

Thank you for this opportunity!

- ✓ I have been passionate about Math and Science since I started my career as a senior high Math and Science teacher in 1990
- ✓ Taught grade 4-12
- Elem, Middle and Sec experience teaching and administration

 ✓ 2006 Math Challenge Zone Champions at Lake Trail



Why are we reviewing Math and Science?

- ✓ All curricular areas are going through a fundamental change with the introduction of the revised curriculum from the Ministry of Education
- The K-9 system is now in year 2 of implementation of this revised curriculum and this is a perfect time to reflect on our progress
- ✓ The 10-12 system is just starting down the same renewal journey that Elementary schools are journeying along. Are we on the journey together?
- ✓ Math and Science are critically important areas for students in the 21st century with STEM, Coding, A.I., Robotics all flourishing

Process for this Review

- ✓ 13 teachers invited, representing K-12, Math & Science, participated in an appreciative inquiry process Sept 26, 2018
- The group produced initial thoughts, concerns, suggestions, "what we want", survey suggestion and possible recommendations (Appendix A)
- Online survey developed and implemented for all SD71 to participate
 October 2018 (Appendix B)
- Survey responses were analysed and recommendations developed and finalized November 26 2018 (Appendix C)
- ✓ Final report produced with recommendations Dec 2018

Program Review Goals

- Determine if program is aligned and coherent and achieving its mandate
- ✓ Determine if all facets of the program are in place to ensure efficacy
- Determine if elements in the program are aligned to the correct program or should shift to a different program
- Build capacity through involvement in this process and by publishing a report to enable others to review and contribute to the report
- ✓ Identify program champions
- Develop a presentation to inform the board and provide options for future direction

Program Review Key Questions

- ✓ Where are we now?
- ✓ How did we get to where we are?
- ✓ Where do we want or need to be in the future?
- ✓ How do we know what this future is?
- ✓ How are we going to get to where we want to be?
- ✓ Is what we are doing making a difference for students?
- ✓ What is the evidence that supports this view?

Survey Highlights

- ✓ 58 responses (some survey fatigue?)
- Significant experience from all respondents

Years of Experience by Survey Respondent



Years of Declared Teaching Experience from Survey Respondents

Survey Highlights - Math

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 Student centered approaches, focus on "big ideas" and number sense understanding were highlighted in the work of the review group for Mathematics

> Question 3 Summary: What are we doing right in Math?



Survey Highlights - Math

 Need for more resources, more collaboration time were common themes throughout the work of the review group for Mathematics

Quick Summary of Question 4: Areas of Concern in Math



Survey Highlights - Math

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 Need for more resources, more collaboration time were common themes throughout the work of the review group for Mathematics

> Quick Summary Q7 How comfortable are you with Math?





Survey Highlights - Science

 Need for more resources a clear recommendation throughout the review work on Science

> Quick Summary Q10 Areas of Concern in Science





- ✓ There is a desire for more info on some Science topics
- Resources a key concern for teachers again

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(consistent concern throughout this review)

Quick Summary Q13 How comfortable are you with Science?



The Program Review Facets: Inventory of programs and sub programs residing in program area?

- ✓ Not applicable as Math/Sc are curricular areas
- ✓ There are separate courses for both areas at grade 10-12 (more student options now)
- Secondary teachers report that they feel these courses are serving students well

The Program Review Facets: Current financial review of total revenue and expenditures?

- ✓ Not applicable as Math/Science are curricular areas
- ✓ There is significant reported need from K-12 for more resources for both curricular areas
- Resource areas needed include human, updated teaching materials and hands-on materials for students

The Program Review Facets: Current staff levels and staff development needs by sub-program?

- Staff levels not applicable as Math/Science are curricular areas that do not have specific staffing connected to them
- Secondary teachers strongly support lab assistant position being returned because it provides support for lab use as well as providing professional development and sharing between high schools
- Teachers strongly support more collaboration time for professional development and sharing

The Program Review Facets: Is the program aligned and demonstrating coherence?

