CMASTE
Centre for Mathematics, Science, and Technology Education

GlycoNet

UNIVERSITY OF ALBERTA
FACULTY OF EDUCATION

Student debate:

Drug affordability and accessibility

Author
David Lagacé

Educational objectives
This lesson plan falls within the “Environmental Awareness and Consumer Rights and Responsibilities” theme of the Broad Areas of Learning (QEP, Ministry of Québec). Students will discuss the prices of drugs and medicines. Pharmaceutical companies, along with their investors, sometimes set high prices for their life-saving drugs. Are these prices justified? How much does it really cost to develop these drugs? Students will be required to debate these questions and to develop an informed opinion.

Target class			
Cycle and year: 2nd Cycle 1st Year		Timing: After January	

Time devoted to the activity
Two periods of 75 minutes

Activity type
■ Classroom debate

Introduction
In order to pique students’ curiosity around this subject, the teacher presents the following (or similar) article from CBC news about recent surges in the prices of some off-patent drugs. The article can be printed and distributed, or projected at the front of the room. http://www.cbc.ca/news/health/turing-clinton-prescription-drugs-1.3238202

Targeted Competencies		
□ CD2	Makes the most of his/her knowledge of science and technology ❑ Puts scientific or technological issues in context (2nd cycle) ❑ Understands the scientific principles underlying the issue (2nd cycle) ❑ Forms an opinion about the issue (2nd cycle S&T)	❑ Appropriate use of scientific and technological concepts, laws, models and theories ❑ Relevant explanations or solutions ❑ Suitable justification of explanations, solutions, decisions or opinions
□ CD3	Communicates in the languages used in science and technology ❑ Participates in exchanging scientific and technological information ❑ Interprets scientific and technological messages* ❑ Produces and shares scientific and technological messages*	❑ Accurate interpretation of scientific and technological messages* ❑ Appropriate production or sharing of scientific and technological messages*
Students should begin by researching the subject to develop an argument. Students will then be assigned an opinion (for or against) and divided into one of three groups: economic, social, or scientific.		

Cross-curricular competencies			
Intellectual	Communication-related	Personal and social	Methodological
Uses information	Communicates appropriately	Cooperates with others	Adopts effective work methods
Exercises critical judgement		Respects others	
Students must demonstrate critical judgement in selecting articles for research that are relevant to the debate question. Articles must be cited appropriately, and taken from reliable sources (newspaper articles, reports from national or international bodies, scientific articles, etc.).			

BAL and focuses of development		
□ Personal and career planning ❑ familiarity with the world of work, social roles, and occupations and trades	□ Health and well-being ❑ Self-awareness and awareness of basic needs ❑ Awareness of the impact of his/her choices on health and	□ Citizenship and community life ❑ Promotion of the rules of social conduct and democratic institutions ❑ Participation, cooperation, and

	well-being	solidarity ❑ Contribution to a culture of peace
□ Media literacy ❑ Awareness of the place and influence of the different media in his/her daily life and in society ❑ Understanding of media representations of reality ❑ Knowledge of and respect for individual and collective rights and responsibilities regarding the different media	□ Environmental awareness and consumer rights and responsibilities ❑ Construction of a viable environment based on sustainable development ❑ Responsible use of goods and services ❑ Awareness of social, economic, and ethical aspects of consumption	

One of the educational aims of this lesson is for students to explore the factors influencing drug prices, as well as their social and economic consequences. Specifically, the debate requires students to investigate the effects of high drug prices on the accessibility of some medicines in developing countries, as well as the effects of these prices on the health care systems of developed countries. For this reason, the debate falls within the "Environmental awareness and consumer rights and responsibilities" Broad Area of Learning.

Compulsory concepts

■ The living world ■ The technological world

Cultural references

- The pharmaceutical industry
- The Québec health care system

Prerequisite knowledge
This debate should be carried out after students have been introduced to immunity and immunization. It is an extension activity that can be linked to vaccination as a method of protecting against infectious diseases and the costs associated with developing new vaccines and drugs. Students will be required to form an opinion about whether or not pharmaceutical companies are justified in selling their products at their current prices.

