uBEATS Teacher's Guide:

Careers in Pharmacy

(Grades 6-12)

This teacher guide is a supplementary text to support the use of the uBEATS "Careers in Pharmacy" module for grades 6-12.

To help students develop the knowledge necessary for an incredible future in health care, we created UNMC Building Excellence in Academics Through STEM (uBEATS), an online health science resource for Nebraska students.

UNMC uBEATS modules are short (15 minutes or less), interactive online health science modules to supplement curriculum taught in grades 6 – 12. These do not replace curriculum, but are a supplement for teachers and students incorporating evidence-based information and UNMC expert guided material. Each module is chunked into sections with formative and summative assessments with immediate feedback provided.

Tips on how to utilize uBEATS modules:

- Internet access is required to view uBEATS modules.
- For those who have access to one-to-one technology, modules can be used in or outside of the classroom as a topic introduction, extension, or review.
- For classrooms without individual student devices modules can be used in whole group instruction. Formative assessment questions can use the teacher's preferred call and response method and summative assessment questions can be displayed on the board and answered individually by students or printed and distributed to students after viewing the module.

Objectives

- List health science careers in Pharmacy.
- Determine courses that can prepare a person for a career in pharmacy.
- Explain how pharmacy professionals are involved in solving real-world problems.

Introduction

Did you know that most Americans live within 5 miles of a pharmacy? In fact, there are around 67,000 pharmacies nationwide, which is more than 4 times the number of McDonald's in the U.S.! Pharmacy careers are vital to the health and wellness of the nation as the vast majority of us will need pharmacy services at some point in our lives.

Prior Knowledge

Before beginning this module, the student should understand the Next Generation Science Standards (NGSS) featuring Three-Dimensional Learning.

Core Idea PS1.B Chemical Reactions A Framework for K-12 Science Education

- Chemical processes, their rates, and whether or not energy is stored or released can be understood in terms of the collisions of molecules and the rearrangements of atoms into new molecules, with consequent changes in total binding energy (i.e., the sum of all bond energies in the set of molecules) that are matched by changes in kinetic energy. In many situations, a dynamic and condition-dependent balance between a reaction and the reverse reaction determines the numbers of all types of molecules present. The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions. Chemical processes and properties of materials underlie many important biological and geophysical phenomena.

Science and Engineering Practices NGSS

- Constructing explanations and designing solutions

Crosscutting Concepts NGSS

- Patterns

Key Terms/Vocabulary

Pharmacy technician, pharmacist, prescriptions, medication therapy, vaccinations, side effects, pharmacy specialties, geriatric, nuclear, organ transplant, medication regiment, compounding, radioactive, diagnostic imaging, industry pharmacist, pharmaceutical companies.

Science Standards

Nebraska Science Standards

SC.HSP.6 Structure and Function: Anatomy & Physiology

- Gather, analyze, and communicate evidence of the relationship between the structures and physiological processes of the human body systems.

SC.HSP.3 Chemistry: Structure and Properties of Matter

- Evaluate a solution to a complex, real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Extensions of the lesson

- To help students become more familiar with the Key Terms of this module, the teacher can use the vocabulary list for a classroom Word Wall, or integrate the vocabulary into classroom word games during review sessions.
- To help the students see personal relevance, suggest that they privately ponder people they know (particularly relatives, friends, neighbors) who work in any of the careers mentioned in this module.

- As student misconceptions become apparent, the teacher may need to reinforce these important concepts:
    - High school science and math courses, especially chemistry and calculus, can prepare a student for a future career in pharmacy.
    - There are many different jobs in pharmacy, from hospitals and community pharmacies (which are the most visible to the general public) to pharmaceutical companies where industry pharmacists work “behind the scenes” producing medications.
    - When you visit a pharmacy to pick up a prescription, you may talk directly with a pharmacist or a pharmacy technician. Those two occupations have different responsibilities and different education requirements.
    - There are currently 14 pharmacy specializations, including geriatric pharmacy and nuclear pharmacy, all of which require additional education beyond the doctorate in Pharmacy.

Enrichment

- For information about career opportunities, see UNMC's Careers in Healthcare.
- The Occupational Outlook Handbook provides detailed information about becoming a Pharmacy Technician or a Pharmacist.
- UNMC's College of Pharmacy offers details about Pharmacy Technician Certification, as well as the Doctor of Pharmacy Program.
- To learn more about specialized pharmacy careers, see Board of Pharmacy Specialties.
- To make connections in your community, contact local hospitals, healthcare clinics, nurses, doctors, pharmacies, private pharmaceutical companies.