THE GREEN LIGHT ACADEMY

ADDENDUM

Program Evaluation
and
Program Alignments with SDE Frameworks

Program Evaluation Contents:

Samples of:

- **Pre/Post Comprehensive Test**
- **Student Attitudinal/Diversity Survey**
- **Student Attitudinal Surveys: Mutual Respect, Academic Achievement, Program "Climate"**
- **Student Year End Program Evaluation**
- **Parent Year End Program Evaluation**
- **Teacher Year End Program Evaluation**
- **Student Summer Program Survey**
- **Parent Summer Program Survey**

Program Alignment with SDE Frameworks Contents:

- **Alignment with Core Scientific Inquiry, Literacy, Numeracy**
- **Alignment with Science Content & CMT Correlations**
- **Alignment with Social Studies Curricular Strands & GLE**
- **Alignment with Math standards & GLE**
- **Alignment with Performance Base Assessment**
- **Alignment with SDE Position Paper on Science Education for District and Grade Level(s) (Marked with xx)**

Parent Orientation Form/Registration

THE GREEN LIGHT ACADEMY
Renewable/Sustainable Energy
Pre/post Test

1) Wind is produced by the difference of _____ in the atmosphere.
a. Conduction b. moisture c. pressure d. none of these

2) Thermal energy is the motion of _____.
a. molecules b. radiation c. convection d. all of these

3) Windmills can be used to produce _____.
a. electricity b. radiation c. convection d. none of these

4) Windmills can be connected to produce _____ of energy.
a. some amount b. more amounts c. some amount, but for longer time
d. all of these

5) The precision of construction will affect a windmills _____.
a. appearance b. efficiency c. durability d. none of these

6) Molecules are farthest apart in _____.
a. liquids b. gases c. solids

7) Electrical energy can be produced from _____.
a. wind b. sun c. moving H2O d. all of these

8) Most of the world's energy is started in which form? _____
a. chemical b. electrical c. nuclear d. mechanical

9) Fossil fuels can best be described as _____.
a. finite b. infinite c. clean burning d. in expansive

10) The human body converts chemical energy into _____.
a. nuclear b. heat c. radiant d. none of these

11) Which of these bulbs is most efficient? _____
a. incandescent b. fluorescent c. halogen

12) Which uses the most energy in American homes? _____
a. lights b. heating H2O c. heating & cooling home d. stove

13) The voltage of electricity produced by a model windmill generally _____ with the distance from the fan.
a. increases b. decreases c. goes up then down d. none

14) Which of these gives the U.S. most of its energy? _____
a. wind b. gas c. coal d. petroleum

15) Most of which fuel comes from foreign sources? _____
a. nuclear b. gas c. petroleum d. all of these

16) Coal's major use in this country is _____.
a. pizza ovens b. electricity c. fuel trains d. none

17) Which of these is produced from the remains of ancient plants? _____
a. gas b. oil c. coal d. uranium

18) Solar, biomass, and wind are called renewable because _____.
a. they are free and do not pollute
b. they can be used to make electricity
c. they can be "re-made" by nature
d. they do not pollute

19) In 2006, what percent of the nation's energy supply comes from renewable sources? _____
a. 0% b.6% c. 15% d.25%

20) Which of these gives the U.S. most energy today? _____
a. wind b. solar c. geothermal d. biomass

21) Hydrogen fuel cells use _____.
a.CO2 b. H2O c. air d. none of these

22) A photovoltaic cell converts solar energy into _____.
a. mechanical energy b. electricity c. H2O d. none of these

23) Biodiesel fuel can be made from _____.
a. used frying oil b. H2O c. uranium d. none of these

24) Electricity is the motion of _____.
a. atoms b. molecules c. neutrons d. non of these

25) How much of the energy from burning coal reaches the consumer? _____
a.1% b.33% c.50% d.75%

26) Which of these will affect a wind generator's ability to produce electricity? ___
a. The material the blades are made from
b. The shape of the blades.
c. The angle of the blades.
d. All of these.

27) One by-product of making biodiesel is _____.
a. glycerin b. coal c. propane d. non of these

28) Which country is the world's biggest consumer of oil? _____
a. India b. China c. U.S. d. none of these

29) Which of these energy sources produces the least amount of pollution? _____
a. oil b. natural gas c. hydrogen fuel cell d. coal

30) Geothermal energy uses the _____ stored within the earth.
a. heat b. water c. electricity d. none of these

PART II

1) **How does the burning of fossil fuels contribute to the "greenhouse effect"?**

2) **Name and discuss 3 roadblocks to the U.S. becoming energy independent.**

3) **What are some steps your community takes to help improve the air quality?**

4) **Does the need to rely on foreign energy have any impact on the security of a country? Support answers with 2 proofs.**

5) **How is the way of life a people/culture influenced by its need, supply, and use of energy? You may discuss an ancient or contemporary culture to answer this.**

6) **Describe how energy is made from any 2 types of renewable energy.**

7) **List the steps in making biodiesel fuel.**

8) **How will the law of supply and demand influence the use of non-renewable and renewable energies in the future?**

