STEMJOBS℠
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5-E CLASSROOM STEM ACTIVITY:
WHY NURSING?

By Jill C. Cataldi

LIFE-THREATENING ILLNESS CREATES CAREER OPPORTUNITY

BY ELLEN EGLEY

For most people, being diagnosed with a potentially fatal disease could feel like the end rather than a new beginning. That was not the case for Emily Browne, who serves as the director of professional development and advanced practice at St. Jude Children's Research Hospital. STEM Jobs spoke with Emily to learn how she turned a scary diagnosis into inspiration for a new career.

STEM JOBS: What sparked your interest in pursuing a career in nursing?
EMILY BROWNE: I was diagnosed with leukemia when I was 17 years old. Prior to that, I wanted to be an elementary school teacher and had no interest in a health care career. I had never even heard of a nurse practitioner (NP), but was so inspired by the NPs who cared for me that I decided I wanted to be a pediatric oncology NP just like them.

SJ: What type of education is needed to be qualified for your position?
EB: In my professional development role, a doctor of nursing practice (DNP) or doctor of philosophy (Ph.D.) in nursing is preferred because you need a very clear understanding of the research process and how to implement research findings into clinical practice. You must be able to teach and mentor others in appraising research, evaluation methods, and dissemination of results.

For my role in supporting our advanced practice nurses (APN), being an APN is essential. APN is the collective term for nurse practitioners, clinical nurse specialists, nurse anesthetists, and nurse midwives. To be an APN, you need a master's degree in nursing (MSN) or doctor of nursing practice (DNP) degree with specialization in one of the four roles. Following graduation, you must pass a national certification exam.

SJ: What experiences did you have that were the most valuable on your path to your current career?
EB: My experience as a teenager with leukemia was definitely the biggest influence on my career trajectory, as well as my approach to patient care. I tried as hard as I could to always put myself in the shoes of the patient and family in front of me, to empathize with their situation. It is easy to get focused on checking off your to-do list, but being a patient and having many friends who were patients helped me to remember that every decision I made impacted the whole family.

SJ: What is your current role, and what all does that encompass?
EB: I wear two hats in my current role. The professional development component involves working with individuals or small groups of nurses and multidisciplinary team members to guide them through the decision-making process known as evidence-based practice. I lead the team in defining a question or topic, then searching for and appraising the research evidence related to that topic. If there is enough quality research to support a practice change, then I guide the team in implementing the change and evaluating the results of the change. Once that is complete, I mentor them in disseminating their results through presentation or publication. Many aspects of this role involve teaching, which I absolutely love to do. It is ironic that my initial ambition was to be a teacher and now I am both nurse and teacher.

The other piece of my role is to advocate for and support our APN and physician assistants (PA). I help to ensure that regulatory requirements are met and that their professional and educational needs are met. I also coordinate clinical rotations for visiting APN and PA students.

EMILY BROWNE
DIRECTOR OF PROFESSIONAL DEVELOPMENT & ADVANCED PRACTICE
DEGREES: DOCTOR OF NURSING PRACTICE (DNP), MASTER'S IN NURSING, BACHELOR'S IN BIOLOGY
YEARS IN THE INDUSTRY: 15
STEM TYPE: EXPLORER

"I TRIED AS HARD AS I COULD TO ALWAYS PUT MYSELF IN THE SHOES OF THE PATIENT AND FAMILY IN FRONT OF ME, TO EMPATHIZE WITH THEIR SITUATION."

SJ: What do you see as the future of the health care industry?
EB: Three areas come to mind as I think about the future of the health care industry. The first is the nursing profession. There are already over 3 million nurses in the United States, and the profession must continue to grow to meet the demands of the rapidly changing health care system. There is a growing physician shortage, especially in rural and economically disadvantaged communities, and APNs have shown that they can provide exceptional care to a substantial portion of this population's needs. We need to critically examine the role of each health care provider and the needs of the patient and ensure that each provider is practicing to the full extent of what they were trained to do.

The second area is technology. We are already seeing the incorporation of personal technology devices such as heart rate monitors and fitness trackers that are built into watches. Our bathroom scales can send data directly to our health records. Many of these instruments aren't yet "medical grade," but I anticipate that we will soon see an explosion in the number of wearable devices that can send information from patients directly to their primary care providers.

The third area is genetics and the realm of personalized therapeutics. In the future, more and more treatment plans and medications will be tailored to a patient's individual genetic results. I would not be surprised to see genetic testing occurring earlier and earlier in a patient's life to enable tailored disease surveillance and prescription selection.

SJ: What advice would you give to high school students who are interested in a career in nursing?
EB: Nurses provide holistic care, meaning they are attuned to the physical, mental, emotional, and spiritual needs of their patients. Therefore, nursing is a perfect example of a career where a well-rounded person will succeed. You must have interpersonal skills so that you can strongly advocate for a patient in one minute and console the family of a dying patient in the next minute. You must be flexible, adaptable, and a critical thinker. You need strong computer skills, a strong science foundation, and insights into human psychology. If you've not been exposed to a health care setting, explore hospital internships or volunteer opportunities, such as summer programs for children with special health conditions. Ask your family and friends to introduce you to nurses that they know and learn the story of how and why they became a nurse.

