



2018 International Conference Professional Development

Day 2, Session 3: Science and Social Studies

Information, Resources, and Strategies for the Classroom

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Overview of Social Studies Themes and Example Content

		Social Studies Example Topics			
		Civics & Gov't (50%)	US History (20%)	Economics (15%)	Geography & the World (15%)
Focusing Themes	<i>Development of Modern Liberties and Democracy</i>	<ul style="list-style-type: none"> Types of modern and historical governments Principles that have contributed to development of American constitutional democracy Structure and design of U.S. government Individual rights and civic responsibilities 	<ul style="list-style-type: none"> Key historical documents that have shaped American constitutional government Revolutionary and Early Republic Periods Civil War and Reconstruction Civil Rights Movement 	<ul style="list-style-type: none"> Key economic events that shape American government and policies Relationship between political and economic freedoms 	<ul style="list-style-type: none"> Development of classical civilizations
	<i>Dynamic Responses in Societal Systems</i>	<ul style="list-style-type: none"> Political parties, campaigns, and elections in American politics Contemporary public policy 	<ul style="list-style-type: none"> European population of the Americas World War I & II Cold War American foreign policy since 9/11 	<ul style="list-style-type: none"> Fundamental economic concepts Microeconomics and macroeconomics Consumer economics Economic causes and impacts of war Economic drivers of exploration and colonization Scientific and Industrial 	<ul style="list-style-type: none"> Relationships between the environment and societal development Borders between peoples and nations Human migration

Social Studies Practices

SSP.1 Drawing Conclusions and Making Inferences

- a. Determine the details of what is explicitly stated in primary and secondary sources and make logical inferences or validate claims based on evidence.
- b. Cite or identify specific evidence to support inferences or analyses or primary and secondary sources, attending to the precise details of explanations or descriptions of a process, event, or concept.

SSP.2 Determining Central Ideas, Hypotheses and Conclusions

- a. Determine the central ideas or information of a primary or secondary source document, corroborating or challenging conclusions with evidence.
- b. Describe people, places, environments, processes, and events, and the connections between and among them.

SSP.3 Analyzing Events and Ideas

- a. Identify the chronological structure of historical narrative and sequence steps in a process.
- b. Analyze in detail how events, processes, and ideas develop and interact in a written document; determine whether earlier events caused later ones or simply preceded them.
- c. Analyze cause-and-effect relationships and multiple causation, including action by individuals, natural and societal processes, and the influence of ideas.
- d. Compare differing sets of ideas related to political, historical, economic, geographic, or societal contexts; evaluate the assumptions and implications inherent in differing positions.

SSP.4 Interpreting Meaning of Symbols, Words and Phrases

- a. Determine the meaning of words and phrases as they are used in context, including vocabulary that describes historical, political, social, geographic, and economic aspects of social studies.

SSP.5 Analyzing Purpose and Point of View

- a. Identify aspects of a historical document that reveal an author's point of view or purpose (e.g. loaded language, inclusions or avoidance of particular facts).
- b. Identify instances of bias or propagandizing.
- c. Analyze how a historical context shapes an author's point of view.
- d. Evaluate the credibility of an author in historical and contemporary political discourse.

SSP.6 Integrating Content Presented in Different Ways

- a. Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analyses in print or digital text.
- b. Analyze information presented in a variety of maps, graphic organizers, tables, and charts and in a variety of visual sources such as artifacts, photographs, political cartoons.

Social Studies High Impact Indicators

Indicator	What to look for in student work: Students' work shows they have . . .
SSP.2.a Determine the central ideas or information of a primary or secondary source document, corroborating or challenging conclusions with evidence.	<ul style="list-style-type: none"> differentiated between the concepts of topic and main idea. identified the topic and/or main idea of a piece of text. identified supporting details for a given main idea. summarized a piece of text. fully explained relevant details in the text that support the main idea. located a single piece of evidence in the text. located multiple pieces of evidence in a text. differentiated between relevant and irrelevant evidence. used evidenced to support or challenge an author's conclusion.
SSP.2.b Describe people, places, environments, processes, and events, and the connections between and among them.	<ul style="list-style-type: none"> described pertinent elements in the text, including: people, places, environments, processes, and events. identified relationships among multiple elements (listed above) in the text. fully explained relationships among the elements.
SSP.3.c Analyze cause-and-effect relationships and multiple causation, including action by individuals, natural and societal processes, and the influence of ideas.	<ul style="list-style-type: none"> identified (potential or actual) causes for given effects. identified (potential or actual) effects for a given cause. identified examples of cause-effect relationships in texts. fully explained how or why one event or set of circumstances in a cause-effect relationship caused another. fully explained a sequence of causes leading to a given effect. identified multiple causes of a given event or set of circumstances.
SSP.5.c Analyze how a historical context shapes an author's point of view.	<ul style="list-style-type: none"> identified the author's point of view in a primary source text. identified the major eras in U.S. history relevant to a specific text and identify influential events, figures, and ideas therein. identified context (events, figures, ideas) relevant to the given text. fully explained how the historical context directly relates to the author's point of view.
SSP.8.a Compare treatments of the same social studies topic in various primary and secondary sources, noting discrepancies between and among the sources.	<ul style="list-style-type: none"> identified a common topic in multiple sources. described commonalities in treatment of a topic across multiple sources. identified differences in the way the sources treat the topic. fully explained how a given difference in treatment is meaningful to the understanding of the topic itself.

Sample Primary Sources

The Federalist No. 51

Publius (James Madison)

February 6, 1788

To the People of the State of New York:

TO WHAT expedient, then, shall we finally resort, for maintaining in practice the necessary partition of power among the several departments, as laid down in the Constitution? The only answer that can be given is, that as all these exterior provisions are found to be inadequate, the defect must be supplied, by so contriving the interior structure of the government as that its several constituent parts may, by their mutual relations, be the means of keeping each other in their proper places. Without presuming to undertake a full development of this important idea, I will hazard a few general observations, which may perhaps place it in a clearer light, and enable us to form a more correct judgment of the principles and structure of the government planned by the convention.

In order to lay a due foundation for that separate and distinct exercise of the different powers of government, which to a certain extent is admitted on all hands to be essential to the preservation of liberty, it is evident that each department should have a will of its own; and consequently should be so constituted that the members of each should have as little agency as possible in the appointment of the members of the others. Were this principle rigorously adhered to, it would require that all the appointments for the supreme executive, legislative, and judiciary magistracies should be drawn from the same fountain of authority, the people, through channels having no communication whatever with one another. Perhaps such a plan of constructing the several departments would be less difficult in practice than it may in contemplation appear. Some difficulties, however, and some additional expense would attend the execution of it. Some deviations, therefore, from the principle must be admitted. In the constitution of the judiciary department in particular, it might be inexpedient to insist rigorously on the principle: first, because peculiar qualifications being essential in the members, the primary consideration ought to be to select that mode of choice which best secures these qualifications; secondly, because the permanent tenure by which the appointments are held in that department, must soon destroy all sense of dependence on the authority conferring them.

It is equally evident, that the members of each department should be as little dependent as possible on those of the others, for the emoluments annexed to their offices. Were the executive magistrate, or the judges, not independent of the legislature in this particular, their independence in every other would be merely nominal. But the great security against a gradual concentration of the several powers in the same department consists in giving to those who administer each department the necessary constitutional means and personal motives to resist encroachments of the others. The provision for defense must in this, as in all other cases, be made commensurate to the danger of attack. Ambition must be made to counteract ambition. The interest of the man must be connected with the constitutional rights of the place. It may be a reflection on human nature, that such devices should be necessary to control the abuses of government. But what is government itself, but the greatest of all reflections on human nature? If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself.

A dependence on the people is, no doubt, the primary control on the government; but experience has taught mankind the necessity of auxiliary precautions. This policy of supplying, by opposite and rival interests, the defect of better motives, might be traced through the whole system of human affairs, private as well as public. We see it particularly displayed in all the subordinate distributions of power, where the constant aim is to divide and arrange the several offices in such a manner as that each may be a check

on the other that the private interest of every individual may be a sentinel over the public rights. These inventions of prudence cannot be less requisite in the distribution of the supreme powers of the State. But it is not possible to give to each department an equal power of self-defense. In republican government, the legislative authority necessarily predominates. The remedy for this inconveniency is to divide the legislature into different branches; and to render them, by different modes of election and different principles of action, as little connected with each other as the nature of their common functions and their common dependence on the society will admit. It may even be necessary to guard against dangerous encroachments by still further precautions. As the weight of the legislative authority requires that it should be thus divided, the weakness of the executive may require, on the other hand, that it should be fortified.

An absolute negative on the legislature appears, at first view, to be the natural defense with which the executive magistrate should be armed. But perhaps it would be neither altogether safe nor alone sufficient. On ordinary occasions it might not be exerted with the requisite firmness, and on extraordinary occasions it might be perfidiously abused. May not this defect of an absolute negative be supplied by some qualified connection between this weaker department and the weaker branch of the stronger department, by which the latter may be led to support the constitutional rights of the former, without being too much detached from the rights of its own department? If the principles on which these observations are founded be just, as I persuade myself they are, and they be applied as a criterion to the several State constitutions, and to the federal Constitution it will be found that if the latter does not perfectly correspond with them, the former are infinitely less able to bear such a test.

There are, moreover, two considerations particularly applicable to the federal system of America, which place that system in a very interesting point of view. First. In a single republic, all the power surrendered by the people is submitted to the administration of a single government; and the usurpations are guarded against by a division of the government into distinct and separate departments. In the compound republic of America, the power surrendered by the people is first divided between two distinct governments, and then the portion allotted to each subdivided among distinct and separate departments. Hence a double security arises to the rights of the people. The different governments will control each other, at the same time that each will be controlled by itself. Second. It is of great importance in a republic not only to guard the society against the oppression of its rulers, but to guard one part of the society against the injustice of the other part. Different interests necessarily exist in different classes of citizens. If a majority be united by a common interest, the rights of the minority will be insecure.

There are but two methods of providing against this evil: the one by creating a will in the community independent of the majority that is, of the society itself; the other, by comprehending in the society so many separate descriptions of citizens as will render an unjust combination of a majority of the whole very improbable, if not impracticable. The first method prevails in all governments possessing an hereditary or self-appointed authority. This, at best, is but a precarious security; because a power independent of the society may as well espouse the unjust views of the major, as the rightful interests of the minor party, and may possibly be turned against both parties. The second method will be exemplified in the federal republic of the United States. Whilst all authority in it will be derived from and dependent on the society, the society itself will be broken into so many parts, interests, and classes of citizens, that the rights of individuals, or of the minority, will be in little danger from interested combinations of the majority.

In a free government the security for civil rights must be the same as that for religious rights. It consists in the one case in the multiplicity of interests, and in the other in the multiplicity of sects. The degree of security in both cases will depend on the number of interests and sects; and this may be presumed to depend on the extent of country and number of people comprehended under the same government. This view of the subject must particularly recommend a proper federal system to all the sincere and considerate friends of republican government, since it shows that in exact proportion as the territory of the Union may be formed into more circumscribed Confederacies, or States oppressive combinations of a majority will be facilitated: the best security, under the republican forms, for the rights of every class of citizens, will be diminished: and consequently the stability and independence of some member of the government, the only other security, must be proportionately increased. Justice is the end of government. It is the end of civil society. It ever has been and ever will be pursued until it be obtained, or until liberty be lost in the pursuit. In a society under the forms of which the stronger faction can readily unite and oppress the weaker, anarchy may as truly be said to reign as in a state of nature, where the weaker individual is

not secured against the violence of the stronger; and as, in the latter state, even the stronger individuals are prompted, by the uncertainty of their condition, to submit to a government which may protect the weak as well as themselves; so, in the former state, will the more powerful factions or parties be gradually induced, by a like motive, to wish for a government which will protect all parties, the weaker as well as the more powerful.

