Teaching Social Studies and Science in the GED® Classroom

Debi Faucette, Senior Director
Student Advocacy Services Summer Conference 2017
Participants will...

- Explore the GED® High Impact Indicators (HIIs) for social studies and science
- Investigate close reading strategies to analyze primary sources
- Identify strategies and activities for teaching the scientific method
- Share resources and ideas
Focusing Social Studies Instruction

Integrating High Impact Indicators
What Should I Teach?

Social Studies Content

(GEDTS Assessment Guide – Social Studies)

Social Studies Focusing Themes

Social Studies Practices (HII s)

Students apply skills of analyzing and evaluating to create meaning and understanding
Focusing Themes

- U.S. History
- Economics
- Civics & Government
- Geography & the World
Social Studies Practices

- Drawing conclusions and making inferences
- Determining central ideas, hypotheses, and conclusions
- Analyzing events and ideas
- Interpreting meaning of symbols, words, and phrases
- Analyzing purpose and point of view
- Integrating content presented in different ways
- Evaluating reasoning and evidence
- Analyzing relationships in source texts
- Reading and interpreting graphics, charts, and other data representations
- Measuring the center of a statistical dataset
Social Studies High Impact Indicators

- **SSP.2.a** Determine the central ideas or information of a primary or secondary source document, corroborating or challenging conclusions with evidence.
- **SSP.2.b** Describe people, places, environments, processes, and events, and the connections between and among them.
- **SSP.3.c** Analyze cause-and-effect relationships and multiple causation, including action by individuals, natural and societal processes, and the influence of ideas.
- **SSP.5.c** Analyze how a historical context shapes an 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.
# Why do I need to teach primary sources?

<table>
<thead>
<tr>
<th>Indicator</th>
<th>What to look for in student work: Students’ work shows they have . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSP.2.a:</td>
<td>• differentiated between the concepts of topic and main idea.</td>
</tr>
<tr>
<td></td>
<td>• identified the topic and/or main idea of a piece of text.</td>
</tr>
<tr>
<td></td>
<td>• identified supporting details for a given main idea.</td>
</tr>
<tr>
<td></td>
<td>• summarized a piece of text.</td>
</tr>
<tr>
<td></td>
<td>• fully explained relevant details in the text that support the main idea.</td>
</tr>
<tr>
<td></td>
<td>• located a single piece of evidence in the text.</td>
</tr>
<tr>
<td></td>
<td>• located multiple pieces of evidence in a text.</td>
</tr>
<tr>
<td></td>
<td>• differentiated between relevant and irrelevant evidence.</td>
</tr>
<tr>
<td></td>
<td>• used evidence to support or challenge an author's conclusion.</td>
</tr>
</tbody>
</table>
Why do I need to teach primary sources?

<table>
<thead>
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</table>
| SSP.5.c: Analyze how a historical context shapes an author's point of view. | • 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. |
What is a primary source?
Selecting Primary Sources

“We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, 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.”
Close Reading of Primary Sources

Read Like a Historian
How Do I Teach with Primary Sources?
Reading Like a Historian

Source

Contextualization

Close Reading

Corroboration
Sourcing (Before Reading)

• 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?
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 eves 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
Contextualization

• When and where was the document created?
• What else was going on at this time?
• What was it like to be alive at this time?
• What was different then? What was the same?
• How might the circumstances in which the document was created affect its content?
Contextualization

The average stagecoach could squeeze 18-20 passengers into it. They averaged 8 mph over good terrain and horses were changed every 12 to 15 miles. Each cost over $1,500 to build.

Mark Twain, Roughing It 1872

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Close Reading

• What claims does the author make?
• What evidence does the author use to support those claims?
• What language (words, phrases, images, symbols) does the author use to persuade or inform?
• How does the document's language indicate the author's perspective?
• What information does the author leave out?
• How does the document make me feel?
Corroboration

• What do other documents say?
• Do the documents agree? If not, why?
• What are other possible documents?
• What documents are most reliable or most believable?
Corroboration

“Don’t believe everything you read on the Internet just because there’s a picture with a quote next to it.”

—Abraham Lincoln
Sample Lesson Plans and Organizers

Reading Like a Historian

http://sheg.stanford.edu/rlh
Where can I get started with lessons using this tool?

