

**Curriculum Subcommittee Meeting  
Wednesday, March 7, 2012 5:30 PM  
Central Services**

**I. Consent Agenda**

**A. Minutes from Last Meeting**

**Attachments:**

Curriculum Subcommittee Minutes 2-15-12

2

**B. Curriculum Director's Report**

**Attachments:**

Curriculum Director's Report - Feb.

3

**C. NEAS&C 5-Year Report Summary**

**Attachments:**

NEAS&C 5-Year Report Summary

6

**II. Discussion of Process for Curriculum Subcommittee**

**III. Old Business**

**A. D&CP Implementation**

**B. Homework Update**

**IV. New Business**

**A. Process for Curriculum Review**

**B. Curriculum Planning**

**C. Budget Issues: New Texts and Big History Course**

**Attachments:**

Big History Course Proposal

7

Big History Course Support Materials

12

**Curriculum/Policy/Technology/Communication Subcommittee Meeting Minutes  
February 15, 2012  
6:00 p.m.**

Attendance:

Jenny Emery – Present  
Lynn Guelzow – Present  
Cal Heminway– Present  
Ed Ohannessian- Present  
Ben Perron – Present  
Rosemarie Weber – Present  
Matt Wutka – Present

Alan Addley - Present  
Diane Dugas - Present  
Mike Dunn - Present  
Pat Law – Present

Meeting commenced at: 6:00 p.m.

Meeting adjourned at: 7:00 p.m.

1. Discussion on High School Courses – Discussed English 11 AP, Honors and Academic courses. Normal process was not followed to remove the English 11 Honors class and it has been reinstated.

## Monthly Curriculum Sub Committee Report

From: Diane Dugas, Director of Curriculum, Teaching and Learning

Date: February 2012

### Professional Development:

- Two Day workshop on Student Progress Monitoring using AIMSWEB (K-12 Special Education Teachers, Literacy Specialists, Consulting Teachers and some administrators)
- One Day workshop on PLATO Online learning interventions (HS teachers)
- Visitation to CREC Reggio Magnet School in Avon to see full Day Kindergarten (Kearns K teachers, Principal and D of C).
- MS work on school wide-writing rubric
- Leadership Academy – Aspiring leaders meet monthly to develop leadership capacity – School Improvement Planning
- Facilitation and participation in cultural awareness book club - 3<sup>rd</sup> meeting (18 staff members district-wide) sponsored by CREC - Creating the Opportunity to Learn.
- GMHS hosted teachers from Jilin Province, China. (Presented an overview of curriculum development and professional development processes followed by questions and answers)

### Curriculum:

- Curriculum Committee Work:  
During the month of February the following curriculum committees met to continue deepening awareness of standards, developing units and designing assessments:

Math- Mapping common core standards K-11; researching and discussing resources and tools for effective instruction to match units of instruction created.

Science – In the process of developing rigorous performance assessments that emphasize content and inquiry; developing rubrics to assess student performance.

Social Studies- Focused on learning expectations 5-12; in the process of creating big ideas 5-12.

World Language- Finished unwrapping standards; determining standards per grade and essential questions 7-12.

Practical Arts- Focus powering standards by course and creating yearlong big ideas and essential questions for course completion.

Language Arts – Some grade levels met to further work on performance assessments for units, work was advanced on matching the pacing of K-8 reading and writing units

Developmental Guidance– identified current reality of instructional focus of content, lessons, resources and implementation structure. Next steps to view the developmental guidance standards and state expectations for strengths and gaps.

## **DCP Update:**

### **Communications**

- Principals met with Teaching Assistants and Tutors to communicate T of A and potential changes at the building level
- Harry, Cal and Karen Walther met with representatives for TA's and tutors to communicate staffing implications for 2012-2013.
- Alan met personally with several folks

### **Professional Development/Planning and Organization**

During the month of February the large work group (consisting of all administrators and representative teachers from each building) was provided with an over view of SRBI Best Practice as a review for future planning and implementation of the process.

Administrators worked on solidifying intervention schedules to identify TA's, tutors and special education staffing decisions.

## **Other Committee Work:**

- Student Success Plan Committee – The Group is developing Student Success Plans for all students in grades 6-12; Overview of the Naviance on-line management system.
- Technology Committee – Drafting the 3 year technology plan to be brought to the BOE subcommittee in late spring.
- Early Childhood Committee meetings – Meetings to plan the implementation of the integrated preschool and full day kindergarten. Developing the peer screening process for integrated Pre-k, viewing pre- k curriculum standards in prep for curriculum development.
- TEAM Coordinating Committee – New Module (5) to be delivered by districts on Professional Teaching Standards

## **Other:**

- Budget – Ongoing budget processes.
- Held Director of Summer School Interviews, establishing processes and initial implementation steps
- Posted and initiated organization of Global Learning Academy summer session
- Ongoing work with TEAM (new teachers) – Module 5 training this week.
- SIIP – Participation with Bob Gilbert and Anna Forlenza Baily through the Connecticut Center for School Change on alignment and coherence of school improvement initiatives to district and Superintendent theory of action.
- K-12 Intervention Work – Focus on Numeracy
- District Testing Coordinator - Preparation for CMT/CAPT.
- Collaborative Planning with SERC on our equity and cultural awareness work
- Ongoing collaboration with our district data expert to make revisions to our data management system to reflect more in-depth data analysis of our district benchmarks to support student growth AND to begin revisions of our curriculum warehouse system

### **Monthly Meetings:**

- District Ad Council – Emphasis on creating the structures to support focused time on instructional leadership to advance student learning.
- Elementary Ad Council Meetings – Scheduling and implementation of World Language and training and implementation of new interventions.
- Principals Seminar – Three book study on Teacher Supervision and the importance of meaningful feedback to impact teacher practice.
- Monthly Walkthrough's – Worked collaboratively with High School Principal to facilitate walkthrough and debriefing focused on student engagement and effective teaching strategies.
- Bi Monthly building Administrator meetings – Discussions around budget, future planning, implementation and upcoming curriculum, assessment and instruction issues, CMT and CAPT.
- K-12 Language Arts meetings- Inclusion of two consulting teachers Elaine Chagnon and Jessica Beecher, annual focus on coaching issues in enhancing teacher capacity
- PLC Team meetings – As requested.
- Superintendent meetings – Ongoing daily communication and district level planning
- BOE meetings
- ELL tutor – monthly updates

**NEAS&C Five Report Follow-Up Report Summary  
BOE Subcommittee Meeting – March 7, 2012**

<b>Initial Report – May 2007</b>			<b>Two Year Report - #</b>	<b>Two Year Report- %</b>		<b>Five Year Report - #</b>	<b>Five Year Report - %</b>
42 Commendations		<b>Completed</b>	11	39%		26	90%
29 Recommendations		<b>In Progress</b>	15	54%		3	10%
		<b>Planned for the Future</b>	2	7%		0	0
		<b>Rejected</b>	0	0		0	0
		<b>No Action Required</b>	0	0		0	0
		<b>Total</b>	28	100%		29	100%

**Details of five year report:**

6 highlighted recommendations - all completed

3 areas still in progress:

- Complete the curriculum revision for all subject areas.
- Provide storage space throughout the building that secures equipment and materials and that addresses safety issues.
- Implement all physical plant recommendations to meet the standards for handicapped accessibility

**Next Steps:**

Next accreditation visit – May 2017

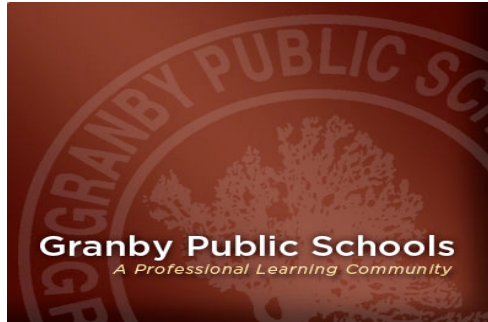
New NEAS&C standards developed and in place for next visit

Continued work with facilities to meet compliance standards and storage issues

Curriculum committees continuing to work on developing/updating curriculum maps, units, assessments

Course Proposal Requests are to be communicated with and between:

- Department/CAS Leader
- Principal
- Director of Curriculum
- Curriculum Committee
- Director of Curriculum/BOE Curriculum Sub Committee



## Granby Public Schools Course Proposal Request

To be completed for recommendation of:

- New course**
- Revision of a course (not offered for 2 or more years)**
- Course Elimination**
- Course level change**
- Impact on Graduation Requirements**

Date: 27 Feb. 2012

Teacher: Joe Jarvis

Department/School: GMHS

### **Recommendation: (Course title/grade and level/number of credits/prerequisites)**

“Big History” is proposed as a 9<sup>th</sup> grade honors level 1 credit course that meets the 9<sup>th</sup> grade World Civilizations graduation requirement. There are no prerequisites. A comparison matrix has been developed to show that Big History matches very well with the current enduring understandings and academic expectations of the current 9<sup>th</sup> grade course. ***A copy of the comparison is included in the documents that accompany this proposal.*** It is our department’s professional opinion that even though the course content will be different, all of the 9<sup>th</sup> grade big ideas and essential questions will be covered.