It can be little doubted that if the State of Rhode Island was separated from the Confederacy and left to itself, the insecurity of rights under the popular form of government within such narrow limits would be displayed by such reiterated oppressions of factious majorities that some power altogether independent of the people would soon be called for by the voice of the very factions whose misrule had proved the necessity of it. In the extended republic of the United States, and among the great variety of interests, parties, and sects which it embraces, a coalition of a majority of the whole society could seldom take place on any other principles than those of justice and the general good; whilst there being thus less danger to a minor from the will of a major party, there must be less pretext, also, to provide for the security of the former, by introducing into the government a will not dependent on the latter, or, in other words, a will independent of the society itself. It is no less certain than it is important, notwithstanding the contrary opinions which have been entertained, that the larger the society, provided it lie within a practical sphere, the more duly capable it will be of self-government. And happily for the REPUBLICAN CAUSE, the practicable sphere may be carried to a very great extent, by a judicious modification and mixture of the FEDERAL PRINCIPLE.

PUBLIUS.

The original text of the Federalist Papers (also known as *The Federalist*) was obtained by the Library of Congress from the e-text archives of Project Gutenberg

FEDERALIST NO. 51 (1788)

Excerpt

“It may be a reflection on human nature, that such devices [checks and balances] should be necessary to control the abuses of government. But what is government itself, but the greatest of all reflections on human nature? If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself. A dependence on the people is, no doubt, the primary control on the government; but experience has taught mankind the necessity of auxiliary precautions.”

“ . . . [I]n the federal republic of the United States... all authority in it will be derived from and dependent on the society, the society itself will be broken into so many parts, interests, and classes of citizens, that the rights of individuals, or of the minority, will be in little danger from interested combinations of the majority.” All of the Constitution’s checks and balances, Madison concludes, serve to preserve liberty by ensuring justice. Madison explained, “Justice is the end of government. It is the end of civil society.”

Primary Source Analysis Tool from the Library of Congress

Name of Document _____

Observe	Reflect	Question
<ul style="list-style-type: none">• Describe what you see.• What do you notice first?• How much of the text can you read? What does it say?• Describe anything that you see on the page besides words, such as images.• How is the text and information arranged?• Describe anything about this text that looks unfamiliar.• What other details can you see?	<ul style="list-style-type: none">• What the purpose of this text?• Who created it?• Who do you think was its audience?• Can you tell anything about what was important at the time it was written?• Why do you think this document is important?• What can you learn from examining this?• If someone wrote this today, what would be different?	<ul style="list-style-type: none">• What do you wonder – who?• What do you wonder – what?• What do you wonder – where?• What do you wonder – why?• What do you wonder – when?• What do you wonder – how?

Further Investigation

What more do you want to know, and how can you find out?

Follow-up activities

Select a section of the text and put it in your own words. Look for clues to the points of view of the person, or people, who created this document. Discuss what someone with an opposing or differing point of view might say about the issues or events described. How would the information be presented differently?

Examine a section of the text. Think about what you already know about this period in history. How does the text support or contradict your current understanding of this period? Can you see any clues to the point of view of the person who created this document?

Primary Source Analysis Tool from the Library of Congress

Name of Document _____

Observe	Reflect	Question

Further Investigation

Reading Like a Historian (Stanford History Education Group) <http://sheg.stanford.edu/rh>

Historical Reading Skills	Questions	Students should be able to . . .	Prompts
Sourcing (Before reading document)	<ul style="list-style-type: none"> Who authored the document? What is the author's point of view? Why was it written? When was it written? Where was it written? Is this source believable? Why? Why not? 	<ul style="list-style-type: none"> Identify author's position Identify and evaluate author's purpose in producing document Predict what author will say BEFORE reading document Evaluate source's believability/trustworthiness by considering genre, audience, and author's purpose 	<p>This author probably believes...</p> <p>I think the audience is...</p> <p>Based on the sourcing information, I predict this author will...</p> <p>I do/don't trust this document because...</p>
Contextualization	<ul style="list-style-type: none"> What else was going on at the time this was written? What was it like to be alive at this time? What things were different back then? What things were the same? 	<ul style="list-style-type: none"> Use context/background information to draw more meaning from document Infer historical context from document(s) Recognize that document reflects one moment in changing past Understand that words must be understood in a larger context 	<p>I already know that ____ is happening at this time...</p> <p>From this document I would guess that people at this time were feeling...</p> <p>This document might not give me the whole picture because ...</p>
Close Reading	<ul style="list-style-type: none"> What claims does the author make? What evidence does the author use to support those claims? What words or phrases does the author use to convince me that he/she is right? What information does the author leave out? How does this document make me feel? 	<ul style="list-style-type: none"> Identify author's claims about event Evaluate evidence/reasoning author uses to support claims Evaluate author's word choice; understand that language is used deliberately 	<p>I think the author chose these words because they make me feel...</p> <p>The author is trying to convince me... (by using/saying...)</p>
Corroboration	<ul style="list-style-type: none"> What do other pieces of evidence say? Am I finding different versions of the story? Why or why not? What pieces of evidence are most believable? 	<ul style="list-style-type: none"> Establish what is true by comparing documents to each other Recognize disparities between two accounts 	<p>This author agrees/ disagrees with...</p> <p>This document was written earlier/later than the other, so...</p>

Read Like a Historian

Document Name _____

Examine: What do you see? What topic does it address? What details do you notice in this source? What is interesting? Is there something that you don't understand?

Question: What other information do you need to understand this source? What questions do you have for further research?

Think: What are some guesses you can make about this document? Who do you think made it? When? Why did they make it? Is it neutral or biased?

Draw conclusions: Base on your background knowledge and the details in this document, what conclusions can you draw about the historical period and the meaning of the document?

The Way Station

Each evening, the stage announces its approach to a way station by the driver blowing a bugle. The way station offers sparse comfort.

"The station buildings were long, low huts, made of sun-dried, mud-colored bricks, laid up without mortar (adobes the Spaniards call these bricks, and Americans shorten it to 'dobies'). The roofs, which had no slant to them worth speaking of, were thatched and then sodded or covered with a thick layer of earth, and from this sprang a pretty rank growth of weeds and grass. It was the first time we had ever seen a man's front yard on top of his house. The buildings consisted of barns, stable-room for twelve or fifteen horses, and a hut for an eating room for passengers. This latter had bunks in it for the station-keeper and a hostler or two. You could rest your elbow on its eaves, and you had to bend in order to get in at the door. In place of a window there was a square hole about large enough for a man to crawl through, but this had no glass in it. There was no flooring, but the ground was packed hard. There was no stove, but fire-place served all needful purposes. There were no shelves, no cupboards, no closets. In a corner stood an open sack of flour, and nestling against its base were a couple of black and venerable tin coffee-pots, a tin teapot, a little bag of salt, and a side of bacon.

By the door of the station keeper's den, outside, was a tin wash-basin, on the ground. Near it was a pail of water and a piece of yellow soap, and from the eaves hung a hoary blue woolen shirt, significantly - but this latter was the station-keeper's private towel, and only two persons in all the party might venture to use it - the stage-driver and the conductor."

Mark Twain, *Roughing It* (1872)

Questions for Analyzing Primary Sources

1. Who created the source and why? Was it created through a spur-of-the-moment act, a routine transaction, or a thoughtful, deliberate process?
2. Did the recorder have firsthand knowledge of the event? Or, did the recorder report what others saw and heard?
3. Was the recorder a neutral party, or did the creator have opinions or interests that might have influenced what was recorded?
4. Did the recorder produce the source for personal use, for one or more individuals, or for a large audience?
5. Was the source meant to be public or private?
6. Did the recorder wish to inform or persuade others? (Check the words in the source. The words may tell you whether the recorder was trying to be objective or persuasive.) Did the recorder have reasons to be honest or dishonest?
7. Was the information recorded during the event, immediately after the event, or after some lapse of time? How large a lapse of time?

Social Studies Resources from the Internet

An Outline of American History. An overview of history and government developed as part of *The American Revolution—an HTML Project*. <http://www.let.rug.nl/usa/>

Annenberg Classroom. Great course for civics education. <http://www.annenbergclassroom.org>

Digital History. An interactive, multimedia history of the United States from the Revolution to the present. <http://www.digitalhistory.uh.edu/>

DocsTeach – This site includes links to primary sources, lesson plans, activity ideas, and template to build your own lessons. <http://docsteach.org/>

Library of Congress. Classroom and professional development materials to help teachers effectively use primary sources. To get started, try these quick starting points:

- **Browse by Topic** - Easy browsing for primary sources across all the digital collections of the Library of Congress. <http://www.loc.gov/topics/>
- **Primary Source Sets** - Each set collects primary sources on a specific topic. <http://www.loc.gov/teachers/classroommaterials/primarysourcesets/>
- **Using Primary Sources in the Classroom** - <http://www.loc.gov/teachers/usingprimarysources/>

50 Core Documents. Teaching American History. <http://teachingamericanhistory.org/50docs/>

Four Reads: Learning to Read Primary Documents. Take a step-by-step process for reading primary documents. <http://teachinghistory.org/teaching-materials/teaching-guides/25690>

National Archives and Records Administration. The website of the National Archives. All types of educational units and copies of national documents are available from this governmental site. <http://www.archives.gov>

Newsela. A site with nonfiction articles available in 4-5 different Lexile Levels with many of them providing a quiz that is aligned to a specific anchor standard. It is necessary to sign up for the free account to see the different level of articles. <https://newsela.com/>

Our Documents. <http://www.ourdocuments.gov/index.php?flash=true&>

Reading Like a Historian. Stanford History Education Group. Information on how to teach students to closely read primary sources. <http://sheg.stanford.edu/?q=node/21>

Roy Rosenzweig Center for History and New Media. The resources are a great addition for your classroom. <http://chnm.gmu.edu/teaching-and-learning/>

- **Live Binders.** <http://www.livebinders.com/play/play/573792>

Teaching History – National History Clearinghouse. This site has a lot of materials to assist in the teaching of history. <http://teachinghistory.org>

The History Channel. The History Channel provides both historic and current topics, readings, audio and video recordings, and lessons for the classroom. <http://www.history.com/>

Analyzing Primary Sources: Observe, Reflect, Question

Guide students with the sample questions as they respond to the primary source.
Encourage them to go back and forth between the columns; there is no correct order.

Observe	Reflect	Question
Ask students to identify and note details.	Encourage students to generate and test hypotheses about the source.	Invite students to ask questions that lead to more observations and reflections.
<p>Sample Questions:</p> <ul style="list-style-type: none"> • What do you notice first? • Find something small but interesting. • What do you notice that you didn't expect? • What do you notice that you can't explain? • What do you notice that you didn't earlier? 	<p>Sample Questions:</p> <ul style="list-style-type: none"> • Where do you think this came from? • Why do you think somebody made this? • What do you think was happening when this was made? • Who do you think was the audience for this item? • What tool was used to create this? • Why do you think this item is so important? • If somebody made this today, what would be different? • What can you learn from examining this? 	<p>Sample Questions:</p> <ul style="list-style-type: none"> • What do you wonder about . . . • who? • what? • when? • where? • why? • how? • What claims does the author make? • What evidence does the author use to support these claims?

Further Investigation

Help students to identify questions appropriate for further investigation, and to develop a research strategy for finding answers.

Sample Question: What more do you want to know, and how can you find out?

Sample Follow-Up Activity Ideas

Beginning: Have students compare two related primary source items.

Intermediate: Have students expand or alter textbook explanations of history based on primary sources they study.

Advanced: Ask students to consider how a series of primary sources support or challenge information and understanding on a particular topic. Have students refine or revise conclusions based on their study of each subsequent primary source.

From the Library of Congress

Primary Source Analysis Tool: Observe, Reflect, Question

Use this tool to record your responses to a primary source. If you need guidance, use the sample questions. Feel free to go back and forth between the columns; there is no correct order.

Observe	Reflect	Question

Further Investigation

Library of Congress <http://www.loc.gov/teachers/primary-source-analysis-tool/>

Sample Primary Sources

Declaration of Independence

In Congress, July 4, 1776.

Excerpt

The unanimous Declaration of the thirteen united States of America, When in the Course of human events, it becomes necessary for one people to dissolve the political bands which have connected them with another, and to assume among the powers of the earth, the separate and equal station to which the Laws of Nature and of Nature's God entitle them, a decent respect to the opinions of mankind requires that they should declare the causes which impel them to the separation.

We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty and the pursuit of Happiness.-That to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed, --That whenever any Form of Government becomes destructive of these ends, it is the Right of the People to alter or to abolish it, and to institute new Government, laying its foundation on such principles and organizing its powers in such form, as to them shall seem most likely to effect their Safety and Happiness.

