



May | Activity of the Month

Science for our Health: there's more to it than meets the eye

What's it about:

When you think of health, most likely you think of your doctor, and perhaps nurses, medicines, and hospitals. All very important parts of the health system, but along with these there is an amazingly broad and diverse range of research fields, and people, working to keep us healthy and improve our wellbeing from when we are young like you, to a little older like your parents and grandparents.

Let's have a look at some of the career fields that are possible in health science. Bet you didn't think physics would have anything to do with health! How about engineering? Play the game below with your friends, and delve into the worlds of your brain (neuroscience), psychology (the brain and how we behave), aboriginal health, microbiology, geography, health and social policy, medical physics, and engineering.

What to do:

1. Together with some friends or classmates, find out what some Uvic health scientists are researching and discovering. Read the eight [scientist profiles](#) that follow, and have a look at these websites: <http://web.uvic.ca/psyc/people/faculty/macdonald.php> for Stuart MacDonald Psychologist, and <http://cahr.uvic.ca/> for the Centre for Aboriginal Health Research.
2. Now you are ready for the game. Print off a copy of the question sheets and cut along the lines so you have a set of 30 questions. Choose a questioner and teams, just like Jeopardy or your favorite TV game show.
3. See how much you've learned about the science of our health. Good luck!

Questions

Brian Christie studies brain disorders. Which of these is not a brain disorder?

- Fetal Alcohol Spectrum Disorder
- Autism
- Blindness
- Fragile X Syndrome
- Alzheimer's disease

Answer: All of these except blindness are brain disorders or diseases that Brian Christie studies.

The goal of Dr. Christie's neuroscience research is to?

- Develop treatments for brain disorders
- Improve the brain structure and function of people with these disorders
- Improve the quality of life of individuals with these disorders
- All of the above

Answer: All of the above are things that Brian Christie is working to achieve.

What is one of the most interesting findings that Dr. Christie has made?

- Brains are pretty squishy and give a lot of people the creeps.
- Exercise helps grow new brain cells.
- Neither of the above.

Answer: Christie found that aerobic exercise can help grow new brain cells. The brain, he says, is much more dynamic than other scientists may have thought. So get out there, exercise, and grow some new brain cells in the process.

In order to work in the Division of Medical Sciences at the University of Victoria you must be a medical doctor?

- True
- False

Answer: False. While there are medical doctors in the Division, many other researchers such as Michael Hayes come from other fields like geography and epidemiology.

What public investments may lead to better health outcomes and disease prevention?

- A good education
- Stimulating, and licensed, childcare early in life
- Safe housing
- All of the above

Answer: All of the above, as well as programs that positively address poverty, can all improve people's health outcomes according to Michael Hayes.

How can research on health outcomes help policy makers?

- They can use the research results to find out how people are likely to vote.
- They can use the research to help make communities safer places to live.
- They can use this research to decide where to locate restaurants.

Answer: Public health research is used to help policy makers make communities safer places to live.

Stephanie Willerth is a biomedical engineer. What does she study?

- Robots and computers
- Nematodes (a type of worm)
- How biological and engineering knowledge can help to solve health related problems

Answer: Biomedical engineering is the application of engineering principles and design concepts to biology to help solve health problems.

How does Dr. Willerth use stem cells in her research?

- To grow stems and leaves for important plants.
- To grow strong bones which will support the spinal cord.
- To grow and/or repair damaged tissues in the central nervous system

Answer: In her lab, Dr. Willerth designs and develops stem cell replacements for repairing damaged tissues from neurotraumatic injuries to the spinal cord part of the central nervous system.

What classes or subjects are important for students wanting to become biomedical engineers?

- Biology
- Chemistry
- Physics
- All of the above

Answer: All of these subjects are important in biomedical engineering. Students should also be strong in mathematics and enjoy technology.

Francis Nano is a microbiologist. What do microbiologists study?

- microscopes
- microscopic life
- extremely small objects

Answer: Microbiologists study microscopic life such as bacteria and viruses. Some microscopic life may cause or cure certain diseases.

What is the function of a vaccine?

- Vaccines keep people healthy, just like vitamins
- Vaccines are medical products developed to protect people from serious illnesses or diseases by helping the immune system recognize harmful viruses or bacteria
- Both of the above

Answer: Vaccines are developed by microbiologists and doctors to help protect people from serious illnesses or diseases.

Nigel Livingston works with the CanAssist program at the University of Victoria.
What does CanAssist do?

- Helps students pass their tests.
- Helps the University build new classrooms
- Helps people with disabilities live better lives

Answer: CanAssist is an organization dedicated to helping improve the quality of life for people with special needs.

What is an assistive device?

- A technology that helps improve a person's quality of life.
- Assistive devices can utilize both simple and complex technologies.
- Both of the above

Answer: Both of the above. An assistive device is any technology (simple or complex) that can help improve a person's quality of life.

If you were going to design an assistive device for someone, what is the most important thing to know?

- You need to know electronics and programming to make devices.
- You need to fully understand the person's specific needs before designing any assistive device.
- You need to know how to construct machines.

Answer: According to CanAssist, before designing an assistive device the most important thing to know is what a person's specific needs are.