In addition, the science portion of this interdisciplinary course best matches with the 9<sup>th</sup> grade Science & Society curriculum. Therefore, students will best benefit from cross-curricular connects if Big History is offered to freshmen.

Finally, staffing and budget constraints require that we not offer Big History as an elective course because doing so would necessitate the elimination of a currently offered elective. These courses already have enrollments that approach or exceed capacity. Consequently, we do not believe it is in the students’ best interest to eliminate one of these popular courses for an elective Big History course.

### **Background/Course History:**

Big History is an introduction to the big ideas and methods of history and science, and to the many different fields of research that continue to advance our understanding of the cosmos, ourselves, and our trajectory as a species. It is neither a course in science or history. Instead, it bridges those boundaries to reveal a larger narrative. By covering so much subject matter, spanning so many disciplines, the course helps students develop important 21<sup>st</sup> century skills such as critical thinking, synthesizing information, and identifying and creating arguments based

on different forms of evidence—skills which dovetail beautifully with the GMHS’s Mission, Achievement Goal, and Academic Expectations for Student Learning.

**Rational for recommendation: (Vision, mission, standards, enrollment)**

As noted above, the 21<sup>st</sup> century skills embedded in Big History clearly connect to our Vision to ensure students are “prepared for 21st Century Citizenship.” Big History focus on critical thinking, synthesizing information, and identifying and creating arguments will ensure we meet our Mission to make students “powerful thinkers” and our Achievement Goal of “Systemically improving students’ ability to analyze and synthesize information, solve problems and articulate/defend a position.”

Additionally, the goals and objectives of the course align perfectly with the school’s Mission in the following ways:

- Integrating and evaluating multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- Determining the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- Determining the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific context.
- Using technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- Gathering relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience.
- Drawing evidence from informational texts to support analysis, reflection, and research.

*(from The Big History Project’s “Mapping Big History to the Common Core In History/Social Studies, Science and Technical Subjects, Grades 9-10”)*

NEAS&C recommends that more interdisciplinary courses be offered at our school and an attempt has been made to retrofit existing courses into the interdisciplinary model. This course is unique in that it would be the only course taught that is interdisciplinary by design as it integrates elements from social studies, science and math at the very onset. See the common core alignment section below for specifics on how the course matches up.

Only one section of this course will be offered during the 2012-2013 school year. This course will be team taught by a social studies teacher and a science teacher. As of right now, the science teacher has a limited amount of time that can be dedicated to the course with zero budgetary implications. During the first year of the course an evaluation will be presented to the board with plans for expansion. In order to expand the number of sections offered, some

funding will be necessary to increase staffing. See the budgetary implications section below for more details.

**Curriculum: (Alignment to Standards (common core expectations), integration of other content area standards, performance assessment, rubrics)**

The Big History Project (BHP) used Common Core Standards to help create Big History’s learning outcomes and its spiraling curriculum frame. They are using the Common Core documents to help create assessments, rubrics, lessons and tools to support student learning. BHP has mapped all the learning outcomes to the Common Core Standards in reading, writing, speaking and listening in history/social studies, science and technical subjects. ***Accompanying this proposal, are a series of charts that illuminate the connections to relevant domains between the Common Core literacy standards and BH learning outcomes/activities.***

In addition to the Common Core Standards, BHP used the “Facets of Understanding” from *Understanding by Design*, Principles of Learning from *How People Learn* series, the revised Bloom’s Taxonomy and recent research on Cognitive Demands to create learning outcomes.

To effectively provide the necessary evidence of students learning BHP has created three different types of assessments that will be used at five different times throughout the course.

1. **Concept Assessments:** The Big History course is developed around a set of important big ideas from historical, scientific and social scientific disciplines. A central goal of the course is to help students develop their understanding of these concepts and increase their ability to use them in their future studies and in their daily lives. Thus, the assessments have been created to gauge students’ understanding and use of the core concepts. At four different times in the course students will be assessed to determine their understanding and skill in using these big ideas. The concept assessments are a mix of identifications, short answers, and released items from national and state tests in World History, Geography, Biology, Chemistry, and Earth Science.
2. **Text-based Assessments:** The BHP has a strong commitment to the Common Core standards as demonstrated in how carefully they have mapped the course standards and requirements to College and Career Readiness Standards for reading, writing, speaking and listening. To assess students’ progress in developing facility to read scientific and historical material, and to create narratives, explanations, and arguments in a range of genres and formats, they have created their own version of the “Document-Based Question” (DBQ) developed by College Board. They call these assessments Text-Based Assessment (TA) and are using these to provide evidence of how well students are learning to read complex informational texts and to write evidence-based explanations and arguments. The TAs involve extensive reading and writing in the style of explanations and arguments versus the traditional essays and narratives. Students are required to use sources to inform their own argument development and explanations.
3. **Little-Big History (LBH): A Problem-based Investigation:** Helping students develop multi-disciplinary research skills is another goal of the BHP and thus they have created

an assessment task to encourage students to engage in Big history research and to generate evidence on ways students approach and complete this task. The Little Big History (LBH) assignment provides students (1) the opportunity to learn how to conduct a Big history investigation and (2) a further chance to develop their skills in creating explanatory texts. In the LBH task, students conduct an historical investigation that ranges across time before and after human history and employs at least one other approach to knowledge, (outside history) such as cosmology, chemistry, biology and paleontology. To complete this sustained research project, students will conduct an investigation that creates focused questions, gathers relevant information from multiple print and digital sources to support analysis, reflection and research, assesses the credibility and accuracy of each source, draws evidence from texts, and then writes an informative/ explanatory text to convey what they have learned about the topic they studied. Finally, students will represent their work in another format – such as electronic, dramatic, visual – to an audience outside their teacher or BHP team, such as classmates, parents, other schools and students. The little big history assessment is given in the second half of the course.

Good assessments provide tasks or situations that enable students to *show* what they know and what they are able to do, and thus provide others the chance to observe students' performance. We think that the BHP assessments offer students multiple chances to think carefully -- and at times critically -- with Big History concepts, evidence and texts.

***Examples of all three assessments are included in the attachments accompanying this proposal.***

### **How will the content of this course be delivered?**

Course content will be delivered utilizing a variety of instructional strategies including cooperative learning, class discussions, research projects, inquiry-based activities, lectures (both online and in-class), and other strategies which allow the incorporation of hands-on and Web 2.0-based learning. Such a variety of strategies will allow students to learn valuable 21<sup>st</sup> century skills while mastering sophisticated content in a digital-rich environment.

What makes this course unique is the manner in which the material is presented to the students. The course is designed partially using the inverted classroom pedagogy in that much of the content will be learned at home and class time will be spent working with the material in cooperative groups, class discussions, projects, media creation and document analysis writing. Sal Khan, creator of the Khan Academy, is a major contributor to the content delivery structure of Big History, which is revolutionary and cutting edge.

### **Timelines for consideration (significant dates/deadlines/professional development/curriculum writing):**

- Early March 2012 – Course approval process complete
- March 22-26, 2012 – Big History Summit and Professional Development in Seattle
- Spring-Summer 2012 – Joe Jarvis and Jacky Paton create lessons using Big History curriculum
- Fall 2012 – Big History course begins

- 2012-2013 School Year – Ongoing analysis of the course with the Big History Project including monthly conference calls
- Fall 2012 – Discuss and evaluate enrollment and staffing projections for the 2013/14 school year
- Spring 2013 – Assess the need for curriculum writing for summer 2013

**Budget Implications (textbooks, supplemental resources, staffing, scheduling, professional development training, and curriculum writing):**

This course requires no textbook, as all of the content will be presented online through the Big History Project curriculum. There are no additional resources needed. There will be zero staffing impacts as the course will be an option to take in lieu of an existing course. The Big History Project will also supply an initial \$1500 subsidy paid directly to the school to cover the costs of substitutes, occasional staff release time, field trips, lab expenses, etc.

