



CFSD 21st Century Learning Rubric
Skill: Critical & Creative Thinking

| Thinking/Reasoning Skill | Novice | Basic | Proficient | Advanced |
|--------------------------|--|--|--|---|
| <p>Comparing</p> | <p>Selects items that are inappropriate to the basic objective of the comparison.</p> <p>Selects characteristics that are trivial or do not address the basic objective of the comparison. Selects characteristics on which the items cannot be compared.</p> <p>Makes many significant errors in identifying the major similarities and differences among the identified characteristics.</p> | <p>Selects items that satisfy the basic requirements of the comparison but create some difficulties for completing the task.</p> <p>Selects characteristics that provide for a partial comparison of the items and may include some extraneous characteristics.</p> <p>Makes some important errors in identifying the major similarities and differences among the identified characteristics.</p> | <p>Selects items that provide a means for successfully addressing the basic objective of the comparison.</p> <p>Selects characteristics that provide a vehicle for meaningful comparison of the items and address the basic objective of the comparison.</p> <p>Accurately assesses the major similarities and differences among the identified characteristics.</p> | <p>Selects items that are extremely suitable for addressing the basic objective of the comparison and that show original or creative thinking.</p> <p>Selects characteristics that encompass the most essential aspects of the items and present a unique challenge or provide an unusual thought.</p> <p>Accurately assesses all identified similarities and differences for each item on the selected characteristic. Additionally, the student provides inferences from the comparison that were not explicitly requested in the task description.</p> |

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| Classifying | <p>Selects trivial items or items that have no relationship to the task.</p> <p>Creates categories that address only trivial aspects of the items.</p> <p>Identifies characteristics that do not accurately describe the categories.</p> <p>Makes frequent and significant errors in assigning items to categories and does not show how the items have the characteristics of their assigned categories.</p> | <p>Selects items of little significance or presents a routine sorting problem.</p> <p>Creates categories that provide for some analysis of the items but may not include all the important characteristics of the items.</p> <p>Describes the defining characteristics of categories in a way that results in some overlap or confusion between categories, or describes characteristics that are unrelated to the rules for category membership.</p> <p>Makes some errors in assigning items to their appropriate categories, or does not describe the extent to which each item has the characteristics of the category, when it is clearly appropriate for the task.</p> | <p>Selects significant items for classification that present some challenge in classification</p> <p>Creates categories that focus on the significant characteristics of the items.</p> <p>Clearly specifies the defining characteristics of the categories and addresses any questions of overlap in characteristics.</p> <p>Correctly sorts each of the items into the categories and, when appropriate, describes the extent to which each item has the characteristics ascribed to the categories.</p> | <p>Specifies the items to be classified and selects significant items that present some interesting challenge in classification.</p> <p>Creates categories that provide a useful way of looking at the items at an unusual level of depth.</p> <p>Provides a clear and complete specification of the defining characteristics of each category. Describes the defining characteristics in such a way as to provide a unique or unusual way of looking at the items.</p> <p>Correctly sorts each of the items into the categories and describes the extent to which each item has the characteristics ascribed to the categories. Describes insights gained during the sorting process.</p> |

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| Inductive Reasoning | <p>Selects unimportant or trivial information for the induction.</p> <p>Significantly misinterprets the information. Makes interpretations that have no bearing on the area or a re clearly illogical.</p> <p>Draws many erroneous conclusions from the selected information or observations and cannot satisfactorily describe the rationale behind the conclusions.</p> | <p>Includes some information that is not important to the induction or does not accurately identify the important information from which the induction(s) could be made.</p> <p>Provides some interpretations that are based on significant misunderstandings of the subject matter.</p> <p>Presents some conclusions that reflect erroneous interpretations made from the information or observations.</p> | <p>Specifies all relevant information from which to make inductions. Selects information that is important to the general topic.</p> <p>Provides interpretations that, with few exceptions, are valid and say something important about the topic.</p> <p>Presents conclusions that, with few exceptions, follow logically from the selected information or observations.</p> | <p>Clearly and accurately identifies all relevant information from which to make inductions. The type of information selected reflects creative insight and a careful analysis of the situation.</p> <p>Provides accurate interpretations that illustrate insight into the information from which they were made. The interpretations reflect a study of or a familiarity with the particulars of the topic.</p> <p>Draws conclusions that reflect clear and logical links between the information or observations and the interpretations made from them. The rationale for the interpretations shows a thoughtful and accurate attention to the process of induction.</p> |

