

Real-world chemistry examples to engage and motivate students

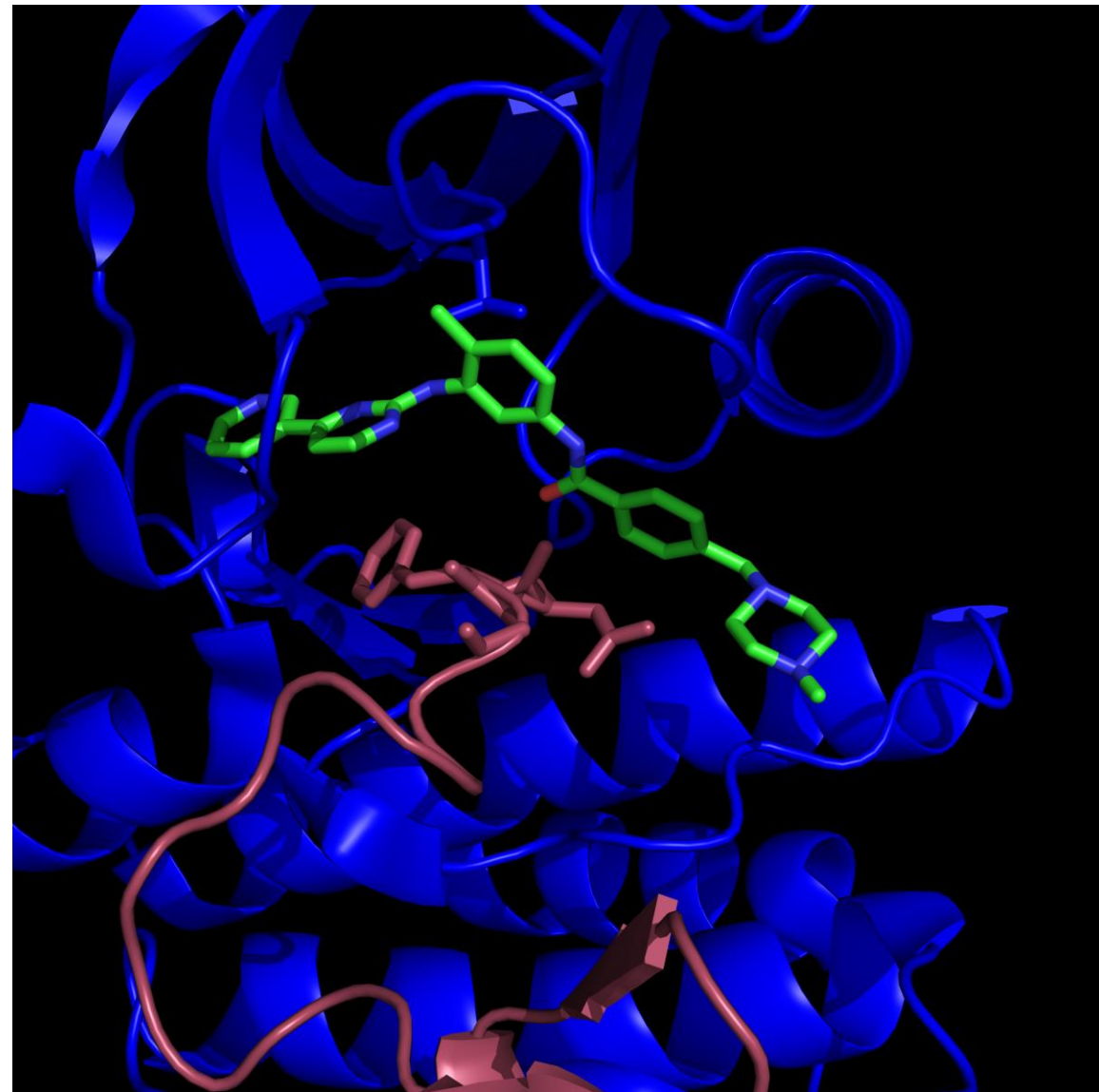
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Prezantasyon nan:
Senpozyòm MIT-Ayiti

Need: class materials relating chemistry concepts to real-world applications.

Too often, students in introductory chemistry don't find the material relevant or inspiring.

Chemical principles underlie applications ranging from cancer research to environmental issues, yet many classes and books use problems that lack context, missing an opportunity to engage students.



Cancer drug Gleevec (in green) inhibiting its protein target.

To motivate students without altering the curriculum, we created:

- a set of <5 minute lecture examples connecting chemical principles with human health, the environment, and cutting edge research.
- homework/in-class problems addressing key skills.

The resources fit into any curriculum and are easy to implement, requiring minimal class time or teacher preparation.

A selection of examples/problems are available in Kreyol.

Nanpikonekte konsèp bazik yo avèk sante moun ak lamedsin: Egzanp bayo se pou klas chimi.*

Lè entwodui egzanp monn reyèl yo nan klas chimi an, se yon fason ki efikas pou fasil pou nou mete aksan sou aplikasyon prensip antifik bazik yo epi pou ogmante angajman ak motivasyon etidyan an.