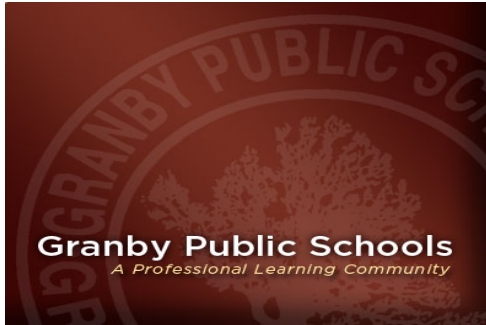
The social studies and science teachers who have signed on for the initial course offering are being given a stipend for their work on developing this course into something that can be launched globally, free of charge, for the 2013-14. Their work will require monthly conference calls with the Big History Project and submission of course evaluations and assessment data.

For future planning, if a decision is made to increase the number of course sections offered, and if a decision is made to keep the course a team-taught course between social studies and science, then there will be budgetary implications for staffing in the science department only. If the course offerings are increased within the social studies department alone, abandoning the team-taught model, then there will continue to be no staffing implications. In addition, since the initial \$1500 subsidy will only be given out the first year the course is taught, money for occasional staff release time and lab expenses will be furnished within the current social studies budget.

**FOR OFFICE USE ONLY:**

**Date BOE sub-committee reviewed:** \_\_\_\_\_

**Action:** \_\_\_Approved \_\_\_Not Approved



## Granby Public Schools Course Proposal Request

“Big History”

### Support Materials

Date: 27 Feb. 2012

Teacher: Joe Jarvis

Department/School: GMHS

**This document contains the following support materials:**

- 1. Course Comparison Matrix:  
Current 9<sup>th</sup> Grade World Civilizations vs. Big History**
- 2. Common Core Alignment Charts**
- 3. Sample Assessments**

# Big History Project

Course Comparison Matrix:

Current 9<sup>th</sup> Grade World Civilizations vs. Big History

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## Big History vs. 9<sup>th</sup> Grade World Civilizations Course Comparison

<b>Enduring Understandings</b>	
<b>9<sup>th</sup> Grade World Civilizations</b>	<b>Big History</b>
One person can make a difference.	Big History tries to explain how the knowledge of the past affects who we are and why we got here and how certain individuals accelerated change (Ptolemy, Da Vinci, etc.).
There is a pattern to the rise and fall of empires.	As human communities developed, so did their networks of exchange. This accelerated collective learning, which helped generate and spread diverse innovations like writing, accounting, irrigation, division of labor and government. Civilizations blossomed and strove for power. Empires were born, rose and fell. Big History explores why.
Religious belief is a compelling force in human history.	The course spends a great deal of time on religious origin stories and weaves the impact of religion throughout all of the units.
Geography impacts the development and relative success of civilizations.	Not only will Big History explore how the first humans lived, but also, the consequences of agriculture and when, where and why did the first cities and states appear?
History repeats itself.	Big History nurtures an understanding and appreciation of the connections that exist between human beings such as ourselves, the universe and the body of knowledge that shapes how we experience today's world.
History favors innovation and adaptation.	Collective learning explains why human technologies have become more and more powerful, and why only human beings seem to have a 'history'. The idea of collective learning helps us understand the unique place of human beings in big history.
We can better understand the present through the lens of history.	Big History helps us see and assess webs of interconnected events and to explore plausible relationships among the concepts, ideas and types of knowledge people have generated across time and space.  By telling us where we and our world came from, big history can help us understand more deeply who and what we are, and what challenges we face today.
Ideas matter.	Collective learning means sharing what you have learned with others so that the knowledge available to everyone increases over time. Collective learning is unique to our own species, Homo sapiens.

<b>Academic Expectations for Student Learning</b>	
Literacy – Students will evidence proficiency in reading and writing.	Writing arguments focused on discipline-specific content and informative texts, including narration of historical events and scientific changes, producing clear and coherent writing.
Global Awareness – Students will evidence knowledge of diverse cultures and world issues.	Big History advances understanding across time and place by studying how human beings, their culture and shared knowledge are interconnected

**District Achievement Goal:** *By 2015, enable students to demonstrate powerful thinking by systemically solving problems through analyzing and synthesizing information and articulating/defending a position*

**From Big History’s “Mapping to Standards”:**

- Reading different genres of texts including primary and secondary sources, and scientific and technical reports.
- Integrating and evaluating multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
- Determining the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.
- Determining the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific context.
- Using technology, including the Internet, to produce, publish, and update individual or shared writing products in response to ongoing feedback, including new arguments or information.
- Conducting short research projects to answer a question (including a self-generated question) or solve a problem.
- Gathering relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the specific task, purpose, and audience.
- Drawing evidence from informational texts to support analysis, reflection, and research.

# **Big History Project Curriculum**

## Common Core Alignment Charts

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## Reading Standards for Literacy in History/Social Studies

Standard	Alignment	Curricular Examples
<b>Key Ideas and Details</b>		
<p>1. Cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information</p>	<p>High</p>	<p>Big history students work with claims and warrants from Unit 2 through Unit 20. They read a range of primary and secondary sources for comprehension, attribution, and context.</p> <p><b>Examples:</b>  <u>Analyzing how foraging and agricultural communities lived:</u> In Unit 14, students will use a range of texts from archeologists, anthropologists and primatologists to develop narratives about ways early human communities lived and worked.</p> <p><u>Explaining the rate and scope of change:</u> Students use documents to will evaluate the claim pace and scope of change has been increasing over the past 500 years.</p>
<p>2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.</p>	<p>High</p>	<p>Big history curriculum is built around a set of well-articulated core concepts and events, and all the texts align to those concepts. The literacy work, therefore, requires students to regularly determine central ideas in texts (and in mini-lectures, charts, graphs) and articulate how these connect to Big history’s core concepts.</p> <p><b>Examples:</b>  <u>Impact of oceanic travel:</u> Students summarize and explicate the central ideas in a set of maps, data charts, and texts to identify the changing global consequences of new oceanic travel in Unit. 18.</p>
<p>3. Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them.</p>	<p>High</p>	<p>Using texts to situate events in time while identifying the cause and consequences of “big” historical events is a major and regular feature of students’ work in this course.</p> <p><b>Examples:</b>  <u>Life and death of stars:</u> In the sixth unit, students incorporate the birth and death of stars into their argument about the growing complexity of</p>

		<p>the universe.</p> <p><u>Development of human societies:</u> Students place the development of foraging communities and of agricultural communities on Big history timeline and develop a hypothesis about the relationship between the two (Unit 15)</p>
<b><i>Craft and Structure</i></b>		
<p>4. Determine the meaning of words and phrases as they are used in a text, including vocabulary describing political, social, or economic aspects of history/social studies.</p>	<p>High</p>	<p>Big history uses technical, academic and sophisticated language in its materials and assessments, and thus helps students understand how authors use the vocabulary to convey specific meaning.</p> <p><b>Examples:</b>  <u>Changes in governance structures:</u> In Unit 18, in comparing the similarities and differences among economic and political systems, the students use language of political science and economics, including industrial, feudal, colonial, democratic, agricultural and absolutist.</p> <p><u>Analysis of agrarian civilizations:</u> Students use a range of texts to compare the similarities in political, economic and social structures of agrarian civilizations.</p>
<p>5. Analyze how a text uses structure to emphasize key points or advance an explanation or analysis</p>	<p>High</p>	<p>Since students read for claims and warrants (e.g., intuition, logic, authority and evidence) and they will construct explanations, narratives, and arguments, Big history works on text structure to emphasize key points and advance an explanation or analysis.</p> <p><b>Examples:</b>  <u>Using Big history’s claim testers to assess arguments or explanations:</u> Students regularly analyze texts to determine the claims made and how does the text/author support the claims (units after Unit 2).</p> <p><u>Determining the consequences of transformations in economic systems:</u> Near the end of the course, students will compare and contrast major systems of human organization from first foraging communities through modern societies (Unit 19)</p>
<p>6. Compare the point of view of two or more</p>	<p>Moderate</p>	<p>Big history introduces students to different scientists’ and historians’</p>

