



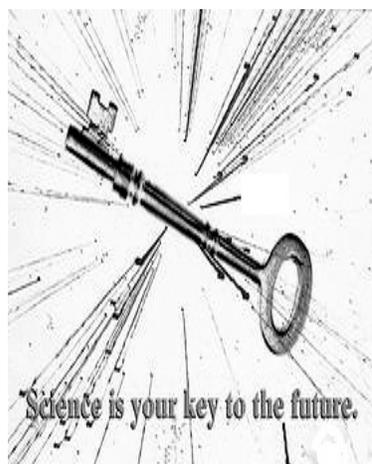
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New Haven Public Schools

OUTLINE OF PROFESSIONAL DEVELOPMENT DAY SCIENCE

Nov 7th

7:45 – 8:10 Welcome, Orientation, Breakfast

8:15 – 9:00

Auditorium

Whole Group discussion:

What use is science, STS skills:

Evaluation of sources,

analyzing data,

communication,

making/ defending decisions,

risks/benefits.

common vocabulary

9:00 – 11:00 Break out by grade. Practice STS, Write ?s:

seventh grade: A101 (SJ)

eighth grade: A102 (MC)

high school (Cross) A103 (BS)

high school (Hillhouse) A105 (DL)

11:00 – 12:15 lunch

12:15 – 3:00

Middle School:

Embedded lab task s

Write ?s

7th grade:(SJ) A309

8th grade:(MC) A313

12:15 – 1:00

High School group B Auditorium

Whole Group discussion:

What use is science, STS skills:

Evaluation of sources,

analyzing data,

communication,

making/ defending decisions,

risks/benefits.

common vocabulary

1:00 – 3:00 Break out by grade.

Practice STS/write ?:

ninth grade (+11): A101 (BS)

tenth (+12) grade: A102 (DL)

Attachments:

STS Notes

CT Science Standards

Workshop Evaluation (Turn IN)

Lab Report Rubric Scoring

Open Ended Questions Scoring/Interdisciplinary

Grade Level Tasks, Scoring, Example Assessments



NEW HAVEN SCIENCE!

WHY USE SCIENCE?



-STATE SCIENCE STANDARDS STS:

Science and Technology in Society – How do science and technology affect the quality of our lives?

In addition to the life, physical and earth science standards, the Core Science Curriculum Framework includes standards and expected performances for inquiry and for science and technology in society. Inquiry performances include the abilities to apply science process skills, as well as the abilities to read and write science-related texts, search scientific databases and use mathematics to make sense out of data. The science and technology in society standards deal with applications of science to everyday and global issues, and reflect content and issues described in *Standards for Technological Literacy* (International Technology Education Association, 2000).

Scientific literacy also implies having the capacity to pose and evaluate arguments based on evidence and to apply logical conclusions from such arguments. Language arts and mathematics are the communication vehicles that people use to convey, critique and evaluate science-related ideas. Therefore, language arts and mathematics learning expectations are included in the framework as integral components of science learning.

I. SCIENTIFIC INQUIRY

- ◆ Scientific inquiry is a thoughtful and coordinated attempt to search out, describe, explain and predict natural phenomena.
- ◆ Scientific inquiry progresses through a continuous process of questioning, data collection, analysis and interpretation.
- ◆ Scientific inquiry requires the sharing of findings and ideas for critical review by colleagues and other scientists.

SCIENTIFIC LITERACY

- ◆ Scientific literacy includes the ability to read, write, discuss and present coherent ideas about science.
- ◆ Scientific literacy includes the ability to search for and assess the relevance and credibility of scientific information found in various print and electronic media.

SCIENTIFIC NUMERACY

- ◆ Scientific numeracy includes the ability to use mathematical operations and procedures to calculate, analyze and present scientific data and ideas.

Core Scientific Inquiry, Literacy and Numeracy

How is scientific knowledge created and communicated?

