NOMINATION FORM

CHE SERVICE LEARNING PROJECT COMPETITION

Institution: **Medical University of South Carolina**

Title of Project: **Graduate students Reaching Out With Science (GROWS)**

Director(s) of Project: **Sarah Cisewski and Krystal Nolan (Graduate Students)**

Contact Information of Project Director

Address: **68 President Street, MSC 501, Charleston, SC 29425**

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Establishment Date of Project: **Spring 2009**

Unit That Administers Project: **College of Graduate Studies/Graduate Student Association**

Total Number of Students Involved: **Since Spring 2009, approximately 90 graduate students and 1350 middle and high school students.**

Signature of Institutional President 

Mark S. Sothmann, Ph.D

PLEASE ANSWER THE FOLLOWING QUESTIONS REGARDING THE NOMINATED PROJECT (Insert your answer after each question.)

1. For purposes of this competition, the Commission on Higher Education defines service learning as college student learning at any level and in any situation that is linked in a direct, hands-on fashion to the resolution of a problem or concern in a target community outside the institution and is related to a college course with some type of reflection activity. Briefly, how does your project meet the parameters of this definition?

   A major highlighted problem across South Carolina, recently emphasized in the local Post and Courier article titled *Wanted: Female Engineers,* is the absence of cultivating excitement in the STEM fields (science, technology, engineering, and math) in middle and high schools. This has led to a deprivation in the workforce in South Carolina, where reports show there are 1.8 STEM jobs for every unemployed person in the state. The service learning outreach program, GROWS (Graduate students Reaching Out With Science), in collaboration with the Graduate Student Association and College of Graduate Studies at the Medical University of South Carolina (MUSC), strives to increase awareness and excitement surrounding scientific research and graduate education in Charleston County middle schools. Through the GROWS program, graduate students deliver interactive in-class presentations on a variety of biomedical topics. GROWS presentations are developed by graduate students at MUSC from information learned in their first and second-year coursework. Not only do these presentations introduce middle school students to the various biomedical sciences studied at MUSC, graduate students are exposed to teaching STEM subjects and encouraged to pursue further teaching opportunities. GROWS provides MUSC graduate students the opportunity to share their knowledge and passion for STEM related research with the community. Feedback that is received from middle school students, middle school teachers, and graduate student teachers after each session is evaluated to enable continuous improvement to the GROWS program (Please see our supplemental for reflections and responses from teachers). Through the development, delivery, and modification of GROWS presentations, graduate students at MUSC have learned how to better communicate scientific information to individuals in the community. This is critical for the development of effective teachers and for the dissemination of research results. GROWS serves as a beneficial role in enhancing early academic interest and excitement surrounding scientific study and increasing interest in educating students in the STEM fields.

2. Specifically, which segments of the college/university community does your project involve?

   Participation in the GROWS teaching program is open to all graduate students at MUSC. Since 2009 when GROWS was first initiated, students from the following departments have served as graduate student teachers: Bioengineering, Cardiology, Craniofacial Biology, Medicine, Microbiology and Immunology, Molecular and Cellular Biology and Pathobiology, Neurosciences, Pathology and Laboratory Medicine, and Regenerative Medicine and Cell Biology. The diverse scientific backgrounds of GROWS teachers provides middle school students with a unique opportunity to learn about the various applied sciences studied at MUSC, the numerous career

opportunities in scientific research, and the different educational paths that can be taken to get to graduate school. GROWS provides an excellent opportunity for graduate students from all departments to gain teaching experience and to share their knowledge and excitement about scientific research and the STEM fields with the local middle and high school students in Charleston County.

3. How many students (specify degree levels to the extent possible) does the project affect?

   GROWS impacts both graduate students at MUSC and middle school students in Charleston County. Approximately 20-25 MUSC graduate students have served as teachers since August of this school year. However, many more have participated since the inception of the GROWS program in 2009. All graduate students have bachelor's degrees and are pursuing masters, doctorate, medical, or dual degrees (MD/PhD and DMD/PhD) at MUSC. Since August of 2013, these graduate students have taught 30 GROWS sessions. We estimate that over 350 Charleston County middle school students have been served by the GROWS program this school year alone.