Nan reyèl sila, genyen yon pakèt egzanp ki oganize nan sijè chimi, ki relate avèk konsèp ki ann aplikasyon ak sante moun ak lamedsin. Ou ka itilize egzanp sila yo tankou yon pati nan yon egzèsis prantisaj aktif, yon pwoblèm pou evalyasyon, oswa yon egzanp nan klas.

Nou mete kontni sila sou fòm general nan fason pou chak edikatè kapab jiste kontni nan an yon plan leson ki satisfè objektif prantisaj oswa modil klas yo. Anpil nan egzanp yo kapab itilize nan plizyè konsèp chimik epi nan yon varyete fòm.

Katalòg Egzanp yo

Sijè Chimi	Egzanp nan rapò ak sante/lamedsin	# paj pdf
Tandans peryodik (tay atomik)	Selektivite sou kanal yonik nan newon yo	2
Liyezon kovalan polè ak molekil polè	Vitamin ki solib nan lolo vs. sa ki solib nan gres	3
Estrikti Lewis	Siyani (-CN) nan manyòk	4
Estrikti Lewis pou radikal lib yo	Radikal lib nan kò moun	5
Hibridizasyon (sp, sp ² , sp ³)	Idantifye prensip nan fin" nan	6
Restriksyon votasyon nan liyezon double (izomè cis/trans)	Dwòg antisikotik ki elektòpwo tiksin nan	7
Stereyochimi: Enansyomè	Pwopriete stereyochimik pou yon seleksyon medikaman	8-9
Antalpi liyezon hidwojèn	Mayetid liyezon hidwojèn nan aplikasyon ADN	10
Prensip LeChâtelier	Nivo oksijèn nan san nan altitud ki òlve	11
pH ak K _a	Absòpsyon aspirin	12
Oksidasyon/rediksyon xns	Metabolism dwòg medikal nan kò moun	13-14
Oksidasyon/rediksyon xns	Rediksyon vitamin B ₁₂	15
Metal tranzisyon: chelasyon	Tretman toksikasyon plon ki grav	16
Izomè wometrik nan konplèks metal tranzisyon yo	Dwòg antikansè ki elektis-platinum nan	17
Sinetik reyaksyon lemantè yo	Aplikasyon medikal dezentegrasyon radyoaktif	18

* Li modifiye pati referans Taylor, Drennan, C. Biology and Medicine Related Examples for General Chemistry Lectures. Piblikasyon MedEdPORTAL, 2010. Li disponib nan: <https://www.mededportal.org/publication/8080>

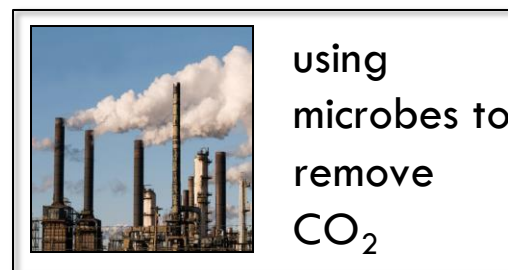
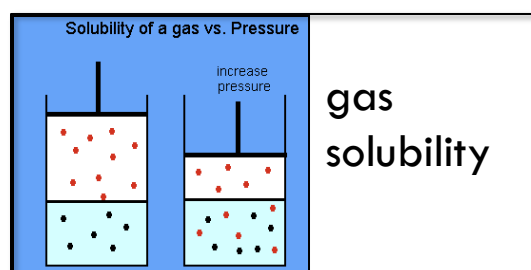
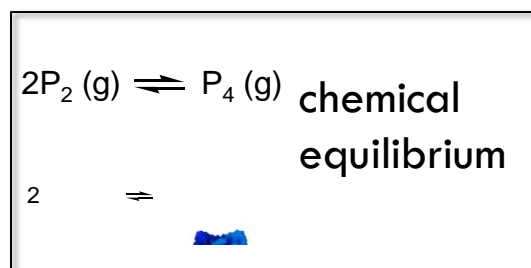
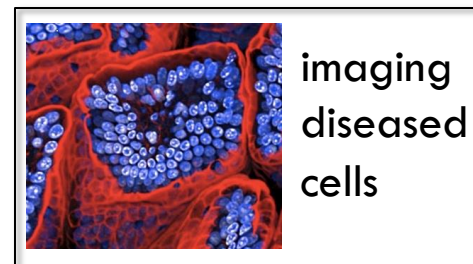
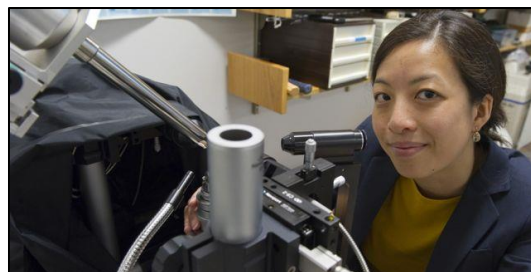
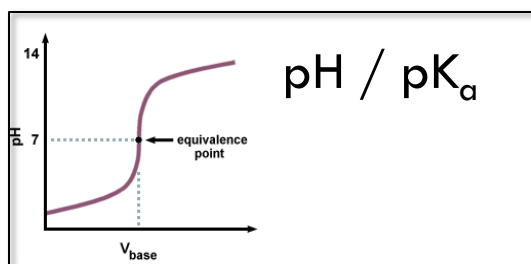


