# Higher Order Thinking & Reasoning (HOTR)

## Content Enhancement Routines

HOTR Content Enhancement Routines help students engage in the critical skills of higher order thinking and reasoning required by state standards. Each of the routines include instructional supports for teacher use, learning supports for students, and take into account the diverse learning needs of students. To learn more about each specific routine, click on the hyperlinks below. Use the information in the chart to identify a HOTR routine that may address an instructional need in your course of study.

| Routine | Higher Order Thinking Skills | ELA Examples | Math Examples | Science Examples | Social Studies Examples |
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| Question Exploration | This routine helps students break-down complex, higher-order questions by following a series of steps. The skills taught in this routine will aid in independent problem solving and higher-order thinking. | € Practice answering FSA Reading & Writing Questions<br>€ Practice answering FRQs in AP exams. | € Practice answering Algebra & Geometry EOC questions.<br>€ Practice answering FRQs in AP exams. | € Practice answering Biology EOC questions.<br>€ Practice answering Grade 8 Statewide Science Assessment questions.<br>€ Practice answering FRQs in AP exams. | € Practice answering Civics & US History EOC questions.<br>€ Practice answering FRQs in AP exams.<br>€ Answer a DBQ<br>€ Answer a Compelling Question using the Inquiry Design Model |
| Cause & Effect | This routine helps students engage in higher-order reasoning and think critically about an event, action, idea, topic, or procedure and its causes and effects. The skills taught in this routine will enhance student's ability to think | | € | € Evaluate many environmental topics (water pollution, climate change, land use, energy use, etc)<br>€ Evaluate the use of biotechnology on society, individual, environment, and public health. | € SS.912.A.1.6 Use case studies to explore social, political, legal, and economic relationships in history.<br>€ SS.912.A.4.5 Examine causes, course, and consequences of United States involvement in World War I.<br>€ SS.912.A.2.1 Review causes and consequences of the Civil War. |

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| | critically about causes and effects. | | | | € SS.912.A.3.9 Examine causes, course, and consequences of the labor movement in the late 19th and early 20th centuries. |
| Concept Comparison | This routine helps students understand concepts by analyzing how they are the same and how they are different. The skills taught in this routine will aid students in summarizing the similarities and differences between two concepts. | € ELA.9.R.3.3 - Compare and contrast the ways in which authors have adapted mythical, classical, or religious literary texts.<br>€ ELA.9.R.2.4 - Compare the development of two opposing arguments on the same topic, evaluating the effectiveness and validity of the claims. | € Compare and contrast different types of triangles | € Biology: Compare and contrast prokaryotic and eukaryotic cells, plant and animal cells, mitosis and meiosis, transcription and translation.<br>€ Chemistry: Compare and contrast physical and chemical changes, states of matter<br>€ Anatomy: types of tissues (structure and function) | € Compare and contrast primary and secondary sources (to identify author, historical significance, audience, and authenticity to understand a historical period.)<br>€ SS.912.A.3.3 Compare the first and second Industrial Revolutions in the United States. |
| Decision Making | This routine helps students engage in higher order reasoning when thinking about an issue that may have more than one option, or way to respond. In this process, students and teacher engage in a range of high-level reasoning skills. Examples of such skills are critical thinking, analysis, | € ELA.9.R.2.4 - Compare the development of two opposing arguments on the same topic, evaluating the effectiveness and validity of the claims.<br>€ Prepare for a debate on an issue (https://www.procon.org/) | | € To help students make sustainable choices (Environmental Science Standards)<br>€ The help students analyze the pros and cons of various biotechnologies, renewable vs nonrenewable resources, etc.<br>€ Prepare for a debate on an issue (https://www.procon.org/) | € SS.912.A.7.4 Evaluate the success of 1960s era presidents' foreign and domestic policies.<br>€ Prepare for a debate on an issue (https://www.procon.org/) |

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| | synthesis, evaluation, and judgment. | | | | |
| Cross-Curricular Argumentation | This routine helps students carefully examine a claim and engage in the process of argumentation. The skills taught in this routine will aid students in clarifying, analyzing, and evaluating arguments, both across academic content and within their daily lives. | € ELA.9.R.2.4 - Compare the development of two opposing arguments on the same topic, evaluating the effectiveness and validity of the claims<br>€ ELA.K12.EE.1.1 - Cite evidence to explain and justify reasoning | € MA.912.LT.4.10 Judge the validity of arguments and give counterexamples to disprove statements.<br>€ SS.912.A.1.5 Evaluate the validity, reliability, bias, and authenticity of current events and Internet resources. | € To be used when evaluating scientific research/study, scientific journals, or peer reviewing other classmate's lab reports.<br>€ | € Answer a DBQ |
| Scientific Argumentation | This routine helps students engage in the higher order reasoning associated with argumentation. The routine will provide teachers and students with evidence-based procedures that will enable them to think critically about a claim, decide on the strength of the claim, and explain the reasoning that supports the claim. | € ELA.9.C.1.3 - Write to argue a position, supporting claims using logical reasoning and credible evidence from multiple sources, rebutting counterclaims with relevant evidence, using a logical organizational structure ,elaboration, purposeful transitions, and a tone appropriate to the task<br>€ ELA.K12.EE.1.1 - Cite evidence to explain and justify reasoning | | € To be used when evaluating scientific research/study, scientific journals, or peer reviewing other classmate's lab reports. | |