4. Describe the target community or communities that your project serves.

   The GROWS program is designed to target students enrolled in Charleston County middle schools. Through GROWS, these students are encouraged to develop a scientific attitude by participation in hands-on activities and are introduced to careers in scientific research and STEM fields. Since its establishment in 2009, graduate student teachers have taught in local public, private, magnet, and Montessori middle schools. For example, our interaction with Moultrie Middle School's Women in Charge Program has provided valuable STEM field exposure to the young women, and they are encouraged to pursue careers in these fields. At each type of school, we have found students to be largely unaware of the career opportunities provided by graduate education in scientific fields. Given our nation's interest in educating students in the STEM fields, we believe GROWS plays a beneficial role in enhancing early academic interest and excitement surrounding scientific study.

5. Describe your project's effectiveness in helping to solve the problems or concerns in the target community.

   The U.S. Department of Labor has projected that by 2014 the U.S. will have more than 2 million job openings in STEM fields. Even amid the worst economic recession in decades, hundreds of thousands of technology-related jobs went unfilled in 2009 due to a lack of qualified workers, according to Labor Department estimates. As acknowledged by the STEM mission, fewer than 15 percent of current U.S. college undergraduates are pursuing degrees in science, engineering, or mathematics-related fields. Multiple studies have found that many students either are not exposed to or begin to lose interest in these subjects as early as middle school. GROWS seeks to address these problems in Charleston County by cultivating middle school students' interests in science and engineering. This is done effectively through interactive and exciting in-class presentations delivered by participating graduate students. Middle school students are also encouraged to excel academically and are taught about rewarding STEM career opportunities. Because our program is available for all middle schools in Charleston County, we serve students at numerous schools

from a variety of backgrounds including race and family income. Approximately, 25.4% of students under the age of 18 in Charleston County are in poverty. In addition, of all the students in the Charleston County School District, an estimated 24,798 students are on free or reduced lunch. It is well documented and studied that family income is a key factor in the educational outcome for children. In Charleston County, there is room for improvement with a high school graduation rate of 75.5%. Our service-learning project aims to address this problem by creating awareness and excitement regarding STEM career opportunities to young and impressionable middle school students.

6. Describe the degree to which your project enhances student learning while providing examples of the service learning activities the students engage in. Also, explain how the service learning activities reinforce or apply what the students learn in the classroom.

   The GROWS teaching program provides four unique educational opportunities for graduate students at MUSC. First, graduate students who participate in GROWS gain valuable teaching experience in an environment outside of university academia. Second, graduate students learn to develop new and modify existing lesson plans based on the requests of middle school teachers and their specific research interests. Third, GROWS graduate studies are able to reinforce their learning and knowledge base within their studies. Lastly, through GROWS, graduate students learn basic scientific information beyond their immediate field of study. These four learning opportunities improve the ability of graduate students to communicate scientific information to individuals in the general community. Such communication is critical for the development of effective teachers that will participate in the broad dissemination and development of excitement for STEM topics.

   As described previously, GROWS is a science outreach program in which in-class presentations are developed and delivered by graduate students from MUSC's College of Graduate Studies. Graduate students have developed lesson plans for the following topics based on their previous coursework and research experience: Heart Health and Exercise; Brain Health; Bacteria, Viruses, Immunology; Cancer; Genetics; Nutrition; Mental Health, and Salt Marshes and Estuaries. Each lesson plan is designed to address basic biological concepts and to engage students in interactive hands-on learning (Please see our sample Neuroscience lesson plan.) For example, during the Brain Health presentation, graduate students first teach about the general functions of each region of the brain as well as how to keep our brains safe and healthy. Middle school students are then engaged in games related to memory and response time, and are challenged to identify how each part of their brain was used during the activities. The anatomy of the brain is explored further through a cadaveric human brain and spinal cord demonstration. In addition to having the opportunity to see and touch a human brain and spinal cord, students are encouraged during this time to ask questions, whether related to the presented material, scientific research, and/or STEM undergraduate and graduate education. In this way, middle school students are exposed to a unique relaxed atmosphere in which they can learn more about the STEM fields from graduate students who are pursuing STEM careers.

   In addition to teaching about specific biological concepts, throughout all GROWS sessions graduate students describe their educational path and their research interests. This provides a very unique opportunity for middle school students to be

exposed to recent advances in biomedical research and career opportunities in various STEM fields.

7. Is there academic credit associated with the project (not necessary for submission)? If so, please explain the particulars.

   There is no academic credit associated with GROWS. Participation in this community outreach project represents service learning in its purest form. We greatly appreciate all GROWS graduate teachers as they take time from their studies and research to assist in the education of students in our local community.