Compulsory concepts	Optional concepts
Compulsory concepts developed in this activity, listed by concept	Optional concepts developed in this activity, listed by concept
Living World - Lymphatic system - Vaccination **Technological World** - Marketing - Pharmaceutical engineering	

Intradisciplinary or interdisciplinary links
Social world (economy) Mathematics (percentage)

Textbook resources
Observation Manual (2nd year of the 2nd cycle, the environment)

Internet resources
Online documents Debates on drug prices 1- https://www.nytimes.com/2016/09/28/business/furor-over-drug-prices-puts-patient-advocacy-groups-in-bind.html?_r=0 2- http://www.cnbc.com/2016/01/11/ceos-whats-missing-in-the-drug-pricing-debate.html 3- http://www.theglobeandmail.com/news/national/canada-wont-see-inflated-epipen-prices-allergy-official/article31570003/ 4- http://pharmacare2020.ca/assets/pdf/The_Future_of_Drug_Coverage_in_Canada.pdf 5- http://www.pmprb-cepmb.gc.ca/news.asp?a=view&id=186 6- http://www.cbc.ca/news/health/prescription-drug-prices-1.3239317 7- http://www.cbc.ca/news/health/overdiagnose-underuse-1.3927847 Steps and cost of the development of a drug 1- http://www.fda.gov/forpatients/approvals/drugs/default.htm 2- http://phrma-docs.phrma.org/sites/default/files/pdf/rd_brochure_022307.pdf 3- http://www.hc-sc.gc.ca/dhp-mps/prodpharma/activit/fs-fi/reviewfs_examenfd-eng.php 4- https://www.scientificamerican.com/article/cost-to-develop-new-pharmaceutical-drug-now-exceeds-2-5b/ 5- https://www.washingtonpost.com/news/wonk/wp/2014/11/18/does-it-really-cost-2-6-billion-to-develop-a-new-drug/?utm_term=.765ba57f36f6

CMASTE
Centre for Mathematics, Science, and Technology Education

GlycoNet

UNIVERSITY OF ALBERTA
FACULTY OF EDUCATION

Lesson Timeline

Student debate: Drug affordability and accessibility

(CD2 and CD3), (CT8): Exercise critical judgement

Lesson Preparation
Activity 1 (75 minutes) - Present the article about the CEO who bought an off-patent drug and subsequently raised its price by 5500% (5 min) - Facilitate a discussion about the price of drugs based upon the reading/video presented above (10 min) - Generate a well-defined debate question with the students (5 min) - Explain how the debate will proceed, and define the role of each participant (5 min) - Present the evaluation rubric (5 min) - Explain the difference between a primary, secondary, and tertiary source of information: (https://en.wikipedia.org/wiki/Wikipedia:Identifying_and_using_primary_sources) (10 min) - The students begin their literature search, and read a minimum of three references proposed by the teacher (see above) in addition to two references of their own choosing (35 min)
Lesson Activities
Activity 2 (75 minutes) - The teacher divides the class and assigns a position (preferably randomly) to each group, either in agreement with or against the perception that drug prices are too high (5 min) - The teacher informs the students that there will be three debates, each covering a different perspective – economic, social, and scientific (5 min) - For a class of thirty students, there will be three groups (one for each perspective). For each group, there will be two teams of five who compete. Each student will have one minute to speak, alternating between the teams. Alternatively, a more formal debate setup is found here (5 min) - Once the instructions and format have been discussed, the students continue their research with members of their team (60 min). Activity 3 (60 minutes) - The third class is devoted to the debate. Instructions and format are given to students in the prior class. The teacher acts as facilitator and mediator, and appoints one student to act as a timekeeper to ensure the 1-minute limit is respected. A second student acts as secretary by recording the arguments of each presenter into a smartboard table.

Conclusion and Reflection

Activity 4 (15 minutes)

- At the end of the debate, the teacher draws the class back for a group discussion. The teacher thanks the students for their participation and for respecting other students' opinions.

- The teacher concludes the lesson by summarizing the debate that just took place. As a conclusion, the opportunities for new drug development made possible by advances in glycomics and other fields can be discussed. Using discoveries in glycomics to develop new, less expensive methods of manufacturing drugs could help to reduce the price paid by consumers.

CT9 : Manage communication