THE GREEN LIGHT ACADEMY

Student Attitudinal/ Diversity Survey (Pre/Post)

Name:_____ School:_____

	Agree Always	Agree Sometimes	Undecided	Disagree Sometimes	Disagree Always
I tend to place people into groups or categories based on race, ethnicity, or economic background.					
Students in my school group people into categories based on race, ethnicity, or economic background.					
I am feel comfortable about interacting with students from diverse cultural backgrounds					
I tend to stereotype people based on appearance.					
I look forward to working with students from diverse cultural backgrounds.					
Working, playing, and interacting with other students will help teach me the skills I need in school and later in life.					
Participating in this program will help me to develop new academic skills and abilities.					
Planning and sharing ideas with teammates is important in achieving success.					
Students from other schools/towns share many of the same interests (clothes, movies, foods) as I do.					
Building solar cars, heaters, windmills, and participating in team challenges will help me build self esteem					
Interacting with others will help me appreciate their individuality and help me understand that we share much in common					

How do you think this experience might have an effect on your future job interests or career path?

In what ways might the information you gain through the Green Light Academy assist you in your next year in school?

How do you think this experience might impact your decision to go to college?

Comments, thoughts, or reflections:

THE GREEN LIGHT ACADEMY

Student Attitudinal Survey on Mutual Respect

	Strongly Disagree	Disagree	Agree	Strongly Agree
It doesn't matter where someone comes from, I can get along with anyone				
I would rather be in a school that did not have cultural or racial diversity				
I would rather be in a school that does not have kids with physical or mental disabilities				
Students with disabilities have many skills				
I have at least one friend who has a disability				
It doesn't matter what race someone is or what language they speak, I can be friends with anyone.				

THE GREEN LIGHT ACADEMY

Student Attitudinal Survey on Academic Achievement

	Strongly Disagree	Disagree	Agree	Strongly Agree
I try to do my best in school and in this program				
Being well educated is important to me				
Earning good grades is important to my future				
My teachers care about how well I do in school				
I believe the work I do in the Academy could help me when I return to class in the fall				
I believe the work I do in the Academy could help me getting into college or technical trade school after I graduate from high school.				
I believe the work I do in the Academy could help me succeed in college some day				

I believe the Green Light Academy experience will help me earn better grades.				

THE GREEN LIGHT ACADEMY

Student Year-End Program Evaluation

One of the goals of the Green Light Academy is to provide numerous opportunities for students to meets and get to know students from other districts. Do you think this goal was accomplished?

Yes _____ No_____

Comments:

Another goal of the project is to provide educational experiences centered on the global energy crisis and renewable/sustainable energy sources. Do you think this goal was accomplished?

Yes _____ No_____

Comments:

Teachers in the program wanted to provide instructional experiences in an enjoyable relaxed atmosphere. They were successful:

_____All of the time
_____Most of the time
_____Some of the time
_____Not often
_____Never

By the end of the Academy I knew the names of about _____ other students in the program. (Not including friends I had at the beginning)

By the end of the Academy I knew the names of _____ teachers, professors or interns. (Not including ones I knew at the beginning of of the Academy).

During the Academy we visited a number of farms, energy facilities, parks, universities, manufacturers of renewable/sustainable energy, buildings utilizing renewable energy, and power plants. Which of these most impressed you? For what reason(s)?

Listed below are some of the themes and activities you experienced this year. Please do your best to rank them in order of preference. (Number one indicates it was your favorite part of the program and # 14 your least favorite).

_____ Mapping the Long Island Sound
_____ Building a Solar Still
_____Visiting water treatment plant
_____Great Pond Farm visit
_____Fuel Cell Cars
_____Building a Windmill
_____ Visiting Lighthouses
_____ Making Biodiesel
____ Studying Mud Crabs
____ Learning about careers
____ Searsburg Wind Farm
____ Yale Sustainable Food
____ Installing Solar Panels
____ Beach Clean Up

Please briefly explain why you liked your # 1 so much and what you disliked about your #9. _____

_____

_____

If a more advanced follow-up program was offered next year would you enroll?

_____Absolutely! _____Maybe _____ No thanks

Please explain_____

Please list three observations that you noted regarding students from other districts.

_____

_____

_____

Did you have any questions about the project before your first day?

What kinds of things did you wonder about?

How could we make it easier for all students to get to know each other?

_____

_____

_____

What did you learn about yourself by attending the GLA?

_____

_____

_____

The summer residency program was a substantial and important segment of the program and therefore deserves some special attention. Please take a several minutes to think before responding to this question.

Please write a five or six paragraph essay to address the following: How did the summer residency benefit you personally, socially, academically, and culturally?