8. If funding is required, how is the project funded and what is the approximate annual budget for the project?

   The GROWS teaching program is funded largely by the Graduate Student Association (GSA) in the College of Graduate Studies. Approximately $100 is requested from GSA each semester to purchase new activity materials (e.g. dissection gloves, pipettes, and other disposable items). In addition, for use in the Brain Health demonstration, the Neuroscience department provides GROWS with a human brain and spinal cord, as well as safety glasses. The Marine Biomedicine and Environmental Science program also provides GROWS with a refractometer, a terrapin, and a baby alligator for the Salt Marshes and Estuaries module. GROWS is unique in that multiple MUSC departments support its service learning mission through financial assistance, donations, and graduate student support.

9. Feel free to add any other comments you may have about your project.

If you choose to include supplemental information about the project (such as brochures, pictures, etc.), please include at least five copies.

Please return this form via e-mail by to:

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Military Magnet Academy (Ms. Desbrow and Mr. Blaney)

MUSC GROWS students inspire high school students to pursue higher education. The MUSC students make my students aware of careers that are out there and what they need in order to be able to attain those career goals. This allows high school students to set a goal and make a plan to follow and keep them in school. The long and short of it is the MUSC GROWS students inspire my high school students to be like them.

Students become motivated to learn when they are presented with hands on activities. The labs and activities that the MUSC GROWS students bring in with them are wonderful because they fit into our curriculum and do not require any set up on our part. The MUSC GROWS students often have greater insight into the topics that they are teaching because they are currently doing research in those areas. It is wonderful to have experts teach our students.

MUSC GROWS students provide tutorials and labs to more than 200 students at Military Magnet Academy every semester. We have invited middle school students from our middle school in the past and they loved the activities as much as the high school students do.

Moultrie Middle School (Ms. Millibeth Currie)

As Program Director of "Women in Charge: Engineering Women's Lives", I have utilized the MUSC GROWS Module lessons for the past six years. In each case, my students have been able to explore questions they have about health and the human body. Our program is unique because our program is designed to increase young girls' knowledge of and interest in science and math. The MUSC GROWS program certainly accomplishes our aim!

The graduate students come into our classes eager to help them better understand the issues they are concerned with. For example, several students had concerns about heart disease because of family history. After the program presentation the students were able to better understand the risks of heart disease and how to prevent it. The modules fit my curriculum as the Science Department Chair of Moultrie Middle School. Each time the MUSC GROWS program has met with our program, 55 students have been helped. Students have studied the brain and spinal cord but they had so many unresolved questions prior the sessions. Afterward, our middle school students could grasp the details needed for deeper understanding.

G.R.O.W.S Program
Neuroscience Lecture

Introduction: Questions/Main Concepts

1. Ask students: "What do you think the brain does?"
    - Do you think it helps you walk?
    - Do you think it helps you talk?
    - Make decisions?
    - Breath? Eat? Wake up? Go to sleep?
    - The brain controls behaviors
    - Feel pain, Feel sadness, Feel happiness…
    - Overall, the brain has inputs (mainly sensory) and outputs (motor) – different parts of the brain are responsible for these tasks
2. How much does the brain weigh? Answer: average adult human = about 3 lbs.
3. How many neurons does the brain have? (Describe "neurons" = cells of the brain) Answer: about 100 billion

Some cool facts:
Average number of neurons in the brain = 100 billion
Number of neurons in *octopus* brain = 300 million (from *How Animals See*, S. Sinclair, 1985)
Number of neurons in *honey bee* brain = 950,000 (from Menzel, R. and Giurfa, M., Cognitive architecture of a mini-brain: the honeybee, *Trd. Cog. Sci.*, 5:62-71, 2001.)
Number of neurons in *Aplysia* nervous system = 18,000-20,000
Number of neurons in each segmental ganglia in the *leech* = 350

--- Your brain feels no pain. There are no nerves that register pain within the brain itself. Because of this, neurosurgeons can probe the brain while a patient is conscious (what fun!). By doing this, they can use feedback from the patient to identify important regions, such as those used for speech, or visualization.

--- An elephant's brain is huge - about six times as large as a human brain. However, in relation to body size, humans have the largest brain of all the animals, averaging about 2% of body weight. A cat's brain? It weighs about one ounce, a little over 1% of body weight.