The Federalist No. 51

Publius (James Madison)

February 6, 1788

To the People of the State of New York:

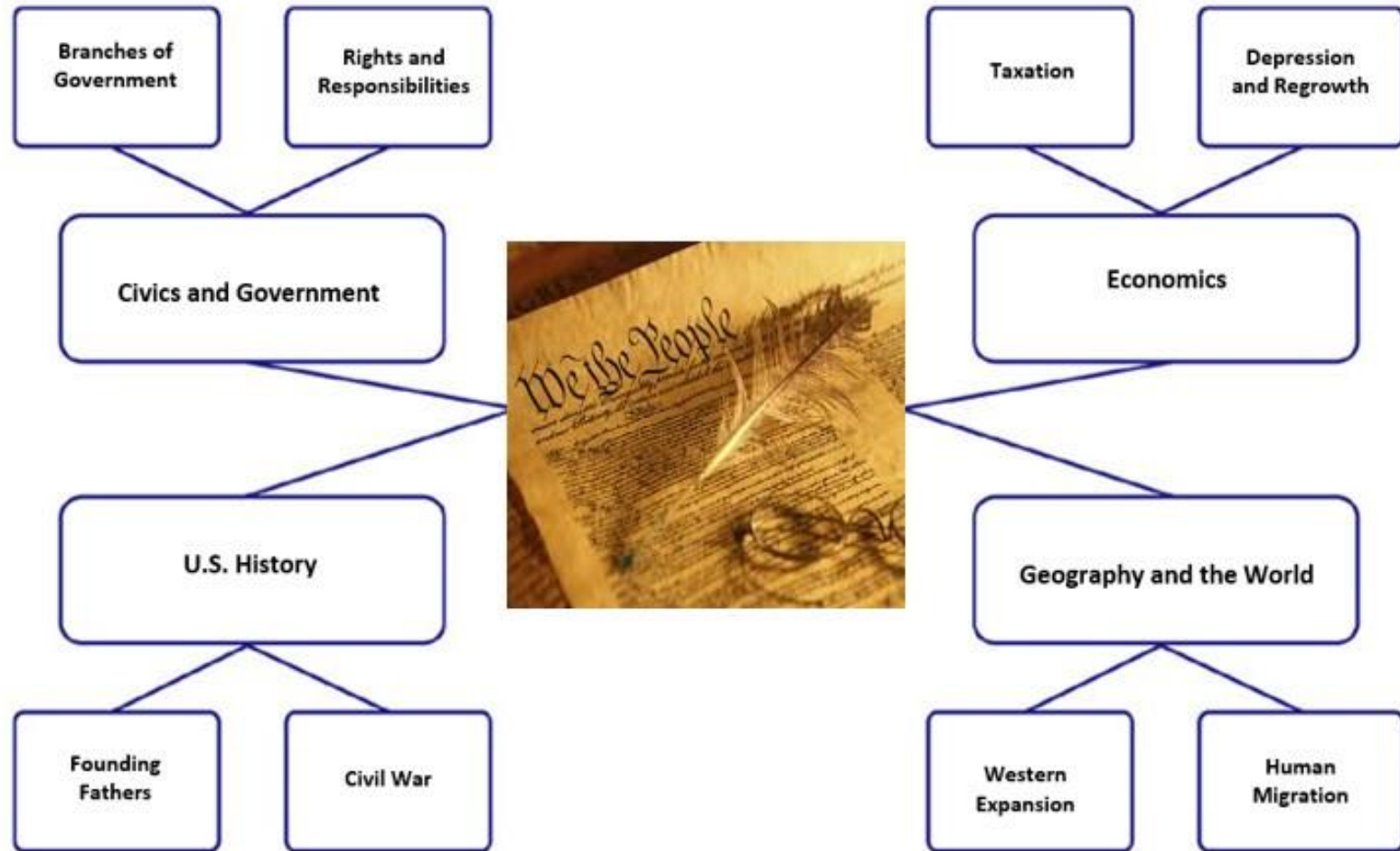
Excerpt

"It may be a reflection on human nature, that such devices [checks and balances] should be necessary to control the abuses of government. But what is government itself, but the greatest of all reflections on human nature? If men were angels, no government would be necessary. If angels were to govern men, neither external nor internal controls on government would be necessary. In framing a government which is to be administered by men over men, the great difficulty lies in this: you must first enable the government to control the governed; and in the next place oblige it to control itself. A dependence on the people is, no doubt, the primary control on the government; but experience has taught mankind the necessity of auxiliary precautions."

". . . [I]n the federal republic of the United States... all authority in it will be derived from and dependent on the society, the society itself will be broken into so many parts, interests, and classes of citizens, that the rights of individuals, or of the minority, will be in little danger from interested combinations of the majority." All of the Constitution's checks and balances, Madison concludes, serve to preserve liberty by ensuring justice. Madison explained, "Justice is the end of government. It is the end of civil society."

Thematic Lesson

In Order to Form a More Perfect Union



A, B, C Brainstorm – The Founding Fathers and the Beginnings of the US

For each letter of the alphabet, write a word related to the founding of the country, the Founding Fathers, and the establishment of the Constitution

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z

Compare and Contrast – Working with Secondary Documents

Use the Venn Diagram to compare and contrast the Articles of Confederation and U.S. Constitution. Be prepared to share your diagrams. After comparing the documents, discuss the ways in which the ratification of the Constitution improved the government.

Difference between the Articles of Confederation and U.S. Constitution



Two of the most prominent documents to manifest during the American Revolution were the Articles of Confederation and the Constitution.

The Articles of Confederation were the first successful effort of organizing and mobilizing the original thirteen colonies of the United States. Prior to its inception, all American activities deemed subversive to the Crown of England were viewed in the same way that terrorism is deemed today.

These rebel activities acted independently of a sovereign authority. As a result, the revolutionary forces in the United States couldn't leverage or seek the assistance of other foreign governments, leaving them tactically and diplomatically weak against its British foe.

The Continental Congress, in need of domestic unity and foreign assistance, pushed for the ratification of these documents in 1776. It wasn't until 1781 that the group was able to finalize the document, which acted as one-third of the United States' founding documents (also including the Declaration of Independence and the Model Treaty). The Articles of Confederation gave the original colonial powers some added leverage in handling diplomatic affairs, including negotiating land deals with foreign governments.

Following the American Revolution, the Articles of Confederation reemerged as a topic of intense conversation. American nationalists, recently emboldened by their victory over the English crown, claimed that the Articles of Confederation did not provide an adequate central authority for purposes of governance. There was no established executive power. There was no judicial branch, so disputes couldn't be adequately arbitrated. International treaties were adopted with the Articles of Confederation, but individual states were able to violate these treaties at will, putting the United States in a bad place diplomatically in the late 18th century. Most importantly, there was no taxing authority, so money couldn't be collected to pay off the American war expenses and debt. The Continental Congress was able to print money, but the money was rendered worthless. The term "not worth a Continental" became widespread during this era.

There were key differences between the two documents in the how they both codified the law. The Articles of Confederation established a unicameral legislature, as opposed to the eventual bicameral system created by the Constitution. Voting power was delegated to states based on committees (consisting of anywhere from two to seven people) and each state had one vote in the Articles of Confederation; the Constitution allowed for a single vote for each legislative representative (for each state, two Senators and a number of House representatives based on

census population). Furthermore, the Constitution created the Executive Branch of government, establishing a figurehead department of the government that was still held accountable to public scrutiny. In the grand scheme of things, the Constitution did more to centralize authority in a single political entity, rather than rely on the laxer union created by the Articles of Confederation.

The American Constitution was adopted in 1789, replacing the Articles of Confederation permanently. This document laid out a much more expansive system of governance, creating the checks and balances between the three branches of government. It also enumerated the relationship of the Federal Government and the states. Most importantly, it established the Bill of Rights, the first ten amendments of the Constitution which laid out the foundation for the civil liberties we enjoy as American citizens. The Constitution was a unique document for its time. It inspired many other countries to follow in a similar fashion for the development of their own democratically based reformations.

However, despite its originality, the Constitution was not perfect. Intentionally vague from its inception, the Constitution did not address several prominent issues, such as the institution of slavery. Since its inception, the Constitution has been amended several times. Even then, new additions to the Constitution – such as the 18th Amendment which outlawed the sale of alcohol and started the Prohibition – were subject to repeal. Now, the document possesses 27 amendments and 7 articles. Despite this seemingly large document, the U.S. Constitution is one of the shortest constitutions in existence to date.

Name: _____

Date: _____



Venn Diagram

A Venn diagram template consisting of two overlapping circles. Each circle has a rectangular label box above it. The circles are filled with horizontal lines for writing. The intersection of the two circles is highlighted with red lines.

Break it Down – Preamble to the U. S. Constitution

1. Underline each phrase in the Preamble and determine what it means. Share your ideas with your group.

We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

2. What does the Preamble have to do with protecting your rights and the common good?

The Bill of Rights

Amendment I

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech, or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances.

Amendment II

A well regulated Militia, being necessary to the security of a free State, the right of the people to keep and bear Arms, shall not be infringed.

Amendment III

No Soldier shall, in time of peace be quartered in any house, without the consent of the Owner, nor in time of war, but in a manner to be prescribed by law.

Amendment IV

The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

Amendment V

No person shall be held to answer for a capital, or otherwise infamous crime, unless on a presentment or indictment of a Grand Jury, except in cases arising in the land or naval forces, or in the Militia, when in actual service in time of War or public danger; nor shall any person be subject for the same offence to be twice put in jeopardy of life or limb; nor shall be compelled in any criminal case to be a witness against himself, nor be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use, without just compensation.

Amendment VI

In all criminal prosecutions, the accused shall enjoy the right to a speedy and public trial, by an impartial jury of the State and district wherein the crime shall have been committed, which district shall have been previously ascertained by law, and to be informed of the nature and cause of the accusation; to be confronted with the witnesses against him; to have compulsory process for obtaining witnesses in his favor, and to have the Assistance of Counsel for his defence.

Amendment VII

In Suits at common law, where the value in controversy shall exceed twenty dollars, the right of trial by jury shall be preserved, and no fact tried by a jury, shall be otherwise re-examined in any Court of the United States, than according to the rules of the common law.

Amendment VIII

Excessive bail shall not be required, nor excessive fines imposed, nor cruel and unusual punishments inflicted.

Amendment IX

The enumeration in the Constitution, of certain rights, shall not be construed to deny or disparage others retained by the people.

