



5-E CLASSROOM STEM ACTIVITY:
COMBATING THE OPIOID CRISIS

By Dr. Alexandra Owens

LEAVING WALL STREET TO INVEST IN PATIENTS

BY SUE HAMILTON

A job start in business and finance on Wall Street that evolved into a career helping others as a psychiatric nurse may seem a strange career twist, but Alexander Swana knows it was the right path for him.

The tragic events of 9/11 impacted Alex and caused him to leave Wall St. and move from New York to Tampa, Florida, where he found work in the mortgage industry. That career continued when he met his wife and moved to Pennsylvania, but when the industry started its downhill slide, he began to search for a career helping people in need. His wife, who worked at a local community hospital, encouraged him to apply for a position as a milieu therapist on the hospital psychiatric floor. He took that position, which involved working with a group of patients who are encouraged to take responsibility for themselves and the others within the unit, and began a nursing career. "I decided to take advantage of the hospital's tuition reimbursement program and expand my education—that's when I became a nurse."

Alex had already earned a bachelor's degree in both science and psychology, but took classes at the community college while working to get his nursing license. He is currently studying to obtain a bachelor's degree in nursing, and works as a registered nurse at UPMC Mercy Hospital on the psychiatric floor.

"On a daily basis, my patients struggle with not only the disease of addiction, but also mental health disorders like depression, anxiety, schizophrenia, and more," explains Alex. "My daily goal is to help them realize that their current condition does not make them who they are, their choices do. I spend a lot of time encouraging them to make simple changes in their lives to get them back on track."



MILIEU IS FRENCH FOR "MIDDLE SPACE." THIS TYPE OF THERAPIST CREATES A "MIDDLE" ENVIRONMENT FOR PATIENTS TO HELP THEM LEARN COPING MECHANISMS TO USE IN THE REAL WORLD. THEY ALSO ACT AS THE CONTACT PERSON BETWEEN PATIENTS, FAMILIES, AND MEDICAL STAFF.

Alex has traveled extensively, and his travels brought him close to many people who have struggled with addiction and mental health issues. "Becoming a psych nurse has allowed me to help my patients overcome and live with their disease," reports Alex. The most challenging part of his job is that he sees some patients return again to the nursing unit. "I always remind them that Rome wasn't built in a day, and if they fail, they can always get up again!" The most rewarding part of his nursing career is seeing patients outside of the hospital. "There is not a trophy big enough to see the smile on their face knowing that they have fought and won!" explains Alex.

High school students interested in a nursing career should pursue a degree, Alex advises. "An education can never be taken away from you," he said, and there are many opportunities in the nursing field. "Once you become a nurse, don't be afraid to try everything until you find your niche." The health care industry is always changing, but Alexander's hope for the future is that the patient's best interest is never forgotten. "Patients should always receive the care and compassion they deserve." 📧

ALEXANDER SWANA
REGISTERED NURSE
DEGREES: BACHELOR'S IN
SCIENCE AND PSYCHOLOGY
YEARS IN THE INDUSTRY: 7
STEM TYPE: ADVISOR



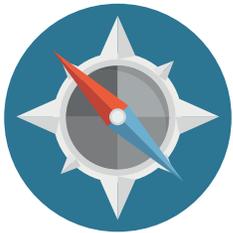
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Here are some ideas for how middle school teachers could use this story as a launching point for integrated STEM learning. Our activities follow the 5-E Learning Cycle Model.



Part 1: Engage

- ① Have students read the article “Leaving Wall Street to Invest in Patients” in *STEM Jobs* magazine. Discuss the following questions:
 - a. What various roles do nurses have in our daily lives?
 - b. What skills are needed to be a nurse?
 - c. Addiction in particular was a focus of this article—what additional skills may be needed to specialize in this field?
- ② Ask students what they have heard about the opioid crisis in our country. Show the video “The Facts on America’s Opioid Epidemic” found at edu.STEMjobs.com/teacher-resources to introduce the topic. Optionally you may also show the documentary “Understanding the Opioid Epidemic” found at edu.STEMjobs.com/teacher-resources if there is time. As always, we recommend educators preview suggested videos to ensure they are appropriate for their students, especially as this topic can be upsetting for students who have been affected by the opioid crisis.
 - a. What are the causes of this crisis?
 - b. Why is this now a public health emergency?
 - c. Why is opioid misuse so prevalent? Even among teens?
 - d. What role do nurses play in the treatment and prevention of opioid addiction?