<p>authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts.</p>		<p>perspectives on similar questions and then helps students analyze the differences in positions.</p> <p><b>Examples:</b>  <u>How did our view of the universe change?</u> In Unit 3, the students compare the views of the universe of Ptolemy, Copernicus, Newton and Hubble. In later units, students compare the points of view of historians to explain changes in modern world.</p> <p><u>Compare different explanations for “peopling” of the earth:</u> Students will compare different explanations for how it is that human beings spread throughout and came to inhabit the earth.</p>
<p><b><i>Integration of Knowledge and Ideas</i></b></p>		
<p>7. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text.</p>	<p>High</p>	<p>Since Big history requires students to use data in multiple forms including charts, scientific models, and research data, the course helps students to integrate and move with facility among these different forms.</p> <p><b>Examples:</b>  <u>How does Big history use evidence in their lectures and texts?</u> Most of David Christian’s lectures use textual, quantitative, qualitative and visual information to engage students with a problem, and students regularly analyze the nature and type of evidence Professor Christian is using to make Big history claims.</p> <p><u>Why did oceanic travel matter?</u> Using maps, data charts and graphs, students will describe the demographic, environmental, and political consequences of new oceanic travel, new conquests, and new interactions among and within the four world zones, and new exchanges during the 16th and 17<sup>th</sup> centuries. (18.1)</p>
<p>8. Assess the extent to which the reasoning and evidence in a text support the author’s claims.</p>	<p>High</p>	<p>Big history curriculum teaches students to recognize and analyze the ways people use logic, authority and evidence to support their claims and regularly includes such analysis in instruction and assessment.</p> <p><b>Examples:</b>  <u>What makes the “modern” origin story different?</u> In the second unit, students analyze examples of ‘stories’ collected from a range of present</p>

		<p>day texts (e.g. newspaper article, Wikipedia, YouTube etc) to explain which ‘claim testers’ (intuition/gut feeling, authority, logic &amp; reason, evidence) best describes their understanding of the claims made. (2.1)</p> <p><u>Was the development of agriculture really “revolutionary?”</u>: Later in the course, students analyze texts to evaluate the claim that the development of agriculture revolutionized human history, accelerating the pace and scope of change, and justifies its inclusion as Threshold 7 in increasing complexity. (15.1)</p>
<p>9. Compare and contrast treatments of the same topic in several primary and secondary sources</p>	<p>Moderate</p>	<p>Students in Big history work with primary sources in a wide range of formats, and towards the end of the course, encounter secondary historical accounts of important changes in human life.</p> <p><b>Examples:</b>  <u>How do different scholars explain the differences in resource use?</u>  Toward the end of the course, students will contrast different historical, economic and political explanations for the variation in humans’ use of resources.</p> <p><u>Was farming “really” an improvement in human living?</u> Students will use evidence from anthropology, archaeology, biology and history to compare Paleolithic and Neolithic life ways, including analyzing the transition from a foraging and nomadic life to a more sedentary life, differences in divisions of labor, population, tools, governance structure, relationship in the biosphere, and relative differences in standard of living. (15.3)</p>
<p><b><i>Range of Reading and Level of Text Complexity</i></b></p>		
<p>10. By the end of grade 10, read and comprehend history/social studies texts in the grades 9–10 text complexity band independently and proficiently.</p>	<p>High</p>	<p>Big history course materials are geared to the 9-10<sup>th</sup> grade level of complexity, and are scaffolded to support students’ independent use of the varied texts. Because we are piloting the curriculum in a wide range of schools and students, we anticipate pilot teachers will develop tools to support students’ effective use of historical and social scientific texts.</p> <p>In a specially designed document-based- question, Big history will assess students’ abilities to read and interpret primary and secondary sources.</p>

### Reading Standards for Literacy in Science and Technical Subjects, Grades 9-10

Standard	Alignment	Example - How
<b>Key Ideas and Details</b>		
<p>1. Cite specific textual evidence to support analysis of science and technical texts, attending to such features as the precise details of the explanations or descriptions.</p>	<p>High</p>	<p>Big history students work with claims and warrants for claims from Unit 2 through Unit 20. They read a range of primary and secondary sources for comprehension, attribution, and context.</p> <p><b>Examples:</b>  <u>What has it meant and what does it mean that the earth is moving under our feet?</u> Student can use available evidence to explain how plate tectonics accounts for the features and processes that occur on or near the Earth’s surface and why it matters for the Big history story. (8.3)</p> <p><u>Where and how did life begin?</u> In Unit 9, students use evidence from biology, geology, and chemistry to construct an explanation of “where life began,” and why this remains a complex scientific puzzle today. (9. 4)</p>
<p>2. Determine the central ideas or information of a text; trace the text’s explanation or depiction of a complex process, phenomenon or concept; provide an accurate summary of the text.</p>	<p>High</p>	<p>Big history curriculum is built around a set of well-articulated core concepts and events, and all the texts align to those concepts. The literacy work, therefore, requires students regularly to determine central ideas in texts (and in mini-lectures, charts, graphs) and articulate how these connect to Big history’s core concepts.</p> <p><b>Examples:</b>  <u>Using questions to read texts: What is the question? What are the claims? How are the claims supported?</u> Big history students regularly answer these questions before and after viewing a lecture or reading offered by a scientist, students to determine the central ideas and meaning of significant terms and symbols, and consistently use what we call ‘claim testers’ to analyze supports offered for claims. (2.5)</p> <p><u>How has the astronomer explained is the lifecycle of stars and why it matters?</u> In Unit 6, students summarize and paraphrase a text explaining lifecycle of stars (e.g. small, medium, large stars) and the relationship between the lifecycle of stars and the creation of new chemical elements (Goldilocks’ condition for new elements). (6.1)</p>

<p>3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.</p>	<p>Moderate</p>	<p>Periodically throughout the course, BH students directly generate data as one might in a science classroom using protocols or technical procedures, though this is does not define student work within every unit.</p> <p><b>Examples:</b></p> <p><u>Building and using a spectrometer:</u> Students follow instructions to build a spectrometer that they will employ in their study of shifting understanding of the universe in Unit 3 and Unit 4.</p> <p><u>Using patterns of radiocarbon dating and geologic location to determine dates of past events or objects:</u> Students in later units use various chronometric procedures to understand how scientist and historians currently situate events in time.</p>
<p><b><i>Craft and Structure</i></b></p>		
<p>4. Determine the meaning of symbols, key terms and other domain specific words and phrases as they are used in specific scientific or technical context.</p>	<p>High</p>	<p>Big history uses technical, academic and sophisticated language in its materials and assessments, and thus helps students understand how authors use the vocabulary to convey specific meaning.</p> <p><b>Examples:</b></p> <p><u>Using evidence to support idea of expanding universe:</u> In Unit 3, students explain ways that new methods of research and approaches to knowledge, intellectual and technological innovations (parallax, Doppler effect, spectroscopy, absorption lines, red shift) offered new evidence that challenged previous “trusted stories” and led to our current model of the universe. (3.3)</p> <p><u>Explaining biological characteristics of living things:</u> Students will identify the characteristics that biologists use to define living things – metabolism and use of energy, reproduction, adaptation – and the ideal conditions under which living organisms must have formed to distinguish between living and non-living things in Unit 9. (9.1)</p>
<p>5. Analyze the structure of the relationships among concepts in a text, including relationships among key terms (e.g., force, friction, reaction, force, energy)</p>	<p>High</p>	<p>Since students read for claims and warrants (e.g., intuition, logic, authority and evidence) and they will construct their own explanations, narratives, and arguments. Big history, by necessity, works on helping students recognize the structure of arguments and ways key concepts link to make an explanation or argument.</p>

		<p><b>Examples:</b>  <u>What makes organisms more complex?</u> In Unit 10, students use texts to differentiate and distinguish among prokaryotes and eukaryotes, single-celled, multi-celled organism and those organisms with brains. (10.2)</p> <p><u>Using texts, fossils and pictures to analyze patterns of adaptation and extinction:</u> Students spend time in Unit 12 summarizing and explaining the relationships between present-day organisms and those that inhabited the Earth in the past, analyzing connections between development and adaptation of different organisms, and explanations for the “random-extinction” of species of organisms. (12.3)</p>
<p>6. Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, defining the question the author seeks to address.</p>	<p>High</p>	<p>Students in Big history become familiar with scientific explanations drawn from a variety of scientific domains in the first 15 units to support the development of its narrative.</p> <p><b>Examples:</b>  <u>What is Alvarez arguing and how did he arrive at his conclusion?</u> Using Walter Alvarez’s explanation for how the dinosaurs were wiped out, students will determine the central ideas and meaning of significant terms, symbols and supports for the idea of an asteroids impact (2.5).</p> <p><u>How did Penzias and Wilson “noise” answer another question?:</u> In Unit 4, the students construct an argument to explain why most scientists accept the Big Bang and expanding universe story using new ideas, discoveries, and technology in <b>physics</b> (including Hubble’s proof of expanding Universe and detection of Cosmic Background Radiation. (4.3)</p>