Additional

Comments:_____

_____

_____

THE GREEN LIGHT ACADEMY

Parent Program End Evaluation Survey

1) **How did you hear about The Green Light Academy?**
   _____ Mailings
   _____ Parent Night
   _____ Classroom Teachers
   _____ In-school display/posters
   _____Newsletters
   _____ Other (please specify) _____

2) **What were your reasons for enrolling your child in the Academy?**
   _____ Educational experience
   _____ Make new friends
   _____ Other friends were attending
   _____Personal growth (for your child)
   _____ Other (please specify) _____

3) **The decision to enroll your child in the Academy was:**
   _____ Mostly mine
   _____ Mostly his/hers
   _____ Half/Half

4) **Did your child share their program experience with you?**
   Frequently____ Occasionally ____ Never____

5) **If given the opportunity, do you feel your child would enroll in a follow-up school year program next year?**
   Absolutely ____ Maybe ____ Not likely ____

6) **I believe my child's favorite program experience was**
   _____
   _____
   _____.

7) **I would recommend this program to other parents:**
   _____ Very Strongly
   _____ Some what strongly
   _____ Maybe
   _____ Not at all

8) **From those listed which 2 methods do you feel would be most effective in notifying parents and recruiting students for next year's school year program?**
   _____Mailings _____Local newspapers ____Classroom teachers
   _____Parent Visiting _____ Notices sent home ____ Other

9) **Would you like to see this program continue?**

   _____Yes
   _____ No
   _____ Not Sure

10) **From the methods listed, which do you believe were most effective in notifying parents and recruiting students?**

   _____ Mailings **_____ Local Papers**
   _____ Classroom teacher **_____ Parent visiting night**
   _____ Principal's newsletter **_____ Bulletin boards**
   _____ Notices sent home

11) **If there was a follow-up program offered, would you want to enroll your child?**
   _____ Yes
   _____ No
   _____ Not sure

12) **One of the goals of the program is to provide educational opportunities for students that acquaint them with renewable forms of energy and the varied career opportunities this field has to offer. Do you believe this goal has been accomplished? Please explain.**

<u>Additional COMMENTS---SUGGESTIONS---REFLECTIONS</u>

THE GREEN LIGHT ACADEMY

End of Year Teacher Program Evaluation

	Strongly Agree	Agree	**Undecided**	**Disagree**	**Strongly Disagree**
The program was effective in acquainting students with the scientific, technological, economic, and ecological aspects of sustainable energy and the global energy crisis.					
The program's content and performance standards were closely aligned with those of my school.					
The programs content and performance standards were closely aligned with K-12 Framework and the Common Core of Learning.					
I was provided ample opportunity to offer my input and suggestion for the content and delivery of the program.					
Students participated in numerous exchange day activities to better prepare them for the next generation of CAPT (depending on grade level)					
Students were afforded numerous opportunities to use higher order, critical thinking skills.					
Students were afforded numerous opportunities to apply acquired content knowledge.					
In completing team challenges and lab activities, students were afforded the opportunity to discuss, plan, strategize, and take action steps to complete activity.					
I would recommend this program to my colleagues.					
The program was effective in reducing racial, ethnic, and economic isolation by bringing together a diverse population of students					
Exchange day activities provided meaningful opportunities for students to enhance their multi-cultural awareness and understanding					
The program was effective in creating interest in a career in the energy field					

THE GREEN LIGHT ACADEMY

Student Program Evaluation

1) **One of the goals of The Green Light Academy was to provide numerous opportunities for students to meet and get to know students from other districts. Do you think this goal was accomplished?**

   Yes _____ No_____

2) **Another goal of The Academy was to provide educational experiences centered on renewable and alternative energy sources. Do you think this goal was accomplished?**

   Yes _____ No_____

3) **Teachers in the program wanted to provide these Academy experiences in an enjoyable and relaxed atmosphere. They were successful:**

   All of the time____
   Most of the time____
   Some of the time____
   Not often____
   Never____

4) **By the end of the program, I knew the names of about _____ other students in the program. (Not including friends I had at the beginning).**

5) **By the end of the Academy I knew the names of _____ teachers. (Not including ones I knew at the beginning of the GLA).**

6) **Rank the activities from most enjoyable to least (1 being the most- 10 being the least).**

   _____ Movie Night
   _____ Team Sports & Recreation Time
   _____ Visiting Lighthouses and Parks
   _____ Boat Tour of Long Island Sound
   _____ Oil Drum Art
   _____ Pot Luck Dinners
   _____ Green Light Cookbook Club
   _____ Service Learning (Yale Farm, Clean Sound, Shoes for Haiti)
   _____ Photography and Photo Exhibit
   _____Event Planning (Graduation)

6b.) Please briefly explain why you liked your #1 so much and what you disliked about your #10_____

_____

_____

7) If there was a follow up to this Academy next summer would you attend?
_____ Absolutely!! _____ Maybe _____ No Thanks

8) During the Academy what did you notice, realize, or learn about other kids?
_____
_____
_____.

9) Did you make new friends during the program?
_____Of course! _____Not really

10) Would you like to become better acquainted with some of he students at the Academy?
_____ Yes _____No

11) How could we make it easier for kids to get to know each other?
_____
_____
_____.

12) What did your learn about yourself by attending the Academy?
_____
_____
_____.

13) Additional Comments:_____
_____
_____
_____.