Part 2: Explore

- ① Break students into small groups of three or four students.
- ② Ask students to research the opioid crisis and current treatment or preventative measures. This may be done as a group or individually. If needed, a list of recommended resources can be found at edu.STEMjobs.com/teacher-resources.
- ③ Challenge students to consider how they think is the best way to address this national crisis. Students must design a proposal that outlines a preventative measure or treatment strategy. This proposal should include the role that nurses will play in its success. Allow students to conduct more research as necessary.
- ④ Provide time for students to design their proposal and create a presentation to share with the class in order to get feedback.



Part 3: Explain

- ① Groups will present their proposal for a preventative measure or treatment strategy to the class. Each member should share the information that they were responsible for. Students should share their research and proposal using presentation software such as PowerPoint or Google Slides. Students must be able to explain how their proposal will help prevent or treat opioid addiction, the role of nurses, and other information they deem important. This includes a mathematical representation illustrating the projected impact of their proposed treatment, such as a data table or graph. Students may choose to focus on their community, state, or the entire country.
- ② After each presentation, allow audience members to ask questions and provide constructive feedback.
- ③ When all presentations are complete, ask groups to reflect on their feedback in order to improve their proposal.



Part 4: Elaborate

- ① Encourage students to inform the community using what they have learned about the national opioid crisis. Students should create an educational Public Service Announcement of their choice to spread awareness. This may include, but is not limited to:
 - a. Brochure
 - b. Flyer
 - c. Radio infomercial
 - d. Public Service Announcement video
 - e. Appearance on the local news channel
 - f. Editorial for the local newspaper
- ② Optionally, students may choose to create a video PSA to enter into a competition headed by Operation Prevention. A link to details about the competition can be found at edu.STEMjobs.com/teacher-resources.
- ③ Have students share their piece with the class for feedback and critique.
- ④ When complete, invite community members to visit your classroom to view student work through formal presentations or a gallery walk.



Part 5: Evaluate

Students will be evaluated for their proposal and PSA using the following rubric. 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.

<p>Scoring Rubric</p> <p>___ /20 Proposal and Presentation Was research on opioid addiction, prevention, and treatment completed? Did they consider this research in their proposal? Was a proposal of a treatment or preventative measure designed that is realistic and impactful?</p> <p>___ /20 Participation Did each student contribute to the overall project? Did each student assist in creating the presentation and proposal?</p> <p>___ /10 Public Service Announcement Did the PSA include a description of the opioid crisis and preventative measures? Was the PSA clean and easy to understand?</p> <p>___ /50 Total</p>

Standards Addressed:

Common Core State Standards - Math

CCSS.MATH.PRACTICE.MP1 Make sense of problems and persevere in solving them.

CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.

CCSS.MATH.PRACTICE.MP4 Model with mathematics.

Common Core State Standards - ELA

CCSS.ELA-LITERACY.RI.6.7 Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

CCSS.ELA-LITERACY.W.6.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

CCSS.ELA-LITERACY.W.6.2.A Introduce a topic; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

CCSS.ELA-LITERACY.W.6.2.B Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.

CCSS.ELA-LITERACY.W.6.2.C Use appropriate transitions to clarify the relationships among ideas and concepts.

CCSS.ELA-LITERACY.W.6.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.

CCSS.ELA-LITERACY.W.6.2.E Establish and maintain a formal style.

CCSS.ELA-LITERACY.W.6.2.F Provide a concluding statement or section that follows from the information or explanation presented.

CCSS.ELA-LITERACY.W.6.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

CCSS.ELA-LITERACY.SL.6.2 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.6.1.A Come to discussions prepared, having read or studied required material;

explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

CCSS.ELA-LITERACY.SL.6.1.B Follow rules for collegial discussions, set specific goals and deadlines, and define individual roles as needed.

CCSS.ELA-LITERACY.SL.6.1.C Pose and respond to specific questions with elaboration

and detail by making comments that contribute to the topic, text, or issue under discussion.

CCSS.ELA-LITERACY.SL.6.1.D Review the key ideas expressed and demonstrate understanding of multiple perspectives through reflection and paraphrasing.

CCSS.ELA-LITERACY.SL.6.2 Interpret information presented in diverse media and formats

(e.g., visually, quantitatively, orally) and explain how it contributes to a topic, text, or issue under study.

CCSS.ELA-LITERACY.SL.6.4 Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.6.5 Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

CCSS.ELA-LITERACY.SL.6.6 Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

CCSS.ELA-LITERACY.W.7.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

CCSS.ELA-LITERACY.W.7.2.A Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information, using strategies such as definition, classification, comparison/contrast, and cause/effect; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

CCSS.ELA-LITERACY.W.7.2.B Develop the topic with relevant facts, definitions, concrete details, quotations, or other information and examples.

