December 9, 2021

Honourable Adriana LaGrange
Minister of Education
204 Legislature Building
10800 – 97 Avenue
Edmonton, AB   T5K 2B6

Dear Minister LaGrange,

Request for revisions to the K-6 curriculum and implementation timeline

The draft K-6 curriculum and your government's plan to implement this curriculum in the fall of 2022 is of significant concern to the Edmonton Public Schools Board of Trustees and the staff, families and communities we represent.

In May, the Board of Trustees wrote to share our agreement that the current curriculum being used in schools needs updating, but expressed concerns about the draft curriculum content and the process used for its creation. We also noted that, due to the continued impacts of the COVID-19 pandemic, the next year is not an appropriate time to introduce a wholesale change in curriculum, nor is there sufficient time for teachers to prepare given that it is already December and the curriculum is not finalized.

Students, staff and families deserve to have their first-rate public education system sustained with a first-rate curriculum redesign. Let's work together to design a curriculum that will continue to make Alberta the gold standard in public education and give our students the skills and knowledge they need for success.

Working with this goal in mind, we are sharing with you an in-depth analysis of the draft curriculum that staff in our Division's Curriculum and Learning Supports department conducted. A range of expertise from across Edmonton Public Schools was also accessed to complete this report, including the following areas: diversity education, learning technologies, and specialized learning supports. The perspectives of K-6 classroom teachers were captured to contribute to this report. The report is attached for your review.

Given the recommendations on page 23 of the report and the continued feedback Trustees are receiving from concerned staff, students and parents, the Edmonton Public School Board put forward the

following emergent position statement at the recent Fall General Meeting of the Alberta School Boards Association.

> Given that school boards across Alberta wish to collaborate with the Minister of Education and all stakeholders to leave a legacy of quality curriculum for our students;
>
> And given that our provincial curriculum should prepare our students for post-secondary studies and the workplace by providing experiences that move learners beyond acquiring facts into learners who are engaged students, agile thinkers, and creative problem solvers for the 21st century;
>
> And given that successful implementation of the new curriculum across Kindergarten to Grade 6, will require a range of supports and resources, including:
> - quality student resources aligned to curricular outcomes;
> - professional learning opportunities for teachers to understand the new architecture and design;
> - provision and creation of supporting documents needed to understand the new curriculum (e.g., glossaries, illustrative examples, guides to implementation, etc.); and
> - a robust pilot of the new curriculum with opportunities to make refinements through a transparent stakeholder feedback process and field testing of quality assessments to support student learning;
>
> *BE IT RESOLVED THAT, the ASBA advocate to the provincial government that recommended stakeholder revisions to the curriculum be included and released in a second draft in the Spring of 2022, be piloted, field tested and reviewed by stakeholder groups for two years;*
>
> *BE IT FURTHER RESOLVED THAT, this feedback will include robust engagement with teachers, curriculum experts, subject area experts, parents, Indigenous leaders, francophone leaders, and other key stakeholders including the business community. The feedback gathered will also help inform the phased implementation of the new curriculum beginning in September 2024.*

More than 85 per cent of boards supported this emergent position statement, cementing the fact that concerns with the curriculum and the implementation process are widespread.

We provided further detail on what is required for a successful curriculum implementation through a motion unanimously carried at our November 30 public Board meeting. Through the motion, Trustees made clear that the following points are critical:

- anti-racism embedded within the K-6 curriculum
- environmental and climate change literacy and competencies embedded within the K-6 curriculum

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- a delay in implementing the proposed K-6 curriculum, to be preceded by two years of piloting and field testing
- piloting to begin only after the current reviewed and rewritten where necessary, using the advice and feedback of current teachers, curriculum and subject-area experts, Indigenous leaders, francophone leaders and parents
- transparency in the feedback received by the government and how that feedback was incorporated into the revised draft; specifically, how the feedback of teachers, curriculum and subject-area experts, parents, Indigenous leaders, francophone leaders and other key stakeholders such as employers were incorporated
- phased implementation beginning no earlier than September 2024
    - To successfully implement new curriculum across Kindergarten to Grade 6, a range of supports and resources would be required, including quality student resources aligned to curricular outcomes, professional learning opportunities for teachers to understand the new architecture and design and the provision of supporting documents needed to understand the new curriculum (e.g., glossaries, illustrative examples, guides to implementation, etc.). These resources will take time to develop and deliver.

