



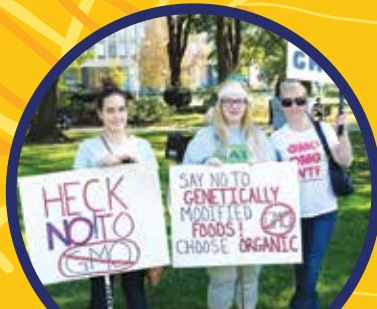
50
lessons



Maththatmatters 2

A teacher resource linking math and social justice

by David Stocker





50
lessons



Math that matters 2

a teacher resource linking math and social justice

by David Stocker



Maththatmatters 2 gets to the very root of what education is about: giving students the tools to better understand their world and facilitate positive social change. David Stocker's groundbreaking work provides educators and students with timely and engaging lesson plans, designed for grades 6-9, using math to teach about social justice in a way that is both accessible and powerful.

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Founded in 1980 and with provincial offices in British Columbia, Saskatchewan, Manitoba, Ontario, and Nova Scotia, the Ottawa-based Canadian Centre for Policy Alternatives is Canada's leading independent progressive think tank.



BTL

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The opinions expressed in Maththatmatters 2 are those of the author, and do not necessarily reflect the views of the CCPA.

Maththatmatters 2

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dedicated to

jazz, kio, storm
and
rogue

◦ ◦ ◦

your basic average super star
is singing about justice
and peace
and love
and I am glaring at the radio,
swearing saying
that's just what I was afraid of



~ ANI DIFRANCO

Acknowledgements

I have heard that it's possible to write a book in the span of a year. This collection of lessons has taken me over a decade, in large part because creating a family is no small feat and that is what I have been up to. For those of you who are parents, you may appreciate the fuzziness of mind that goes along with the journey, and likewise my apology to those I fail to mention below. I promise it's not personal.

I have had the good fortune of working with many talented colleagues whom undoubtedly pushed my understanding of issues to greater depths: James Bryers, Janis Cadieux, Colleen Costa, Antonino Giambrone, David Finkelstein, Sue Freypons, Carolyn Jankovskis, Sheena Matheson, Anne McKenna, Hayley Mezei, Michelle Munk, Maria Pasquino, Christine Saraceno, Nancy Steele, Biljana Svilaric, Shawna Watson, Demitra Zervas as well as dozens of inspiring teacher candidates from York University and OISE. I am grateful to the instructional leaders and professors at universities across Ontario who have graciously invited me in to do workshops on mathematics and social justice: your work gives me hope.

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Thanks so much to you all.

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21	The (Bottom) Line Drawing lines around territory has led to huge conflicts throughout history. Here's the story of a showdown between Suriname and Guyana, over the discovery of natural resources and the lines drawn between them.	109
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Buffet

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29

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30

Bay of the Beaver

147

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-
-
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-
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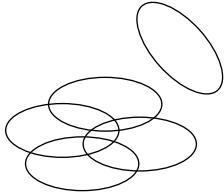
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Introduction



I like turning over rocks. It's not knowing what's underneath and being surprised by what I discover that motivates me.

Today, my class and I are reading the Upstream/Downstream allegory, as described by Cathy Crowe, a Toronto street nurse. The no-nonsense version is that a community of people living along a riverbank start to notice bodies floating by and, without a shred of time to spare, throw in a rope and pull them out.

Except over the following weeks, the bodies keep coming.

The community responds admirably, with compassion. They train rescue crews, mobilize round-the-clock volunteers, and raise funds to build an on-site hospital. As their success rate goes up, so too their notoriety. Articles and national conferences lead to awards and further funding.

What's missing, of course, is the fact that nobody questions why the bodies are in the river in the first place. What is happening upstream? What are the consequences of devoting all of our efforts entirely to downstream interventions?

The students are turning these rocks over in their heads. "Donations to food banks: upstream or down?" I ask.

"Down," spoken firmly from the back of the room.

"Giving food to someone sitting on the street?" I ask again.

"Down."

"Collections of clothes to give to the Syrian refugees arriving this month?"

"Down."

"Raising money to find a cure for cancer."

"Down. I think. Maybe."

What's missing, of course, is the fact that nobody questions why the bodies are in the river in the first place. What is happening upstream?

As social justice has entered the mainstream, the connection to mathematics has followed. People see it in their everyday lives... scratch the surface and you'll be speaking mathematics.

.....

"I'm confused, David. Why did we go out and collect money for women's shelters last week. Is that all for nothing?"