<b>Integration of Knowledge and Ideas</b>		
<p>7. Translate quantitative or technical information expressed in words in a text into a visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.</p>	<p>Moderate</p>	<p>Since Big history requires students to use data in multiple forms including charts, scientific models, and research data, students, the course helps students to integrate and move with facility among these different forms.</p> <p><b>Examples:</b>  <u>Build a model to explain the formation of rocky planets:</u> Using ideas about chemistry (how atoms combined to form molecules of water or dust particles), and the process of accretion, students will build a model or develop an explanation of the formation of rocky planets (such as the earth) and explain how planets, such as earth, represent a new form of complexity (7.3)</p> <p><u>Use the periodic table to explain the development of key elements:</u> Students gather information about the distribution of chemical elements in the universe and use the periodic table to identify the elements created before and after stars (6.2)</p>
<p>8. Assess the extent to which the reasoning and evidence in a text support the author’s claim or a recommendation for solving a scientific or technical problem.</p>	<p>High</p>	<p>Big history curriculum teaches students to recognize and analyze the ways people use logic, authority and evidence to support their claims and regularly includes such analysis in instruction and assessment.</p> <p><b>Examples:</b>  <u>Evaluate claims of the Malthusian cycle:</u> Using demographic data, and evidence from historians, biologists, geologists and other disciplines, students can apply and then evaluate the idea (value?) of Malthusian cycles in understanding the agrarian era of human history. (17.6)</p> <p><u>Assess the argument scholars have made about the development of global inequities:</u> Using data from many disciplines, students will analyze and explain the change in and the consequences of the growth and shifts in world population and the global balance of military, political, and economic power between 1500 and 1900, including the changing place of Europe within the global network and the emergence of shifting forms of global inequalities. (18.2)</p>

<p>9. Compare and contrast findings presented in a text to these from other sources (including their own experiments), noting when the findings support or contradict previous explanations or accounts.</p>	<p>High</p>	<p>Since two Big history’s core concepts are the scientific claims and collective learning, students regularly and consistently assess and reassess the confidence humans should/could hold claims change and the ways that new evidence contradicts claims.</p> <p><b>Examples:</b>  <u>How has and why did our understanding of the universe change over the past 2,000 years?</u> Using texts and data, students can explain ways that new methods of research and approaches to knowledge, intellectual and technological innovations (parallax, Doppler effect, spectroscopy, absorption lines, red shift) offered new evidence that challenged previous “trusted stories” and led to our current model of the universe. (3.3)</p> <p><u>Explain how and why your understanding has changed?</u> Using the claim tester of “evidence,” the student will review their previous argument about what s/he thinks are the five most important types of evidence, ideas and/or tools that scientists have used to support the modern origin story thus far and why these are so significant to the story. (13.4)</p>
<p><b><i>Range of Reading and Level of Text Complexity</i></b></p>		
<p>10. By the end of grade 10, read and comprehend science/ technical texts in the grades 9–10 text complexity band independently and proficiently.</p>	<p>High</p>	<p>Big history course materials are geared to the 9-10<sup>th</sup> grade level of complexity, and are scaffolded to support students’ independent use of the very texts. Because we are piloting the curriculum in a wide range of schools and students, we anticipate pilot teachers will develop tools to support students’ effective use of scientific and technical texts.</p> <p>In a specially designed document-based- question, Big history will assess students’ abilities to read and interpret science and technical texts.</p>

### Writing Standards for Literacy in History/ Social Studies, Science and Technical Subjects, Grades 9-10

Standard	Alignment	Example - How
<b>Text Types and Purposes</b>		
<p>1. Write arguments focused on <i>discipline-specific content</i>.</p> <p>a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.</p> <p>b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience’s knowledge level and concerns.</p> <p>c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.</p> <p>d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</p> <p>e. Provide a concluding statement or section that follows from or supports the argument presented.</p>	<p>High</p>	<p>Big history requires students regularly to use evidence, logic and authority to construct arguments, causal and consequential explanations and narratives. They produce mini-arguments, explanations and narratives in almost every unit, and engage in some large-scale assignments demanding they present their understanding/research for others.</p> <p><b>Examples:</b>  <u>So, what happened during the universe’s first half-million years?</u> Using texts presented in class or from students investigations, students in Unit 4 create a written, visual or oral narrative of the first 400,000 years of the universe by comparing and contrasting the universe at three points in time: a. before Big Bang; b. 1 second after the Big Bang, (note: needs to be checked) and c. 380,00 years after the Big Bang. (4.2)</p> <p><u>Develop an argument identifying places in the Big history story where more evidence is needed:</u> After Unit 13, students develop an argument to identify two or three places in the story where they think logic, intuition, inference or authority has “stood in” for evidence, or where scientists have used their best guess in place of evidence, and then speculate on what type of evidence science would need fill in the gaps. (13.5)</p> <p><u>Use a model to construct an explanation for the formation of the earth:</u> Using ideas about chemistry (how atoms combined to form molecules of water or dust particles), and the process of accretion, students will build a model or develop an explanation of the formation of rocky planets (such as the earth) and explain how planets, such as earth, represent a new form of complexity (more complex chemically than stars because contain more diverse elements and chemical compounds and more complex structures; Goldilocks’ condition for life). 7.3)</p>
<p>2. Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.</p>		<p><u>Develop an explanation of the differential consequences of oceanic travel on human societies and the world zones:</u> Using maps, data charts and graphs, students will describe the demographic, environmental, and political consequences of new oceanic travel, new conquests, and new interactions among</p>

Big History Project and Common Core

<p>a. Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions; include formatting (e.g., headings), graphics (e.g., figures, tables), and multimedia when useful to aiding comprehension.</p> <p>b. Develop the topic with well-chosen, relevant, and sufficient facts, extended definitions, concrete details, quotations, or other information and examples appropriate to the audience’s knowledge of the topic.</p> <p>c. Use varied transitions and sentence structures to link the major sections of the text, create cohesion, and clarify the relationships among ideas and concepts.</p> <p>d. Use precise language and domain-specific vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline and context as well as to the expertise of likely readers.</p> <p>e. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.</p> <p>f. Provide a concluding statement or section that follows from and supports the information or explanation presented (e.g., articulating implications or the significance of the topic).</p>		<p>and within the four world zones, and new exchanges during the 16th and 17<sup>th</sup> centuries. (18.1)</p>
<p>3. Students’ narrative skills continue to grow in these grades. The Standards require that students be able to incorporate narrative elements effectively</p>	<p>High</p>	<p>Since Big history is developing students’ capacity to tell an evidentiary based “origin story” the course regularly has students retell the story, and to do so to different audiences in mind, using different “props.”</p>

<p>into arguments and informative/explanatory texts. In history/social studies, students must be able to incorporate narrative accounts into their analyses of individuals or events of historical import. In science and technical subjects, students must be able to write precise enough descriptions of the step-by-step procedures they use in their investigations or technical work that others can replicate them and (possibly) reach the same results</p>		<p><b>Example:</b>  <u>Use threshold cards to construct a narrative of change over 13.7 billions years of time:</u> At four times during the course, students will use “Threshold Cards” to sequence major events in the course, and then make a case for the idea of increasing complexity as a central theme to the history of the universe and everything in it.</p>
<p><b><i>Production and Distribution of Writing</i></b></p>		
<p>4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>High</p>	<p>Big history differentiates among narrative, explanatory and argumentative forms of writing and scaffolds students to work in the style appropriate to each.</p> <p><b>Examples:</b>  <u>Explain when and why you trust stories?</u> Students will write or create a self-reflective essay on “When should I trust a story? When should I suspend full trust for more investigation and evidence collecting? (2.6)</p> <p><u>Construct a metaphor to explain temporal/spatial scale:</u> In Unit 5, students will work on analogies, metaphors or other representations to help them explain the scale of time and space they have been working on regarding the universe. (5.4)</p> <p><u>Make an argument comparing the differences among foraging, agrarian and modern human societies:</u> Students will develop arguments to compare and contrast the major scales of social organization from first foraging communities through modern societies, focusing on concepts of increasing complexity and collective learning, and similarities and differences governance structures, economic systems, systems of communication, divisions of labor, network of exchanges, systems of religion and ideology, <b>and inter-connections</b> among peoples within communities. (16.2)</p>
<p>5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most</p>	<p>High</p>	<p>Since the Big history course aims at coherence from the first unit through the last, students revisit their earlier ideas, predictions and speculations to support, expand or change them as needed.</p>