Given the lifespan and reach of curriculum, it is imperative that we get it right. We encourage you to review the attached report, which provides details into why these elements are critical and how they can be incorporated into the curriculum.

Students—and all Albertans—need a curriculum that moves beyond the mastery and memorization of facts. We must prepare students for lifelong learning, holistic development, full engagement with adult life, and participation in complex, global contexts. We, our administration and staff are eager to work with you and your staff to create just such a curriculum. Please let us know how we can assist you.

Sincerely,

Trisha Estabrooks
Board Chair

KM/mj

Attachment: Analysis and Review of the 2021 Draft K-6 Curriculum

c.   Marilyn Dennis, President, Alberta School Boards Association
        Dennis McNeil, President, Public School Boards' Association of Alberta
        Darrel Robertson, Superintendent, Edmonton Public Schools

EDMONTON PUBLIC SCHOOLS

Analysis and Review
of the 2021 Draft K-6 Curriculum

November 2021

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INTRODUCTION

"Writing curriculum is a sacred act because it is what we want to tell our children" - Dr. Dwayne Donald

Purpose

The purpose of this report is to provide feedback to Alberta Education on the *2021 Draft Kindergarten to Grade 6 (K-6) curriculum*. To this end, Edmonton Public Schools conducted a curriculum analysis using a mixed-methods approach that included a curriculum analysis tool to collect quantitative data and focus groups to gather qualitative data.

The curriculum analysis was guided by the following questions:

1. What will a detailed analysis of the learning outcomes and knowledge, understanding, skills & procedures (KUSPs) in the *2021 Draft K-6 Curriculum* reveal?

2. In what ways could the *2021 Draft K-6 Curriculum* be improved?

3. What are the implications for implementation?

This report provides:

- a summary of the findings of our analysis;

- a discussion of issues related to implementation; and

- feedback and recommendations for improvements.

Edmonton Public Schools

Edmonton Public Schools is one of the largest public school divisions in Canada. With 225 schools, the Division serves over 105,000 Kindergarten to Grade 12 students, their families, and communities. Currently, Kindergarten to Grade 6 curriculum is taught in:

- 121 Elementary Schools.

- 41 Elementary/Junior High Schools.

- 5 Elementary/Junior/Senior High Schools.

A new K-6 curriculum will impact more than 55,000 elementary students, over 2,800 teachers, and 75 per cent of the schools within the Division.

This report was prepared by the Curriculum and Learning Supports (CLS) department within Edmonton Public Schools. CLS provides a range of supports and expertise in the following areas: assessment, career pathways, First Nations, Métis, and Inuit education, K-12 curriculum, literacy, numeracy, resources, and second languages. A range of expertise from across Edmonton Public Schools was also accessed to complete this report, including the following areas: diversity education, learning technologies, and specialized learning supports. The perspectives of K-6 classroom teachers were captured to contribute to this report.

What is "Good Curriculum"?

Contemporary research suggests that the primary goal of school curriculum is to prepare students for participation in a complex and constantly changing world. This same body of research literature states that the primary means to achieving this goal is by developing curriculum that support higher-order thinking skills across a range of knowledge domains, and acknowledges that the processes of learning and transfer are the means by which competencies are developed (Partnership for 21st Century Skills, 2008: Halpern, 2014; Chipman, Segal, & Glaser, 2013; Wegerif, Li, & Kaufman, 2015). A summary of contemporary research suggests that a good curriculum for learners in the 21st century is:

- competency and concept-based.

- focused on preparing students for complex futures.

- centred around higher order thinking, problem solving, and transfer.

- designed to increase critical thinking skills.

- grounded in constructivist understanding.

This description of a good curriculum is further supported by Fisher (2005) who stated that, "core skills of thinking, creativity and problem solving [lie] at the heart of successful learning and should be embedded in primary and secondary school curricula" (p. 210).