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| Deductive Reasoning | <p>Selects generalizations or principles that do not have significant bearing on the material and do not contribute to the understanding of the subject.</p> <p>Demonstrates an incorrect understanding or interpretation of the generalizations or principles.</p> <p>Identifies consequences that have little significance and are not logical or relevant to the topic.</p> | <p>Selects generalizations or principles that generally relate to the information available but that may not have significant explanatory power.</p> <p>Demonstrates a somewhat inaccurate understanding of the generalizations or principles.</p> <p>Includes important consequences of the generalizations or principles, but identifies consequences that may not be relevant to the topic; or makes logical errors in identifying the consequences.</p> | <p>Selects important generalizations or principles that contribute to the understanding of the topic.</p> <p>Demonstrates an understanding of the generalizations or principles that is accurate and contributes to an understanding of the topic.</p> <p>With few errors, accurately identifies the consequences of the generalizations or principles. The consequences relate closely to the subject area and are worthwhile subjects for discussion.</p> | <p>Selects generalizations or principles that show extreme insight into the topic.</p> <p>Demonstrates an understanding of the generalizations or principles that is not only accurate but provides a unique perspective on the topic.</p> <p>Accurately identifies logical conclusions implied by the generalizations or principles. Recognizes more subtle inferences that could have important effects on the subject area.</p> |

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| Error Analysis | <p>Recognizes only insignificant errors or mistakes valid points for errors</p> <p>Does not correctly assess the effects of the errors, or describes effects that do not exist</p> <p>Does not accurately describe how to correct the errors</p> | <p>Fails to recognize some important errors or identifies some points that are not errors</p> <p>Describes the effects of the errors, but omits some important consequences; or does not accurately describe all the effects of the errors</p> <p>Provides an approach for correcting the errors. The approach addresses some of the major errors, though it may not be the best or most appropriate response to the situation.</p> | <p>Accurately identifies all critical errors in the information process under study and makes clear why the points identified are errors</p> <p>Provides an accurate analysis of the effects of the errors, omitting few details</p> <p>Provides a workable way of correcting the errors. The response addresses the major concerns raised by the errors.</p> | <p>Accurately identifies all errors in the information or process under study and makes clear why the points identified are errors. Also identifies subtle but important errors that are difficult to recognize</p> <p>Provides an accurate analysis of the effects of the errors, including a complete description of the effects of the errors beyond the most obvious levels of impact.</p> <p>Provides a highly thoughtful or creative approach for correcting the errors.</p> |

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| Constructing Support | <p>Identifies information that does not require support and fails to identify a claim that should have support</p> <p>Fails to provide convincing evidence for the claim.</p> <p>Does not address qualifications or restrictions for the claim.</p> | <p>Identifies a claim that requires support but may mistakenly include information that does not require support.</p> <p>Provides evidence for the claim, but may not address all necessary aspects.</p> <p>Qualifies or restricts the claim, but leaves out important aspects of the qualifications or restrictions.</p> | <p>Accurately identifies a claim that requires support and does not confuse the claim with any other information.</p> <p>With no major errors, presents all relevant evidence needed to support the claim.</p> <p>Provides accurate qualifications or restrictions for the claim, with the result being a well-defended claim.</p> | <p>Accurately identifies a claim that requires support. The identified claim has been mistaken by many others for a fact that requires no support.</p> <p>Presents a clear and accurate treatment of all available evidence that addresses the central point of the claim. Considers what evidence is missing and how it should affect an evaluation of the claim.</p> <p>Provides careful and reasoned qualifications or restrictions for the claim in such a way that the argument provides a unique perspective on the claim.</p> |

