior	0
Senior	0
Graduate	13
Other	7

Hours/Week Spent on Course

Under 2	0	13 to 15	0
2 to 6	12	16 to 18	0
7 to 9	3	19 to 21	0
10 to 12	4	22 or More	0

Appendix XVII

CENTRAL WASHINGTON UNIVERSITY
Office of Continuing Education

PROGRAM EVALUATION SUMMARY COMMENTS

Instructor: M. McCormack
Program: SCED 500.52
Date: Spring 1996

Strengths of this program

-Inviting a wide variety of specialists speaking on current day issues while they are active in field. The 2 field trips learning on route and being able to ask questions were excellent growing awareness. Fantastic resource books.

-The hands on examples/demonstrations. The field trips were excellent. Guest lecturers were excellent although occasionally, they were discussing issues too complex to be explained in the allotted time.

-I thought this was a wonderful, interesting class that is much needed not only for teachers, but also the public in general. I have learned so much about science in areas that are important to all of us. The field trips were excellent, and speakers were great. I enjoyed everything about the class. It is one of the best ones I've taken.

-Extremely well organized. Instructors enthusiastic about the material great expertise from all the speakers.

-The parts in which I could relate to 9-10 yr. old students-Astronomy, Geology, Chemistry.

-My thinking was broadened as to development and growth of our world. I feel my knowledge was greatly broadened and challenged.

-Covered many subjects. Made me curious to learn more about the various subjects covered.

-Guest speakers on Genetics, Risk, Physics.

-A better understanding of the whole around us especially in the science areas. I feel the class was very valuable to me as a person and a teacher.

Appendix XVIII

"Stars, Bugs, Molecules and You"

Darrington - Summer Quarter 1994

Evaluation Summary (15 out of 23)

Please circle the number of the statement that most fits what you learned from that session.

5 - The subject is of great value to me and in my teaching
4 - The subject will help me somewhat
3 - The subject was interesting
2 - The subject was over my head
1 - The subject was of no value to me whatsoever

Subject	5	4	3	2	1	Average
Astronomy	7	5	1			4.46
Math	5	7	1			4.31
Chemistry	3	5	3	2		3.69
Geology	6	3	3	1		4.08
Physics	4	6	2	1		4.00
Origins of Life	4	6	4			4.71
Population Explosion	7	6	1			4.43
Global Warming	8	3	3			4.36
Chemophobia	6	4	3			4.23
Radiation	6	3	5			4.07
Electromagnetic Fields	1	7	4	1		3.62
Overall Course	3	7	2			4.08
Overall Average						4.17

The Institute for Science and Society

Washington State University

Eastern Washington University

and

The Institute for Science and Society

present

A Course in Science Literacy for Teachers

"Stars, Bugs, Molecules & You"

Week Days - Monday, July 8 through Friday, July 19, 1996
at the
Sirti Building - Spokane

FOR REGISTRATION CONTACT:
THE INSTITUTE FOR SCIENCE & SOCIETY
707 N. PEARL ST., SUITE I, ELLENSBURG, WA 98926
(509) 925-9620 FAX (509) 925-9621

This course will explore physical, life, and earth sciences and their relationships to current societal issues. The course is designed for educators who have little or no background in science, but all educators are welcome. A mini-library of science books valued at $160 will be provided free of charge. Funding for this course is provided by the Department of Energy, corporations and individuals. Classes will be held from 8 am until noon daily except for two full day field trips.

Registration Fees

Washington State University
4.3 Continuing Education Credits *(pass/fail)* **$20**

Eastern Washington University
5 Academic Credits - NTSC 497 *(pass/fail))* **$175**

Alternately, teachers may earn 50 clock hours through ESD 101 for $100.

"Stars, Bugs, Molecules and You"

"Stars, Bugs, Molecules and You" is an exciting adventure for all K-12 teachers that enhances their levels of science literacy and confidence. It is of special value to those teachers having little or no experience or training in science, but also for those teachers who are teaching science. Science Literacy is essential for any educator who is committed to helping all students grow into responsible contributing citizens.

Instructors who are experts in their fields and who teach at the proper level and pace for science literacy will be drawn from educational institutions, scientific corporations, and the Institute for Science and Society. Reading assignments will be from a mini-library of science books written for non-scientists which will be provided free of charge to enrolled educators. No other texts will be required.