Overall, trajectories in education are moving away from surface and unreflective learning in favour of learning experiences that develop competencies associated with lifelong learning, holistic development, full engagement with adult life, and participation in complex, global contexts. National and international research and policy organizations have acknowledged the roles of problem solving, critical thinking, metacognition, innovation, and creativity in school curriculum, and have stated that the transfer of knowledge and skills is a fundamental goal of education. These organizations include the Council of Ministers of Education, Canada (CMEC); United Nations Educational, Scientific and Cultural Organization (UNESCO); International Association for the Evaluation of Educational Achievement (IEA); and the Organisation for Economic Co-operation and Development (OECD).

The concept of "transfer" in education describes a process that "requires students not only to remember but also to make sense of and be able to use what they have learned" (Anderson & Krathwohl, 2001 p. 63). Transfer is the kind of thinking that requires students to characterize their learning as a series of opportunities to apply, analyze and innovate rather than as a series of recall assignments to be done (Brookhart, 2010). *The Guiding Framework for the Design and Development of Kindergarten to the Grade 12 Provincial Curriculum* (herein referred to as *The Guiding Framework*) suggests that providing learning outcomes that "integrate competencies with subject and grade-specific knowledge, understanding, and skills, [ensures] that students are also able to apply what they know to a variety of contexts" (p. 17). The ability to transfer knowledge and skills to new or similar contexts is evidence of deeper understanding and higher-order thinking. Deeper understanding comes when students analyze, evaluate and create. Erickson, Lanning, and French (2017) suggest "curriculum must be designed to facilitate transfer and not leave it up to chance" (p. 16).

The above body of scholarly work describes a shift in the trajectories of education. Broad trends in education have pulled away from content-based curriculum and have moved towards competence- and concept-based

curriculum (Wesselink, 2010, Bergsmann 2015). Competence and concept-based curriculum stresses the importance of developing multi-dimensional knowledge and higher-order thinking skills (OECD, 2010). Curriculum can no longer be solely about the mastery and memorization of facts within specific subjects, regardless of their perceived usefulness. Contexts for 21st century learners demand curriculum that create cognitively agile thinkers. Cognitive agility involves being able to identify a problem, access relevant and credible information, posit methods for solving, make connections that exemplify transfer, clarify misunderstandings in thinking and processes, evaluate progress, and innovate solutions. Overall, education is about developing intelligence and capabilities through structured experiences to prepare students to participate in adult life.

Curriculum in Alberta

Transmissionist Models

In the early 1900's, curriculum in Alberta was largely an endeavor to create a population suited to the labour market economies of the time. During this era, educational practices were informed by transmissionist models, which view education as a process by which teachers deposit curricular knowledge into students who are seen as the *tabula rasa* or "blank slate" (Richardson, 2003). In transmissionist approaches to education, teachers are seen as the knowledge experts who impart knowledge to learners who then work to achieve mastery of that knowledge through memorization and repetitive practice. Curriculum in the early 1900's reflected this view of education; outcomes were highly knowledge-focused and prescriptive.

A Learner-Centred Approach

Over the last 45 years, education and curriculum have shifted to focus on preparing students for participation in a global society. Transmissionist models have been abandoned in favour of more innovative approaches to teaching and learning. Learners are no longer considered to be empty vessels; they are known to have accumulated a wide range of experiences and interests that predate their enrolment in school settings. As invested and experienced individuals, students are capable of engaging deeply with learning in personally and socially meaningful ways (Beck & Kosnik, 2006). Moreover, teachers are active in their pedagogies and approaches to instruction as a set of experiences to be "lived" alongside students (Aoki, 1993). Education is no longer about simply acquiring knowledge; it is about structuring and constructing experiences that move learners beyond acquiring facts into learners who are engaged students, agile thinkers, and creative problem solvers.