THE GREEN LIGHT ACADEMY
Parent Program Evaluation

How did you hear about The Green Light Academy?

_____ Mailings

_____ Parent Night

_____ Classroom Teachers

_____ In school display/posters

_____ Principals newsletter

_____ Other (Please specify) _____

What were your reasons for enrolling your child in the GLA?

_____ Educational experience

_____ Make new friends

_____ Other friends were attending

_____ Personal growth (for your child)

_____ It sounded like a fun experience

_____ Other (please specify) _____

The decision to enroll your child in GLA was

_____ Mostly mine

_____ Mostly his/hers

_____ Half/Half

Did your child share his/her Academy experience with you?

_____Frequently _____Occasionally _____Never (these are teenagers!)

If given the opportunity do you feel your child would enroll in another summer residential program next year?

_____Absolutely _____Maybe _____ No Thanks

If such a follow-up program was offered would you want your child to enroll?

_____Absolutely _____Maybe _____ No Thanks

I believe my child's favorite Academy experience was _____

_____

_____

Is there an activity, event, program or educational experience you think would enhance the program?

_____

_____

_____

I would recommend this program to other parents:

_____ Very Strongly

_____ Somewhat strongly

_____ Maybe

_____ Not at all

From those listed which 2 methods do you feel would be most effective in notifying parents and recruiting students for next year's summer Academy?

_____ Mailings

_____Parent evenings

_____Local Newspapers

_____Notices sent home (newsletters etc)

_____Classroom teachers

_____Other

Name: _____ Gender: _____High School: _____

Age: _____ Grade: _____ H.S. Science Courses Taken:_____

Math and Science Interest Survey – Student Version

from: http://gk12.uark.edu/programresults/Student%20Science%20Survey.pdf

We would like to know your opinion about your interest in math and science. The survey is voluntary and your individual responses will be kept completely confidential. Your parents, the program staff, and fellow students will NOT see your responses to this survey. Data entry and analysis will be completed solely by the program coordinator. Thank you for your assistance.

from: Jenkins, E.W., & Pell, R.G. (2006). "Me and the Environmental Challenges": A survey of English secondary school students' attitudes towards the environment. *International Journal of Science Education, 28,* 7, 765-780

Name: _____ High School: _____

The Environment and Sustainability

Please answer all of these open-ended questions to the best of your ability. An open-ended question can have many good answers. A good answer is one that is scientifically correct and complete. Your ideas should be explained clearly and thoroughly. You can always draw a diagram as a part of your answer even if the question does not specifically call for one.

