

SCIENCE AND HEALTH OCCUPATIONS CAREERS

Performance Standards 13B/12A-F/13A.J

Students will apply the interactions of the concepts, principles and interconnections of the life, physical and earth/space sciences to analyze health career and occupational decisions accordingly:

- *Knowledge*: identify and describe the interconnections of science associated with health occupations skills.
- *Application*: examine how scientific concepts influence health career and occupation decisions.
- *Communication*: present foundational scientific concepts and applications in on-the-job processes in health occupations.

Procedures

1. ***In order to know and apply concepts that describe the interaction between science, technology and society (13B); the fundamental concepts, principles and interconnections of the life, physical and earth/space sciences (12A-F); and the accepted practices of science (13A)***, students should experience sufficient learning opportunities to develop the following:

- Identify and describe the science-related knowledge in common use in the health occupational skill clusters.
- Interview people from a variety of health occupations to determine how knowledge of science influences their daily work.
- Correlate the pure science foundations to the applied health science connections in daily use.

Note to teacher: This activity integrates information as suggested in Standard 13B at Stage J. It should incorporate information from the life, environmental, chemical, physical, earth and space concepts from Goal 12. The format for this activity could be incorporated into all Goal 12 units to assure the understanding of the applications of science in the real-world applications of health occupations. Additional applications into the accepted practices of science in Standard 13A may be integrated as well. The various sciences are a major component of the technical skills Health Occupations students must understand to successfully enter this field of employment. Science courses taught to Health Occupations students become more meaningful when they can make this connection.

2. Have students review and discuss the assessment task and how the rubric will be used to evaluate their work.
3. Set the scope for this careers research project. Each student will gather information about the particular application of scientific concepts in health careers through research and interviews. An interview format is provided. Students should present their findings with appropriate visual aids and documented health occupations skill standards which require knowledge and application of performance elements. Following presentations, students should infer the common denominators associated with scientific knowledge, skills and behaviors in health career settings for discussion and personal journal reflections.
4. Suggestions from the National Health Care Skills Standards include:
 - From the Life Sciences: Bioethical health occupations issues related to genetics and genetic engineering and all cellular and organism metabolic processes, testing, diagnoses, treatments and prevention measures.
 - From the Environmental Sciences: Testing for environmental interactions of biotic and abiotic factors in varying environmental settings.
 - From the Chemical Sciences: Examine federal and state regulations regarding the handling, use and storage of radioactive, toxic and hazardous chemicals; apply Occupational Safety and Health Administration (OSHA) regulations to situations in which blood-borne pathogens exist and need to be labeled; execute a pest-control system appropriate for the facility.
 - From the Physical Sciences: Evaluate external support systems that provide services for patients relating to testing for force and motion in biomechanics and the Doppler effects in ultrasonic testing, motion and pressure with buoyancy factors in body fat measurements and blood pressure testing and nuclear physics applications for diagnosis and treatments.
 - From the Earth Sciences: Geographic, altitude and depth factors for health effects on disease and health.
 - From the Space Sciences: Utilize various factors that affect all health science issues associated with space travel, conditions for maintenance of life functions and projections for medical advances from space research.

- From Safety policies in 13B: Demonstrate handling and disposing of contaminants, chemicals and wastes from medical operations and processes; estimation and analysis of risks and benefits for medical procedures; and projecting medical emergency procedures and responsibilities.
5. Evaluate each student’s work using the Science Rubric, and add the scores to determine the performance level:
- *Knowledge*: The descriptions of the interconnections of science with health occupations skills were complete, detailed and accurate.
 - *Application*: The scientific influences in health career and occupational decisions were insightful and thorough.
 - *Communication*: The presentation was well focused, well organized and thoroughly explained through on-the-job applications in the health fields.

