

FUTURES FOR SCIENCES

Performance Standard 13B/12A-F.J

Students will analyze challenges created by international cooperation and competition in scientific knowledge, technological advances, policy-making and implementation from global perspectives accordingly:

- *Knowledge:* Understand the basic foundations associated with sharing scientific knowledge and technological advances.
- *Application:* Analyze a specific example of a multi-national scientific or technological endeavor for its partnership challenges, impact and successes.
- *Communication:* Present the specific partnership research findings to find common denominators of challenges, impact and successes for future efforts.

Procedures

1. ***In order to know and apply concepts that describe the interaction between science, technology, and society (13B), and understand the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences (12 A-F),*** students should experience sufficient learning opportunities to develop the following:
 - Identify current multinational scientific venture for individual or group research,
 - Review existing resources associated with the foundations for economic, political, social partnerships
 - Integrate social science perspectives into research components of a scientific partnership:
 - Analyze relationships and tensions among members of international community. (14E)
 - Interpret how changes affect American ideas and traditions. (14F)
 - Relate nature and variations of global competitive economies. (15C)
 - Relate how population, urbanization, economic development and technological advancements cause changes (in current or historical contexts). (16C)
 - Analyze related social and historical aspects to political, economic and environmental settings. (16D-E)
 - Analyze issue involving interaction of people and geographic factors. (17D)
 - Compare effects of political, environmental, economic and technological changes. (18A)
 - Explore challenges and impact of natural, energy or fiscal resource acquisition (and possible depletion) for multinational partnership.
 - Examine how cultural beliefs and attitudes influence advances.
 - Analyze associated scientific policies in terms of costs, benefits and effects.
 - Consider American and non-American perspectives of impact of partnership.
 - Evaluate media promotional and status reports on partnership impact.
 - Analyze how partnership has affected or will affect job markets and everyday life over time.
 - Assess costs for progress of partnership on personal, governmental, economic and ecosystem impact.
 - Infer common denominators between international competitive and cooperative partnerships.

Note to teacher: This activity integrates information as suggested in standard 13B at stage J. It should incorporate information from scientific research directly associated with specific curricular units while making the societal interconnections. Its impact can be enhanced with incorporation of social science performance descriptors from standards 14E-F, 15A, C-D, 16B-D, 17D and 18A.
2. Have students review and discuss the assessment task and how the rubric will be used to evaluate their work.
3. Present scope of “Futures for Sciences” project. How have/do/will scientific knowledge and technological advances affect(ed) the international community? Introduce the connections for this project as a starting or culminating component in a curricular unit. Establish historical and political background for settings in collegial university and pure science research to commercial competitive partnerships generally. Students should research and make classroom presentations which incorporate the pertinent scientific concepts and future potential from pure and applied scientific research to the economic, political, social, and environmental relationships of competitive and/or cooperative multinational partnerships. Determine grouping or individual responsibilities and parameters for presentation. Following presentations, students should infer the common (positive and negative and neutral) denominators associated with scientific and technological partnerships as world citizens for personal journal reflections.

4. Possible international or multi-national partnerships for consideration include:
 - The Human Genome Project for life sciences.
 - Global conferences or treaties (Montreal, Kyoto, Rio de Janeiro, South Africa) on sustainable development for environmental sciences.
 - Superconducting supercollider research for physical sciences.
 - Alternative energy engineering for chemical sciences.
 - Commercial ventures for mining the ocean floor for earth sciences.
 - International Space Station for earth and/or space sciences.
5. Evaluate the student's performance using the Science Rubric as follows and add the scores to determine the performance level:
 - *Knowledge*: The basic foundations for the necessities of sharing scientific knowledge and technological advances were complete and accurate.
 - *Application*: The analysis of a scientific partnership was thorough, well-organized and accurate.
 - *Communication*: The presentation of individual partnership research and contributions for group analysis were complete, well-organized and well-detailed.

Examples of Student Work not available

Resources

- Access to current research resources
- Science Rubric

Time Requirements

- 1-2 weeks for research, presentations discussions and reflections.