1. How do the physical and chemical properties of marine water affect the life it sustains?

2. What are nitrates and what are the effects on Long Island Sound?

3. What is reverse osmosis? How can reverse osmosis be used practically in a marine environment?

4. How is human activity impacting Long Island Sound. Cite three (3) examples.

5. Select three sources of energy used in Connecticut. List an advantage and disadvantage for each.

6. What is sustainable energy? What are some of the benefits of sustainable energy?

7. How can sustainable energy be effectively used?

8. What is the "best" source for energy? Justify your position.

Name: _____ Child's Name: _____ Gender: _____

Age: _____ Grade: _____ H.S. Science Courses Taken:_____

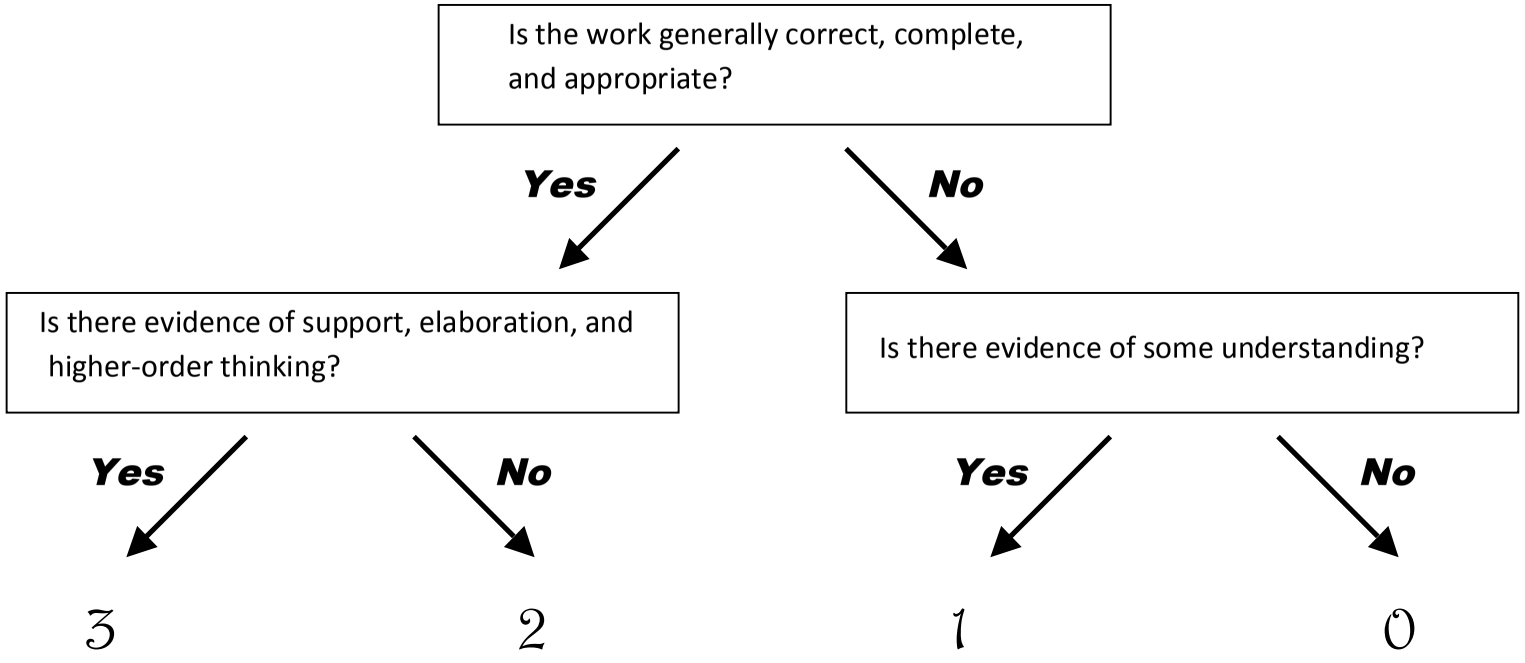
Me and the environmental challenges

Please read the following statements and indicate your agreement or disagreement with each. Circle your corresponding choice.

1.	Threats to the environment are not my business	Disagree	Low Disagree	Low Agree	Agree
2.	Environmental problems make the future of the world look bleak	Disagree	Low Disagree	Low Agree	Agree
3.	Environmental problems are exaggerated	Disagree	Low Disagree	Low Agree	Agree
4.	Science and technology can solve all environmental problems	Disagree	Low Disagree	Low Agree	Agree
5.	I am willing to have environmental problems solved even if this means sacrificing many goods	Disagree	Low Disagree	Low Agree	Agree
6.	I can personally influence what happens with the environment	Disagree	Low Disagree	Low Agree	Agree
7.	We can still find solutions to our environmental problems	Disagree	Low Disagree	Low Agree	Agree
8.	People worry too much about environmental problems	Disagree	Low Disagree	Low Agree	Agree
9.	Environmental problems can be solved without big changes in our way of living	Disagree	Low Disagree	Low Agree	Agree
10.	People should care more about protection of the environment	Disagree	Low Disagree	Low Agree	Agree
11.	It is the responsibility of the rich countries to solve the environmental problems of the world	Disagree	Low Disagree	Low Agree	Agree
12.	I think each of us can make a significant contribution to environmental protection	Disagree	Low Disagree	Low Agree	Agree
13.	Environmental problems should be left to the experts	Disagree	Low Disagree	Low Agree	Agree
14.	I am optimistic about the future	Disagree	Low Disagree	Low Agree	Agree
15.	Animals should have the same right to life as people	Disagree	Low Disagree	Low Agree	Agree
16.	It is right to use animals in medical experiments if this can save human lives	Disagree	Low Disagree	Low Agree	Agree
17.	Nearly all human activity is damaging to the environment	Disagree	Low Disagree	Low Agree	Agree
18.	The natural world is sacred and should be left in peace	Disagree	Low Disagree	Low Agree	Agree

from: Jenkins, E.W., & Pell, R.G. (2006). "Me and the Environmental Challenges": A survey of English secondary school students' attitudes towards the environment. *International Journal of Science Education, 28,* 7, 765-780

Holistic Science Scoring Rubric for Open-ended (Constructed) Responses



Score	3	2	1	0
Evidence	The response is an excellent answer to the question. It is correct, complete, and appropriate and contains elaboration, extension, and/or evidence of higher-order thinking and relevant prior knowledge. There is no evidence of misconceptions. Minor errors will not necessarily lower the score.	The response is a proficient answer to the question. It is generally correct, complete, and appropriate although minor inaccuracies may appear. There may be limited evidence of elaboration, extension, higher-order thinking, and relevant prior knowledge, or there may be significant evidence of these traits but other flaws (e.g., inaccuracies, omissions, inappropriateness) may be more than minor.	The response is a marginal answer to the question. While it may contain some elements of a proficient response, it is inaccurate, incomplete and/or inappropriate. There is little if any evidence of elaboration, extension, higher-order thinking or relevant prior knowledge. There may be evidence of significant misconceptions.	The response, although on topic, is an unsatisfactory answer to the question. It may fail to address the question, or it may address the question in a very limited way. There may be no evidence of elaboration, extension, higher-order thinking, or relevant prior knowledge. There may be evidence of serious misconceptions.

based on: CT State Department of Education, modified by Frank LaBanca, Ed.D.