It's an interesting question. Each year, our students raise thousands of dollars for local women's shelters as the culminating task following a couple months of gender studies. The money pays for clothing and food and toys for the children's programs in the shelters.

"People are going to need those shelters in the short term," says one student, "but we've been talking about the construction of masculinity...."

"And femininity," I squeak in.

"...it's like the upstream solutions to violence against women have to be challenging those social constructions. From very early on."

o o o



A lot has happened in the years since I first wrote **Maththatmatters**. I used to go to conferences where people would look at me strangely for suggesting that math and social justice are intimately connected. Not so anymore. As social justice has entered the mainstream, the connection to mathematics has followed. People see it in their everyday lives, whether it's patterns pertaining to global warming, or the economics of the austerity movement; scratch the surface and you'll be speaking mathematics.

But what has also happened is that social justice work with students has leaned heavily on the downstream solutions. Some people call it "social justice lite", or "social justice cool": the things that we do that we feel pretty good about and that seem to improve people's lives. Who could argue about engaging young students in the excitement and positivity of collecting 10 boxes of food for the local food bank? "Surely something is better than nothing, right?"

Maybe.

But buried in one of the 50 lessons in this book is a mathematical exploration of the iatrogenic effect. 'Pointed Questions' looks at what might happen if people who have cervixes are encouraged to get the HPV vaccination, and then think that they are immune to the human papilloma virus (they are not: there are 200 strains of it). Imagine those people deciding that they no longer needed a Pap test every three years, and instead of the cervical cancer rate going down, it went up.

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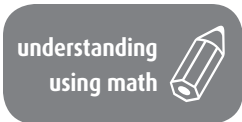


Metaphorically speaking, that’s what we need to avoid.

o o o



I went to a talk given by Umair Muhammad, who spoke passionately about the problem with individualist approaches to justice issues, wherein people eat less meat, bike more often, and stop drinking bottled water. Capitalism is delighted by these acts of ‘conscious consumerism’ and ‘lifestyle changes’, primarily because they are not a bridge to challenging the roots of injustice, but rather “a distraction”. Downstream waters are not only saturated with Sisyphean “activism”, but so too have we been convinced that in order to change the world, we must focus on changing ourselves.



I hear the laughter and clinking of wine glasses coming from corporate boardrooms.



The “Call to Action” section of each lesson has therefore concerned me to no end. How do we keep our eye on and meaningfully engage in upstream solutions with youth? Can we learn to collectively fight broader battles and side step the lure of feel-good food drives?

o o o

In the spirit of upstream solutions, let’s also make sure that identity politics inform but don’t supplant or cloak the broader challenges to the system.

There are, I suspect, many ways to use **Maththatmatters** lessons with questionable impact. Without knowing the issues of justice that are important to your students, it’s hard to imagine that the lessons are necessarily going to mean anything or engage anyone in direct action. Students in Tennessee may indeed face problems similar to young people in Toronto, and probably vastly different ones as well. If it turns out that none of the lessons resonate with the students in front of you, I recommend that you put the book down and mine the classroom for issues that make them passionate or angry.

No lesson is meant to capture the complexity or entirety of the justice topic. They are meant as introductions to a whole world of interesting questions and as such are opportunities to stop along the way when more complex, engaging, or vastly different directions appear from the group. There are days where my lesson develops around a single question from a lesson. And I can rarely anticipate when it will be that way.

The concept of intersectionality has found its way more regularly into discussions about justice, and within lessons it’s a good idea to remember that we come to the table with multiple identities and complex layered barriers. It’s not good enough to talk, for example, about women’s rights. Women have different

The connections between lessons are almost more important than the individual lessons themselves.

.....

skin colours, different body parts, different sexualities, different physical abilities, different levels of wealth, and when those complexities and many others come together, we get a more complete picture of what's going on and how to change it. At the same time, and in the spirit of upstream solutions, let's also make sure that identity politics inform but don't supplant or cloak the broader challenges to the system.

Lessons are not designed to stand apart from other lessons. I'd suggest that the connections between lessons are almost more important than the individual lessons themselves. Discussions with students in the second half of the school year inevitably turn out to be far more interesting as learners pull from a much greater range of experiences and ideas. Stop and ask, "How does this relate to what you learned in history last week?" or "Which science unit brought similar questions into this space?"

o o o

I have been turning over rocks for almost 20 years now, and have met a fine group of co-conspirators along the way. Although faced with big challenges that will require complex and creative thinking, I am more hopeful today than at any point in the past that students will be able to make the world kinder and more just. And if mathematics can play a part in that transformation, all the better.