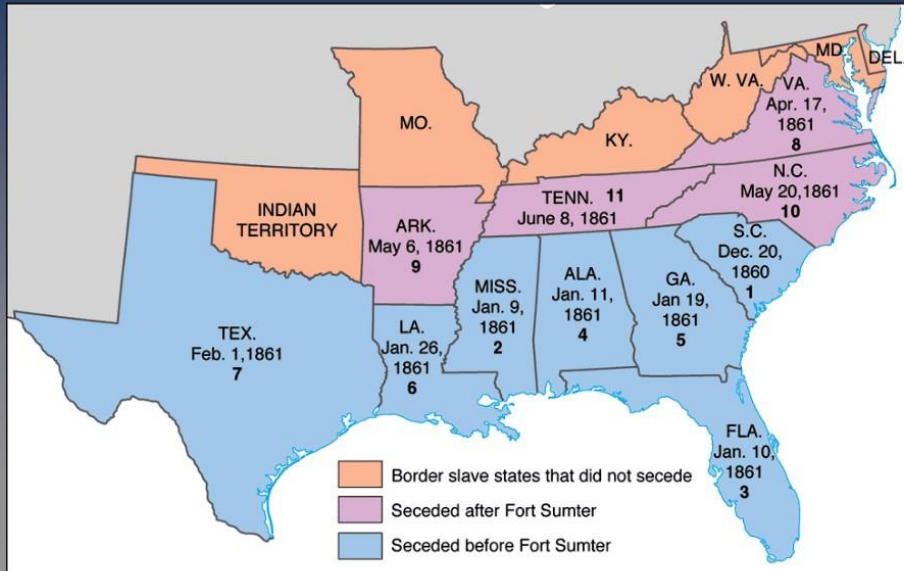
Amendment X

The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

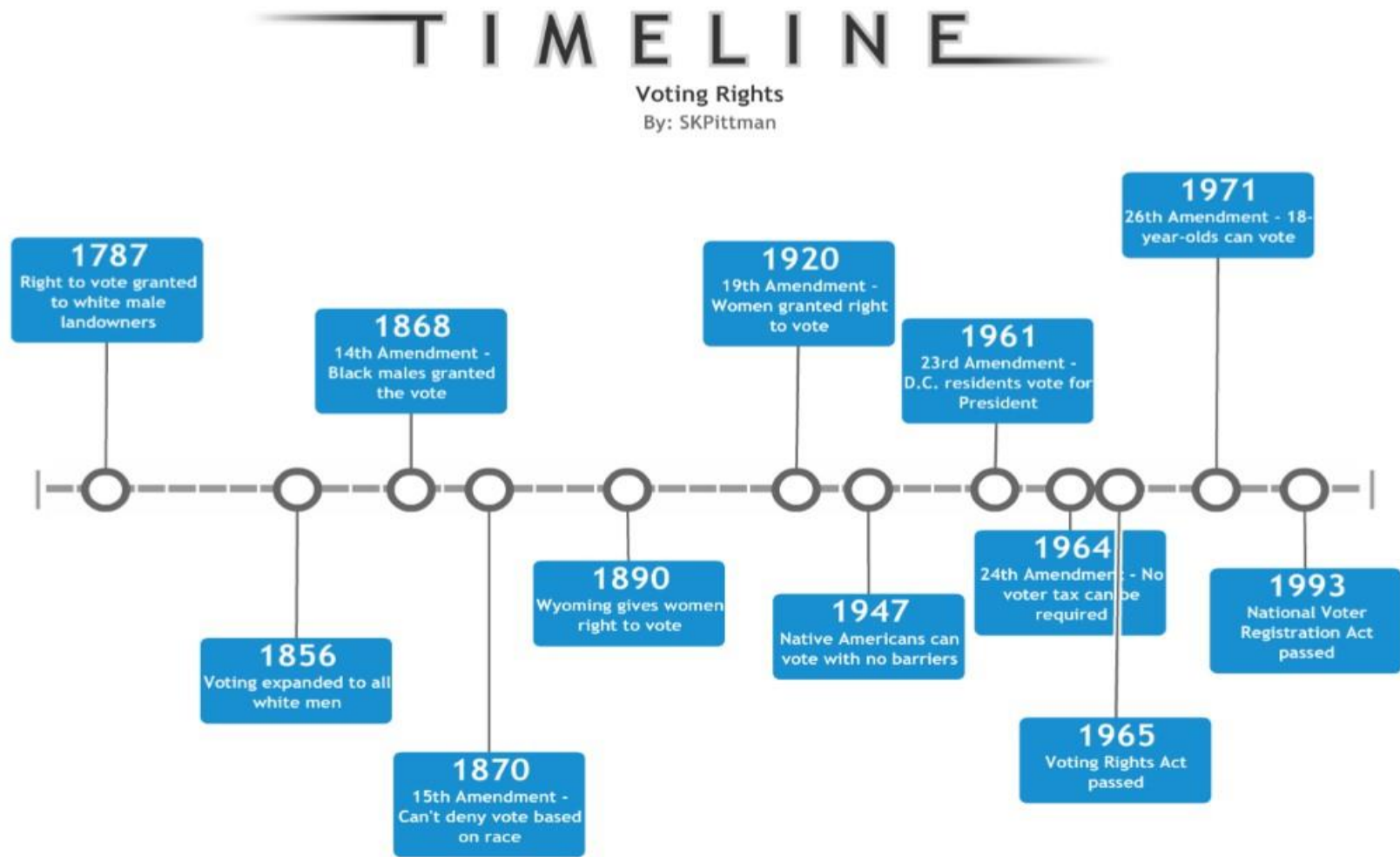
A Nation Torn Apart – A Constitution Rewritten



Secession!: SC → Dec. 20, 1860



The Evolution of Voting – A Timeline



readwritethink

International Reading Association

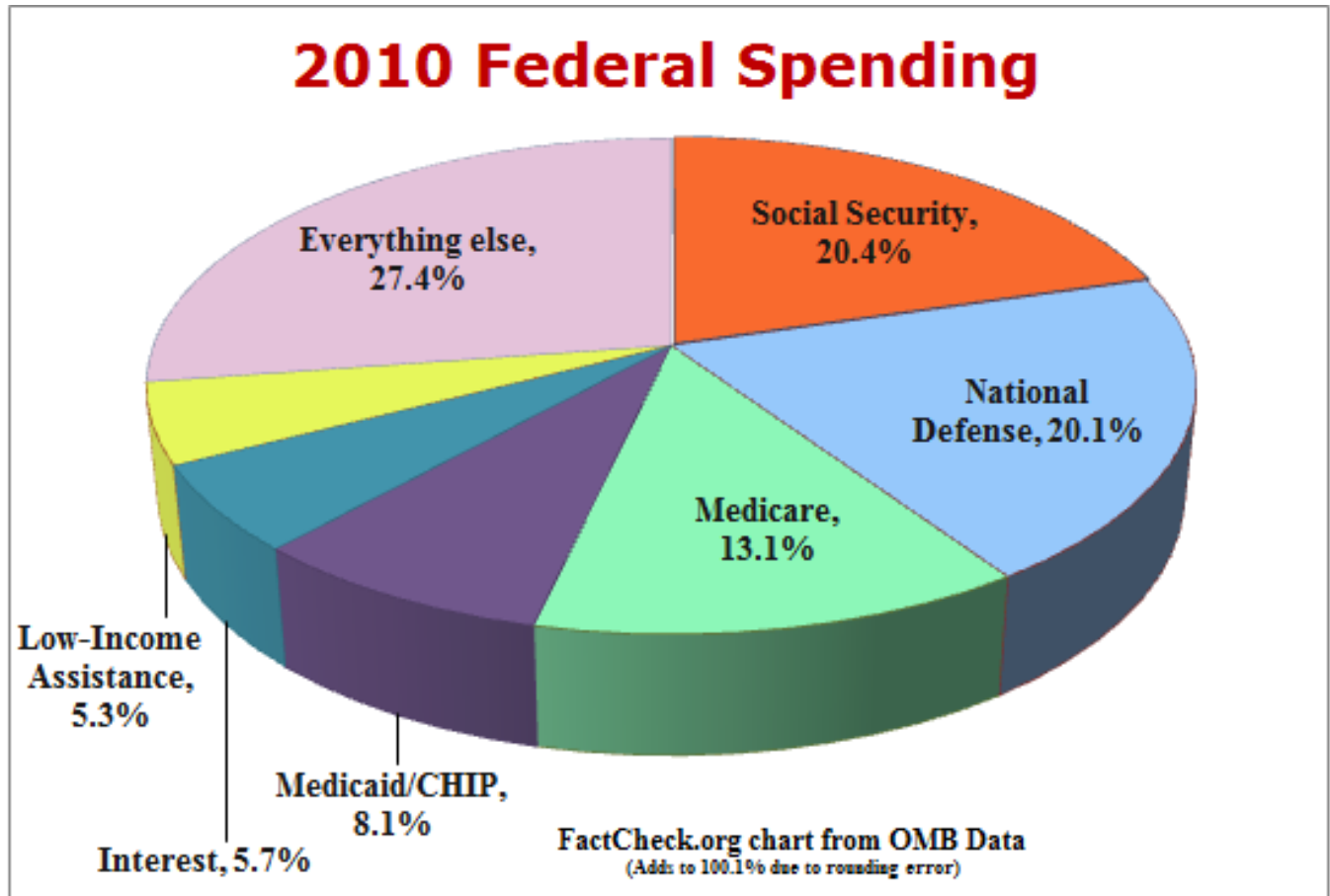
NCTE

Thinkfinity | verizon foundation

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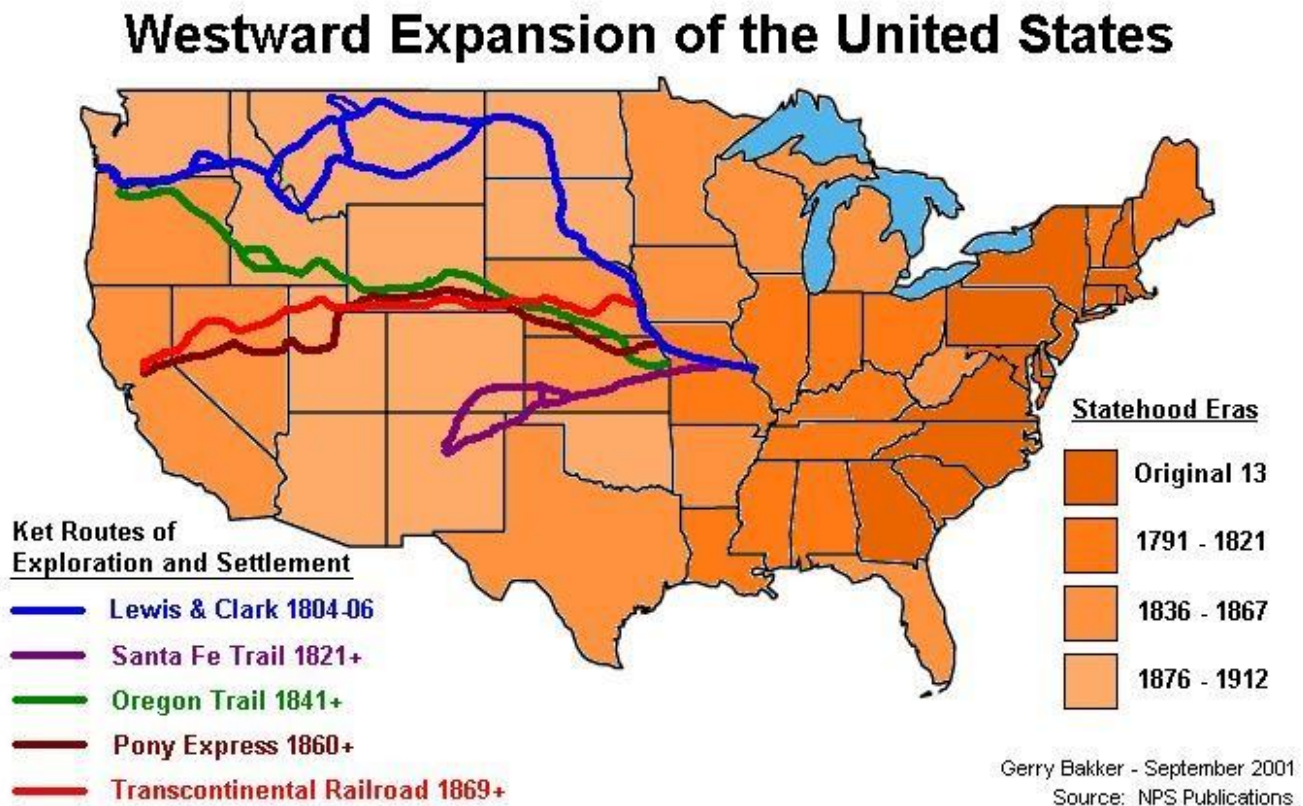
Disclaimer: The content provided on this handout in no way reflects the opinions of ReadWriteThink or its supporting organizations: IRA, NCTE, or Verizon Thinkfinity.

What Would You Cut?

