

It Takes Two Hands to Clap
My Visits to Schools in Singapore
Chris Shore, CMC-South Conference, Nov 2021

The Visits

History & Geography

- Island City-State at the southern tip of Malaysian Peninsula, almost on the equator.
- Then Portuguese, Dutch and finally England (considered the birth of Modern Singapore) for 150 years.
- Occupied by Japanese in WWII. Threats from Communist expansion in Asia.
- 54 years of independence won by Founding Father Henry Lee, Prime Minister of 30 years, started as part of Malaysia, then created its own city-state due to ethnic conflict.
- Founded on Meritocracy and Racial Harmony
- Natural Harbor
- Once had one of the world's worst slums -- 'a disgrace to a civilized community.'
- 80% live in public housing, 90% home-ownership = highest in the world.

Education System

- Official Language is English
- Also teach four Mother Tongues for diversity's sake.
- Math & Science also tested.
- In 30 years, went from worst to first in international rankings of math education.
- Look at the sign... they invested intentionally!

Secondary School (Middle)

- Homeroom system since the 1990s. (Students travel to classrooms.)
- Attempting to instill common implementation of Kagan Research (collaborative learning), as well Metacognition, 5 Practices of Math Discourse, Concept-Based, Differentiation/Inquiry, as well as Joyful Learning... "If math is not fun, I have failed."
- Teacher Hiring Process: 1st Quick Sample Lesson, 2nd Essay, 3rd Interview
- "Would you track by ethnicity?" ... "No Way!"
- Holiday training for EL Students (20 hours)
- PLC one hour a week. Job-Embedded PD by the Head of Department (HOD).
 - "Must develop teachers through persuasion, not coercion."
 - One class for HOD = half the number of students.
- Class of HOD has 6 tables of 6.
- 50% of the day with students. Three 1-hour classes. 2 periods to reflect and mark. 1 period department work.

National Institute of Early Childhood Education

- Primary School schedule: 7:30-1:30 plus supplemental lessons in the afternoon.
- Ranking of teachers before panel of 16 for performance bonuses that can be worth 2-month salary.
- The challenge for progressive change is that the NIE trains one way, then the culture of the school takes over.
- Teachers are hired first, trained for 1 year at NIE, then 6 months on the job training (teacher salary throughout training). Teachers are then bonded for 3-year service.

Singapore American School

- Teachers teach 5 of 8 periods, 80-minute blocks (63% of the day vs 86%)
- Students go to class 6-7 of the 8 blocks. They are given time to do schoolwork on campus.
- American curriculum: Common Core & NGSS, AP exams, plus Advanced Topics (beyond standard curriculum).
- 10% SpEd, 100% College Placement
- Experimental more than innovative.
- Facility is Amazing!
- 22:1 student ratio

Primary School

- Students: 5 hours English, 5 hours Maths, 2.5 hours Science, 2.5 hours Mother Tongue, plus other subjects. These are the four subjects that get tested.
- Teachers: 17 hours a week with students
- Dual Subject specialists
- Visions & Mission statement omnipresent
- Principal is very knowledgeable of the reform changes & vision, Reading Hattie & Williams
- Ministry of Education may ask for copy of common assessments.
- Foreign Workers with Visas must pay significantly higher tuition.

Sample Lesson Observation

- 6th grade (7th grade here, 12-year old cohort) on dividing a unit fractions by a whole number
- Very much like progressive lessons in the U.S.
- “Wrong thinking is okay; in math we adjust our thinking.”
- “Who has a different equation?”
- When students presenting solution:
 - “Look around and see if all your friends are ready.”
 - “Any feedback? Do any of you disagree?”
- RE: $\frac{\frac{3}{4}}{3} = \frac{3}{4} \times \frac{1}{3} = \frac{1}{4}$. Student very articulate with explanations, questions or challenges... “Can you explain how you got this intermediate answer?”
- Principal, “It took 6 months to get the students there.”
- Teacher: “I have a key question: $\frac{\frac{5}{6}}{5} = \frac{1}{6}$. Why when I divide by 5, do we get a denominator of 6?”
 - “I hear key words, ‘Part of the whole’”
 - “I want to hear more of your ideas before I share mine.”
 - “Can you link your idea to his?”
 - “I am still missing a key word in the definition of a fraction. It’s on your activity sheet.”
(EQUAL)
- Other teachers still aren’t all there. They are still teaching directly to the test.