Examples of Student Work

- [Meets](#)
- [Exceeds](#)

Time Requirements

- One day to orient expectations
- Three-to-five days for research (in or out of class)
- Two-to-three days for ten-minute career presentations, discussions and reflections

Resources

- Integrating Science and Technology Career Interview suggestion page
- Career Interest Areas Overview (for teachers)
- Science Rubric

INTEGRATING SCIENCE AND TECHNOLOGY CAREER INTERVIEW

STUDENT DIRECTIONS

Conduct an interview with an individual in a health occupation or career. Develop a list of questions to use during the interview. Use the questions given below as a guide; modify or add to them to meet your needs. Be prepared to present your findings from the interview, either written, or orally to the class.

SAMPLE INTERVIEW QUESTIONS

Career Description

- ◆ Describe your job.
- ◆ How does knowledge of science affect your job?
- ◆ Describe any specific regulations in your job that have a scientific basis. What is the regulatory agency which enforces these regulations?
- ◆ How do you see technology affecting your job in the past 5-10 years? In the next 5-10 years?

Education and Training Requirements

- ◆ What special education or training is required to perform your job? What kind of high school training, post-secondary or on-the-job training have you had or would be helpful?
- ◆ What science skills are needed in your job? Does your job require expertise in assembling, maintaining, and repairing instruments? Does your job require you to do troubleshooting, analysis, recording, collecting data, or monitoring equipment or processes? How did you learn to do this?
- ◆ What kinds of mathematics skills are needed in your job?
- ◆ What communication skills are needed in your job?
- ◆ What were your career goals when you were in elementary, middle and high school? What about summer or part-time jobs?

Teamwork, Problem Solving, and Decision Making

- ◆ In your position, do you more often function as an individual or as part of a team?
- ◆ When working on a team, do you have the responsibility for making final decisions? How is the responsibility shared?
- ◆ Do you generate new ideas, solve problems, make decisions? Please describe the kind of processes you use with your colleagues to follow through with the new ideas, reach cooperative consensus, or find answers.
- ◆ Describe the ideal work atmosphere for teamwork, problem-solving and decision-making.

SCIENCE RUBRIC

Exceeds - must receive no more than one 3 and the rest 4s in the other areas of the rubric.

Meets - may receive no more than one 2 and a combination of 3s and 4s in the other areas of the rubric.

Approaches - may receive no more than one 1 and a combination of 2s, 3s or 4s, in the other areas of the rubric.

Begins - must receive at least a 1 in all 3 areas of the rubric.

	KNOWLEDGE	APPLICATION	COMMUNICATION
	Knows and understands scientific terms, facts, concepts, principles, theories and methods.	Applies scientific knowledge, skills and methods to manipulate, analyze, synthesize, create and evaluate.	Communicates scientific knowledge and applications through writing, speech and visual displays.
4	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are complete and correct. 	<ul style="list-style-type: none"> • Applications are thorough, appropriate and accurate. 	<ul style="list-style-type: none"> • Written, oral and/or visual communication is well organized and effective.
3	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are mostly complete and correct. 	<ul style="list-style-type: none"> • Applications are mostly thorough, appropriate and accurate. 	<ul style="list-style-type: none"> • Most of the written, oral and/or visual communication is well organized and effective.
2	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are somewhat complete and correct. 	<ul style="list-style-type: none"> • Applications are somewhat appropriate and accurate. 	<ul style="list-style-type: none"> • Some of the written, oral and/or visual communication is organized and effective.
1	<ul style="list-style-type: none"> • Descriptions of scientific terms, facts, concepts, principles, theories and methods are minimally present or correct. 	<ul style="list-style-type: none"> • Applications are minimally appropriate and accurate. 	<ul style="list-style-type: none"> • Little of the written, oral and/or visual communication is organized and effective.
0	<ul style="list-style-type: none"> • All descriptions of scientific terms, facts, concepts, principles, theories and methods are missing and/or incorrect. 	<ul style="list-style-type: none"> • All applications are missing and/or incorrect. 	<ul style="list-style-type: none"> • All of the written, oral or visual communication is missing and/or lacks organization.
Score			