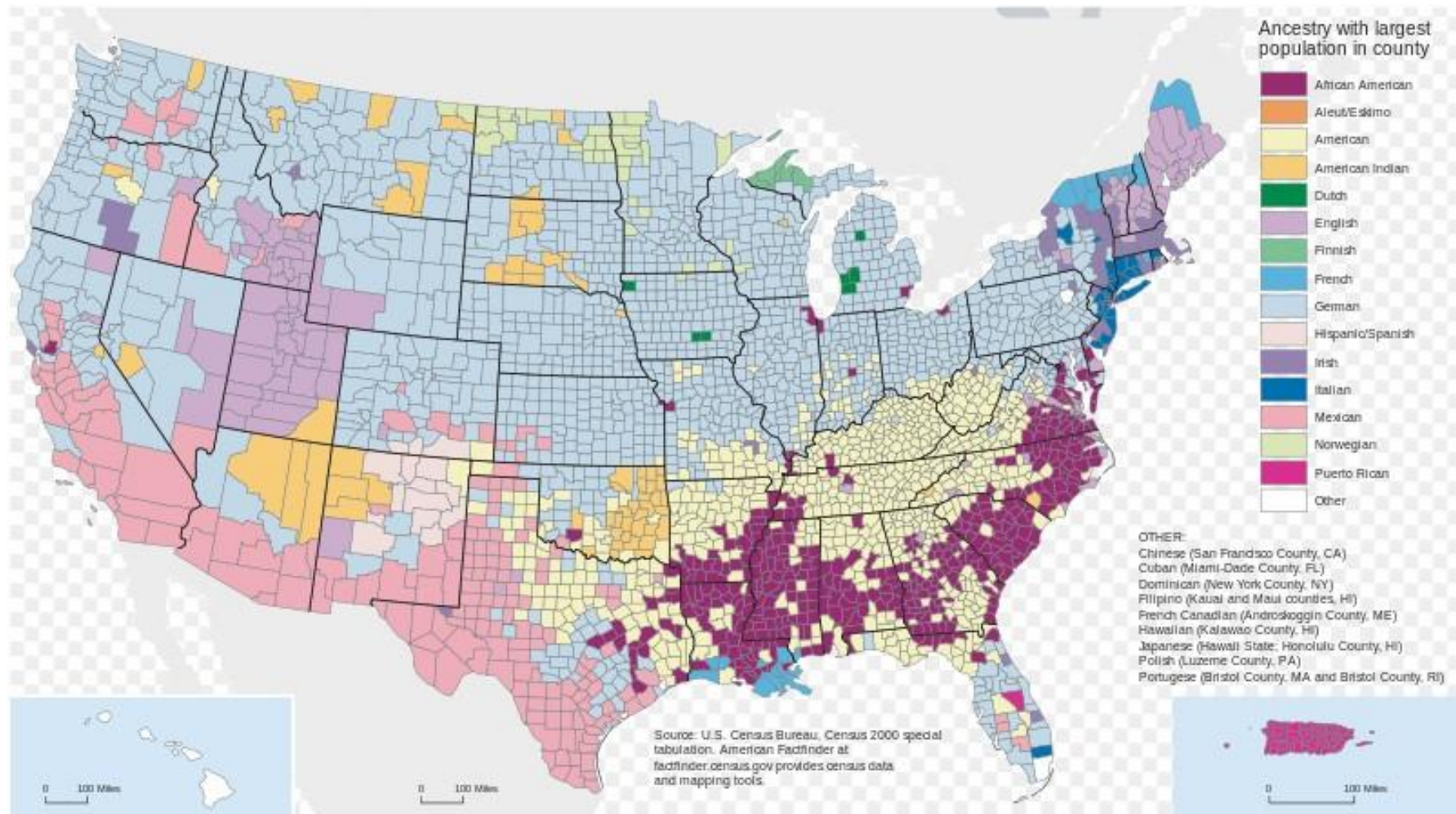


Which Route Would You Take?

Take a look at each of the routes for westward expansion. Which one would you choose if you were going to make the trek across the country? List the reasons for your selection.



A Land of Immigrants



What Does It Mean?



"That reminds me, did you
file our tax return?"



Social Studies Resources from the Internet

Annenberg Classroom – Resources for Excellent Civics Education

<http://www.annenbergclassroom.org>

Cartoons in the Classroom – part of Newspapers in the Classroom <https://www.nieonline.com/aaec/cftc.cfm>

Center for Civic Education

<http://www.civiced.org/resources/curriculum/constitution-day-and-citizenship-day>

Constitution Facts (Games and Activities)

<https://www.constitutionfacts.com/?page=foundingFatherShort.cfm>

Daryl Cagle Cartoon Index <http://www.cagle.com>

Detroit News. Part of the Newspapers in the Classroom project, this site provides online articles, worksheets, editorial cartoons, and lessons already developed.

<http://nieonline.com/detroit/>

Digital History Reader (source texts, activities)

<http://www.dhr.history.vt.edu/modules/us/index.html>

iCivics (lessons, resources)

<https://www.icivics.org/curriculum/constitution>

National Archives (DocsTeach) Lesson plans and activities

<http://docsteach.org>

Library of Congress. Searchable database of primary source documents with references to CCSS and lesson ideas from lowest grade levels through high school.

<http://www.loc.gov/teachers/>

National Atlas.Gov. This site provides free outline maps that can be printed for and used in the classroom. <http://nationalatlas.gov/index.html>

National History Education Clearing House Political Cartoons

<http://teachinghistory.org/teaching-materials/teaching-guides/21733>

Newsela. This site provides an innovative way to build reading comprehension with nonfiction text that's always relevant. Each article is available in 4-5 different Lexile Levels with many of

them providing a quiz that is aligned to a specific anchor standard. It is necessary to sign up for the free account to see the different level of articles. <https://newsela.com/>

Reading Like a Historian

<http://sheg.stanford.edu/rh>

Roy Rosenzweig Center for History and New Media

<http://chnm.gmu.edu/teaching-and-learning/>

SoftSchool (Interactive timeline – Westward Expansion)

http://www.softschools.com/timelines/westward_expansion_timeline/238

Teaching History (Primary source sets)

<http://teachinghistory.org/best-practices/using-primary-sources/24490>

Teaching American History (50 Core Documents)

<http://teachingamericanhistory.org/50docs/>

The Dirksen Center’s Editorial Cartoon Collection (with lesson plans)

<http://www.dirksencenterprojects.org/cartoons/index.htm>

The Learning Network. Teaching and Learning with the New York Times. Articles and graphics for use in the classroom. <https://www.nytimes.com/section/learning>

The Opper Project. An on-line collection of historic editorial cartoons. Covering more than one hundred years of American history, the cartoons are organized topically with associated lesson plans. <http://hti.osu.edu/opper/index.cfm>

Tween Tribune. Daily news sites, including text, photos, graphics, and audio and/or video materials prepared by the Smithsonian about current events, history, art, culture, and science. <http://tweentribune.com>

US History.org. This site provides access to numerous types of historic documents and nonfiction articles on U.S. history, ancient civilizations, and American Government. <http://www.ushistory.org>

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- YouTube Channel – <https://www.youtube.com/user/GEDTestingService>
- “Tuesdays for Teachers” archived webinars
<http://www.gedtestingservice.com/educators/exploring-the-2014-ged-test-webinar-archive>

Federal government sues North Carolina over new voting law

Members of North Carolina student chapters of the NAACP and opponents of voter ID legislation wear tape over their mouths while sitting silently in the gallery of the House chamber of the North Carolina General Assembly where lawmakers debated and voted on voter identification legislation in Raleigh, N.C., April 24, 2013.



WASHINGTON - The U.S. Justice Department sued North Carolina on Monday over a new state law that forces people to present a photo identification before voting and that limits early voting. The lawsuit argues the measure discriminates against minorities.

It was the second time in recent months that the Democratic Obama administration has challenged a voting law in a Republican-led state. In August, it sued to block a 2011 Texas voter-identification measure.

Attorney General Eric Holder said the North Carolina law imposes several "troubling new restrictions" on voters. Those include reducing early voting days, eliminating same-day registration during the early-voting period and requiring photo identification.

Holder announced the lawsuit at a news conference joined by federal prosecutors based in North Carolina.

Law Limits Voters, Holder Says

The Justice Department will try to show that the changes made by North Carolina were meant to limit the number of people able to vote, Holder said. And that those changes result in the unequal voting access based on race, he explained.

The North Carolina law is one of a series enacted in Republican-governed states imposing new voting requirements. Republicans argue that the changes are needed to combat voter fraud. Democrats say that the laws are intended to make it harder for blacks and other people who are likely to vote Democratic cast their ballots.

Holder said his department could bring more voting rights cases. "I fear that it will not be our last," he added.

The U.S. Supreme Court in June invalidated part of the 1965 U.S. Voting Rights Act that the federal government had previously relied upon to challenge state voting laws.

Republican Governor Pat McCrory signed North Carolina's voting changes into law in August. "Common practices like boarding an airplane and purchasing Sudafed (a common decongestant) require photo ID, and we should expect nothing less for the protection of our right to vote," he said then.

N.C. Governor Defends New Law

In a statement on Monday, McCrory called the Justice Department's lawsuit an overreach with no merit. "I believe that North Carolina is in the

mainstream on this issue, and it's the Justice Department that's working in the fringes," he added.

Civil rights groups filed suit against the law immediately after it was signed, and Democratic U.S. Senator Kay Hagan of North Carolina asked Holder to review the matter.

Holder said that by restricting access to the polls and the ease of voter participation, the law would shrink rather than expand people's ability to cast ballots. He said he was especially troubled that the law would significantly shorten the early voting period.

U.S. elections generally are held on Tuesdays. North Carolina and some other states allow people to vote early in part to make it more convenient to vote.

Shortening the early voting period affects minorities more than other voters, Holder said. More than 70 percent of blacks who voted in the November 2008 and 2012 elections in North Carolina did so in this early period, according to the Justice Department.

Justice Seeks To Block Four Provisions

The department's suit asks the court to block four provisions of the North Carolina law:

- -- cutting early voting from 17 to 10 days, though the overall number of early voting hours remains unchanged;
- -- the elimination of same-day voter registration during early voting;
- -- the prohibition on counting certain provisional ballots, which a voter fills out when there are questions about his or her registration;
- -- and the adoption of an ID requirement that is stricter than the Justice Department allows.

Changes in voting laws can affect voter turnout and swing close elections. Civil rights advocates say recent changes echo the earlier, century-long fight to win voting rights for black Americans in the U.S. South.

Feds Have To Prove Discrimination

The challenge to North Carolina would fall under the Voting Rights Act's Section 2. That part of the law prohibits state voting practices or procedures that discriminate by race. The federal government will have to prove that discrimination was both the intent behind the North Carolina law and its effect.

Requirements for voters to show identification have been a flashpoint. The Justice Department has approved of them in some states such as Virginia that take steps to ensure that IDs are available at little to no cost. But it has opposed the rules in states where it said the mandate would be a burden on the poor and minorities.

The department said that blacks comprised 23 percent of the North Carolina's registered voters. But they accounted for 34 percent of registered voters who did not have a driver's license or other ID provided by the state.

The case was assigned to a federal judge in Winston-Salem, N.C.

<

Quiz

Question
1/4

Your Choice
-

Which paragraph suggests that North Carolina's identification card fees may be high?

A Attorney General Eric Holder said the North Carolina law imposes several "troubling new restrictions" on voters. Those include reducing early voting days, eliminating same-day registration during the early-voting period and requiring photo identification.

B The Justice Department will try to show that the changes made by North Carolina were meant to limit the number of people able to vote, Holder said. And that those changes result in the unequal voting access based on race, he explained.

C Requirements for voters to show identification have been a flashpoint. The Justice Department has approved of them in some states such as Virginia that take steps to ensure that IDs are available at little to no cost. But it has opposed the rules in states where it said the mandate would be a burden on the poor and minorities.

D The department said that blacks comprised 23 percent of the North Carolina's registered voters. But they accounted for 34 percent of registered voters who did not have a driver's license or other ID provided by the state.

Question

2/4

Your Choice

-

Select the paragraph from the section, "Law Limits Voters, Holder Says" that highlights the political tension created by the voter laws.

Click a paragraph in the article

Back

Next

<

Quiz

Question

3/4

Your Choice

-

How does the section "Justice Seeks To Block Four Provisions" contribute to the central idea of the article?

A

It proves that the law suit is similar to civil rights cases from earlier years.

B

It shows how the North Carolina law is unconstitutional.

C

It provides very clear details about the new voter laws Republican-led states are trying to impose.

D

It suggests that the department will be successful in preventing voter discrimination.

