

Integrated Project-based Learning: Combining PTE Standards and Academic Standards

Use this template for planning and sharing ideas for projects. This template is based on the 6 A's:

Authenticity Academic Rigor* Applied Learning* Active Exploration* Adult Connections* Assessment*

Project

Title of Project	Minerals in the Human Body
Project Developed by	Steve Barns and Shanna Legault
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School	Minico High School
Pathway / Small Learning Community/Academy	Health. Geology
Course Title(s)	Honors Geology (HA) and Health Occupations
Time Frame	1 Unit 10 days Geology and 2 days Health Occupations

Authenticity

Briefly describe your project. Include the key question and provide an overview of what students do and learn. Tell why the question is meaningful to the students and where one might see a similar question tackled by an adult in the workplace.

Key Question	Identify and describe the function of key minerals in the human body
Overview	<ul style="list-style-type: none">*Students will identify at least 15 key minerals in the human body.*The student will identify how the normal amounts of the mineral affect the human body.*Students will identify signs and symptoms of lack of minerals in the human body.*Students will identify the source of the minerals

Vocabulary/Key Terms

List vocabulary words and key terms essential to student understanding.

- *Normal Values
- *Mineral
- *Element
- *Bonding Ionic and Covalent
- *Mineral deficiency (identify at least 5)
- *Hyponatremia
- *Hypokalemia
- *Hyperphosphatemia
- *Anemia
- *Iron Deficiency
- *Goiter
- *Hypocalcemia and Chevostkii's sign

Active Exploration * Applied Learning * Adult Connections

What classroom-based, community-based, and career-based activities does the project involve? Include a description of the active exploration, applied learning, and adult connections in the project (as needed).

Active Exploration How does the project engage students in real investigations using a variety of methods, media and sources? What field-based work will students perform? How does student learning and service support active career exploration? Students will examine real models of homes. Math will explain scaled units in architecture. They will have lessons on home construction and the building codes for bids. How knowledge is used in industry?

Applied Learning How do students apply what they have learned and researched to a complex problem (e.g. designing a product, improving a system, creating an exhibit, organizing an event)? Lecture on industry usage of this concept i.e. model designs. Application with their own proportions also will be explored along with industry standards.

Adult Connections Who from the community, workplace, postsecondary and/or industry partnership works with students on the project? Lecture from local industry and community in home design.

Classroom Activities

*Geology

Identify 25 unknown minerals using physical properties.

*Health Occupations:

Determine which mineral is missing in a human by assessing hyper and hypo activity of muscles in the body.

Community Activities

*Geology and Health Occupations

Contact health care professionals in our community to determine the use of minerals in treatment of human, animals, plants etc.

Career Activities

*Geology

Mining, environmentalist, geological engineering, mineral processing, geological mapping

Health Occupations

Pharmacist, laboratory, surgeons, health care in general because it affects all the body

Academic/PTE Rigor

Standards Use the space below to list the state content standards and PTE industry standards addressed by the project. (A list of the content standards is available at <http://www.sde.idaho.gov/ContentStandards/default.asp>. This page, which includes selected high school level standards, is designed to let you easily create a list of standards you are addressing. You may then copy and paste the list into this template.)

Standards Geology:

Standard 1 goal 1.1, 1.6 and 1.8

Health Education Standards:

Standard 1,3,6,7,8

School to Career Competencies Please check (x) the competencies addressed by the project

- Communicate and understand ideas and information
- Collect, analyze and organize information
- Identify and solve problems
- Use technology
- Initiate and complete entire activities
- Act professionally
- Interact with others
- Understand all aspects of an industry
- Take responsibility for career and life choices

Student Goal(s) Once the project begins, ask students to generate one or two personal goals.

Students will understand the importance of minerals in the human body.

Students will understand the sources of minerals.

Students will identify diseases or illnesses that can be prevented with the accurate use of minerals,

Assessment

How do you and the students know the project is a success? What are your criteria for measuring students' achievement of the disciplinary knowledge and applied learning goals of the project? What evidence do they use to demonstrate their progress? What deliverables do they need to complete prior to the final exhibition? How will students self-assess?

Students will have identified 25 unknown minerals using common physical properties.

Students will be able to identify everyday sources in minerals that affect patient health.

Recommended Resources / Sample Products

Software or Materials Needed

(Examples)

DVD “Minerals and their uses”

Minerals samples, testing materials (hardness kits, porcelain plates, specific gravity testing equipment, stereoscopes, protective eyewear, physical property identification charts, lab, paper, pencils)

Internet interactive sites for assessment of physical body lacking minerals.

Teacher-Developed Materials

(Examples of materials that can be shared with other classes. Please attach samples.)

Power point, DVD, discussion materials

Student-Developed Materials

(Examples of products that can be shared with other classes. Please attach samples.)

Power point, lab sheets, signs and symptoms of mineral depletion

Websites Used

(Examples)

Websites listed on school computer

Final Words

(In a sentence or two, highlight your project’s overall value.)

Mineral identification and the ramifications on the body

Teacher Tips/Extensions

(Use the first person to share a useful idea that helps with implementation and ensures success. Make it chatty, informal.)

High quality lab equipment to identify physical properties.

Extensions

(List any ideas for students who may want to go deeper into the learning standards.)

Identify areas of regional mining operations where minerals processed.

List where minerals are produced. List uses of minerals for humans and community use. List general uses of minerals

Timeline

What sequence of teaching and learning experiences will equip students to develop and demonstrate the PTE standards and the Academic standards?

- Learn about common minerals
- Identify them by their physical qualities.
- Identify what minerals should be found in the human body
- Identify what the lack of minerals or too much minerals will do to the human body.
- Students will develop ad power points presentation which interpret minerals and their use in the human

Timeline

body.

(Adapted from the Boston Public Schools Signature Projects.)