Lesson Plans from the Library of Congress using the Primary Source Analysis Tool

http://www.loc.gov/teachers/classroommaterials/
High Impact Indicators for the GED® Science Test

Focusing Instruction
Science is a way of thinking much more than it is a body of knowledge

— Carl Sagan
What Should I Teach?

Science Content
(GEDTS Assessment Guide – Science)

Science Focusing Themes

Science Practices (HII s)

Students apply skills of science to develop an understanding of the scientific concepts.
# Focusing Themes

<table>
<thead>
<tr>
<th>Focusing Themes</th>
<th>Science Content Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Life Science (40%)</td>
</tr>
<tr>
<td>Human Health and Living Systems</td>
<td>• Human body and health</td>
</tr>
<tr>
<td></td>
<td>• Organization of life</td>
</tr>
<tr>
<td></td>
<td>• Molecular basis for heredity</td>
</tr>
<tr>
<td></td>
<td>• Evolution</td>
</tr>
<tr>
<td></td>
<td>Physical Science (40%)</td>
</tr>
<tr>
<td></td>
<td>• Chemical properties and reactions related to human systems</td>
</tr>
<tr>
<td></td>
<td>Earth &amp; Space Science (20%)</td>
</tr>
<tr>
<td></td>
<td>• Interactions between Earth’s systems and living things</td>
</tr>
<tr>
<td>Energy and Related Systems</td>
<td>• Relationships between life functions and energy intake</td>
</tr>
<tr>
<td></td>
<td>• Energy flows in ecologic networks (ecosystems)</td>
</tr>
<tr>
<td></td>
<td>• Conservation, transformation, and flow of energy</td>
</tr>
<tr>
<td></td>
<td>• Work, motion, and forces</td>
</tr>
<tr>
<td></td>
<td>• Earth and its system components</td>
</tr>
<tr>
<td></td>
<td>• Structure and organization of the cosmos</td>
</tr>
</tbody>
</table>
Science Practices

- THE REAL WORLD
  - Observing
  - Experimenting
  - Measuring
  - Testing
- COLLECT DATA, TEST SOLUTIONS
  - Investigating

- ARGUE, CRITIQUE

- THEORIES AND MODELS
  - Creative thinking
  - Reasoning
  - Calculating
  - Planning
- FORMULATE HYPOTHESES, PROPOSE SOLUTIONS
  - Developing explanations and solutions
Science High Impact Indicators

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

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

SP.4.a: Evaluate whether a conclusion or theory is supported or challenged by particular data or evidence.

SP.6.a: Express scientific information or findings visually.

SP.7: Apply formulas from scientific theories.
## Assessment Target—SP.2

<table>
<thead>
<tr>
<th>Assessment Target</th>
<th>Indicators</th>
<th>What to look for in student work: The student has . . .</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP.2 Investigation Design (Experimental and Observational)</td>
<td>SP.2.b Identify and refine hypotheses for scientific investigations</td>
<td>• identified a hypothesis for a given scientific investigation.</td>
</tr>
<tr>
<td></td>
<td>SP.2.e Identify and interpret independent and dependent variables in scientific investigations.</td>
<td>• differentiated between an appropriate hypothesis and a poorly conceived hypothesis.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• used a hypothesis to support or challenge a given conclusion.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• identified a hypothesis for a given data set.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• refined a hypothesis to more appropriately suit a scientific experiment.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• identified the independent variable in a given investigation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• identified the dependent variable in a given investigation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• fully explained the relationship between the independent and dependent variables in a given experiment.</td>
</tr>
</tbody>
</table>
Build Student’s Scientific Reasoning Skills
One Experiment at a Time
Can your students . . .

- Evaluate a method for whether data supports a hypothesis?
- Identify variables in an experimental process?
- Determine a method for collecting data?
- Determine the correct process for an experiment?
- Draw a conclusion based on scientific data?
- Create a hypothesis?
- Design a scientific investigation based on a given hypothesis?
The Scientific Method

Teach experimental design through real-world application and reporting.
Scientific Method in Action

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>There is something wrong with the car</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predictions</td>
<td>battery dead, ignition problem, out of gas</td>
</tr>
<tr>
<td>Test Predictions</td>
<td>turn on headlights, check spark plug wires, dip stick in gas tank</td>
</tr>
<tr>
<td>Analyze Results</td>
<td>headlights work, strong ignition spark, no gas on dip stick-gas gauge reads half full</td>
</tr>
<tr>
<td>Draw Conclusion</td>
<td>gauge inaccurate, out of gas</td>
</tr>
</tbody>
</table>
Observation/Define the Problem

Does exercise make your heart beat faster?