Activity #1: Parts of the Brain

*** Before class, make handouts of the "Human Brain" worksheet

- There is a copy of a "teacher's guide" with parts labeled
- Go through parts of the brain
- Small brain picture shows four lobes and cerebellum

- Larger picture shows middle view (corpus callosum, brain stem – can also describe many more parts)

- Picture of parts of neuron

For teacher (pictures taken from "Neuroscience for Kids" webpage): http://faculty.washington.edu/chudler/experi.html

Descriptions of parts of the brain (wikipedia):

Frontal Lobes: The executive functions of the frontal lobes involve the ability to recognize future consequences resulting from current actions, to choose between good and bad actions (or better and best), override and suppress unacceptable social responses, and determine similarities and differences between things or events.Therefore, it is involved in higher mental functions.

Parietal lobes: The parietal lobe plays important roles in integrating sensory information from various parts of the body, knowledge of numbers and their relations[1], and in the manipulation of objects. Portions of the parietal lobe are involved with visuospatial processing. Although multisensory in nature, the posterior parietal cortex is often referred to by vision scientists as the dorsal stream of vision (as opposed to the ventral stream in the temporal lobe). This dorsal stream has been called both the 'where' stream (as in spatial vision)[2] and the 'how' stream (as in vision for action)[3].

Temporal lobes: The superior temporal gyrus includes an area (within the Sylvian fissure) where auditory signals from the cochlea (relayed via several subcortical nuclei) first reach the cerebral cortex. This part of the cortex (primary auditory cortex) is involved in hearing. Adjacent areas in the superior, posterior and lateral parts of the temporal lobes are involved in high-level auditory processing. In humans this includes speech, for which the left temporal lobe in particular seems to be specialized. Wernicke's area, which spans the region between temporal and parietal lobes, plays a key role (in tandem with Broca's area, which is in the frontal lobe). The functions of the left temporal lobe are not limited to low-level perception but extend to comprehension, naming, verbal memory and other language functions. Sound processing is controlled by the temporal lobes- in the Broca's area and Wernicke's area.

The underside (ventral) part of the temporal cortices appear to be involved in high-level visual processing of complex stimuli such as faces (fusiform gyrus) and scenes (parahippocampal gyrus). Anterior parts of this ventral stream for visual processing are involved in object perception and recognition.

The medial temporal lobes (near the Sagittal plane that divides left and right cerebral hemispheres) are thought to be involved in episodic/declarative memory. Deep inside the medial temporal lobes, the hippocampi seem to be particularly important for memory function - particularly transference from short to long term memory and control of spatial memory and behavior.

Occipital lobes: The most important functional aspect of the occipital lobe is that it contains the primary visual cortex.

Corpus Callosum: The **corpus callosum** is a structure of the mammalian brain in the longitudinal fissure that connects the left and right cerebral hemispheres. It also facilitates communication between the two hemispheres. It is the largest white matter structure in the brain, consisting of 200-250 million contralateral axonal projections.

The **cerebellum** (Latin for *little brain*) is a region of the brain that plays an important role in the integration of sensory perception, coordination and motor control. In order to coordinate motor control, there are many neural pathways linking the cerebellum with the cerebral motor cortex (which sends information to the muscles causing them to move) and the spinocerebellar tract (which provides proprioceptive feedback on the position of the body in space). The cerebellum integrates these pathways, like a train conductor, using the constant feedback on body position to fine-tune motor movements.[1]

Dendrites (from Greek δένδρον *déndron*, "tree") are the branched projections of a neuron that act to conduct the electrochemical stimulation received from other neural cells to the cell body, or soma, of the neuron from which the dendrites project. Electrical stimulation is transmitted onto dendrites by upstream neurons via synapses which are located at various points throughout the dendritic arbor.

The **soma**, or *cyton* or **perikaryon**, is the bulbous end of a neuron, containing the cell nucleus. The word *soma* is Greek, meaning "body"; the soma of a neuron is often called the "cell body". There are many different specialized types of neurons and the size of the soma can range from about 3 micrometres to over 1 millimetre for some of the largest neurons of invertebrates.

An **axon** or **nerve fiber** is a long, slender projection of a nerve cell, or neuron, that conducts electrical impulses away from the neuron's cell body or soma.

Myelin is an electrically-insulating dielectric material that forms a layer, the **myelin sheath**. Usually, myelin surrounds only the axon of a neuron. It is essential for proper functioning of the nervous system. Myelin is an outgrowth glial cell: Schwann cells supply the myelin for peripheral neurons, whereas oligodendrocytes supply it to those of the central nervous system.