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So go ahead.

Turn over some rocks.

DAVID

Lessons Overview: 1-25

Lesson	Page	Mathematics Strand					Justice Topic									
		Number Sense & Numeration	Measurement	Geometry & Spatial Sense	Algebra	Data Management & Probability	Class/Poverty	Gender	Race/Ethnicity	Age/Youth	Ability	Workplace	Big Business	Sexuality	Civics/Community	Intersectionality
1. Canada: Peacekeeper or Profiteer?	22	✓				✓						✓			✓	
2. Tar-Nished	30	✓	✓		✓	✓			✓			✓				✓
3. Pointed Questions	36	✓			✓	✓	✓			✓		✓	✓		✓	
4. Little Do We Know	41				✓											✓
5. Fear	45	✓				✓		✓	✓			✓				✓
6. All that Glitters	48	✓				✓					✓	✓				✓
7. Exhaust-ed	53	✓	✓	✓		✓			✓						✓	✓
8. Spilled	58		✓		✓											✓
9. Thin	62	✓				✓	✓			✓				✓	✓	
10. Unsettling	65					✓			✓							✓
11. Beyond Left & Right	70			✓			✓					✓		✓		
12. Well Spoke-n	75	✓	✓											✓		✓
13. Jux-tice	78					✓	✓									
14. Bridge Over Troubled Waters	82		✓	✓					✓			✓		✓	✓	✓
15. Exit Strategy	86	✓	✓			✓						✓				✓
16. Cross Roads	91	✓	✓						✓							✓
17. Take A Peak	94				✓							✓				✓
18. Shark Infested Waters	98	✓					✓		✓			✓				
19. Mapping Access	103	✓	✓	✓			✓							✓		✓
20. Unity	106	✓	✓	✓		✓	✓	✓				✓		✓	✓	
21. The (Bottom) Line	109		✓	✓								✓				✓
22. Fare Prices	114	✓			✓		✓							✓		
23. Bitter	117	✓	✓		✓		✓		✓		✓	✓			✓	
24. Washed Up	120	✓	✓	✓			✓				✓	✓			✓	
25. Under Threat	124	✓				✓		✓		✓	✓					

Lessons Overview: 26-50

Lesson	Page	Mathematics Strand					Justice Topic										
		Number Sense & Numeration	Measurement	Geometry & Spatial Sense	Algebra	Data Management & Probability	Class/Poverty	Gender	Race/Ethnicity	Age/Youth	Ability	Workplace	Big Business	Sexuality	Civics/Community	Intersectionality	Environment
26. Collapse	130	✓					✓						✓				
27. Where Can They Bee?	134	✓				✓						✓					✓
28. Buffet	137	✓	✓			✓	✓		✓		✓	✓				✓	✓
29. Earthship	143	✓	✓	✓	✓	✓											✓
30. Bay of the Beaver	147	✓	✓	✓	✓				✓			✓					✓
31. Tough Call	151	✓	✓		✓	✓	✓			✓		✓			✓	✓	✓
32. WTF? (What the Frack?)	155	✓	✓		✓	✓						✓					✓
33. David and Goliath	160	✓	✓		✓												✓
34. Trans[form]	163	✓			✓	✓		✓	✓	✓			✓			✓	
35. Missing	168	✓			✓	✓	✓	✓	✓	✓		✓			✓		
36. Up Front	174				✓		✓					✓					✓
37. Mouseprint	177	✓				✓						✓					
38. Tipping Point	180	✓	✓			✓						✓					✓
39. Get Out The Lead	184	✓	✓		✓					✓		✓			✓		✓
40. The Cat in the Coalmine	187	✓			✓	✓			✓	✓		✓	✓			✓	✓
41. Pillaging the Public Purse (P3s)	191	✓			✓	✓						✓	✓			✓	
42. Damned	195		✓	✓					✓						✓		✓
43. Pad-dling Upstream	199	✓	✓		✓	✓		✓		✓		✓					✓
44. Vice Grip	202	✓										✓	✓				✓
45. The Drone of War	206	✓	✓				✓			✓						✓	
46. Layers	210	✓					✓	✓	✓	✓	✓		✓			✓	
47. The Threat of a Good Example	213	✓										✓	✓		✓	✓	
48. Sweet and Dangerous	216	✓	✓		✓		✓			✓						✓	
49. Unplug	219	✓			✓	✓	✓	✓	✓	✓						✓	
50. Paying for It	222	✓			✓	✓	✓	✓				✓					