CCSS.ELA-LITERACY.W.7.2.C Use appropriate transitions to create cohesion and clarify the relationships among ideas and concepts.

CCSS.ELA-LITERACY.W.7.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.

CCSS.ELA-LITERACY.W.7.2.E Establish and maintain a formal style.

CCSS.ELA-LITERACY.W.7.2.F Provide a concluding statement or section that follows from and supports the information or explanation presented.

CCSS.ELA-LITERACY.W.7.7 Conduct short research projects to answer a question, drawing on several sources

and generating additional related, focused questions for further research and investigation.

CCSS.ELA-LITERACY.W.7.10 Write routinely over extended time frames (time for research, reflection, and revision)

and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

CCSS.ELA-LITERACY.SL.7.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led)

with diverse partners on grade 7 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.7.1.A Come to discussions prepared, having read or researched material under study;

explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

CCSS.ELA-LITERACY.SL.7.1.B Follow rules for collegial discussions, track progress toward specific goals and deadlines, and define individual roles as needed.

CCSS.ELA-LITERACY.SL.7.1.C Pose questions that elicit elaboration and respond to others' questions and comments

with relevant observations and ideas that bring the discussion back on topic as needed.

CCSS.ELA-LITERACY.SL.7.1.D Acknowledge new information expressed by others and, when warranted, modify their own views.

CCSS.ELA-LITERACY.SL.7.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with pertinent descriptions, facts, details, and examples; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.7.5 Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

CCSS.ELA-LITERACY.SL.7.6 Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Standards Addressed (Cont.):

Common Core State Standards - ELA (Cont.)

CCSS.ELA-LITERACY.W.8.1 Write arguments to support claims with clear reasons and relevant evidence

CCSS.ELA-LITERACY.W.8.1.A Introduce claim(s), acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.

CCSS.ELA-LITERACY.W.8.1.B Support claim(s) with logical reasoning and relevant evidence, using accurate, credible sources and demonstrating an understanding of the topic or text.

CCSS.ELA-LITERACY.W.8.1.C Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.

CCSS.ELA-LITERACY.W.8.1.D Establish and maintain a formal style.

CCSS.ELA-LITERACY.W.8.1.E Provide a concluding statement or section that follows from and supports the argument presented.

CCSS.ELA-LITERACY.W.8.2 Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content.

CCSS.ELA-LITERACY.W.8.2.A Introduce a topic clearly, previewing what is to follow; organize ideas, concepts, and information into broader categories; include formatting (e.g., headings), graphics (e.g., charts, tables), and multimedia when useful to aiding comprehension.

CCSS.ELA-LITERACY.W.8.2.B Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.

CCSS.ELA-LITERACY.W.8.2.C Use appropriate and varied transitions to create cohesion and clarify the relationships among ideas and concepts.

CCSS.ELA-LITERACY.W.8.2.D Use precise language and domain-specific vocabulary to inform about or explain the topic.

CCSS.ELA-LITERACY.W.8.2.E Establish and maintain a formal style.

CCSS.ELA-LITERACY.W.8.2.F Provide a concluding statement or section that follows from and supports the information or explanation presented.

CCSS.ELA-LITERACY.W.8.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

CCSS.ELA-LITERACY.SL.8.1 Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.8.1.A Come to discussions prepared, having read or researched material under study; explicitly draw on that preparation by referring to evidence on the topic, text, or issue to probe and reflect on ideas under discussion.

CCSS.ELA-LITERACY.SL.8.1.B Follow rules for collegial discussions and decision-making, track progress toward specific goals and deadlines, and define individual roles as needed.

CCSS.ELA-LITERACY.SL.8.1.C Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

CCSS.ELA-LITERACY.SL.8.1.D Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented.

CCSS.ELA-LITERACY.SL.8.4 Present claims and findings, emphasizing salient points in a focused, coherent manner with relevant evidence, sound valid reasoning, and well-chosen details; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.8.5 Integrate multimedia and visual displays into presentations to clarify information, strengthen claims and evidence, and add interest.

CCSS.ELA-LITERACY.SL.8.6 Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Next Generation Science Standards

MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Science and Engineering Practices

Asking Questions and Defining Problems. Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions.

Disciplinary Core Ideas

ETS1.A: Defining and Delimiting Engineering Problems

The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful.

Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.

Crosscutting Concepts

Influence of Science, Engineering, and Technology on Society and the Natural World. All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment.

ISTE Standards for Students

3d Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

6a Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.

6c Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.