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| Abstracting | <p>Identifies trivial information having no identifiable pattern that can be used in the abstracting process</p> <p>Does not create a general or abstract pattern that accurately represents the information or situation selected</p> <p>Selects another situation or set of information that does not conform in any way to the general or abstract pattern identified.</p> | <p>Identifies information that seems unimportant but does have a pattern that can be used in the abstracting process.</p> <p>Creates a general or abstract pattern that may not be a completely accurate representation of the information or situation from which it was drawn but does focus on its most important elements.</p> <p>Identifies another situation or set of information that does perfectly match the general or abstract form but has some similarities</p> | <p>Identifies significant information that also has a pattern that lends itself to the abstracting process.</p> <p>Constructs a general or abstract pattern that accurately represents the information from which it came.</p> <p>Correctly identifies another situation or set of information that contains the essential characteristics of the general or abstract form and provides a worthwhile subject for study.</p> | <p>Identifies a situation or information that provides a rich source of material for abstracting, which may not be commonly used, but has a pattern that could be powerful when abstracted.</p> <p>Identifies a general or abstract pattern that provides novel insights into the information studied. The pattern furnishes the means for seeing other material from a unique perspective.</p> <p>Demonstrates creativity in the selection of another situation or information that contains a similar general or abstract form. The situation or information is important and provides a suitable subject for analysis.</p> |

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| Analyzing Perspectives | <p> Ignores explicit and implicit points of disagreement.</p> <p> Does not articulate a clear position.</p> <p> Does not articulate a clear opposing position.</p> | <p> Identifies and articulates issues that are not points of disagreement as important points of disagreement.</p> <p> Articulates a position but does not present a clear line of reasoning behind it.</p> <p> Articulates an opposing position, but does not present a clear line of reasoning behind it.</p> | <p> Identifies and articulates explicit points of disagreement that cause conflict.</p> <p> Articulates a position and the basic reasoning underlying the position. Does not address or incompletely addresses the errors or holes in the reasoning</p> <p> Articulates an opposing position and the basic reasoning underlying it. Does not address or incompletely addresses the errors or holes in the reasoning.</p> | <p> Identifies and articulates implicit points of disagreement that are not obvious but are the underlying cause of conflict.</p> <p> Articulates a detailed position and the reasoning behind it and, if a strong line of reasoning does not underlie the position, articulates the errors or holes in the reasoning.</p> <p> Articulates a detailed opposing position and the reasoning behind it. If a strong line of reasoning does not underlie the position, articulates the errors or holes in the reasoning.</p> |

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| Decision Making | <p>Selects alternatives that are clearly not relevant to the decision.</p> <p>Identifies few or no criteria that are relevant to the decision task.</p> <p>Does not address the extent to which the alternatives meet the criteria or is inaccurate in assessing how well the alternatives meet the criteria.</p> <p>Makes a selection that does not appear reasonable or cannot be justified by the student’s evaluation of the alternatives.</p> | <p>Identifies some alternatives that are important and others that aren’t.</p> <p>Identifies some important criteria by which the identified alternatives will be assessed. However, some important criteria are omitted, or criteria are included that may not be important to the task.</p> <p>Does not completely address all the criteria; or applies all appropriate criteria to the alternatives but is not completely accurate in assessing how well the criteria have been met</p> <p>Selects an alternative that does not entirely conform to the student’s assessment of the alternatives.</p> | <p>Identifies alternatives that represent most of the important possible alternatives.</p> <p>Clearly identifies the criteria by which the identified alternatives will be assessed. With no significant exceptions, the criteria are important to the decision task.</p> <p>Presents an accurate assessment of the extent to which the alternatives possess the identified criteria</p> <p>Successfully answers the decision question by selecting an alternative that meets or exceeds established criteria.</p> | <p>Presents a comprehensive list of the most important possible alternatives and describes each in detail</p> <p>Clearly identifies the criteria by which the identified alternatives will be assessed. The criteria reflect an unusually thorough understanding of the nature of the decision task.</p> <p>Provides a thorough, fully developed assessment of each alternative based upon the criteria. Exceeds the demands of the decision task by comparing and contrasting the alternatives to provide greater insights</p> <p>Selects an alternative that meets or exceeds the criteria and represents a well-supported answer to the initial decision question. Provides a useful discussion of issues and insights that arose during the selection process.</p> |