INQUIRY STANDARDS

Standard #	*Standard*
D INQ.1	**SCIENTIFIC INQUIRY**
D INQ.2	¨ Scientific inquiry is a thoughtful and coordinated attempt to search out, describe, explain and predict natural phenomena.
D INQ.3	¨ Scientific inquiry progresses through a continuous process of questioning, data collection, analysis and interpretation.
D INQ.4	¨ Scientific inquiry requires the sharing of findings and ideas for critical review by colleagues and other scientists.
D INQ.5	**SCIENTIFIC LITERACY**
D INQ.6	¨ Scientific literacy includes the ability to read, write, discuss and present coherent ideas about science.
D INQ.7	¨ Scientific literacy also includes the ability to search for and assess the relevance and credibility of scientific information found in various print and electronic media.
D INQ.8	**SCIENTIFIC NUMERACY**
D INQ.9	¨ Scientific numeracy includes the ability to use mathematical operations and procedures to calculate, analyze and present scientific data and ideas.
D INQ.10	

CONTENT STANDARDS

Standard#	*Standard*
9.1-D 2.	Energy cannot be created or destroyed; however, energy can be converted from one form to another.

9.1-D 3.	Energy cannot be created or destroyed; however, energy can be converted from one form to another.
9.2-D 4.	The electrical force is a universal force that exists between any two charged objects.
9.2-D 5.	The electrical force is a universal force that exists between any two charged objects.
9.3-D 8.	Various sources of energy are used by humans and all have advantages and disadvantages.
9.3-D 9.	Various sources of energy are used by humans and all have advantages and disadvantages.
9.5-D 14.	Due to its unique chemical structure, carbon forms many organic and inorganic compounds.
9.8-D 24.	The use of resources by human populations may affect the quality of the environment.
9.9-D 25.	Some materials can be recycled, but others accumulate in the environment and may affect the balance of the Earth systems.
9.9-D 26.	Some materials can be recycled, but others accumulate in the environment and may affect the balance of the Earth systems.
10.5-D 42.	Evolution and biodiversity are the result of genetic changes that occur over time in constantly changing environments.

Expected Performance
Identify questions that can be answered through scientific investigation.
Read, interpret and examine the credibility and validity of scientific claims in different sources of information.
Formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment.
Design and conduct appropriate types of scientific investigations to answer different questions.
Identify independent and dependent variables, including those that are kept constant and those used as controls.
Use appropriate tools and techniques to make observations and gather data.
Assess the reliability of the data that was generated in the investigation.
Use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.
Articulate conclusions and explanations based on research data, and assess results based on the design of the investigation.
Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

Expected Performance
Explain how energy is transferred by conduction, convection and radiation

Describe energy transformations among heat, light, electricity and motion.
Explain the relationship among voltage, current and resistance in a simple series circuit.
Explain how electricity is used to produce heat and light in incandescent bulbs and heating elements.
Describe the availability, current uses and environmental issues related to the use of fossil and nuclear fuels to produce electricity.
Describe the availability, current uses and environmental issues related to the use of hydrogen fuel cells, wind and solar energy to produce electricity.
Describe combustion reactions of hydrocarbons and their resulting by-products.
Explain how the accumulation of mercury, phosphates and nitrates affects the quality of water and the organisms that live in rivers, lakes and oceans.
Explain how land development, transportation options and consumption of resources may affect the environment.
Describe human efforts to reduce the consumption of raw materials and improve air and water quality.
Describe how structural and behavioral adaptations increase the chances for organisms to survive in their environments.

INFORMATION LITERACY

Standard: The student will demonstrate strategies to identify, locate, and evaluate information and apply new knowledge using a variety of resources including technology.

Indicator	Developing 1	Near Goal 2	Goal 3	Advanced 4	Score 1 – 4
Accesses resources	Does not find the minimum number of sources required, and information is lacking relevance and essential details.	Uses the minimum number of sources to retrieve information and has a rudimentary organizational structure, however, some of the information are irrelevant and/or may contain errors in essential facts.	Uses an appropriate number of print and non-print sources to retrieve information that has a sound organizational structure, and most of the information is relevant and contains correct essential facts.	Exceeds expectations for the number of print and non-print sources to retrieve information that has a sound organizational structure and all of the information is relevant and contains correct essential facts.	
Selects information (from the resources used)	Selects little or no information or information may not relate to the research purpose	Selects some information that generally relates to the research purpose.	Selects adequate and specific information that consistently relates to the research purpose.	Selects abundant and accurate information relevant to the research purpose from a balance of resources.	
Evaluates information	Does not apply or develop criteria to judge information accuracy or reliability.	Attempts to apply or develop criteria to judge information accuracy or reliability but application is uneven or unreliable.	Reliably applies, or develops and applies, criteria to judge information accuracy or reliability.	Reliably applies, or develops and applies criteria to judge information accuracy or reliability and is able to reflect or improve on the quality of the information.	
Cites resources	Attempts to cite resources	Attempts to cite resources in works consulted/ cited in MLA or APA format.	Cites resources within the text and in works consulted/cited in proper format (MLA, APA).	Cites complex resources within the text and in works consulted/cited in consistently proper format (MLA, APA).	