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Here are some ideas for how high school teachers could use this story as a launching point for integrated STEM learning. Our activities follow the 5-E Learning Cycle Model.

Part 1: Engage

1. Discuss with students reasons someone might go into nursing.
   Have students brainstorm and discuss reasons that a person would pursue a career in nursing.
2. Have students read the article "Life Threatening Illness Creates Career Opportunity" in STEM Jobs magazine.
3. Show the video found at edu.STEMjobs.com/teacher-resources.
4. Discuss the article and the video together as a group. Compare the discussion with the ideas brainstormed before reading the article. Were answers similar? Did reading the article and watching the video change any thoughts or help add to the list?

Part 2: Explore

For this project, students will think about and do research on reasons to become a nurse and what it means to be nurse. Students will work in teams of two to four to conduct interviews and do research. Students will need to find people in the community (friends or family members work well, but they can also reach out into the community) to interview. People they will be looking to interview include:

- A nurse
- A nursing student or someone hoping to one day be a nursing student (or both)
- Someone who feels a nurse had a strong impact on their life

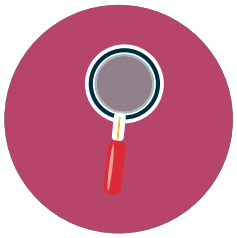
Members of the team will work as researchers, journalists, and videographers.
They will record interviews to be shown during presentations.
Questions to keep in mind when conducting interviews include:

- Why did you decide to become a nurse?
- What do you love most about being a nurse?
- What are some struggles of working as a nurse?
- What parts of STEM are used regularly in nursing?
  What science, technology, engineering, or math is used on a regular basis?
- What types of nursing are there? What ways are there to advance in a nursing field?
- Why is it important to be flexible and a critical thinker as a nurse?
- What do you see as the most rewarding part of this career?

Teams will keep a journal/scrapbook of their findings. They will need to take extensive notes during interviews and keep any pictures or brochures or anything they manage to collect while conducting interviews and research.

Part 3: Explain

Teams will present their projects for the class. The entire presentation may be an edited recording involving narration and interviews or a live presentation with interview reenactments. Students will need to include any information collected during their research.



Part 4: Elaborate

Tell students: You've done research on why people choose careers in nursing and what it means to be a nurse. Think about Emily Browne in the article *Life Threatening Illness Creates Career Opportunity*. In her interview, she mentioned that she wanted to be a teacher until an illness and experiences with nurses changed her career path. She also mentioned that teaching is now a part of her career as a nurse. Elaborate on nursing careers by brainstorming and finding other careers that might be combined with nursing. What might make good combinations? What might not be ideal combinations? Explain. Do research to support explanations.

Part 5: Evaluate

Provide the rubric at the beginning of the lesson to clarify expectations and objectives.
Each group will be graded, therefore all students in the group will receive the same score.

Scoring Rubric

____ /10 Participation
Did all members of the team contribute?
Is there significant research and data to support that each member did their part?

____ /20 Research
Was significant research completed?
Is there adequate data?
Were nursing professionals and aspiring nurses interviewed as part of the research?
Was the information collected during the interviews relevant and useful?

____ /5 Creativity
Was the overall project and presentation creative?

____ /15 Presentation
Did the presentation cover all areas of the process?
Were interviews included and relevant?
Were the visual aids relevant and appropriate and did they add to the overall presentation?

____ /50 Total

Teams will submit all research and presentation materials, as well as the journals/scrapbooks kept during the process (to be returned to students after grading is completed, if desired). Individual students will also submit a brief essay reflecting on their own contributions to the project. The reflection essay can be graded for completion or as a formal writing assignment toward each student's overall total.

Standards Addressed:

Common Core State Standards - Math

CCSS.MATH.CONTENT.HSA-CED.A.1 Create equations and inequalities in one variable and use them to solve problems.
CCSS.MATH.CONTENT.HSA-CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Next Generation Science Standards

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Cross-Curricular Connections

CCSS.ELA-LITERACY.RST.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.
CCSS.ELA-LITERACY.SL.9-10/11-12.1. Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-10/11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
CCSS.ELA-LITERACY.SL.9-10/11-12.1.a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.
CCSS.ELA-LITERACY.SL.11-12.1.d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.

Texas Essential Knowledge and Skills – Math

MMA.1.A apply mathematics to problems arising in everyday life, society, and the workplace
MMA.1.C select tools, including real objects, manipulatives, paper and pencil, and technology as appropriate, and techniques, including mental math, estimation, and number sense as appropriate, to solve problems
MMA.1.D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate

Texas Essential Knowledge and Skills – Science

P.2.E design and implement investigative procedures, including making observations, asking well-defined questions, formulating testable hypotheses, identifying variables, selecting appropriate equipment and technology, and evaluating numerical answers for reasonableness.