<p>significant for a specific purpose and audience</p>		<p><b>Examples:</b>  <u>So, now what do you think about Big history?</u> Using ideas and evidence from their study of Thresholds 5-6 students reread and respond to their initial statements/conjectures about why or if they should care about learning Big history. (13.2)</p> <p><u>Rethinking the most important types of evidence:</u> Using the claim tester of “evidence,” the student will review their previous argument about what s/he thinks are the five most important types of evidence, ideas and/or tools that scientists have used to support the modern origin story thus far and why these are so significant to the story. (13.4)</p> <p><u>Creating a “little” Big history:</u> Students will plan and launch a “little” Big history investigation, and revise their history over the course.</p>
<p>6. Use technology, including the Internet, to produce, publish, and update individual or shared writing products, taking advantage of technology’s capacity to link to other information and to display information flexibly and dynamically</p>	<p>High</p>	<p>Big history course is grounded in a robust set of technological tools that students will use to study, understand, and make connections among Big history’s core concepts and data. Students will use technology to publish their understandings and to interact with other Big history students.</p> <p><b>Examples:</b>  <u>Using the world-wide telescope:</u> Students will use the resources of the world-wide telescope to explore “first-hand” the claims in the first ten units.</p> <p><u>Kahn academy’s explanations:</u> Big history relies on a number of Sal Kahn webcasts to explain complicated concepts, some of which Mr. Kahn has created especially for Big history students.</p>

<b>Research to Build and Present Knowledge</b>		
<p>7. Conduct short as well as more sustained research projects to answer a question (including a self generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation</p>	<p>High</p>	<p>Since Big history is a problem-based course, every unit asks and is structured around a critical question in history (e.g. What did stars give us? How did life begin?). Students thus conduct mini- investigations in each unit. Further, students will participate in a larger research around a topic or problem of their own design, one that requires them to use interdisciplinary evidence across vast expanses of time and space.</p> <p><b>Examples:</b>  <u>Creating a “little” Big history:</u> Students will plan and launch a “little” Big history investigation, and revise their history over the course.</p> <p><u>What do you think explains major changes in human life over the past 200 years?</u> Extending upon work in previous unit, students will illuminate, compare and contrast changes in people’s identity (e.g. national, class, citizenship), governance structures, systems of production, transportation and communication, including changes in global inequalities from previous. (19.6)</p>
<p>8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the usefulness of each source in answering the research question; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and following a standard format for citation.</p> <p>9. Draw evidence from informational texts to support analysis, reflection, and research.</p>	<p>Moderate</p>	<p>Since students in the Big history course will be engaged in gathering information to develop narratives, explanations and augments, the course seeks to help them develop skills needed to conduct searches related to their specific questions and begin to teach them appropriate forms of documentation.</p> <p><b>Examples:</b>  <u>Find evidence to support how early foraging communities lived:</u> Using evidence from archaeologists, anthropologists, and primatologists, students create a narrative describing and analyzing the ways that Paleolithic communities lived and worked, including patterns for acquiring and sharing food, diets, movement, tool and technology use, and other necessities of life, governing the communities and spiritual life. (14.1)</p> <p><u>Explain when and why you trust stories?</u> Students will write or create a self-reflective essay on “When should I trust a story? When should I suspend full trust for more investigation?” (2.6)</p> <p><u>Construct a metaphor to explain temporal/spatial scale:</u> In Unit 5, students will work on analogies, metaphors or other representations to help them explain the scale of time and space they have been working on regarding the universe. (5.4)</p>

		<p><u>Make an argument comparing the differences among foraging, agrarian and modern human societies:</u> Students will develop arguments to compare and contrast the major scales of social organization from first foraging communities through modern societies, focusing on concepts of increasing complexity and collective learning, and similarities and differences governance structures, economic systems, systems of communication, divisions of labor, network of exchanges, systems of religion and ideology, <b>and inter-connections</b> among peoples within communities. (16.2)</p>
<p><b><i>Range of Writing</i></b></p>		
<p>10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.</p>	<p>High</p>	<p>Big history course assessments are built around having students write for various length of time for different purposes: narrative, explanation or argumentation. Further, the instruction scaffolds students writing in each of these written forms. Because we are piloting the curriculum in a wide range of schools and students, we anticipate pilot teachers will develop tools to support students’ skill in writing.</p> <p>With Big history’s specially designed document-based- question, we will assess students’ abilities to read and interpret primary, secondary, scientific and technical texts to construct arguments.</p>

## Speaking and Listening Standards for Grades 9-10

Standard	Alignment	Example - How
<i>Comprehension and Collaboration</i>		
<p>1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others’ ideas and expressing their own clearly and persuasively.</p>	<p>High</p>	<p>BH lessons places students in different discussion settings ranging from one-to-one conversations with a classmate to internet discussions with students or experts in other states or countries.</p> <p><b>Example:</b>  <u>Group discussions on role and importance of the development of Agriculture and the rise of city-states:</u> Students work together to determine key factors and variables that contributed to civilizations progress and the role played by collective learning.</p> <p><u>Presentation of “little” big history:</u> Students will present developing versions of their final project (e.g., little big history), using teachers and classmate’s feedback to develop and improve their project.</p>
<p>2. Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.</p>	<p>High</p>	<p>Since students in the Big history course will be engaged in gathering information to develop narratives, explanations and augments, the course seeks to help them develop skills needed to conduct searches related to their specific questions and begin to teach them appropriate forms of documentation.</p> <p><b>Examples:</b>  <u>Evaluation of evidence for the Big Bang:</u> Students synthesize different media types, information sources (from Big history Project online and third party sources) to highlight key arguments, unknowns and possible explanations.</p> <p><u>Find evidence to support how early foraging communities lived:</u> Using evidence from archaeologists, anthropologists, and primatologists, students create a narrative describing and analyzing the ways that Paleolithic communities lived and worked, including patterns for acquiring and sharing food, diets, movement, tool and technology use, and other necessities of life, governing the communities and spiritual life. (14.1)</p>

<p>3. Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence.</p>	<p>High</p>	<p>BH students regularly analyze and categorize claims, including those made in BH lectures or talks, using “claim tests” of intuition, authority, logic and empirical evidence.</p> <p><b>Examples:</b>  <u>What did Professor Alvarez argue and how did he arrive at his conclusion?</u>                      Using Walter Alvarez’s explanation for how the dinosaurs were wiped out, students will determine the central ideas and meaning of significant terms, symbols and supports for the idea of an asteroids impact (2.5).</p> <p><u>How effectively did Professor Christian make his case in his Unit 8 lecture?:</u>                      David Christian invites students to evaluate his lecture, asking them to identify places where authority stood in for evidence, or his used logic to make connections.</p>
<p><i>Presentation of Knowledge and Ideas</i></p>		
<p>4. Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance and style are appropriate to purpose, audience and task.</p> <p>5. Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.</p> <p>6. Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate</p>	<p>High</p>	<p>BH students will represent their final project in multiple written and oral formats, to at least two different audiences. While the course allows for local variation in the format and audience, early drafts of the course offer these possibilities”</p> <p><b>Present their “little” big history</b></p> <ul style="list-style-type: none"> <li>• as a “conference” talk to other students locally or via the internet</li> <li>• as a “TED” talk at a TEDx conference</li> <li>• to parents</li> <li>• to elementary students</li> <li>• in a video posted to internet</li> </ul>

# Big History Project Curriculum

## Sample Assessments

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## Concept assessment sample:

**Big History Pre-Test. Concept Assessments:** We have created Concept Assessments to gauge students' understanding and use of big history's foundational, core and supporting concepts. At four different times in the course -- as a baseline in the first 10 days of school and after Parts 1, 2, and 3 --we assess students' understanding of and skill in using these big ideas. As the examples shows, the concept assessments are a mix of identifications, short answers, and released items from national and state tests in World History, Geography, Biology, Chemistry, and Earth Science. A typical CA includes five or so identifications, 10-15 multiple choice/matching questions, and two short answers prompts. This is an abbreviated example of a Concept Assessment.