Summer Session 1996

Monday, July 8th, 8 am - noon

What science is - and isn't
Astronomy: The Cosmos and Us
The big bang - stellar life and death
The creation of matter
The formation of the sun and earth

Tuesday, July 9th, 8 am - noon - Physics

Laws of motion, energy, electricity and magnetism
Classroom demonstrations and experiments

Wednesday, July 10th, 8 am - noon - Mathematics

Some easy basics for science literacy and every day living
Large and small numbers, scientific notation, probability
Exponential growth, making estimates, and mental math

Thursday, July 11th, 8 am - 5 pm - Geology Field Trip*

Geologic history of the Spokane area
Lectures will be conducted at selected sites and enroute.
Note: Travel will be by commercial bus.

Friday, July 12th, 8 am - noon - Chemistry

The what, why and how of chemistry
Atomic structure, the periodic table, valence, chemical reactions
The what of bio-chemistry
Demonstrations and experiments

Monday, July 15th, 8 am - noon - Biology

Possible mechanisms for the origin of life
Evolution
Biotechnology, genetic engineering

Tuesday, July 16th, 8 am - noon - Societal Issues

Global climate change
Electromagnetic fields
Human population growth

Wednesday, July 17th, 8 am - noon - Radiation

Ionizing radiation
Health effects and beneficial uses
Spokane radiation background
Using Geiger counters

Thursday, July 18th, 8 am - 9 pm - Hanford Field Trip*

Hanford Museum of Science and History
WPPSS nuclear power plants
Hanford reactors, chemical and waste storage facilities

Friday, July 19th, 8 am - noon

Chemophobia
Risk and perception of risk
The realities of energy supply and demand
The pace of change - our obligation to society

*Field trips are mandatory for a passing grade.
There will be lectures on the bus during the field trips.

"Stars, Bugs, Molecules and You"
Registration Form

Name _____

Home Address _____

City/State/Zip _____

School/city _____

Social Security # _____

Grade level and/or subject taught _____

Home Phone _____ School Phone _____

School District _____

Credit requested from:

_____ Washington State University

_____ Eastern Washington University

_____ ESD 101

Certificate Number (if you want clock hour credit) _____

Registration will be limited to 25 teachers on a first come basis.
All registration applications after 25 will be placed on a waiting list.
Tuition will be payable on the first day of class - July 8, 1996
(checks should be made out to ISS [The Institute for Science & Society])

Mail, fax, e-mail or call your registration to:
The Institute for Science and Society
707 N. Pearl St., Suite I, Ellensburg, WA 98926
(509) 925-9620, FAX: (509) 925-9621. e-mail: iss@adsnet.net

many more teachers out there that will get that chance to be with you. It's truly not just a great class but a fantastic professor that makes it all happen! Cheers to you my friend!

Melisa &

11-6-95

Dear Mike,

You have opened up new doors to a richer world of science, thanks to your enthusiasm and desire to teach.

It has been a fantastic experience taking this class. I know I've only scratched the surface of science as far as how much I've learned but it's been very rich in experiences and knowledge gained. (Kind of like eating a whole pound of fudge instead of just one piece!) I've loved each [illegible] hope there are

Joan and Mike,

Thank you so very much for all the time, effort and expertise you put into the Stars, Bugs, Molecules & You course. It was really one of the most worthwhile courses I have ever had. Your commitment and dedication were obvious at each session. You are amazing people - energetic & generous sharers of knowledge and talented educators. You gave us information and ~~an~~ your example to bring back to our students. Thank you,

Kathy Wilson

Ambassador

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If thanks
came in colors...

Appendix XII

My life has been enriched! Thanks! Karen Travelstead (?)

You have opened my eyes to greater science. Thanks Katy Sallee (?)

Thank you so much for your energy & enthusiasm. I learned a lot! Cathy Fridelson (?)

Thank you so much for all the extras you've provided for us. Kathy W.

I'm so glad I was able to be part of this. I have learned so much! Thanks Pat Rischbieter (?)

This class has renewed my enthusiasm for teaching science!

…you'd get a whole rainbow today!

What a great learning experience. Thank you very much for enriching my knowledge. Sue Sauer (?)

Thank you for your efforts. Mark Herzog (?)

It was a great ride! Sorry it's ending.

Thanks for your dedication - we're infected! Chuck Scott (?)

I truly enjoyed all of the topics of this class. I hate to see it end. When you're ready for the Bingo molecules II, let me know. I'll be the first to sign up. Thanks Dan Clar (?)

Thank you for sharing your passion and enthusiasm. Thanks for science! Kelly Newbury (?)

This has been a terrific class. Thank you for teaching us so much. Susan Johnson

I am so motivated to keep learning! Thanks! Judy Carr

Thank you for sharing your enthusiasm and knowledge. Lisa Gambion (?)

What an experience! Thanks a million, Mike!

