Critical Thinking

a 21st Century Learning Skill

The 21st Century Learning Skill of Creativity Defined:

- Exercising sound reasoning in understanding
- Making complex choices and decisions
- Understanding the interconnections among systems
- Identifying and asking significant questions that clarify various points of view and lead to better solutions
- Framing, analyzing and synthesizing information in order to solve problems and answer question

Classroom Application: The following are practical ways that the 21st Century Learning Skill of Critical Thinking can be integrated into the content areas. These examples come from the P21 Content Area Curriculum maps. The full maps for each are are available at www.p21.org. Over time, we will add more of our own activities and lesson as we develop them.

Critical Thinking in the Social Studies Classroom:

- ***Student Learning Standard (Outcome)***: Using sound reasoning and relevant examples, students analyze the historical evolution of a contemporary public policy issue, place it within an historical context, and use a digital publishing tool to report their work.
- ***Example - Past vs. Present Comparative Research***: In groups, students explore how selected societies of the past used their natural resources for fuel (e.g., England's use of its forests at the beginning of the industrial revolution) and the economic impact of that use. Students use videoconferencing (e.g., www. skype.com) to collect information from relevant government officials about the use of corn for biofuel instead of food and analyze the environmental and economic implications of this use. Students use district-approved wikis to publish the results of their research.

Critical Thinking in the Math Classroom:

- ***Student Learning Standard (Outcome)***: Students identify and ask significant questions about mathematics and engage in analyzing each others' answers.
- ***Example - Group Analysis of Differing Solution Methods***: The class divides into two groups. In one group, students use a piece of string and a ruler to measure the circumference (c) and diameter (d) of circular objects, such as the lid of a jar, the face of a clock, or a pie plate. For each object measured, they calculate c/d. Then they calculate the average of each result to come up with an approximate value for pi. In the other group, students use the method developed by Archimedes, using inscribed and circumscribed polygons. Students compare the two groups' results. They recognize that pi is an irrational number, so it cannot be measured precisely. Then they research how people in different cultures have tried to calculate pi from ancient to modern times.

Critical Thinking in the English Classroom:

- ***Student Learning Standard (Outcome)***: Identify and ask significant questions that clarify various points of view.

- ***Example - Analysis of Current Events Reported in Social Media***: Working in groups, students follow the Twitter logs of a variety of newspapers for several days. Students compare these logs for the differences and similarities in the events posted and speculate on the significance, if any, of these comparisons.

Critical Thinking in the Science Classroom:

- ***Student Learning Standard (Outcome)***: Students plan and conduct scientific investigations and write detailed explanations based on their evidence. Students compare their explanations to those made by scientists and relate them to their own understandings of the natural and designed worlds.
- ***Example - Classroom Archeology***: Students research how the physical and chemical properties of different natural and human-designed materials affect their decomposition under various conditions. They compare their findings to the material evidence used by scientists to reconstruct the lives of past cultures, as well as create a map of their classroom as a future archeological site (including written descriptions of artifacts) discovered by scientists.

Critical Thinking in the Arts Classroom:

- ***Student Learning Standard (Outcome)***: Students will use various types of reasoning to think and reflect critically and solve problems in both conventional and innovative ways.
- ***Example - Peer Critique Solutions for Artistic Problem Solving***: Students view and critique multiple works of art, created by themselves and their peers, which deal with a specified artistic problem. Students use mutually agreed upon criteria (elements and principles of art and design, subject matter, technique, style, etc.) to describe, analyze, interpret, and make informed judgments about the art works. using electronic journals, students reflect on the points in their critical thinking that led to their solution to the problem. Students then compare and contrast how the other students addressed the same problem, and use their electronic journals to form a foundation for their participation in a group discussion convened through the use of a class blog or wiki.

Critical Thinking in the World Languages Classroom:

- ***Student Learning Standard (Outcome)***: Students as inquirers frame, analyze, and synthesize information as well as negotiate meaning across language and culture in order to explore problems and issues from their own and different perspectives.
- ***Example - Employment Advertisement Analysis***: With the job title omitted, students read various job/career ads and then match the appropriate job title to the ad. Students are divided into groups. Each group is asked to investigate 3-5 different career/job sites and identify the jobs and careers that are in high demand in a particular city, region, or country. Students present their findings to the class.

Looking For More Examples? Click here for links to all the P21 curriculum maps for each content area. Each map has dozens of examples and tips to help us on this journey.