Axon terminals are distal terminations of the branches of an axon. An axon nerve fiber is a long, slender projection of a nerve cell, or neuron, that conducts electrical impulses (called "action potentials") away from the neuron's cell body, or soma, in order to transmit those impulses to other neurons.

Chemical synapses are specialized junctions through which neurons signal to each other and to non-neuronal cells such as those in muscles or glands. Chemical synapses allow neurons to form circuits within the central nervous system. They are crucial to the biological computations that underlie perception and thought. They allow the nervous system to connect to and control other systems of the body.

Activity #2 (optional) – if there is plenty of time: Create a Neural Network

This is especially good if students are getting fidgety!

1) Assign each student a different role – as part of a neuron in the class
2) For example, if there are 20 students:

- assign 3 students to the soma (cell body)
- assign 2 students to the nucleus
- assign 5 students to the dendrites
- assign 5 students to axon
- assign 5 students to axon terminals

3) Have all students stand up and get into their assigned group
4) Align dendrites – connected to soma – with nucleus at the center – connected to axon – connected to axon terminals
5) Either have a toy/piece of paper/ or even just a phrase (like telephone) to be passed down the neuron.
6) Teach students that (most) neural messages are received at the dendrites (from other neurons) – the message is sent to the cell body – if the message is strong enough – it is propagated down the axon and out the axon terminals – to the synapse – where it will communicate with another neuron

QUESTIONS to ask students:

- Ask each group what their role is?
    - The dendrites receive signals from other neurons
    - The cell body houses all the important parts of the cell (mitochondria, Golgi apparatus, ribosomes, nucleus)
    - The nucleus contains the DNA and it makes protein
    - The axon propagates the signal. Also ask: What does myelin do? How does it affect the signal?

- The axon terminals are the last stop – message is sent out into the synapse via chemicals (neurotransmitters) and from there the message is sent to the next neuron.
- Talk about importance of a fast message and an accurate message (telephone game idea)

Activity #3 (optional): How much can you remember?

1. Ask students to make an estimate about how many words they think they can remember if they see a list of words
2. Discuss making estimations/ making hypotheses
3. For older students, make the hypothesis stronger with ideas such as:
    i. I hypothesize girls will remember more words than boys
    ii. I hypothesize girls will remember twice as many words as boys
    iii. I hypothesize I will remember more words if I can see the list for 1 minute versus seeing the list for 30 secs
    iv. (etc.)
4. Have students write down their "hypotheses" and ask a few to share them with the class
5. Present the list of words – show the words and say them quickly – then lay the piece of paper down so students can no longer see it. Make sure "pencils are down" so that students are not writing any of the words.
6. Pause at the end of the list
7. Then, let students pick up their pens/pencils and write as many as they remember.
8. Have students share their results – compare this to the hypothesis – talk about testing a hypothesis, trials, etc.

*** Discuss how the brain is working here:
VISUAL SYSTEM is involved in seeing the word (eyes – occipital lobe)
AUDITORY SYSTEM is involved in hearing the word (ears – temporal lobe)
MEMORY SYSTEMS: Have to remember the words (put in the "memory bank") – parts involved = hippocampus (temporal lobe), prefrontal cortex (frontal lobe)
ATTENTION: Brainstem – locus coeruleus (norepinephrine)
MOTOR SYSTEM: (parietal lobe – primary motor cortex, secondary motor cortex… and many other systems such as basal ganglia – spinal cord – muscles – nerves) – all of this is necessary to write the word (grip pencil, pressure to pencil to write, form words…) and to say the word back (if asked by teacher).
So many systems are necessary…
How do you make your brain work faster? More efficient?

PRACTICE MAKES PERFECT!!! Practice/training makes these systems better connected and "tuned up" for certain activities.

ACTIVITY #4 (optional): STROOP TASK

1. Hold up signs and ask students to yell out the word that is written
2. Hold up signs and ask students to yell out the color that the word is written in.
3. Which is harder? Why?

*** Our ability to read words is faster than reading the color (we read words every day – it is more practiced). Therefore, reading the word is an automatic behavior. It takes a lot more thinking to tell your brain to "stop" reading the word and think about what color it is written in. This involves mainly the prefrontal cortex/anterior cingulate (frontal lobe). Basically what the prefrontal cortex does is "quiets" the automatic behavior – you have to tell yourself "don't say the word", and then you can focus in on what color is being shown.