National Health Education Standards

1.8.2 Describe the interrelationships of emotional, intellectual, physical, and social health in adolescence.

1.8.5 Describe ways to reduce or prevent injuries and other adolescent health problems.

1.8.7 Describe the benefits of and barriers to practicing healthy behaviors.

1.8.8 Examine the likelihood of injury or illness if engaging in unhealthy behaviors.

1.8.9 Examine the potential seriousness of injury or illness if engaging in unhealthy behaviors.

3.8.1 Analyze the validity of health information, products, and services.

3.8.4 Describe situations that may require professional health services.

4.8.1 Apply effective verbal and nonverbal communication skills to enhance health.

8.8.1 State a health-enhancing position on a topic and support it with accurate information.

8.8.2 Demonstrate how to influence and support others to make positive health choices.

8.8.3 Work cooperatively to advocate for healthy individuals, families, and schools.

8.8.4 Identify ways in which health messages and communication techniques can be altered for different audiences

Standards Addressed (Cont.):

Texas Essential Knowledge and Skills - Math

- 6-8.1.A apply mathematics to problems arising in everyday life, society, and the workplace.
- 6-8.1.B use a problem-solving model that incorporates analyzing given information, formulating a plan or strategy, determining a solution, justifying the solution, and evaluating the problem-solving process and the reasonableness of the solution.
- 6-8.1.D communicate mathematical ideas, reasoning, and their implications using multiple representations, including symbols, diagrams, graphs, and language as appropriate.
- 6-8.1.E create and use representations to organize, record, and communicate mathematical ideas.

Texas Essential Knowledge and Skills - Science

Possible Standards Include:

- 6-8.3 The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions and knows the contributions of relevant scientists.
- 7.12.B identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems
- 7.13.B describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance

Texas Essential Knowledge and Skills - Technology

- 6-8.2.B communicate effectively with multiple audiences using a variety of media and formats

Texas Essential Knowledge and Skills - Health

- 6.4.B use critical thinking to research and evaluate health information
- 6.5.A define prescription and over-the-counter drugs
- 6.5.B describe the purposes of prescription and over-the-counter drugs, including the intended benefits
- 6.5.C explain why some drugs require a prescription
- 6.5.F identify and describe practices used to safely store and properly dispose of prescription and over-the-counter drugs
- 6.5.G explain the dangers associated with taking expired prescription and over-the-counter drugs
- 6.6.A explain the difference between the misuse and abuse of prescription drugs
- 6.6.B describe the misuse and abuse of prescription and over-the-counter drugs and the dangers associated with each
- 6.6.C describe how the abuse of drugs affects the body systems and brain
- 6.7.B describe chemical dependency and addiction to tobacco, alcohol, drugs, including prescription drugs, and other substances
- 6.7.C explain the relationship among tobacco, alcohol, drugs, and other substances and the role these items play in unsafe situations such as drinking and driving and Human Immunodeficiency Virus (HIV)/sexually transmitted disease (STD) transmission
- 6.7.D identify ways such as alternative activities to prevent the use of tobacco, alcohol, drugs, and other substances
- 6.7.E identify ways to prevent substance misuse, including the misuse of prescription and over-the-counter drugs, and substance use disorders
- 6.7.G identify and describe strategies for avoiding drugs, violence, gangs, weapons, and other harmful situations
- 6.7.I identify signs and symptoms of prescription drug misuse such as using medicine prescribed for someone else or for reasons other than its intended use
- 6.8.A identify how environmental influences may affect an individual's substance misuse and substance use disorder
- 6.13.F identify decision-making practices such as refusing invitations, knowing the risks of substance abuse, and reporting the abuse to a parent school administrator, teacher, or other trusted adult that reduce unsafe health behaviors
- 7-8.1.F examine the relationship between prescription drugs and illegal drugs
- 7-8.2.F identify the common side effects associated with each drug category on the body systems and brain
- 7-8.4.A use critical thinking to analyze and use health information such as interpreting media messages
- 7-8.4.H discuss the legal consequences related to the use of drugs, including the misuse of prescription drugs
- 7-8.5.A analyze the short- and long-term health consequences of prescription and over-the-counter drug misuse and substance use disorders
- 7-8.5.B describe how substance misuse, including prescription drug misuse, and substance use disorders affect the body systems and brain
- 7-8.5.C relate medicine and other drugs to communicable and noncommunicable disease, prenatal health, health problems in later life, and other adverse consequences
- 7-8.6.I identify and discuss efforts to prevent substance abuse, including prescription drug use, in the community
- 7-8.6.L differentiate between appropriate and inappropriate use of prescription and over-the-counter drugs and the resulting consequences of each
- 7-8.6.M describe how substance misuse, including prescription drug misuse, can lead to addiction
- 7-8.12.G discuss how substance misuse, including prescription drug misuse, and substance use disorders impact families and communities