- No, there is significant variation in Math and Science teachers, teaching and learning
 - ✓ In the same school
 - ✓ Across schools at the same level
 - ✓ Across the same grade in different school configs
 - ✓ Between families of schools from K-12
- ✓ There is no consistency or agreement on any area of concern in Math or Science across SD71 at this time!

The Program Review Facets: Identification of gaps in alignment, staffing, funding, etc.?

- ✓ There are significant gaps in both areas
- Curriculum delivery is not consistent at any level nor at any school (there is no consistency for teaching fractions in the same school or between schools as an example)
- ✓ Resources from the LRC are well developed but there are not enough to go around and secondary LRC kits in short supply and more needed

The Program Review Facets: Identification of gaps in alignment, staffing, funding, etc.? Page 2

- There is a clear deficit in Indigenous and French resources K-12 for both curriculum areas
- ✓ There is a desire for, and requested need for, more collaboration and conversation between teachers at the same level and in a family-of-schools scenario

The Program Review Facets: Define the context/history of the Math program

- There has been a substantial or seismic shift from WNCP Math to the new revised curriculum
- ✓ WCP developed in 1993 (western provinces); WNCP with Nunavut added 2000; Common Curriculum Framework 10-12 in 2008 with 7 processes mandated:

Students are expected to use communication in order to learn and express their understanding; make connections among mathematical ideas, other concepts in mathematics, everyday experiences and other disciplines; demonstrate fluency with mental mathematics and estimation; develop and apply new mathematical knowledge through problem solving; develop mathematical reasoning; select and use technology as a tool for learning and solving problems; develop visualization skills to assist in processing information, making connections and solving problems.

The common curriculum framework noted here are a number of characteristics that define the nature of mathematics, including change, constancy, number sense, patterns, relationships, spatial sense and uncertainty.

Pre-calculus, Foundations and Apprenticeship Math came from WNCP with MANY outcomes to cover in each course!

Details at https://www.bced.gov.bc.ca/irp/pdfs/mathematics/WNCPmath1012/2008math1012wncp_ccf.pdf

The Program Review Facets: Define the context/history of the Science program

- There has been a smaller shift from the old IRP Science to the new or revised Science curriculum
- IRP 1995 updated in 2005 with material from Pan Canadian Common Science Curriculum 1997 and other materials late 1990s with 4 goals and 4 areas of study

GOAL 1: Science, technology, society, and the environment (STSE): Students will develop an understanding of the nature of science and technology, of the relationships between science and technology, and of the social and environmental contexts of science and technology. GOAL 2: Skills: Students will develop the skills required for scientific and technological inquiry, for solving problems, for communicating scientific ideas and results, for working collaboratively, and for making informed decisions. GOAL 3: Knowledge: Students will construct knowledge and understandings of concepts in life science, physical science, and Earth and space science, and apply these understandings to interpret, integrate, and extend their knowledge. GOAL 4: Attitudes: Students will be encouraged to develop attitudes that support the responsible acquisition and application of scientific and technological knowledge to the mutual benefit of self, society, and the environment.

4 areas of the curriculum were Processes of Science, Life Sciences, Physical Science and Earth and Space Science (now it is biology, chemistry, physics, and earth, space, and environmental sciences)

Details at https://www2.gov.bc.ca/assets/gov/education/kindergarten-to-grade-12/teach/pdfs/curriculum/sciences/2005scik7.pdf

The Program Review Facets: Identify the program area where the program or sub-program belongs

- ✓ Not applicable as these are curriculum areas
- There is desired need for a "champion" to help bring more alignment to our delivery of Math and Science
- This could/should include some CST focus or lead teacher focus for both curriculum areas

Thank You for this opportunity to explore Math and Science in SD71!

It was very clear that everyone involved enjoyed this process, valued the discussions and they all want to continue the conversation going forward.

Questions? Comments?