**I. Identifications:** Below are five concepts that were addressed in Part 1 (Units 1-8) of the Big History Course. For each of these concepts, you should

- a. Define the concept, including information about where it fits on the Big History timeline and its relationship to other concepts you have studied.
- b. Explain why the concept is important to the Big History story, including how it connects to the Big History themes of thresholds of increasing complexity, goldilocks conditions, collective learning, and/or claim testers

1. Plate Tectonics
2. Life cycle of Stars
3. Agrarian Civilizations
4. Fossil Fuels
5. Ice age

**II. Multiple Choice:** For each statement or question below, choose the letter of the word or expression that best completes the statement or answers the question.

11. What is a property of all galaxies?
- A. All galaxies have a spiral shape.
  - B. All galaxies are the same size.
  - C. All galaxies contain a large number of stars.
  - D. All galaxies rotate around a central star.

12. The two most abundant elements in the Solar System are

- A. hydrogen and helium
- B. hydrogen and calcium
- C. calcium and iron
- D. helium and iron

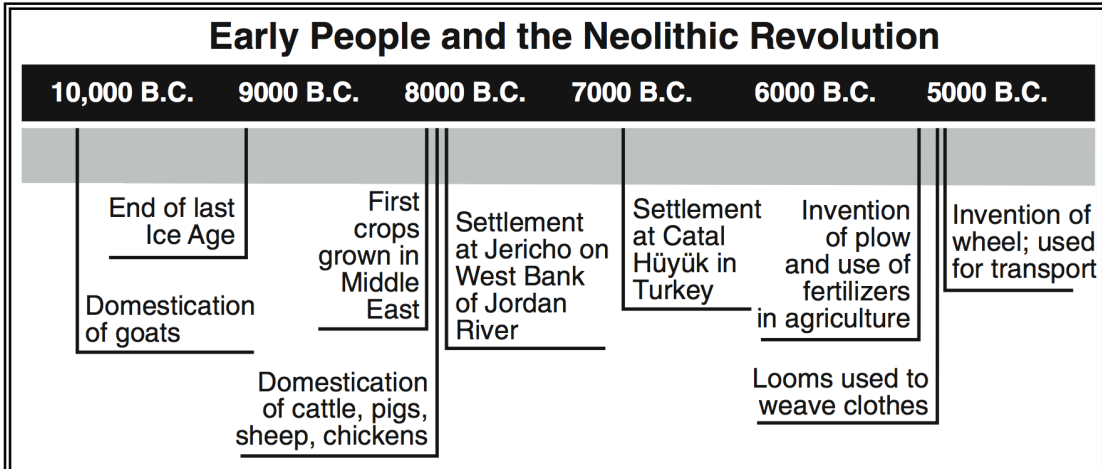
15. Early telescopes were an important tool in humans' changing understanding of the universe because they showed stars as only points of light, while the planets appeared to be much larger.

This provided evidence that stars must

- A. be more plentiful in our solar system than planets.
- B. travel in elliptical orbits like planets.
- C. be much farther from Earth than planets.
- D. reflect much more light than planets.

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III. Short Answer: Use the timeline that follows to answer Questions 21 and 22.



Source: Vivienne Hodges, *New York State Global History Regents Coach*, Educational Design, Inc. (adapted)

21. Approximately how many years before the first crops were grown in the Middle East did the domestication of goats occur?

22. Based on the information provided, give TWO important changes in people's lives that might explain why the Neolithic Revolution would be considered an important turning point in Big History.

## Text-Based Assessment Sample:

**Text-based Assessments:** We created and are using the Text-based Assessments (TA) to provide evidence of how well students are learning to read complex informational texts and to write evidence-based explanations and arguments. The assessment asks students use texts drawn across the sciences, social sciences and humanities to produce either an explanation of some phenomena or event, or to construct an argument. TA's consist of a prompt, asking for either an explanation or an argument and a set of texts to read, analyze, organize and use in responding to the prompt. TAs are given as a baseline and after Parts 1, 2, and 3. This is an abbreviated sample of a TA.

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**What accounts for the changes in our understanding of the universe?**

**Directions:** Over the past 200 years, human beings' understanding of the "birth" and development of the universe has changed. You may have already considered some of these changes by looking at different models of the universe.

In this essay we want you to make an argument about the factors that led to the change in our understanding of the universe. Using the texts provided below and your background knowledge write an essay that answers the following questions:

**What *explains* the changes in our understanding of the universe? What new evidence, tools, and changes in perception help explain the shifts in our understanding of the universe?**

In your essay, try to use all the texts provided. However, if you choose not use a text write a short explanation of why this text did not fit into your argument (3-4 sentences).

**Possible steps for working on the problem:**

- Identify what the question asks and write your initial conjectures.
- Read, analyze, and briefly summarize the texts.
- Determine to what degree each text helps you answer the question.
- Group the texts into analytical categories that will help you answer the question.
- After analyzing and grouping the texts, write an initial informal answer to the question.
- Create an outline with a thesis statement, topic sentences, and the texts you will use as support. Make sure your thesis statement and topic sentences align.

**Write an essay that:**

- Has a clear, analytical, and comprehensive thesis toward the end of the introductory paragraph
- Addresses all or almost all of the texts
- Demonstrates that you have grouped the texts into analytical categories
- Demonstrates careful and insightful analysis of texts, including analysis of point of view
- Remains focused on the thesis
- Uses the texts persuasively as evidence
- Identifies and explains the need for one type of appropriate additional text or source, and, if applicable, explain why you did not use all the texts provided.
- Brings in relevant outside historical content

**Required Texts (abbreviated):**

**Text A: Naked Eye View of the Night Sky/ Hawking Explains the Greeks' View of the Planets**

**Text B: Galileo's Telescope**

**Text C: Journal Excerpt on the Opening of the 100-Inch Telescope at Mount Wilson Observatory in California**

**Text D: New York Times Article on Penzias' and Wilson's Discovery**

**Optional Texts (abbreviated):**

**Text E: Bernini's Painting Of Galileo Showing the Telescope to Community Leaders**

## Text A

### Naked Eye View of the Night Sky



*A photograph of the night sky as it might have appeared to Greek astronomers using only the naked eye*

### Hawking Explains the Greeks' View of the Planets

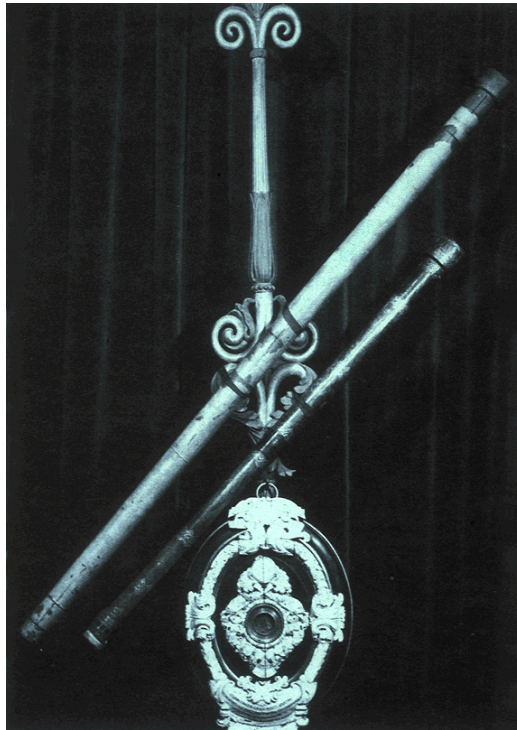
....At the time [before the telescope], five of them [planets] were visible to the naked eye: Mercury, Venus, Mars, Jupiter and Saturn. For the Greeks, our Earth may have been spherical, but it felt solid and stationary and stood on it and observed the movements in the heavens . . . Painstaking observation over many nights enabled the Greeks to plot the paths the planets took.

*Stephen Hawking is a professor at the University of Cambridge and is regarded as one of the most brilliant theoretical physicists since Einstein. Hawking has studied and written on the nature of the universe, including how and why previous scholars have shaped current theories.*

**Source:** Filkin, D. & Hawking, S.W. Stephen Hawking's Universe: The Cosmos Explained. New York: Basic Books, 1997.

## Text B

**Galileo's Telescope, constructed 1609**



**Source:** Helden, A.V. "Galileo's Telescope." Galileo Project.  
<http://galileo.rice.edu/sci/instruments/telescope.html>

## Text C

### Journal Excerpt on the Opening of the 100-Inch Telescope at Mount Wilson Observatory in California

After a series of tests extending over several months, the 100-inch telescope of the Mount Wilson Observatory has been found to be a complete success...