All investigations start with a question.
Observation: John was breathing heavily as he walked into the classroom.

Why? Maybe . . .

He ran to class because he was going to be late.

He had just played basketball in the gym.
Formulate a Hypothesis

• Educated guess about how things work
• Prediction
• Use If, then statements
  – If _____ [I do this], then ______ [this will happen]
• Focus on one variable only
Formulate a Hypothesis

Sentence Frame

If ______________________ (manipulated/independent variable) then __________________________ (responding/dependent variable), because ____________.

Example

If dry bread and moist bread are left in bags for two weeks, then the moist bread will grow mold more quickly than the dry bread, because mold is a living organism, and organisms need water to survive.
Don’t Forget the Vocabulary

- **Independent**, or manipulated variable, is a factor that’s intentionally varied by the experimenter.

- **Dependent** or responding variable, is the factor that may change as a result of changes made in the independent variable.
Geraldo believes that groceries at Costco will be less expensive than groceries at Safeway. Write a measurable hypothesis related to Geraldo's observation.
Gather Evidence and Experiment

• Develop and follow a procedure.
• Include a detailed materials list.
• Make sure the outcome is measurable.
• Develop a procedure, list the needed materials and then, determine the control group.
Gather Evidence and Experiment

Record data in a data table.

- Numerical (quantitative) data organized in rows and columns
- The specific independent variables are listed
- The number of trials are listed
- Blanks are left for data (dependent variable) to be filled in

<table>
<thead>
<tr>
<th>Trial</th>
<th>Variable 1</th>
<th>Variable 2</th>
<th>Variable 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AVERAGE</td>
<td></td>
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<td></td>
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</tbody>
</table>
Example

In order to test the effectiveness of a new vaccine, 50 volunteers are selected and divided into two groups. One group will be the control group and the other will be the experimental group. Both groups are given a pill to take that is identical in size, shape, color and texture.

Describe the control group. Even though the volunteers are given identical looking pills, the control group will not actually receive the vaccine.

Describe the experimental group. This group will receive the vaccine.

What variables are kept constant? The size, shape, color, and texture of the pill.

What variable is being changed? Whether or not the pill contains the vaccine.
Collect and Analyze Results

• Describe what was observed

• Reduce the data
  – Average (Mean)

• Graph
  – Graph the data to look for trends & relationships
Conclusion

• Look back at the hypothesis.
• Analyze the data to see if the hypothesis was accepted or rejected.
• If hypothesis is rejected, give possible reasons for the difference between the hypothesis and the experimental results.
Sample Conclusion

We have concluded that the new vaccine is effective as the experimental group had 90% less chance of contracting the disease than the control group who received a placebo. However, additional studies should be performed to ensure accuracy of the results.
Resources for Science

Getting Started
Resources for Earth and Space Science

Environmental Protection Agency
• http://www.epa.gov/students/lesson-plans-teacher-guides-and-online-resources-educators

Discovery Education
• http://www.discoveryeducation.com/search/page/-/-/lesson-plan/earth%20science/index.cfm
National Science Teachers Association – Freebies for Science Teachers

Videos

Newton’s Apple
http://www.newtonsapple.tv/

Steve Spangler
http://www.stevespanglerscience.com/

Ted-Ed

Khan Academy
https://youtu.be/N6IAzlugWw0
Teachers Sharing

Science with Mr. Jones

http://www.sciencewithmrjones.com/handouts.shtml#scientific
http://www.gedtestingservice.com/

Building the educated and employed communities of tomorrow

Our goals are simple: Open up doors to better paying jobs, new careers, college classrooms, and a brighter future. Together with educators, administrators, legislators, and employers, we will transform our high school equivalency program into a lifelong learning opportunity. Start exploring the GED® program now.
Looking for More Ideas?
Questions?
Thank you!

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