POWER CONTENT STANDARDS	EXPECTED PERFORMANCES
<p data-bbox="261 415 597 449" style="text-align: center;">SCIENTIFIC INQUIRY</p> <ul data-bbox="115 489 732 919" style="list-style-type: none"><li data-bbox="115 489 732 646">✚ Scientific inquiry is a thoughtful and coordinated attempt to search out, describe, explain and predict natural phenomena.<li data-bbox="115 667 732 783">✚ Scientific inquiry progresses through a continuous process of questioning, data collection, analysis and interpretation.<li data-bbox="115 804 732 919">✚ Scientific inquiry requires the sharing of findings and ideas for critical review by colleagues and other scientists. <p data-bbox="261 1014 597 1047" style="text-align: center;">SCIENTIFIC LITERACY</p> <ul data-bbox="115 1087 732 1381" style="list-style-type: none"><li data-bbox="115 1087 732 1203">✚ Scientific literacy includes the ability to read, write, discuss and present coherent ideas about science.<li data-bbox="115 1224 732 1381">✚ Scientific literacy includes the ability to search for and assess the relevance and credibility of scientific information found in various print and electronic media. <p data-bbox="248 1476 610 1509" style="text-align: center;">SCIENTIFIC NUMERACY</p> <ul data-bbox="115 1549 732 1707" style="list-style-type: none"><li data-bbox="115 1549 732 1707">✚ Scientific numeracy includes the ability to use mathematical operations and procedures to calculate, analyze and present scientific data and ideas.	<p data-bbox="816 415 1479 489">INQ1. Identify questions that can be answered through scientific investigation.</p> <p data-bbox="792 531 1511 646">INQ2. Read, interpret and examine the credibility and validity of scientific claims in different sources of information.</p> <p data-bbox="841 688 1495 877">INQ3. Formulate a testable hypothesis and demonstrate logical connections between the scientific concepts guiding the hypothesis and the design of the experiment.</p> <p data-bbox="816 919 1511 1035">INQ4. Design and conduct appropriate types of scientific investigations to answer different questions.</p> <p data-bbox="841 1077 1479 1192">INQ5. Identify independent and dependent variables, including those that are kept constant and those used as controls.</p> <p data-bbox="784 1234 1511 1297">INQ6. Use appropriate tools and techniques to make observations and gather data.</p> <p data-bbox="800 1339 1495 1413">INQ7. Assess the reliability of the data that was generated in the investigation.</p> <p data-bbox="792 1455 1495 1570">INQ8. Use mathematical operations to analyze and interpret data, and present relationships between variables in appropriate forms.</p> <p data-bbox="824 1612 1495 1759">INQ9. Articulate conclusions and explanations based on the results of the research, and assess their validity based on the design of the investigation.</p> <p data-bbox="816 1801 1495 1917">INQ10. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.</p>

WHAT DOES THIS MEAN?:

Classroom activities and lessons need to include the USE of science and the discussion of its impact:

EVALUATION OF SOURCES:

What makes a source credible?

- good experiment (control group, valid, variables).**
- clear data**
- non biased**
- primary source**
- recent**
- academic**

IMPACT OF SCIENCE AND TECHNOLOGY:

RISKS

BENEFITS

ADVANTAGES

DISADVANTAGES

MAKING DECISIONS/ FORMING OPINIONS

Yes/No -----→ IN BETWEEN --→ OPEN ENDED

**What is the effect of fossil fuel use on global temperatures?
(science)**

Why do we use fossil fuels for energy? (science, economics)

**What is the effect of fossil fuel use on the environment? on
society? (science, social)**

What alternatives are there to fossil fuels?

**What are the risks/benefits or the advantages/disadvantages to
using fossil fuels for energy?**

**What are the credible, reliable sources on using fossil fuels for
energy?**

Should we keep using fossil fuels? (Yes/No)

Yes, but..... NO, and use this instead....

What should we do about fossil fuels? Why? How?

Classroom Activities:

AUTHENTIC, and REALISTIC:

Evaluate a web site:

Have a debate:

Write an essay:

Have a FORUM:

(assign a role to each group, they investigate, present, discuss, a town council decides)

OTHERS:

TODAY:

PRACTICE THE STS TASKS.....

DISCUSS WAYS TO USE THEM IN UNIT LESSONS.....

PRODUCE QUESTION IDEAS FOR QUARTERLY

ASSESSMENTS (revisited in CIA meetings)

MIDDLE SCHOOL:

Continue Practicing Embedded Tasks

ASSESSMENT?????

Example Multiple Choice:

Which is NOT a good criteria to use in evaluating a web site for scientific information?

- A) The date of the information.
- B) The validity of the experiment that gave the information.
- C) The organization sponsoring the site.
- D) The amount of big words used.