Short in-class examples can address:

Do people actually use the stuff they learn in general chemistry?

What are real chemists like?

How can chemical principles be used to solve real-world problems?

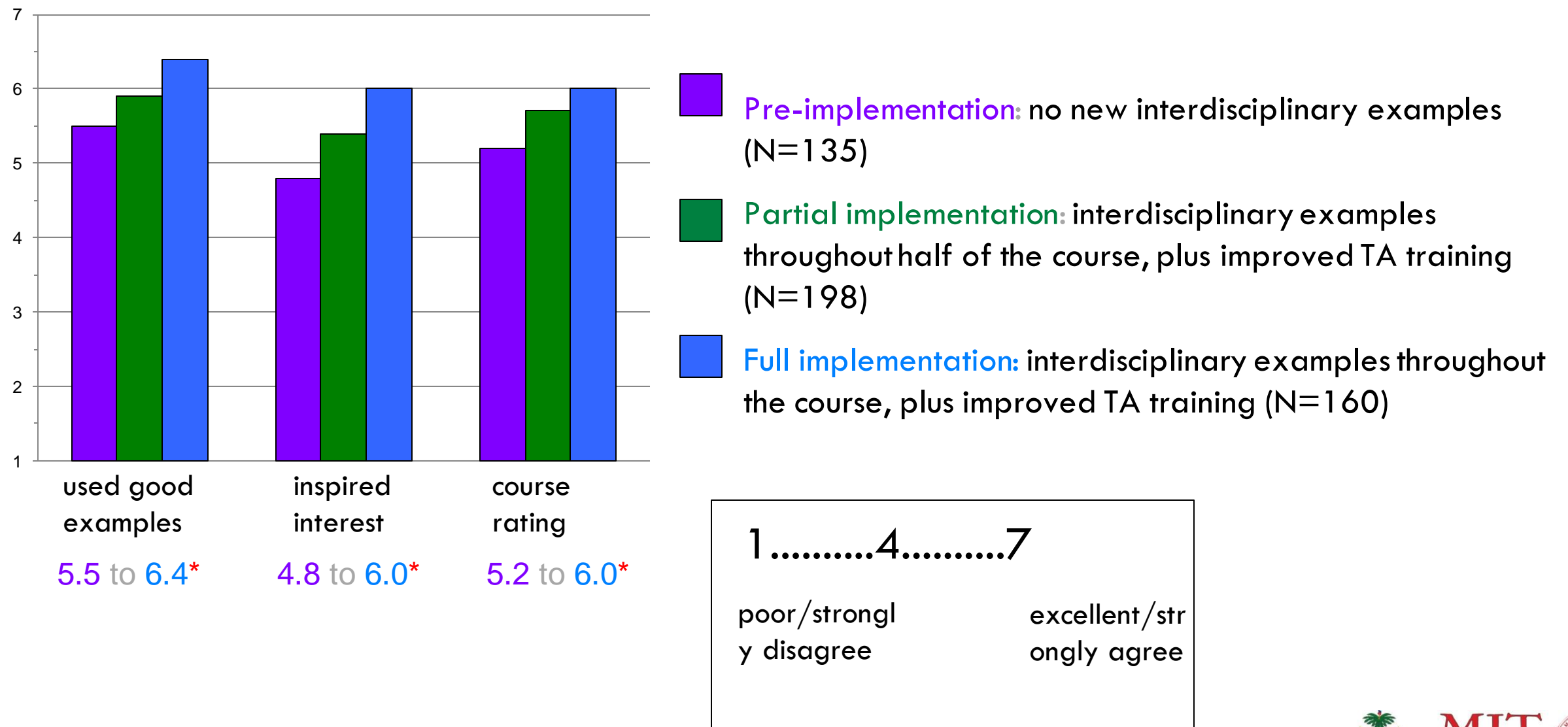


For selected Kreyol chemistry examples, see the MIT-Haiti Initiative website:
<https://haiti.mit.edu/workshops/june-2016-workshop/june-2016-resources/>



Students rated the course significantly higher following minor curriculum interventions.

MIT subject evaluations for three consecutive years enabled comparison of student reported measures (using a 7-point Likert scale.)



A chemistry workshop in Limonad focused on active learning strategies using engaging examples.