Goal is a score of 12, with no indicators of 1.

PROBLEM SOLVING

Standard: The student will use inquiry strategies and apply appropriate procedures to solve and communicate an authentic problem or situation.

Indicator	Developing 1	Near Goal 2	Goal 3	Advanced 4	Score 1 – 4
Problem statement	Attempts to identify the problem.	Identifies aspects of the problem.	Identifies the problem completely.	Identifies the problem and its implications completely.	
Developing an approach	No or inappropriate approach is proposed	Selects a reasonable approach	Selects an approach with a rationale for its success	Selects and creates a reasonable, logical, and creative approach with a rationale for its success	
Data collection	Attempts to use relevant information or data to solve the problem.	Uses some relevant information or data to solve the problem.	Uses relevant information or data to solve the problem.	Uses a variety of sources of relevant information or data to solve the problem.	
Evaluation and implications of the solution	Attempts to formulate a solution or conclusion to the problem.	Formulates a solution or conclusion to the problem with minor misconceptions.	Formulates a solution or conclusion that addresses the problem.	Formulates a solution or conclusion that addresses the problem and has other applications.	
Reporting	Insufficiently documents the solution to the problem.	Documents the solution to the problem with minor areas of confusion.	Documents the solution to the problem in an appropriate medium.	Documents the solution to the problem in an appropriate and advanced medium.	

Goal is a score of 15, with no indicators of 1.

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SPOKEN COMMUNICATION

Standard: Students will convey information and ideas to others in a presentation using spoken language, non-verbal language, and multi-media.

Indicator	Developing 1	Near Goal 2	Goal 3	Advanced 4	Score 1 – 4
Topic focus	Has no discernable, coherent, or valid message	Presents an outline of a valid message	Presents a complete, discernable, and valid message	Presents a complete, valid, message, which is clear, present, and consistent throughout	
Format	Organizes spoken and visual components with support from structured directions.	Organizes spoken and visual components with minor areas of confusion.	Organizes spoken and visual components in a logical sequence with appropriate transitions.	Organizes spoken and visual components in an engaging sequence with skillful transitions	
Content organization	Tends to emphasize information over ideas; information may be inaccurate and/or unclear.	Conveys information with minor inaccuracies; conveys ideas with minor areas of confusion.	Conveys information and ideas with accuracy and clarity.	Conveys information and ideas with authority and originality.	
Visual Aides	Uses multi-media techniques; however, connection to information may not be evident.	Uses multi-media techniques to illustrate information or ideas.	Uses multi-media techniques to illustrate and interpret information and ideas.	Makes skillful and creative use of graphic organizers and other multi-media techniques to illustrate and interpret information and ideas.	
Elocution	Speaks too quickly or too softly for the setting, may incorrectly pronounce terms.	Speaks at a pace and volume that are appropriate for the setting.	Adjusts pace and volume to provide emphasis, pronouncing most words correctly	Makes dynamic use of pace and volume (controlled, energetic and purposeful). Precise pronunciation of terms	
Body language	Uses eye contact, posture or expression with prompting during presentation.	Uses eye contact, posture or expression to convey meaning.	Uses eye contact, posture and expression to convey meaning.	Uses eye contact, posture and expression to convey meaning and engage the audience.	
Addressing questions	Student does not have grasp of information; student cannot answer questions about subject.	Student is uncomfortable with information and is able to answer only rudimentary questions.	Student is at ease with expected answers to all questions, but fails to elaborate.	Student demonstrates full knowledge (more than required) by answering all class questions with explanations and elaboration.	

Goal is a score of 21, with no indicators of 1.

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REFLECTIVE WRITING

Standard: Students will demonstrate understanding of concepts and their own learning through written communication.

Indicator	Developing 1	Near Goal 2	Goal 3	Advanced 4	Score 1 – 4
Topic focus	The main idea is not clear. There is a seemingly random collection of information.	Main idea is somewhat clear but there is a need for more supporting information.	Main idea is clear but the supporting information is general.	There is one clear, well-focused topic. Main idea stands out and is supported by detailed information.	
Topic support	Supporting details and information are typically unclear or not related to the topic.	Supporting details and information are relevant, but several key issues or portions of the storyline are unsupported.	Supporting details and information are relevant, but one key issue or portion of the storyline is unsupported.	Relevant, telling, quality details give the reader important information that goes beyond the obvious or predictable.	
Quality of information	Information has little or nothing to do with the main topic.	Information clearly relates to the main topic. No details and/or examples are given.	Information clearly relates to the main topic. It provides 1-2 supporting details and/or examples.	Information clearly relates to the main topic. It includes several supporting details and/or examples.	
Authenticity	The writer has not tried to transform the information in a personal way. The ideas and the way they are expressed seem to belong to someone else.	The writer relates some of his own knowledge or experience, but it adds nothing to the discussion of the topic.	The writer is drawing on knowledge or experience, but there is some lack of ownership of the topic.	The writer is writing from knowledge or experience. The author has taken the ideas and made them "his or her own."	
Grammar and spelling	Writer makes more than 4 errors in grammar or spelling that distract the reader from the content	Writer makes 3-4 errors in grammar or spelling that distract the reader from the content.	Writer makes 1-2 errors in grammar or spelling that distract the reader from the content.	Writer makes no errors in grammar or spelling that distract the reader from the content.	