Back

Next

<div><</div> <div>Quiz</div>	
<div>Question</div> <div>4/4</div>	<div>Your Choice</div> <div>-</div>
<p>Which paragraph below from the section "Law Limits Voters, Holder Says" provides the BEST support for the main idea of the section?</p>	
<div>A</div>	<p>The North Carolina law is one of a series enacted in Republican-governed states imposing new voting requirements. Republicans argue that the changes are needed to combat voter fraud. Democrats say that the laws are intended to make it harder for blacks and other people who are likely to vote Democratic cast their ballots.</p>
<div>B</div>	<p>Holder said his department could bring more voting rights cases. "I fear that it will not be our last," he added.</p>
<div>C</div>	<p>The U.S. Supreme Court in June invalidated part of the 1965 U.S. Voting Rights Act that the federal government had previously relied upon to challenge state voting laws.</p>
<div>D</div>	<p>Republican Governor Pat McCrory signed North Carolina's voting changes into law in August. "Common practices like boarding an airplane and purchasing Sudafed (a common decongestant) require photo ID, and we should expect nothing less for the protection of our right to vote," he said then.</p>
<div>Back</div>	<div>Submit</div>



Quiz



4/4 Correct

Review Each Question ▶



Question 1

You chose C.



Question 2

You chose Paragraph 6.



Question 3

You chose C.



Question 4

You chose A.

Lesson Plan

PUBLIC POLICY ISSUE: DOES THE FEDERAL GOVERNMENT NEED TO DO MORE TO PROTECT VOTER RIGHTS?

SUPPORTING CLAIMS WITH EVIDENCE FROM A NEWS ARTICLE

Grade Level and Course:

10th Grade National, State, and Local Government

District Standards:

Students demonstrate understanding of how the United States Constitution allocates power and responsibility in the government.

1. Explain how the executive, judicial, and legislative branches make public policy, including the United States Constitution's separation of powers and the system of checks and balances (G1.1.2, 1.1.3)

Students demonstrate understanding of the organization and functions of the national, state, and local governments under a federal system.

1. Compare the national and state governments with emphasis on the structures, functions and authority of each; how power and responsibility are distributed, shared, and limited in the system of federalism established by the US Constitution. (G1.1.1, 1.1.2)

NCSS and/or Common Core Standards:

CCSS.ELA-LITERACY.RH.9-10.8

Assess the extent to which the reasoning and evidence in a text support the author's claims.

Essential Question:

- Does the federal government need to do more to protect voter rights?

Learning Objectives:

Substantive: *Students will/will be able to...*

- Demonstrate understanding of the organization and functions of the national, state, and local governments under a federal system.
- Evaluate whether the federal government is doing enough to protect voting rights for American citizens.

Disciplinary & Language-focused: *Students will/will be able to...*

- Students will read a news article and identify claims, evidence, and reasoning presented in the article
- Use a graphic organizer to write about the 6 aspects of public policy

Informal & Formal Assessment:

Formal:

- Students will participate in a Kahoot that reviews the Supremacy Clause
- Students will complete an online worksheet where they find evidence to support a pre-determined claim, and then provide reasoning for why they chose this evidence.
- Students will complete the "Keeping an Eye on Public Policy" worksheet to summarize the public policy issue.

Informal:

- Using Hapara, teacher will observe select students as they complete their online worksheet.

Resources & Materials:

- Chromebooks (class set)
- Newsela article: “Federal government sues North Carolina over new voting law”
<https://newsela.com/articles/voting-lawsuit/id/1321/>
- Federalism warm-up Kahoot: <https://play.kahoot.it/#/k/5a5e5cfb-8258-4005-8a25-d3c87ffa196b>
- “Finding Evidence to Support a Claim” worksheet (on Google Docs)
- “Keeping an Eye on Public Policy” worksheet

Instructional Activities/Learning Tasks: Warm-Up

- Students will participate in a 3-question Kahoot reviewing the Supremacy Clause (5 min)

Main Instructional Activities/Learning Tasks

- Students will read the Newsela article. After they read, they will complete the “Finding Evidence to Support a Claim” worksheet in the Google Classroom. Teacher will model how to select evidence, and how to justify its selection. (20 min)
- Large group discussion – What is federalism? How is this case an example of federalism? What is the issue? Who needs to act to solve the issue? What are some possible solutions to the issue? (10 min)

Closure

- Students will summarize the issue on the “Keeping an Eye on Public Policy Worksheet” (13 min)

Modifications/Differentiation:

- Students may choose the reading level appropriate for them on the Newsela website

Finding Evidence to Support a Claim

Directions: After reading the Newsela article, “Federal government sues North Carolina over new voting law”, help support the claims below with evidence. Copy and paste evidence from the article, then describe how this evidence supports the claim.

Reading Level Chosen: _____

Example:

Claim: The federal government can make sure that states do not significantly limit voter rights.

△ Evidence:

“The Justice Department has approved of them in some states such as Virginia that take steps to ensure that IDs are available at little to no cost.”



Reasoning:

This evidence shows that the Department of Justice has already enforced laws that make sure voter rights are protected.

Your Turn

1.) Claim: The North Carolina law discriminates against minorities.

△ Evidence:



Reasoning:

2.) Claim: States need to have laws that establish rules for voting.

△ Evidence:



Reasoning:

3.) Claim: Changes in voting laws can affect voter turnout and swing close elections.

△ Evidence:



Reasoning:

Keeping an Eye on Public Policy

Issue: What is the issue? Who is affected by the issue?	
Involvement: Who needs to act to solve the issue? What individuals, groups, institutions, or government (levels/branches)?	Influence: What methods can be used by individuals and groups to influence this public policy issue?
Implementation: How will the policy be carried out?	Impact: How effective is the policy in solving the original issue? What are the recommendations for the policy? How should we modify, continue, end, or redefine the problem?
Inferences: What are possible solutions for the issue? Which is the best solution?	

Overview of Science Themes and Example Content

		Science Example Content Topics		
		Life Science (40%)	Physical Science (40%)	Earth & Space Science (20%)
Focusing Themes	Human Health and Living Systems	<ul style="list-style-type: none"> • Human body and health • Organization of life • Molecular basis for heredity • Evolution 	<ul style="list-style-type: none"> • Chemical properties and reactions related to human systems 	<ul style="list-style-type: none"> • Interactions between Earth's systems and living things
	Energy and Related Systems	<ul style="list-style-type: none"> • Relationships between life functions and energy intake • Energy flows in ecologic networks (ecosystems) 	<ul style="list-style-type: none"> • Conservation, transformation, and flow of energy • Work, motion, and forces 	<ul style="list-style-type: none"> • Earth and its system components • Structure and organization of the cosmos

Science Practices

SP.1 Comprehending Scientific Presentations

SP.1.a Understand and explain textual scientific presentations

SP.1.b Determine the meaning of symbols, terms and phrases as they are used in scientific presentations

SP.1.c Understand and explain a non-textual scientific presentation

SP.2 Investigation Design (Experimental and Observational)

SP.2.a Identify possible sources of error and alter the design of an investigation to ameliorate that error

SP.2.b Identify and refine hypotheses for scientific investigations

SP.2.c Identify the strength and weaknesses of one or more scientific investigation (i.e. experimental or observational) designs

SP.2.d Design a scientific investigation

SP.2.e Identify and interpret independent and dependent variables in scientific investigations

SP.3 Reasoning from Data

SP.3.a Cite specific textual evidence to support a finding or conclusion

SP.3.b Reason from data or evidence to a conclusion

SP.3.c Make a prediction based upon data or evidence

SP.3.d Use sampling techniques to answer scientific questions

SP.4 Evaluating Conclusions with Evidence

SP.4.1 Evaluate whether a conclusion or theory is supported or challenged by particular data or evidence

SP.5 Working with Findings

SP.5.a Reconcile multiple findings, conclusions or theories

SP.6 Expressing Scientific Information

SP.6.a Express scientific information or findings visually

SP.6.b Express scientific information or findings numerically or symbolically

SP.6.c Express scientific information or findings verbally

SP.7 Scientific Theories

SP.7.a Understand and apply scientific models, theories and processes

SP.7.b Apply formulas from scientific theories

SP.8 Probability & Statistics

SP.8.a Describe data set statistically

SP.8.b Use counting and permutations to solve scientific problems.

SP.8.c Determine the probability of events

Science High Impact Indicators

Indicator	What to look for in student work: Students' work shows they have . . .
SP.2.b: Identify and refine hypotheses for scientific investigations.	<ul style="list-style-type: none"> identified a hypothesis for a given scientific investigation. differentiated between an appropriate hypothesis and a poorly conceived hypothesis. used a hypothesis to support or challenge a given conclusion. identified a hypothesis for a given data set. refined a hypothesis to more appropriately suit a scientific experiment.
SP.2.e: Identify and interpret independent and dependent variables in scientific investigations.	<ul style="list-style-type: none"> identified the independent variable in a given investigation. identified the dependent variable in a given investigation. fully explained the relationship between the independent and dependent variables in a given experiment.
SP.4.a: Evaluate whether a conclusion or theory is supported or challenged by particular data or evidence.	<ul style="list-style-type: none"> identified and explained why the evidence supports the proposed claim or solution. identified and explained which piece of data supports or contradicts the given hypothesis. identified multiple reasons a piece of evidence supports a theory or hypothesis and compare those reasons to each other. identified which scientific model would be weakened or strengthened by particular evidence. fully explained why given evidence supports a scientific theory. fully explained why given evidence challenges a scientific theory.
SP.6.a: Express scientific information or findings visually.	<ul style="list-style-type: none"> translated information presented verbally or numerically into a visual format integrated information presented verbally and numerically into a visual format identified relationships among graphs or diagrams identified visual representations of scientific processes explained in a given text completed diagrams to demonstrate understanding of relationships among variables, scientific concepts, or processes
SP.7: Apply formulas from scientific theories.	<ul style="list-style-type: none"> solved for a variable within a scientific equation balanced an equation. identified what changes will result if a variable within a scientific equation increases or decreases. identified relationships between variables in a scientific formula. interpreted symbolic representations of information and scientific data.

Sample Questions for Guiding Scientific Thinking

Question Type	Sample Question Starters
Recalling	Who, what, when, where, how_____?
Comparing	How is_____similar to/different from_____?
Identifying Attributes and Components	What are the characteristics/parts of_____?
Classifying	How might we organize_____into categories?
Ordering	Arrange_____into sequence according to_____.
Identifying Relationships and Patterns	Develop an outline/diagram/web of_____.
Representing	In what other ways might we show/illustrate_____?
Identifying Main Ideas	What is the key concept/issue in_____? Retell the main idea of_____in your own words.
Identifying Errors	What is wrong with_____?
Inferring	What might we infer from_____? What conclusions might be drawn from_____?
Predicting	What might happen if_____?
Elaborating	What ideas/details can you add to_____? Give an example of_____. Summarizing Can you summarize_____?
Establishing Criteria	What criteria would you use to judge/evaluate_____?
Verifying	What evidence supports_____? How might we prove/confirm_____?

Inquiry Method Recording Sheet

Step 1 – Observations, Questions, and Hypotheses	
Observations	Questions
<div>Hypothesis</div> <div>If . . .</div> <div>Then . . .</div>	
Step 2 – Scientific Testing	
Investigation & Data	
Step 3 – Analysis and Conclusion	
Discuss data & draw conclusion	
Step 4 - Communication	
We communicated our results by	

Science Lesson Planning Strategies – The 5 Es

The 5E Instructional Model provides a format for lessons that builds on what students already know. The 5Es sequence the learning experience so that the learners construct their understanding of a concept across time. Each phase of the learning sequence can be described using five words that begin with "E": *engage*, *explore*, *explain*, *extend*, and *evaluate*.

Engage

Begin each unit or topic with a lesson or activity that engages students with an activity or question as they are introduced to the concept. Students should make connections to prior knowledge and what is to be studied. During this phase, teachers ask questions of students and engage them in the guided inquiry lessons. They use strategies such as KWL or ABC Brainstorm that make connections between the past and present learning experience.

Explore

Have students carry out hands-on activities in which they explore the concept or skill. This phase allows students to acquire a common set of experiences that they can use to help each other make sense of the new concept or skill. Teachers should set up the investigation and guide students in inquiry, asking probing questions to clarify understanding.

Explain

After students have explored the concept or skill, the teacher provides the concepts and terms used by the students to develop explanations for the phenomenon they have experienced. The significant aspect of this phase is that explanation follows experience. Teachers should ask probing questions that encourage students to look for additional information.