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| Investigation | <p>Presents little or no accurate and important information about what is already known or agreed upon about the topic.</p> <p>Fails to accurately identify any important confusions, uncertainties, or contradictions surrounding the topic.</p> <p>Presents an unsubstantiated and implausible resolution to the confusions, uncertainties, or contradictions.</p> | <p>Presents information on what is already known or agreed upon about the topic being studied; however the information may not be complete in all particulars, or the student may introduce some inaccuracies.</p> <p>Identifies confusion, uncertainties, or contradictions associated with the topic. The problems identified include some, but not all, of the most critical issues.</p> <p>Develops and presents a resolution to the problems associated with the concept. The resolution is satisfactory, but lacks thorough treatment and accuracy.</p> | <p>Presents an accurate account, with no important omissions, of what is already known or agreed upon about the topic being studied.</p> <p>Identifies, with no important errors, significant confusions, uncertainties, or contradictions surrounding the topic.</p> <p>Presents a clear resolution to the problems associated with the concept. The resolution is a logical and plausible outcome of the investigation.</p> | <p>Presents a thorough and correct account of what is already known. Supplies information that may not be commonly known, but that has some bearing on the topic being studied.</p> <p>Identifies the important confusions, uncertainties or contradictions surrounding the topic. Brings to light misconceptions or confusions that are commonly overlooked.</p> <p>Provides a logical and well-developed resolution to the confusions, uncertainties, or contradictions. The resolution reflects creative thinking as well as thoughtful attention to the details of the problem.</p> |

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| Problem Solving | <p>Omits the most significant constraints and obstacles.</p> <p>Presents solutions that fail to address critical parts of the problem.</p> <p>Does not satisfactorily test the selected solutions.</p> <p>Describes an illogical method for determining the relative value of the alternatives. The student does not present a reasonable review of the strengths and weaknesses of the alternative solutions that were tried and abandoned.</p> | <p>Identifies some constraints or obstacles that are accurate along with some that are not accurate.</p> <p>Presents alternative solutions for dealing with the obstacles or constraints, but the solutions do not all address the important difficulties.</p> <p>Tries out the alternatives, but the trials are incomplete and important elements are omitted or ignored.</p> <p>Describes the processes that led to the ordering of secondary solutions. The description does not provide a clear rationale for the ordering of alternatives that were tried.</p> | <p>Accurately identifies the most important constraints or obstacles.</p> <p>Proposes alternative solutions that appear plausible and that address the most important constraints or obstacles.</p> <p>Puts the selected alternative to trials adequate to determine their utility.</p> <p>Describes the process that led to the ordering of secondary solutions. The description offers a clear, defensible rationale for the ordering of alternatives, and the final selection.</p> | <p>Accurately and thoroughly describes the relevant constraints or obstacles. Addresses obstacles or constraints that are not immediately apparent.</p> <p>Identifies creative but plausible solutions to the problem under consideration. The solutions address the central difficulties posed by the constraint or obstacle.</p> <p>Engages in effective, valid, and exhaustive trials of the selected alternatives. Trials go beyond those required to solve the problem and show a commitment to an in-depth understanding of the problem.</p> <p>Provides a clear, comprehensive summary of the reasoning that led to the selection of secondary solutions. The description includes a review of the decisions that produced the order of selection and how each alternative fared as a solution.</p> |