Goal is a score of 15, with no indicators of 1.

Position Paper on Science Education

Alignments marked with an X

The Connecticut State Board of Education regards scientific literacy as evidence of a high-quality science education. People who are scientifically literate understand core science concepts of life, earth and physical science; use scientific reasoning; and recognize the interactions among science, technology and society. Science education teaches students to raise questions, to persevere in search of answers, to reason logically, and to distinguish between unsubstantiated claims and those that have valid and reliable substantiation. All students need opportunities to refine and strengthen their scientific content knowledge and scientific inquiry skills on a continuum from preschool through high school and beyond.

The Board believes that Connecticut's schools must increase their efforts to motivate and prepare more students to pursue science-related careers. The future of Connecticut's place in a globally competitive market relies on the engagement of students in pursuing innovative careers in science, technology, engineering and mathematics. By ensuring that every student learns science in a way that is intellectually engaging and contextualized in real-world experiences, schools can open new opportunities for students who otherwise may not see how prominent science is to solving the great challenges of this century. In addition, science education fosters students' natural curiosity about the world they live in and deepens students' understanding about their roles as stewards of the planet.

To accomplish these goals, the Board supports an inquiry-based approach to science education, which includes hands-on laboratory experiences for all students. Adequate time and appropriate resources must be provided for this specialized instruction. It is important to engage students in science investigations that foster students' natural curiosity and that provide opportunities for learning experiences to extend into the community.

Teachers play a critical role in helping students to learn the methods of science, how to make sense of data, and how to communicate and critically evaluate information. As part of a quality science program, all students must be held to expectations of high achievement as defined in the Connecticut Core Science Curriculum Framework. Science instruction should prepare students for mastery of content and include regular assessments.

Partnerships among families, school districts, community organizations, businesses and universities are necessary to fulfill this vision of science education as preparation for life, advanced studies and technical careers. In short, all concerned with maintaining a knowledgeable, informed citizenry must contribute expertise, resources, guidance and sustained support. To support this collaborative effort, the Board has developed "Guidelines for Policymakers," a set of recommendations that describe suggested roles and responsibilities for establishing a high-quality science education program.

Components of a High-Quality PK-12 Science Education System: Guidelines for Policymakers

September 3, 2008

The Connecticut State Board of Education, in its 2008 Position Statement on Science Education, calls for a systematic approach to ensuring that every student in Connecticut receives a rich and coordinated PK-12 education in science. Science learning should focus simultaneously on developing an understanding of core concepts, as well as knowing how scientists work collaboratively to test ideas, analyze evidence and solve problems.

The realization of this vision is critical for our students' futures, as well as for Connecticut's place in the globally competitive economy. The Board offers the following guidelines to support the establishment of collaborations among various stakeholders to build a coordinated science education system.

Responsibilities of the Department of Education

XX •Develop and publish PK-12 science curriculum standards that clearly identify a sequenced progression of key science concepts and abilities that all students should develop.

XX •Develop student assessments that are aligned tothe expected performances in the Connecticut Core Science Curriculum Framework.

•Provide current and accurate safety information for science teachers and building administrators.

XX •Provide appropriate professional development opportunities for science educators.

XX *Partner with higher education institutions, business and industry to strengthen science instruction and student interest in science, technology, engineering and mathematics (STEM) career paths.

XX•Ensure that science educators at all grade levelshold the appropriate teaching certificate for their assignment.

XX•Develop model curriculum aligned with the science framework for the core secondary science courses.

Responsibilities of School Districts

•Develop and implement a coherent and coordinated district science curriculum that is aligned with learning expectations set forth in the Connecticut Core Science Curriculum Framework.

XX•Provide a safe, effective learning environment at all grade levels and, when appropriate, grade-level laboratory or combination classroom/laboratory space based on the laboratory occupancy load limit.

XX•Provide instructional materials, supplies, technology and equipment, including safety equipment,storage space and a range of reading materials to support learning science through inquiry.

XX•Provide student's access to science content and coursework through distance learning programs and technologies.

•Establish science safety policies, including a chemical hygiene plan, and

appoint a chemical hygieneofficer to implement and enforce the plan.

XX•Provide ongoing professional development in science content, pedagogy, safety and interdisciplinary instruction.

XX•Employ "highly qualified teachers" who are knowledgeable about the content, methods and pedagogy of the science they teach.

XX•Provide science teacher leaders to coordinate and support science instruction at all grade levels.

XX•Provide time for teachers to collaborate and develop rich science lessons, inquiry investigations and assessments that monitor student achievement in science.

• Provide time for teachers to set up and clean up science instructional materials.

•Inform families about the science curriculum,instructional methods and expectations for student learning.

XX•Encourage community participation in science events during and beyond the school day to promote the importance of scientific literacy and encourage student interest in science.