Elaborate

Students expand their learning, practice skills and behavior, and make connections or applications to related concepts and in the world around them. Teachers provide learning opportunities for students to apply their knowledge and to gain a deeper understanding. Activities can include reading articles and books, writing, designing other experiments, and exploring related topics on the Internet. Provide opportunities for students to apply what they have learned to new situations. It is important for students to discuss and compare their ideas with each other during this phase.

Evaluate

The final phase provides an opportunity for students to review and reflect on their own learning and new understandings and skills. This is the phase where students provide evidence for changes to their understandings, beliefs, and skills. Teachers should assess students understanding through both formative and summative activities.

An Overview of the 5Es		
Phase	Purpose	Role of Teacher
Engage	Create interest and stimulate curiosity. Set learning within a meaningful context. Raise questions for inquiry. Reveal students' ideas and beliefs, compare students' ideas.	Activity or multi-modal text used to set context and establish topicality and relevance. Motivating/discrepant experience to create interest and raise questions. Open questions, individual student writing, drawing, acting out understandings, and discussion to reveal students' existing ideas and beliefs so that teachers are aware of current conceptions and can plan to extend and challenge as appropriate – a form of diagnostic assessment.
Explore	Provide experience of the phenomenon or concept. Explore and inquire into students' questions and test their ideas. Investigate and solve problems.	Open investigations to experience the phenomenon, collect evidence through observation and measurement, test ideas and try to answer questions. Investigation of text-based materials (e.g. newspaper articles, web-based articles) with consideration given to aspects of critical literacy, including making judgments about the reliability of the sources or the scientific claims made in the texts.
Explain	Introduce conceptual tools that can be used to interpret the evidence and construct explanations of the phenomenon. Construct multi-modal explanations and justify claims in terms of the evidence gathered. Compare explanations generated by different students/groups.	Student reading or teacher explanation to access concepts and terms that will be useful in interpreting evidence and explaining the phenomenon. Small group discussion to generate explanations, compare ideas and relate evidence to explanations. Individual writing, drawing and mapping to clarify ideas and explanations. Formative assessment to provide feedback to teacher and students about development of investigation skills and conceptual understandings. Small group writing/design to generate a communication product (e.g. poster, oral report, formal written report or PowerPoint presentation, cartoon strip, drama presentation, letter) with attention to form of argumentation, genre form/function and audience, and with integration of different modes for representing science ideas and findings.
Elaborate (extend)	Use and apply concepts and explanations in new contexts to test their general applicability. Reconstruct and extend explanations and understandings using and integrating different modes, such as written language, diagrammatic and graphic modes, and mathematics.	Further investigations, exercises, problems or design tasks to provide an opportunity to apply, clarify, extend and consolidate new conceptual understandings and skills. Further reading, individual and group writing may be used to introduce additional concepts and clarify meanings through writing. A communication product may be produced to re-represent ideas using and integrating diverse representational modes and genres consolidating and extending science understandings and literacy practices.
Evaluate	Provide an opportunity for students to review and reflect on their own learning and new understandings and skills. Provide evidence for changes to students' understandings, beliefs and skills.	Discussion of open questions or writing and diagrammatic responses to open questions – may use same/similar questions to those used in Engage phase to generate additional evidence of the extent to which the learning outcomes have been achieved. Reflections on changes to explanations generated in Engage and Evaluation phases to help students be more metacognitively aware of their learning.

Lesson Plan: Erosion, Transportation, Deposition

Objective: Students will observe and describe the processes of erosion, transportation, and deposition by creating a physical model and implementing the scientific method.

Materials

- paint tray (the kind used for a paint roller)
- pieces of sod (enough for each group)
- potting soil
- heavy clay like soil
- rainmaker (paper cup with about ten tiny holes poked in the bottom)
- water

Process Using the 5Es Model

Engagement	<p>Take students on a walk outside of the school building and note where the soil is worn away or seems to have collected. Have students make a list of the sites.</p> <p>Ask students:</p> <ul style="list-style-type: none">• Do you notice anything different about these areas?• What do you think caused these changes?
Exploration	<p>Have students construct a model to investigate how these changes may have occurred. Provide students with materials so that they can construct their own model of a landscape. It should include a piece of sod, fine potting soil, and a heavy clay-like soil. Have them use a paint roller tray as the base of their model. Share with students that they should not put any landscape materials in the bottom well. Once students have constructed their models, have them diagram and label their models and make a prediction as to what will happen if it “rains” on their landscape.</p> <p>Have students put a full glass of water into their rainmaker and slowly move the rainmaker over their model. Students should hold the rainmaker about 4 inches above the upper end of the landscape and slowly move it back and forth so the water “rains” down on the model landscape.</p> <p>Have students observe what happens to their landscape when rain occurs. When it is finished raining, have the students observe the final effects of the rain on their landscape. Have students go back to their predictions and record what actually happened.</p>
Explain	<p>Ask students:</p> <ul style="list-style-type: none">• What were your predictions before it rained on your landscape?• What happened to your landscape when it rained?• How is your landscape different after the rain than before the rain?• What happened to the soil? Where did it go? Why did this happen? <p>Explain erosion, transportation, and deposition. Discuss that water was used during this experiment to simulate erosion, transportation, and deposition, but erosion can also be caused by wind, people, animals, etc.</p>

Elaborate (extend)	<p>Have groups of students plan a method to decrease or eliminate erosion. Have them design another landscape using the same roller pan and resources as a base for their landscape. Students should draw a diagram of the model planned and label the materials used in their landscape. Have students write an explanation for why they think their plan will work to curb erosion. Have students experiment with their new landscape and describe whether or not their plan worked.</p> <p>Debrief by having students identify a real-world situation of erosion, what occurred, and what is being done to restore the environment.</p>
Evaluate	<p>Provide students with photographs representing different landscapes. Have students evaluate whether or not each landscape would be effective in preventing erosion. Have students define the terms erosion, transportation, and deposition and provide real-world examples of each.</p>

Experiments for the Classroom – Getting Started

Oil Spill! Clean It Up

When oil tankers accidentally spill their cargo of oil into the ocean they cause a huge environmental danger. Oil is extremely hard to remove from the water and the beaches, and the whole environment is damaged. In this experiment, you can see how hard it is to remove oil from sand.

You will need:

- Large plastic cup
- Sand
- 2 tablespoons of vegetable oil

(This experiment can be messy, so you might want to do it outdoors.)

Step 1 – Observe - Fill a plastic cup with sand and oil and mix well. Observe the problem that you have.

Step 2 – Hypothesize - Based on your observations, make a guess at what tools you could use to get the oil off the sand.

Step 3 – Test the Hypothesis - Conduct an experiment. Use a spoon, a straw, paper towel, an old toothbrush, a sponge – anything that you can think of to get the oil off the sand and help save the environment!

Raw or Cooked?

Find out which spins the longest, a raw egg or a cooked egg. For this experiment, you will need:

- 1 cooked egg
- 1 raw egg
- 1 plate

Step 1 – Observe the two eggs.

Step 2 – Hypothesize - Based on your observations, make a guess as to which egg will spin the longest and why.

Step 3 – Test the Hypothesis - Spin each egg in turn on a plate. The egg that continues to spin for a longer time is the cooked one. Now spin the eggs again, and then quickly stop both of them. Then let go of both eggs. You will see that the cooked egg stays still but the raw one starts spinning again.

Why does this happen? The contents of the egg have more inertia when they are raw, because they are in the form of a liquid. This inertia slows down the raw egg and that is why it stopped spinning before the cooked egg. In step 2, the liquid in the raw egg was still moving when you stopped both eggs, so that movement made the raw egg begin to spin again.

Gummy Bear Absorption: A Scientific Method Investigation

Background information:

- Gummy bears are made from a mixture of sugar, glucose syrup, starch, food coloring, citric acid (vitamin C), gelatin and added flavoring.
- Gelatin absorbs water to a certain extent. There is a limit to how much water a certain amount of gelatin can hold.
- Salt is a solute and draws water towards it. Water moves toward the direction where there is more salt and less water.
- Vinegar is an acid and is corrosive. It can cause various substances to break down.

Problem: How will a gummy bear be affected by water, salt water, sugar water and vinegar?

Hypothesis: I think each of the following will affect a gummy bear in the following way:

- Water: _____
- Salt water: _____
- Vinegar: _____
- Sugar water: _____

Materials:

- Gummy Bears
- Triple Beam Balance
- Metric Ruler
- Plastic Cups
- Water
- Salt
- Vinegar
- Sugar

Procedure:

1. Collect materials.
2. Prepare cups and label: water, salt water, vinegar, and sugar water
3. Measure length, width, height and mass of each gummy bear. Record in data table.
4. Place one gummy bear in each solution.
5. Record observations after one and five minutes.
6. Leave overnight.
7. The following day, record observations of each gummy bear and measure length, width, height and mass of each gummy bear.
8. Find the percent increase in dimensions.
9. Draw a conclusion

Recording Charts

Water	Before	After	% Increase
Length			
Width			
Height			
Mass			

Salt Water	Before	After	% Increase
Length			
Width			
Height			
Mass			

Sugar Water	Before	After	% Increase
Length			
Width			
Height			
Mass			

Vinegar	Before	After	% Increase
Length			
Width			
Height			
Mass			

Observations

	After 1 minute	After 5 minutes	After 1 day
Water			
Salt Water			
Sugar Water			
Vinegar			

Conclusion:

Understanding the Components of an Experiment

Directions: After completing the following table, read the passage (“The Experiment”) below and show your understanding of the different components of an experiment by providing examples and explanations in the table on the reverse side of this paper.

Component	Definition/Description
Hypothesis	
Quantitative Data	
Qualitative Data	
Repeated Trials	
Independent Variable	
Dependent Variable	
Control	
Constants	

The Experiment

A shopping mall wanted to determine whether the more expensive “Tough Stuff” floor wax was better than the cheaper “Steel Seal” floor wax at protecting its floor tiles against scratches. One gallon of each type of floor wax was applied to each of the five test sections of the main hall of the mall. The test sections were all the same size and were covered with the same kind of tiles. Five (5) other test sections received no wax. After 3 weeks, the number of scratches in each of the test sections were counted.

Component	Example from “The Experiment”	Reasoning
Hypothesis		
Quantitative Data		
Qualitative Data		
Repeated Trials		
Independent Variable		
Dependent Variable		
Control		
Constants		

Adapted from Cothron, Julia, et al. *Students and Research*.

Science Resources from the Internet

ABC Science. News, video clips, games, and lots of activities for the science classroom from the American Broadcasting Company. <http://www.abc.net.au/science/>

Annenberg Foundation. Great science materials and courses from *The Habitable Planet* to *Force and Motion*. Courses, lesson plans, and interactives will keep students engage in science. The Habitable Planet is a multimedia course for high school teachers and adult learners interested in studying environmental science. <http://www.learner.org/resources/discipline-science.html>

Discovery Education. The website provides lesson plans on earth and space science. <http://www.discoveryeducation.com/search/page/-/lesson-plan/earth%20science/index.cfm>

How Stuff Works. Ever wondered why a cd works? How about the ten myths about the brain? How about what would happen if you put sugar in your gas tank? An interesting science site filled with real-world information. <http://www.howstuffworks.com/>

Interactive Websites for Teaching Science. Just click on one of the topics and explore the myriad of resources on the World Wide Web. <http://interactivesites.weebly.com/science.html>

Mythbusters. From the Discovery Channel comes great videos that use the scientific method to explore different questions in science. <http://www.discovery.com/tv-shows/mythbusters/>

National Science Teachers Association. Freebies for Teachers. All kinds of curriculum guides, lesson plans, experiments, and resources for the classroom. <http://www.nsta.org/publications/freebies.aspx>

NEWSELA. This website is an innovative way to build reading comprehension with nonfiction through daily news articles. <https://newsela.com/>

Newton's Apple. NEWTON'S APPLE is a production of Twin Cities Public Television from a grant from the 3M Foundation. The site is filled with free videos for use in many different areas. <http://www.newtonsapple.tv/>

Nye Labs.com This is indeed "Bill Nye, the science guy" with lots of activities and applications for science. <http://www.billnye.com>

Steve Spangler. This site has lots of free experiments and videos for use in the classroom. <http://www.stevespanglerscience.com/lab>

Surrounded by Science Infographic. The National Environmental Education Act of 1990 established the National Environmental Education and Training Foundation. Lots of materials to use in the classroom. <https://www.neefusa.org/resource/surrounded-science-infographic>