What kinds of technologies has CanAssist designed?

- Communication systems for people who are unable to talk.
- A hair brush so a girl with cerebral palsy can brush her hair.
- Technologies that improve people's quality of life and independence
- All of the above.

Answer: CanAssist has designed all of these types of technologies and many more.

What is the number one cause of death in young people?

- Accidents
- Influenza (Flu)
- Cancer

Answer: Cancer is the number one cause of death in young people according to the Canadian Cancer Society.

Which of the following cancer treatments is physicist Dr. Jirasek working to make more effective?

- Surgical removal
- Chemotherapy
- Radiation therapy
- All of the above

Answer: Dr. Jirasek is working on more accurate dose measurements of radiation therapy treatments of cancer. Radiation therapy is used in treatment of about half of all cancer cases.

To understand how to maximize the impact of radiation therapy on cancer cells, while minimizing damage to the surrounding healthy cells, Andrew Jirasek is developing 3D detectors. What are 3D detectors?

- 3 Doctor Detectors
- 3 Disease Detectors
- 3 Dimensional Detectors

Answer: 3D detectors are 3 Dimensional detectors. They help confirm, by measurement, how well the radiation doses have hit their intended mark, the cancer tumors.

Peter Keller studies the distribution of pollution and the relationship with human health. Where can we find pollution in BC?

- Indoors
- Outdoors
- Both indoors and outdoors

Answer: There are pollution sources both inside our homes as well as outdoors. All of these must be considered when studying the relationship between people's health and their environment.

What is the BC Atlas of Wellness?

- It contains maps of Canada.
- It teaches people about the world.
- It is a series of maps which show health and wellness factors across British Columbia.

Answer: The BC Atlas of Wellness contains many different maps showing how health and wellness factors, such as activity levels, are distributed around our province.

What is one key finding from the BC Atlas of Wellness?

- Eating right, being active, and having a positive outlook can help your overall well being.
- Government may need to regulate certain industrial pollution
- Canada has many different variables for measuring individual health.

Answer: According to Dr. Keller's research and the BC Atlas of Wellness, eating right, being active, and have a positive outlook are all associated with an individual's overall well being.

What is psychology?

- The study of ghosts and other paranormal phenomenon
- The study of mental powers
- The study of the brain and human behavior

Answer: Psychology is the study of the brain and human behavior. Medical psychologists might study how the brain functions or help people with traumatic brain injuries, while other psychologists might study the behaviors behind drug addictions or how behaviors change as children grow up.

Dr. Stuart MacDonald studies the neuroscience of how people age. He is especially interested in the early identification of risk factors that foreshadow cognitive impairment. What risk factors does he study?

- Biological factors like brain activity, nervous responses, and muscle tone
- Genetic factors like family history of neurological diseases
- Psychological factors linked to mental illness or other diseases
- All of the above

Answer: Stuart MacDonald looks at all of these risk factors in his research.

fMRI stands for functional magnetic resonance imaging. What is this specialized scanning technology used for?

- It is used to attach metal to the body.
- It is used to put iron in human blood.
- It is used to take images of the body.

Answer: fMRIs are used to take images of the body. Stuart MacDonald uses fMRI to look at changes in brain activity as people age.

What is the main mission of the Center for Aboriginal Health Research?

- To help create a health plan for different aboriginal communities.
- To provide research and information on important aboriginal health issues like diabetes.
- To monitor water quality and advocate for safe drinking water in aboriginal communities.
- All of the above.

Answer: The Center for Aboriginal Health Research works on all of these, and many other important health issues affecting aboriginal communities.

Aboriginal communities have many of the same health issues as other communities. However there are some key differences. Do you think the rates of heart disease, diabetes, tuberculosis, and HIV/Aids are higher or lower in aboriginal communities?

- Higher
- Lower

Answer: The rates of these health issues are significantly higher in Aboriginal compared to non-aboriginal communities.

How can research on aboriginal health help communities and policy makers?

- Aboriginal health research can be used to identify issues in different aboriginal communities.
- The research can be used to help make these communities healthier places to live.
- The research can be shared with aboriginal communities in other nations.

Answer: All of the above. The research from Center for Aboriginal Health Research accomplishes all of these and more.

Cecilia Benoit studies 'health inequities' or avoidable health inequalities in Canada and many other countries. How does she suggest that these inequities are changing over time?

- They are getting worse or deepening
- The situation is improving
- Things have stayed the same

Answer: Inequalities in health have deepened (become worse) in Canada and elsewhere in recent decades.

Which of the following health research areas is Cecilia Benoit involved in?

- Health of Aboriginal girls and women in Vancouver's Downtown Eastside
- Health of female adolescents with obesity and asthma
- Health of homeless youth
- Health of pregnant and early parenting women using addictive substances
- All of the above

Answer: All of the above. Cecilia Benoit's community-based research with vulnerable populations has helped improve the lives of many of those who live outside the mainstream.

The problematic use of addictive substances leads to substantial health and social problems, as well as high costs for residents of British Columbia. Which substances does the Centre for Addictions Research of British Columbia focus on?

- Alcohol
- Tobacco
- Other drugs
- All of the above

Answer: All of the above. For more information go to <http://www.carbc.ca/>