Jose doesn't like the idea of using a specific kind of paint. To argue his point in an essay he should write mostly about:

- A) The bad health effects of all kinds of paint.
- B) The benefits of using a different kind of paint.
- C) The risks and benefits of this kind of paint, and an alternative.
- D) The use of paint around the world.

When making a graph to predict future trends in the use of a chemical you should:

- A) Use a bar graph
- B) Use a line graph with space for future years.
- C) Make a break in the middle of the graph if there is a jump in numbers.
- D) Copy a graph from a website.

OPEN ENDED:

Which type of energy source do you think that Connecticut should use? Explain and defend your answer.

Here is a graph of population trends over the next ten years. Explain how scientific advances might affect this graph .

What criteria should an engineer use in deciding to build a bridge? Explain.

What are the advantages and disadvantages of bioengineered food? What is your opinion and why?

What are the advantages and disadvantages of food preservatives? What is your opinion and why?

What are the advantages and disadvantages of using plastics for long term storage? What is your opinion and why?

HIGH SCHOOL EMBEDDED STS TASKS: (NOV 7)

9th Energy and Power Technologies (9.3), Polymers (9.6),
Human Environmental Impacts (9.8, 9.9)

Plastics: (DINQ 2, 9, 10)

Evaluate the credibility of sources of information on plastics web sites: (Kind of site, authority of author, point of view, date, reliability of information)

CT Brownfield Site: (DINQ 2, 9, 10) (DINQ 1, 4, 5)

Find a CT Brownfield site near New Haven. Investigate a contaminant. Formulate a scientific investigation about the site. (IV, DV, procedures, data table, control group)

Energy Uses in Connecticut: (DINQ 2, 9, 10)

Make a line graph from energy sources spreadsheet.

Choose one of the fuel sources to research the advantages and disadvantages, and support Connecticut's initiatives to decrease use of non renewable resources.

10th:

Living with MicroOrganisms (10.2), BioTechnology (10.3),
Human Population Growth (10.6)

BioEngineered Food: (DINQ 2, 9, 10)

Using websites students design a persuasive pamphlet (risks/benefits) in support of or in opposition to genetically engineered food based on scientific evidence. Use several sources to support stance, and consider credibility of sources in defending position.

Human Population Dynamics: (DINQ 2, 9, 10)

Compare and contrast shape of two country (one developed, one undeveloped) population graphs from 2005. Compare changes in populations of both countries projected to 2025. Research and describe three factors that affect changes in human population for one country. Explain how one technological advance might affect population to 2025. Is technology a positive or negative influence, explain evidence.

11th

Chemicals in Our Lives: (DINQ 2, 9, 10)

Using web sites, investigate an issue around a common chemical. Example: adding fluorine to drinking water, or the use of pesticides. Using websites students design a persuasive pamphlet (risks/benefits) in support of or in opposition based on scientific evidence. Use several sources to support stance, and consider credibility of sources in defending position.

MIDDLE SCHOOL NOV 7th DAY

Identify questions that can be answered through scientific investigation.

- C INQ1. Read, interpret and examine the credibility of scientific claims in different sources of information.
- C INQ2. Design and conduct appropriate types of scientific investigations to answer different questions.
- C INQ3. Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment.
- C INQ4. Use appropriate tools and techniques to make observations and gather data.
- C INQ5. Use mathematical operations to analyze and interpret the data.
- C INQ6. Identify and present relationships between variables in appropriate graphs.
- C INQ7. Draw conclusions and identify sources of error.
- C INQ8. Provide explanations to investigated problems or questions.
- C INQ9. Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.

Science and Technology in Society - How do science and technology affect the quality of our lives?

7.4 Technology allows us to improve food production and preservation, thus improving our ability to meet the nutritional needs of growing populations.

Methods have been developed to prevent food spoilage caused by bacteria.

Science and Technology in Society - How do science and Technology affect the quality of our lives?

8.4 In the design of structures there is a need to consider factors such as function, materials, safety, cost and appearance.

7: Feel The Beat Heartbeat CMT Embedded Task Students design experiment to investigate factors that affect heart beat, and communicate conclusions and findings.

8: Shipping and Sliding CMT Embedded Task. Students design experiment to investigate how surfaces/mass/area affect friction forces of a sliding box, and communicate conclusions and findings.