The Table below presents how the **five higher-level literacy skills** – critical thinking, problem solving, mathematical reasoning, inference-making, and visualization/modeling –are *currently defined* and *targeted* across the four core academic subjects.

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1. Critical Thinking (CT)

Critical Thinking = Purposeful Reasoning + Reaching Valid Conclusions

Science CT Illustrative Inquiry Scenario

Using only the materials provided, can you make the Piezo Buzzer beep?

- 1 fruit, 1 vegetable, 1 buzzer, 2 coins, 2 galvanized nails and 3 wires

Social Studies CT Example

Now that we have examined the development of justice throughout Middle Eastern history, how would you evaluate justice as it relates to modern government/economic practices/religious systems/social structures in the region?

Math CT Example

Using the theorems of triangles and angle postulates, how will you prove that two triangles are congruent?

English CT Example

Using the criteria we have discussed, examine the poem to determine the *difference* between your analysis and your opinion of the poem.

2. Problem Solving (PS)

Problem Solving = Overcoming Obstacles + Achieving Goals

Science PS Illustrative Inquiry Scenario

Using the choices (tank shell, golf ball, baseball, bowling ball, football, pumpkin, adult human, piano or Buick) provided in the Projectile Motion Simulation (http://phet.colorado.edu/web-pages/index.html)

- Determine the angle at which your launched object hits the target?
- Can you now hit the target by launching it at an angle that is completely different from the original angle?
- What angle should you launch a projectile to make it travel the farthest distance, with and without air resistance?

Social Studies PS Example

Create a Bill of Rights – a set of laws designed to preserve the concept of justice – that would satisfy the desires of all of your citizens for your developing government.

Math PS Example

Use a general problem-solving plan to create a rule for any number (n^{th} term) in a sequence using numerical strategies or manipulative models.

English PS Example

How do authors use *literary elements* to expand the boundaries of reality? Specifically, (a) Explain this with specific reference to the textual evidence in *Night*, and (b) Analyze how these literary elements "*affect*" the reader?

3. Mathematical Reasoning (MR)

Mathematical Reasoning = Abstract Concepts + Supporting Results

Science MR Illustrative Inquiry Scenario

- Measure the mass of the six colored containers provided. The containers are filled with some unknown object.

• Look for a pattern among the masses of the six boxes and guess what might be accounting for the change in the mass of these containers.
• Explain (in your results) how this activity might be connected with a topic being studied in class*.

*Students had studies Electric Forces and Fields when they were given this activity to connect it with Millikan's Oil Drop Experiment in Modern Physics.

Social Studies MR Example

Compare at least two modern Middle Eastern countries and make sure that you include relevant statistics from the website www.abc-clio.com in your analysis.

Math MR Example

Can you build the numbers 1 – 20 by using the four basic operations and only four 4's?

English MR Example

Now that you have started reading the *Odyssey*, analyze and explain the parallels between the myths in ancient Greece and the myths in the present day.

4. Inference-Making (IM)

Inference-Making = Logical Reasoning + Informed Decision-Making

Science IM Illustrative Inquiry Scenario

Using only two batteries, two light bulbs and no more than 4 wires:

(i) Demonstrate how both light bulbs can be made to glow. (ii) Demonstrate how both light bulbs might be made to glow at their brightest. Which of these arrangements would you choose to use in the headlights of your car. Why?

Social Studies IM Example

Now that you have gone through various activities to understand the background to the Israeli-Palestinian conflict, as a member of UN think tank, what is your plan to peacefully resolve the current Israeli-Palestinian conflict? As you present your plan, your peers will assess your plan on its merits, including: what they liked about your solution; concerns with your solution; and questions on your proposed solution.

Math IM Example

Use inductive reasoning to make real-life conjectures about how you might survive in an urban city for two-weeks with only $100.00?

English IM Example

Using specific quotes from the Nobel laureate Elie based on Oprah's interview, what can you infer about his internal conflict?

5. Visualization/Modeling (V/M)

Visualization = Pattern Recognition + Communicating to Diverse Audience

Science V/M Illustrative Inquiry Scenario

Create a multimedia video presentation to illustrate the difference between gravitational and electric potential. *Sample Worked Example*: Concluding Video in http://doers.us/electrostatics.htm

Social Studies V/M Example

What criteria would you use to assess the successful conclusion of the wars in Iraq and Afghanistan?

Math V/M Example

Based on the properties of geometry's undefined terms we have discussed, can you visualize and sketch the intersections of lines and planes?

English V/M Example
Use your knowledge of poetry sensation which we have discussed (e.g., alliteration, iambic pentameter, etc.) to recognize why the author uses this pattern and rhythm to communicate the poem's meaning.