Teachers Try Science. This site provides free and engaging **lessons**, along with **teaching strategies and resources**. <http://www.tryscience.org/>

Ted Ed Lessons. This website has great videos and lesson plans in all areas of science. <http://ed.ted.com/lessons>

Social Studies Content Topics and Subtopics

Civics and Government	
CG.a	Types of modern and historical governments CG.a.1 Direct democracy, representative democracy, parliamentary democracy, presidential democracy, monarchy and others types of government that contributed to the development of American constitutional democracy
CG.b	Principles that have contributed to development of American constitutional democracy CG.b.1 Natural rights philosophy CG.b.2 Popular sovereignty and consent of the governed CG.b.3 Constitutionalism CG.b.4 Majority rule and minority rights CG.b.5 Checks and balances CG.b.6 Separation of powers CG.b.7 Rule of law CG.b.8 Individual rights CG.b.9 Federalism
CG.c	Structure and design of United States government CG.c.1 Structure, powers, and authority of the federal executive, judicial, and legislative branches CG.c.2 Individual governmental positions (e.g. president, speaker of the house, cabinet secretary, etc.) CG.c.3 Major powers and responsibilities of the federal and state governments CG.c.4 Shared powers CG.c.5 The amendment process CG.c.6 Governmental departments and agencies
CG.d	Individual rights and civic responsibilities CG.d.1 The Bill of Rights CG.d.2 Personal and civil liberties of citizens
CG.e	Political parties, campaigns, and elections in American politics CG.e.1 Political parties CG.e.2 Interest groups CG.e.3 Political campaigns, elections and the electoral process
CG.f	Contemporary Public Policy

United States History	
USH.a	Key historical documents that have shaped American constitutional government USH.a.1 Key documents and the context and ideas that they signify (e.g. Magna Carta, Mayflower Compact, Declaration of Independence, United States Constitution, Martin Luther King's Letter from the Birmingham Jail, landmark decisions of the United States Supreme Court, and other key documents)
USH.b	Revolutionary and Early Republic Periods USH.b.1 Revolutionary War USH.b.2 War of 1812 USH.b.3 George Washington USH.b.4 Thomas Jefferson USH.b.5 Articles of Confederation USH.b.6 Manifest Destiny USH.b.7 U.S. Indian Policy
USH.c	Civil War and Reconstruction USH.c.1 Slavery USH.c.2 Sectionalism USH.c.3 Civil War Amendments USH.c.4 Reconstruction policies
USH.d	Civil Rights USH.d.1 Jim Crow laws USH.d.2 Women's suffrage USH.d.3 Civil Rights Movement USH.d.4 Plessy vs. Ferguson and Brown vs. Board of Education USH.d.5 Warren court decisions
USH.e	European settlement and population of the Americas
USH.f	World Wars I & II USH.f.1 Alliance system USH.f.2 Imperialism, nationalism, and militarism USH.f.3 Russian Revolution USH.f.4 Woodrow Wilson USH.f.5 Treaty of Versailles and League of Nations USH.f.6 Neutrality Acts USH.f.7 Isolationism USH.f.8 Allied and Axis Powers USH.f.9 Fascism, Nazism, and totalitarianism USH.f.10 The Holocaust USH.f.11 Japanese-American internment USH.f.12 Decolonization USH.f.13 GI Bill

United States History	
USH.g	The Cold War USH.g.1 Communism and capitalism USH.g.2 NATO and the Warsaw Pact USH.g.3 U.S. maturation as an international power USH.g.4 Division of Germany, Berlin Blockade and Airlift USH.g.5 Truman Doctrine USH.g.6 Marshall Plan USH.g.7 Lyndon B. Johnson and The Great Society USH.g.8 Richard Nixon and the Watergate scandal USH.g.9 Collapse of U.S.S.R. and democratization of Eastern Europe
USH.h	American foreign policy since 9/11

Economics	
E.a	Key economic events that have shaped American government and policies
E.b	Relationship between political and economic freedoms
E.c	Fundamental Economic Concepts E.c.1 Markets E.c.2 Incentives E.c.3 Monopoly and competition E.c.4 Labor and capital E.c.5 Opportunity cost E.c.6 Profit E.c.7 Entrepreneurship E.c.8 Comparative advantage E.c.9 Specialization E.c.10 Productivity E.c.11 rdependence
E.d	Microeconomics and Macroeconomics E.d.1 Supply, demand and price E.d.2 Individual choice E.d.3 Institutions E.d.4 Fiscal and monetary policy E.d.5 Regulation and costs of government policies E.d.6 Investment E.d.7 Government and market failures E.d.8 Inflation and deflation E.d.9 GDP E.d.10 Unemployment E.d.11 Tariffs
E.e	Consumer economics E.e.1 Types of credit E.e.2 Savings and banking E.e.3 Consumer credit laws
E.f	Economic causes and impacts of wars
E.g	Economic drivers of exploration and colonization
E.h	Scientific and Industrial Revolutions

Geography	
G.a	Development of classical civilizations
G.b	Relationships between the environment and societal development G.b.1 Nationhood and statehood G.b.2 Sustainability G.b.3 Technology G.b.4 Natural resources G.b.5 Human changes to the environment
G.c	Borders between peoples and nations G.c.1 Concepts of region and place G.c.2 Natural and cultural diversity G.c.3 Geographic tools and skills
G.d	Human migration G.d.1 Immigration, emigration and diaspora G.d.2 Culture, cultural diffusion and assimilation G.d.3 Population trends and issues G.d.4 Rural and urban settlement

The Science Content Topics And Subtopics tables on the following pages break down each content topic into greater detail. Individual test items are drawn from the subtopics.

Science Content Topics and Subtopics³

Life Science	
L.a Human Body and Health	
L.a.1	Body systems (e.g. muscular, endocrine, nervous systems) and how they work together to perform a function (e.g. muscular and skeletal work to move the body)
L.a.2	Homeostasis, feedback methods that maintain homeostasis (e.g. sweating to maintain internal temperature), and effects of changes in the external environment on living things (e.g. hypothermia, injury)
L.a.3	Sources of nutrients (e.g. foods, symbiotic organisms) and concepts in nutrition (e.g. calories, vitamins, minerals)
L.a.4	Transmission of disease and pathogens (e.g. airborne, bloodborne), effects of disease or pathogens on populations (e.g. demographics change, extinction), and disease prevention methods (e.g. vaccination, sanitation)
L.b Relationship Between Life Functions and Energy Intake	
L.b.1	Energy for life functions (e.g. photosynthesis, respiration, fermentation)
L.c Energy Flows in Ecologic Networks (Ecosystems)	
L.c.1	Flow of energy in ecosystems (e.g. energy pyramids), conservation of energy in an ecosystem (e.g. energy lost as heat, energy passed on to other organisms) and sources of energy (e.g. sunlight, producers, lower level consumer)
L.c.2	Flow of matter in ecosystems (e.g. food webs and chains, positions of organisms in the web or chain) and the effects of change in communities or environment on food webs
L.c.3	Carrying capacity, changes in carrying capacity based on changes in populations and environmental effects and limiting resources to necessary for growth
L.c.4	Symbiosis (e.g. mutualism, parasitism, commensalism) and predator/prey relationships (e.g. changes in one population affecting another population)
L.c.5	Disruption of ecosystems (e.g. invasive species, flooding, habitat destruction, desertification) and extinction (e.g. causes [human and natural] and effects)
L.d Organization of Life (Structure and Function of Life)	
L.d.1	Essential functions of life (e.g. chemical reactions, reproduction, metabolism) and cellular components that assist the functions of life (e.g. cell membranes, enzymes, energy)
L.d.2	Cell theory (e.g. cells come from cells, cells are the smallest unit of living things), specialized cells and tissues (e.g. muscles, nerve, etc.) and cellular levels of organization (e.g. cells, tissues, organs, systems)
L.d.3	Mitosis, meiosis (e.g. process and purpose)
L.e Molecular Basis for Heredity	
L.e.1	Central dogma of molecular biology, the mechanism of inheritance (e.g. DNA) and chromosomes (e.g. description, chromosome splitting during Meiosis)
L.e.2	Genotypes, phenotypes and the probability of traits in close relatives (e.g. Punnett squares, pedigree charts)
L.e.3	New alleles, assortment of alleles (e.g. mutations, crossing over), environmental altering of traits, and expression of traits (e.g. epigenetics, color-points of Siamese cats)
L.f Evolution	
L.f.1	Common ancestry (e.g. evidence) and cladograms (e.g. drawing, creating, interpreting)
L.f.2	Selection (e.g. natural selection, artificial selection, evidence) and the requirements for selection (e.g. variation in traits, differential survivability)
L.f.3	Adaptation, selection pressure, and speciation

Physical Science

P₁a Conservation, Transformation, and Flow of Energy

- P₁a1 Heat, temperature, the flow of heat results in work and the transfer of heat (e.g. conduction, convection)
- P₁a2 Endothermic and exothermic reactions
- P₁a3 Types of energy (e.g. kinetic, chemical, mechanical) and transformations between types of energy (e.g. chemical energy [sugar] to kinetic energy [motion of a body])
- P₁a4 Sources of energy (e.g. sun, fossil fuels, nuclear) and the relationships between different sources (e.g. levels of pollutions, amount of energy produced)
- P₁a5 Types of waves, parts of waves (e.g. frequency, wavelength), types of electromagnetic radiation, transfer of energy by waves, and the uses and dangers of electromagnetic radiation (e.g. radio transmission, UV light and sunburns)

P₁b Work, Motion, and Forces

- P₁b1 Speed, velocity, acceleration, momentum, and collisions (e.g. inertia in a car accident, momentum transfer between two objects)
- P₁b2 Force, Newton's Laws, gravity, acceleration due to Gravity (e.g. freefall, law of gravitational attraction), mass and weight
- P₁b3 Work, simple machines (types and functions), mechanical advantages (force, distance, and simple machines), and power

P₁c Chemical Properties and Reactions Related to Living Systems

- P₁c1 Structure of matter
- P₁c2 Physical and chemical properties, changes of state, and density
- P₁c3 Balancing chemical equations and different types of chemical equations, conservation of mass in balanced chemical equations and limiting reactants
- P₁c4 Parts in solutions, general rules of solubility (e.g. hotter solvents allow more solute to dissolve), saturation and the differences between weak and strong solutions

Earth and Space Science

ES♦a Interactions between Earth's Systems and Living Things

- ES.a.1 Interactions of matter between living and non-living things (e.g. cycles of matter) and the location, uses and dangers of fossil fuels
- ES.a.2 Natural Hazards (e.g. earthquakes, hurricanes, etc.) their effects (e.g. frequency, severity, and short- and long-term effects), and mitigation thereof (e.g. dikes, storm shelters, building practices)
- ES.a.3 Extraction and use of natural resources, renewable vs. non-renewable resources and sustainability

ES♦b Earth and its System Components and Interactions

- ES.b.1 Characteristics of the atmosphere, including its layers, gases and their effects on the Earth and its organisms, including climate change
- ES.b.2 Characteristics of the oceans (e.g. salt water, currents, coral reefs) and their effects on Earth and organisms
- ES.b.3 Interactions between Earth's systems (e.g. weathering caused by wind or water on rock, wind caused by high/low pressure and Earth rotation, etc.)
- ES.b.4 Interior structure of the Earth (e.g. core, mantle, crust, tectonic plates) and its effects (e.g. volcanoes, earth quakes, etc.) and major landforms of the Earth (e.g. mountains, ocean basins, continental shelves, etc.)

ES♦c Structures and Organization of the Cosmos

- ES.c.1 Structures in the universe (e.g. galaxies, stars, constellations, solar systems), the age and development of the universe, and the age and development of Stars (e.g. main sequence, stellar development, deaths of stars [black hole, white dwarf])
- ES.c.2 Sun, planets, and moons (e.g. types of planets, comets, asteroids), the motion of the Earth's motion and the interactions within the Earth's solar system (e.g. tides, eclipses)
- ES.c.3 The age of the Earth, including radiometrics, fossils, and landforms

3 The GED® Science Content Topics are informed by the National Research Council's A Framework for K-12 Science Education: Practices, Crosscutting Concepts and Core Ideas 2011.