



Tec Voc teacher John Wren says the new approach is a switch from a clinical, top-down approach.

Teachers test new curriculum — with emphasis on vaccines, climate change and Indigenous perspectives

## Science experiment in Manitoba schools

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MANITOBA is piloting a new science curriculum that mandates lessons on vaccination in Grade 9 and puts Indigenous ways of knowing at the forefront of all classroom labs. More than 100 teachers in 19 school divisions began testing out renewed lesson plans for kindergarten-to-Grade 10 science this fall.

The updated documents are slated to replace existing ones developed between 1999 and 2003.

Each is guided by five themes: Indigenous people within the natural world, science identity, scientific knowledge, practical science and the nature of science.

"We really want Manitoba students to see themselves as scientists — not the people in white lab coats, always, but to approach our world with curiosity, seeking to understand and seeking to question," said Janet Tomy, assistant deputy minister of student achievement and inclusion.

Tomy, who said the province is proud of the updates, noted there's an increased emphasis on Indigenous perspectives and sustainability in the latest editions.

Climate change and the human processes that affect it are now explicitly mentioned in Grade 5, along with water conservation and Indigenous traditional teachings on the resource.

While most existing topics have carried over, from investigating seasonal changes in Grade 1 to the study of plant and animal cells in Grade 8, they are categorized differently.

Teachers have fewer specific outcomes to cover and more flexibility on how to achieve them, said Greg Johnson, a member of the science curriculum renewal team.

"Core science is core science, but this curriculum is no longer cluster-based. It's big-idea-based," Johnson said.

Evolution, a "big idea" that emphasizes change happens over time, is introduced across grades 1, 3, 6, 9 and 10.

All high schoolers will get a crash course on the history of natural and sexual selection, selective breeding and genetic modification.

Previously, introductory genetics was optional because it is taught in a senior biology course and Manitoba students have the option to discontinue science after Grade 10.

John Wren, president of the Science Teachers Association of Manitoba, called that change "a big step forward," given genetic engineering is slated to play a major role in society in the coming decades.

"It's going to be important, from farmers to having a child using IVF (in vitro fertilization), you're going to start to get asked questions like, 'Do you want to know what kind of genetics your baby has?'" said the science teacher at Technical Vocational High School.

The new approach is holistic in contrast to the "dry" and "clinical" top-down guidance in documents that preceded it, Wren said.

"It's pretty exciting, for me, that I get to do things and change things a decade into teaching. I'm excited to shake off some of the weight of that old curriculum," he said, adding the new one is more focused on modern-day issues to hook students.

Among the changes, Grade 9 students have to demonstrate an understanding of the nature of adaptation in infectious diseases and related public health measures.

"Include: preventative medicine, mutation, strain, antibiotics, vaccines, antibiotic resistance, waning effectiveness, waning immunity," states an excerpt of the module.

Vaccines were formerly only included in Grade 11 biology.

Johnson noted he and colleagues on the renewal team conducted their work in the wake of the COVID-19 pandemic.

Concerns about misinformation related to immunization and measures to slow the spread of the virus were top of mind.



The new curriculum is 'big-idea based,' says Greg Johnson, a member of the renewal team.

The new curriculum at large makes clear that "scientific literacy is an important feature of a well-functioning society," said Johnson, who teaches science at the Westwood Collegiate.

Ellen Watson, an assistant professor of curriculum and pedagogy at Brandon University, endorsed the new emphasis on how scientific processes work and understanding changes over time.

"There's definitely an attack on expertise and I think that science would fall into that. In Canada, we saw it rampantly with the vaccine protests," Watson said.

The researcher, who studies epistemic beliefs about science, said teaching students more about how evidence is weighed and evaluated should make a difference.

All of the documents discuss the peer review process and how expert consensus is valued in "the scientific endeavour."

Before the curriculum is finalized, elementary science teacher Anju Bajaj said she hopes edits will be made to acknowledge climate anxiety, climate justice and environmental racism.

"These topics are essential for fostering critical climate literacy and preparing students to address real-world challenges. Including them would provide a more comprehensive understanding of environmental issues," said Bajaj, a science, technology, engineering and mathematics adviser for Manitoba Catholic Schools.

Teachers, parents, students, Indigenous groups, academics and experts from the agriculture industry took part in consultations over the last two years.

Curriculum consultants are scheduled to summarize the contents today at a conference organized by the science teachers association.

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