The 100-inch telescope...collects nearly three times as much light as the 60-inch telescope, and concentrates it in images so sharp that the gain in brightness is fully utilized...

It will naturally be the policy of the Observatory to apply the 100-inch telescope chiefly to the study of faint and difficult objects beyond the reach of our smaller instruments. Hitherto most of the observations have been made with the aid of spectrographs attached at the 134

foot focus. The great light-gathering power permits the spectra of extremely faint stars to be photographed with moderate exposures. In this way the motions of faint stars in the heart of globular clusters and in the star-clouds 'of the Milky Way can be measured.

*Popular Astronomy* was a magazine for amateur astronomers. It was published in the United States between 1893 and 1951.

**Source:** "The 100-inch Telescope of the Mount Wilson Observatory" from *Popular Astronomy*, Vol. 27, p. 635, 1919.

## Text D

### ***New York Times* Article on Penzias' and Wilson's Discovery, 1965**

#### **New Light Thrown on the Birth of the Universe**

Did the universe begin with a cataclysmic explosion and if so, will it meet an equally violent end? Is it changeless, eternal and infinite, or is it enclosed within itself and pulsating? Despite the fascination that such questions hold for man, their answers have seemed beyond reach...

Three basic cosmologies, or concepts of the universe, have been advanced to explain this motion [the Big Bang theory, the Steady State theory, and the Oscillation theory]...

Last week, however two dramatic developments raised the possibility that we may soon be able to determine which concept is correct. In one case, it was reported that the flash of the primordial explosion may have been detected, even though it took place 10 or 15 billion years ago...If the flash of the primordial fireball has, indeed, been detected, it might mean that we can see back to the beginning. However its radio waves fill the universe they do not give us a direct look at the geometry of the cosmos, even though they throw light on its history. The geometry of space is the key. It is generally agreed that over distances measured in millions or billions of light years, space is curved. The nature of that curvature would indicate whether or not the universe is closed in upon itself and probably oscillating, or is "open" and expanding into infinite space.

The flash of the primordial fireball appears to have been detected by accident with the giant horn antenna on Crawford Hill in Holmdel, N. J. Drs. Arno A. Penzias and Robert W. Wilson of the Bell Telephone Laboratories...

**Source:** Sullivan, Walter. "Science: New Light Thrown on the Birth of the Universe" in *The New York Times*, 1965.

## Text E<sup>1</sup>

### Bernini's Painting Of Galileo Showing The Telescope To Leaders



**Galileo Galilei and Doge of Venice by Bertini, located in the Bertini Room of the Villa Andrea Ponti, painted in 1858**

Galileo showing the Doge of Venice how to use the telescope

<sup>1</sup> Found at <http://www.gabrielevanin.it/Bertini.jpg>

## Little Big History

**Little-Big History (LBH): A Problem-based Investigation:** To help students develop multi-disciplinary research and writing skills we have created the “Little Big History” assignment. The Little Big History (LBH) assignment provides students (1) the opportunity to learn how to conduct a big history investigation and (2) a further chance to develop their skills in creating explanatory texts. In the LBH task, students conduct a historical investigation that ranges across time before and after human history and employs at least one or two other approaches to knowledge, (outside history) such as cosmology, chemistry, biology and paleontology. To complete this sustained research project, students conduct an investigation that creates focused questions, gathers relevant information from multiple print and digital sources to support analysis, reflection and research, assesses the credibility and accuracy of each source, draws evidence from texts, and then writes an informative/ explanatory text to convey what they have learned about the topic they studied. Finally, students will represent their work in another format – video, dramatic play, museum exhibit, children’s book -- to an audience outside their teacher or classmates. The little big history assessment can be given at any time, but is collected near the end of the course.

We are using the Common Core Literacy standards in informative/explanatory text for 9<sup>th</sup> and 10<sup>th</sup> grade students to assess the students’ final paper. In that paper, students should be able to:

- Introduce a topic and organize ideas, concepts, and information to make important connections and distinctions, including formatting, graphics, and evidence to aid comprehensions
- Develop the topic with well-chosen, relevant and sufficient facts, extended definitions, concrete details, or other appropriate information and examples
- Use varied transitions and sentence structures to link the major sections of the text, create cohesion and clarify the relationship among ideas and concepts
- Use domain-specific, precise vocabulary to manage the complexity of the topic and convey a style appropriate to the discipline
- Establish and maintain a formal style and objective tone, while using the norms and conventions of the appropriate historical and scientific discipline.
- Provide a concluding statement or section that follows form and supports the information or explanation presented, and including articulating the significance or implications of the topic.

## Little Big History

**A Problem-based Investigation:** How can you contribute to our collective learning about big history? Could you make a short video that we could add to our BHP site that could help others learn about some other event in history? Could write a paper using logic and evidence, and relying sometimes on authority or intuition that would teach others about something in big history?

In this assignment, we are asking you and your classmates to define a big history question about an object, an element, an event, a commodity or a process- or just about anything that makes you curious - and uses the big history approach to explain its history. What will make your history a “big history?” First, your investigation must take you through at least two parts of the BHP course. Second you must use at least three approaches to knowledge, such as history, geology, biology or chemistry.

We provided an example of a “Little Big History” in Unit I with the essay on silver. Reviewing that essay might help give you a clearer picture of what a final product might be. Your teacher will also have other examples of LBH.

Your investigation has a number of important steps – thresholds, if you will-- as you create a Little Big History for others to learn from and enjoy.

- (1) Framing a Problem for Study: Select an object to study and framing big history research questions about the object;
- (2) Gathering and analyzing evidence: Learn about your object by locating, reading and analyzing evidence about the history of your topic. Make sure to look for evidence from at least three approaches to knowledge and that take you across at least two parts of the BHP course.
- (3) Making connections: Figure out how your sources and how your evidence connects to each other to form an explanation of the history of your topic. (4) Creating a first draft of your history;
- (5) Create and revise your LBH: Write a draft of your LBH, get feedback on that draft from your classmates and teacher, and then revise the paper. Remember, others will read your LBH to learn something about your topic.
- (6) Create another version of your LBH for a different audience: Creatively develop another version of your LBH for an audience beyond your class. Your teacher and the course site will have some examples and ideas

## Creating a Big History Narrative

Historical narrative is a spoken or written account of connected events from the past. Like a story, it has a beginning, middle, and end, laying out past events in chronological order. Writers of historical narrative aim to bring together parts of the past—actors, their intentions, actions themselves, naturally occurring events, and consequences—into a meaningful whole. Historical narratives are different than simple stories in that they weave evidence into the story, and they do so in such a way as not to interrupt the rhythm and flow of the story.

Your task is to create a Big History narrative. At key points in the course you will revise your previous work as appropriate. You can deliver your narrative as a “scholarly” piece of writing, a “TED talk” (with accompanying script), or a web-based narrative with graphics, or an illustrated children’s book, but you need to meet a number of minimum requirements in the finished product (sample rubric and scaffold):

Requirement	Previous Course Work That Will Help You
<ul style="list-style-type: none"> <li>An <b>introduction</b> that hooks the reader’s interest and communicates the point of your story.</li> </ul>	<ul style="list-style-type: none"> <li>Writing and thinking about why we study Big History</li> <li>Comparison to other origin stories</li> <li>The History of Everything TED Talk,</li> <li>Unit 1 Main Lecture</li> </ul>
<ul style="list-style-type: none"> <li>An accurate <b>chronological ordering</b> of all thresholds and significant corresponding events</li> </ul>	<ul style="list-style-type: none"> <li>Threshold cards</li> <li>Big Timeline</li> </ul>
<ul style="list-style-type: none"> <li>References to important <b>Big History concepts</b>, including (but not limited to) complexity, origin stories, thresholds, scale, and collective learning.</li> </ul>	<ul style="list-style-type: none"> <li>Big History Concept Assessments</li> <li>All Big History articles, videos, etc.</li> </ul>
<ul style="list-style-type: none"> <li>A <b>conclusion</b> that restates or amplifies the point(s) you have been trying to make and brings closure to the narrative.</li> </ul>	<ul style="list-style-type: none"> <li>The History of Everything TED Talk,</li> <li>Unit 1 Main Lecture,</li> </ul>
<ul style="list-style-type: none"> <li>A clear, cohesive, and cogent structure and delivery</li> </ul>	<ul style="list-style-type: none"> <li>An outline you will create as you begin your work</li> </ul>