Afterschool PD

- “Does metacognition matter for primary mathematics students?”
- “Does this solution show the child’s control?”
- Huge emphasis on teaching student self-regulation
- Metacognition, part of the Pentagon (Attitude, Metacognition, Process, Concepts, Skills = Mathematical Problem Solving)
- PD was horribly presented
- RCC = Reasoning, Communication, Connection
- Types of Understanding
 - Conceptual (what) - meaning/representations, examples, non-examples
 - Relational (why)
 - Instrumental (How) – Algorithm
 - Formal (symbol/notation)
- Lesson Closure on Regulation
 - Pupil’s close their eyes and think about the main point of the lesson.
 - Share with a partner.
 - Teacher captures answers on board.
 - Teacher to fill in the gaps.
 - Students start on HW.

Ministry of Education/Textbook Publisher

- Why is Singapore so good in Math Education?
 - Combination of East & West
 - English as primary language to unite nation
 - Balance – small laboratory
- Regarding Equity
 - More girls viewed in the curriculum.
 - Chinese abacus was removed– cultural relevance.
- Curriculum rollout: little by little, year by year
- The 2-Handed Clap: The Culture & the System
 - The culture wants to dial back on testing, but the culture can't let go of the testing.
 - Parents take care of children, because children will take care of parents when old
 - Since parents take the tests seriously, the students & teachers do also.
 - It was the government that intentionally and methodically designed and created the education system.

Chris' Takeaway

Q: What puts Singapore so far ahead?

A: Expectations!

- Problem Solving on the test
- Rigor is extremely high
- Target for all students is clear (prep book)

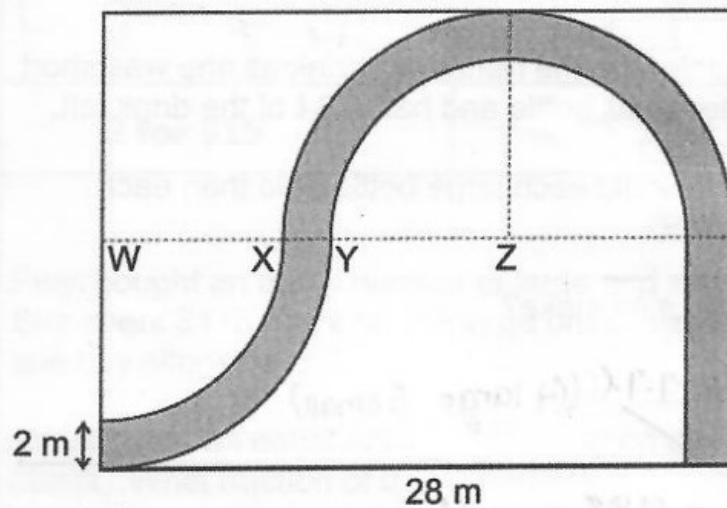
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The Math Problem

Sample of PSLE (Primary School Leave Exam), equivalent to E.O.C. in U.S. 7th Grade.

- 14** The figure shows a path of width 2 m in a rectangular garden of length 28 m. The outline of the path is made up of quarter circles with centre W, semicircles with centre Z and straight lines. $WX = YZ$.

- (a) What is the width of the rectangular garden?
- (b) Find the area of the path. Take $\pi = 3.14$.



1) Solve the sample exam prep problem.

Sample PSLE Problem (cont'd)

2) Compare and contrast the content being tested in Singapore to that of the U.S.

3) What problem solving skills are being tested in this example?

4) How often are our students presented with this kind of assessment rigor?

5) How would this level of expected rigor change your teaching?

The Question

What does Singapore do that YOU can do?

Let me know in the comments at **mathprojects.com**
or by email, shore@mathprojects.com.