(Make note that some students, especially younger may have a lot of trouble with this… it has been found that children with ADD/ADHD will have a lot of difficulty with this task)

ACTIVITY #5: Brain demonstration

*** Bring gloves!

Make sure all students wear gloves – may be smart to bring nitrile in case there are latex allergies

Allow students to feel the weight of the brain and see how "spongy" it feels
Describe some areas of the brain that were mentioned earlier in class

*** MAKE SURE the brain is treated properly – this is the ONLY one we have to recycle for many, many classes and demonstrations. Do not cut, or peel back or pick at the brain. Watch students carefully so they do not break it apart or drop it!!!

Make sure gloves are disposed of properly and students wash their hands – the brain is preserved and these chemicals are dangerous if swallowed, etc.

ACTIVITY #6: POSTER

Pretty self-explanatory
Discuss the importance of protecting the brain: WEAR A HELMET!!!!
What happens if you don't wear a helmet? Can the brain be bruised or damaged? YES!

Eat a good diet!!! The brain requires fuel just like the rest of the body.

Read, learn new things, do puzzles. The brain needs exercise and to be active.
USE IT OR LOSE IT!

SCHEDULING A VISIT

MUSC's G.R.O.W.S Program will be offered year-round and, if desired, can be included as an after-school program or during summer school.

To schedule our visit to your classroom, please contact us by email at gsa@musc.edu or by phone by calling the MUSC Gives Back Office at 843-792-4094.

Your email or call will be returned within 24-48 hours.

Please note that MUSC G.R.O.W..S is operated by students who have class work and research requirements. We are excited to come to your classroom, but we ask that you please make your requests at least two weeks in advance.

MUSC
COLLEGE *of* GRADUATE STUDIES

ABOUT US

The Graduate Student Association of the College of Graduate Studies at MUSC serves as a liaison between students and faculty, as well as the Medical University as a whole. One of our major goals has been to increase involvement in the community, specifically improving awareness and excitement about scientific research. We have made strides in accomplishing this mission by judging local high school science fairs and helping with student research days at local colleges. The G.R.O.W..S program will allow us to continue this work.

As graduate students, we research important biomedical problems in order to understand the underlying causes of disease, to find new preventative strategies, and to discover novel therapies. The career path of a scientist is not as well known as those of students being trained to become medical doctors or dentists, but it is just as exciting and important. This program provides us with the opportunity to spark a scientific interest and curiosity in growing young minds. We sincerely hope you will consider this unique opportunity and schedule our visit to your classroom today.

MUSC
COLLEGE *of* GRADUATE STUDIES

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PROGRAM DESCRIPTION

PURPOSE

To increase awareness and excitement surrounding scientific research in Charleston County middle schools, to introduce students to various applied sciences studied at MUSC, and to provide MUSC graduate students the opportunity to share their knowledge of science and passion for research with the community.

OBJECTIVES

Following each presentation, participating students will be able to:

1. identify opportunities in scientific research.
2. discuss the biology surrounding common medical questions.
3. show a developing scientific attitude as evidenced by:
    - asking questions about the material presented.
    - participation in the hands-on activities.

STRUCTURE

A team of MUSC graduate students will deliver a 45-50 minute interactive in-class presentation related to the module(s) of your choosing. Each presentation will address basic biological concepts and associated medical concerns, while engaging students in a related hands-on activity. Modules are designed to promote interactive and hands-on learning. Students are encouraged to ask questions about the topic being discussed and about scientific research in general throughout the presentation.

MODULES

Heart health and exercise
Brain health
Bacteria, viruses, and immunity
Cancer
Genetics
Nutrition
Marine Biology
Others in development

EXAMPLE LESSON

During the Brain Health module we teach students about the functions of each part of the brain, discuss different ways to maintain a "healthy" brain, and challenge them with games related to memory and response time. We conclude the session by providing a cadaveric human brain and spinal cord demonstration.

RESOURCES PROVIDED

1. Two to three graduate student volunteers from MUSC.
2. Posters and/or PowerPoint presentations produced by the G.R.O.W.S. organizing committee.
3. All materials required for module activities.

REMEMBER: THIS PROGRAM IS ADAPTABLE TO WORK FOR YOUR CLASSROOM.