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| Experimental Inquiry | <p>Leaves out key facts, concepts, or principles in explaining phenomenon, or does not use appropriate facts, concept, or principles to explain the phenomenon.</p> <p>Makes a prediction that cannot be verified.</p> <p>Sets up and carries out an activity or experiment that does not test the central features of the prediction. The experimental design is seriously flawed and the collection of data is unlikely.</p> <p>Provides an inaccurate highly flawed explanation of how the outcome relates to the original explanation.</p> | <p>Explains the phenomenon but misapplies or omits facts, concepts, or principles that are important for understanding the phenomenon.</p> <p>Makes a prediction that reflects a misunderstanding of some aspects of the facts, concepts, or principles used to explain the phenomenon, or makes a prediction that presents difficulties for verification.</p> <p>Sets up and carries out an activity or experiment that addresses some important aspects of the prediction, but omits others. The design of the activity or experiment produces some errors in data collection or interpretation.</p> <p>Provides a general explanation of the outcome of the activity or experiment but omits one or two important aspects, or may not effectively relate the outcome to the facts, concepts, or principles used to generate the prediction.</p> | <p>Provides and accurate explanation of the phenomenon. The facts, concepts, or principles used in the explanation are appropriate to the phenomenon and accurately applied, with no significant errors.</p> <p>Makes a prediction that follows from the facts, concepts, or principles used to explain the phenomenon. The prediction can be verified.</p> <p>Sets up and carries out an activity or experiment that is a fair test of the prediction and addresses the most important questions raised by the prediction. The activity or experiment provides accurate data for evaluation.</p> <p>Provides a complete explanation of the outcome of the activity or experiment with no important errors. Presents the explanation in terms of the relevant facts, concepts, or principles.</p> | <p>Provides and accurate explanation of the phenomenon. The facts, concepts, or principles used for the explanation are appropriate to the phenomenon and accurately applied. The explanation reflects thorough and careful research or understanding.</p> <p>Makes a verifiable prediction that reflects insight into the character of the phenomenon. The prediction is entirely appropriate to the facts, concepts, or principles used to explain the phenomenon.</p> <p>Sets up and carries out an experiment that is a complete and valid test of the prediction and addresses all important questions raised by the prediction. The activity or experiment is designed to provide complete and accurate data and a model of the experimental design.</p> <p>Provided a complete and accurate explanation of the outcome of the activity or experiment and does so in terms of the relevant facts, concepts, or principles. Provides insights into the nature of the phenomenon studied or the facts, concepts, and principles used to explain it.</p> |

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| Invention | <p>Proposes a process or product that has little or no relation to the unmet need.</p> <p>Establishes criteria that fail to address the most important purpose of the invention. Sets standards so low that little quality can be expected.</p> <p>Makes few, if any attempts at revision and appears satisfied with the initial process or product, although obvious difficulties still remain.</p> <p>Finishes revising the process or product before it has met minimal standards. The process or product does not meet many important criteria and fails in its purpose.</p> | <p>Proposes a process or product that will not adequately satisfy the unmet need.</p> <p>Identifies criteria for the invention that may not be completely appropriate for the product or sets standards that do not ensure a worthwhile or completed product.</p> <p>Revises the process or product but attempts to address only the most obvious difficulties</p> <p>Revises the process or product until it meets minimum standards.</p> | <p>Proposes a process or product that provides a good answer to the unmet need.</p> <p>Establishes an appropriate set of criteria for the invention</p> <p>Revises the process or product in ways that serve the purpose of the process or product.</p> <p>Continues revising the process or product until it meets all standards and criteria. The process or product successfully serves the purpose for which it was designed.</p> | <p>Proposes a process or product that provides a unique solution to an unmet need. The proposed process or product reflects a high level of creativity.</p> <p>Sets out rigorous criteria well suited to the purpose of the invention. The student identifies only the highest achievable standards of quality as acceptable outcomes.</p> <p>Reviews the process or product at a considerable level of detail. The revisions or improvements clearly bring the process or product closer to fulfilling the purpose for which it was designed. The student's attention to the details of the draft or model makes a high-quality product likely.</p> <p>Develops a final process or product that meets the criteria established at a demanding level of quality. The process or product fulfills the purpose for which it was designed. In addition, the process or product reflects creativity and establishes a model for creative work of high quality.</p> |