I have learned so much! Denny Miller

This class has been wonderful. Thanks for all your inspiration! Sue Field

I am much more enlightened about science and society! :) Lisa K.

Thanks to y'all I is a scientific literate and lovin' it!
Sira Bennett

Thank you for such a wonderful class. I enjoyed all the learning activities. Judy Pegor (?)

Thank you for everything. Jean R. (?)

Thanks for a great class & a great way to share more ... Trish & Linda

Thank you for caring enough.. & to keep on teaching - Judy F.

Dear ... Thank you for sharing your science expertise and your warm, endearing selves with us. You've whetted my appetite to explore & learn. Kids love science, and I enjoy science too - Now, I can further both of our developments. You two are truly the dynamic duo!

Love, Susan Elston

Remember: an m&m a day and Vitamin C keeps the doctor away ☺

Mike & Joan,
Thanks so much for sharing your love & passion for science. I don't want this class to end. I can't wait to share my new love for science with my students.
Cindy Vauckter

Mike + Joan
Thank you for your enthusiasm, your dedication and your desire to share so much with us. You are truly role models for our profession. I know my students will benefit directly from my experiences in this class. Robin Goetz

Mike and Joan,
Thank you so much. I'm excited about all the areas we explored although still mathphobic. The field trip and speakers were inspirational.
Haigs

Marianne Dickson

Joan -
You're an amazing lady - highly organized, highly energized, very intelligent & awfully SWEET! Thanks for everything!
♡ Jean Ann Williamson

Joan & Mike -

We

18	39.948
87.45	
83.95	
1.784†	Ar
[Ne]3s²p⁶	
Argon	

but . . .

GIG HARBOR CLASS. SMR. 96

Mike & Joan -
I have thoroughly enjoyed my studies of science from you & this experience was inspirational! Thank you!! Kathy Hyle

Mike + Joan -
What a wonderful experience! We are not only enriched as professionals but as human beings.
Thank you! Ellen

Dear Mike and Joan, I've been touched and deeply impressed by the broad scope of this course. Your sincerity, enthusiasm, and clarity have truly inspired me! I have much to take back to my classroom as a result. Keep up the great work and I hope that you'll offer more specialized courses in the future. I hope to maintain contact with you. My best wishes,
Doug McDonnell

Mike & Joan,
I have thoroughly enjoyed this class! Thank you for sharing your knowledge and your experiences. I will never forget that wonderful field trip.
Elizabeth

I've learned so many interesting things for my classroom - and my life! Thanks for your mind and heart, shared so well. Nick Adams

hopefully NOT forgotten!

Dear Mike & Joan,
Thank you for all your efforts to make us more effective teachers! I appreciate the wisdom, balance and breadth you have brought to us. Somehow, the world makes more sense now, because of this experience. Thanks!
Kim Bucklin

Dear Joan & Mike,
I see the world through new eyes and clarity. I appreciate all you have done to help me gain a clearer understanding of my world! Sincerely, Jim Church

I have enjoyed the course. Thanks for providing the opportunity to participate.
Paul [illegible]

Thank You for sharing your knowledge with us. I have enjoyed every day! Chris Jardin

Mike + Joan,
Thank you for opening my eyes to science. The guest speakers were wonderful. The course materials very organized!! I appreciated the frankness + "humour" of your lectures. :)
Mary [illegible]

the

class

of summer '96

Mike -
You were delightful and you are inspirational. I learned [illegible] from you. Thanks!
Jo-Ann [illegible]

Joan & Mike
I once again understand the excitement of learning a child experiences! If I can inspire in students what you have in me I shall have succeeded as an educator [illegible]
Anne [illegible]

Appendix XXIV

RECEIVED

September 11, 1996

Dear Mike,

I am writing to thank you for the packet I received in the mail today - the Questions and Answers from our last class of "Stars, Bugs, Molecules and You" in Sunnyside. I read it immediately and wished I had some more evening classes to attend!

This mailing spurred me to write to you as I had sincerely intended to after our class ended, but being the procrastinator that I am, the entire summer passed by without my doing so! I have wanted to express my sincere thanks to you and Joan and all of the instructors involved in the course for an excellent course and for your extreme generosity and sincerity. I have probably never taken a better organized class than this, and was amazed and highly grateful for the quantity and quality of the materials we received.

I sensed throughout the course your sincere desire to better educate teachers in the sciences, and your passion for the subject and how it daily affects us all. I know that we all marvelled at your knowledge and ability to share it with us in terms we could understand!

I wish you continued success with the Institute and hope that you are able to continue with it. Thank you once again. You have made a mark on my life which I will try to pass on to my students!

Sandra Pascua