In the 1980s and 1990s, curriculum in Alberta was specifically designed to reflect constructivist understanding and learner-centred views of education. A constructivist view of education permeates curriculum documents of this era, for example, "In social studies, critical and creative thinking are promoted through problem solving and decision making … critical thinking is a process of analyzing and evaluating claims, conclusions, definitions, evidence, beliefs, and actions" (Alberta Education, 1989, p. 10). In support of critical thinking skills, learning outcomes contain high-level verbs. For example, students are asked to "analyze how the use of a natural resource can affect the rest of the environment," "predict the consequences of misusing natural resources," and "draw conclusions about the use of renewable and non-renewable resources" (Alberta Education, 1989, p. 13). Historically, curriculum in Alberta has typically been developed and approved on a subject-by-subject basis.

Various subject- and grade-specific curriculum were merged into classroom practice as areas were rewritten and as approvals were granted. At present, Alberta's current curriculum content was written between 1985 and 2016; the *Art (Elementary)* program of studies and the *Mathematics (K-9)* program of studies, respectively.

The current curriculum orients around constructivist understandings of teaching and learning; it upholds learner-centred models that promote critical thinking and problem-solving.

Inspiring Education

In order to address dated content and structural discrepancies across the curriculum, Alberta Education established a long-term vision for education in the province. *Inspiring Education* (2010) articulated a vision for education through to 2030. The goal of *Inspiring Education* was to create the educational conditions that would result in engaged thinkers and ethical citizens with an entrepreneurial spirit.

From 2010 to 2015, Alberta Education established a variety of stakeholder engagement processes and teacher working groups to contribute to the development of a curriculum based on extensive scholarly research. The work began to prototype a draft curriculum that was to be competency-based and built upon a foundation of literacy and numeracy, as articulated in *Ministerial Order #001/2013 Student Learning*.

Simultaneous drafting (and the subsequent simultaneous implementation) of a redesigned curriculum was a cornerstone of *Inspiring Education*. This concurrent implementation model was to be enabled through a focus on a concept-based curriculum, which would not focus on discrete facts and knowledge items that must be acquired before advancing to the next grade level. "A focus on competencies would move education to a process of inquiry and discovery - not just the dissemination of information and recall of facts. Learners would still study subjects like language arts and mathematics, but rather than study a large number of subjects, each independent of the other, learners would focus more deeply on a curriculum that allows for more interdisciplinary learning." (*Inspiring Education*, 2010, p. 7)

The 2018 draft curriculum reflected the vision of *Inspiring Education* through a common framework and architecture into which contemporary understandings of teaching, learning, and disciplinary concepts were placed. The 2018 draft curriculum explicitly stated numeracy and literacy connections associated with learning outcomes and linked competencies with student learning. All subjects in Kindergarten to Grade 4 (arts, language arts [English, French, Français], mathematics, social studies, science, and wellness) were to be drafted and implemented simultaneously.

2021 Draft K-6 Curriculum

In 2020, the Minister of Education signed *Ministerial Order #028/2020*. Along with *The Guiding Framework* and the *ECS to Grade 12 Guide to Education 2021-2022*, the ministerial order took curriculum development in Alberta in a different direction. Rather than being focused on higher-level thinking, conceptual understanding, cognitive development, and competencies for 21st century learners, curriculum will be focused more strongly on "knowledge development" *(Ministerial Order #028/2020*, as cited in *The Guiding Framework for the Design and Development of Kindergarten to Grade 12 Provincial Curriculum*, 2021, p. 5).

In spring of 2021, the Government of Alberta released the *2021 Draft K-6 Curriculum* documents. Along with the curriculum documents, Alberta Education has provided a brief overview of each of the subject areas that includes a short description of the discipline as well as a statement of its importance to the overall education of a student. The *2021 Draft K-6 Curriculum* includes:

- English Language Arts and Literature

- Fine Arts
  - Dance
  - Drama
  - Music
  - Visual Arts

- Français immersion et littérature

- Français langue première et littérature (not included in this analysis)

- Mathematics

- Physical Education and Wellness

- Science

- Social Studies

In comparison to current curriculum, the *2021 Draft K-6 Curriculum* presents a significant shift in layout and content. Currently, the Alberta curriculum consists of subject and grade-specific curricular groupings; the *2021 Draft K-6 Curriculum* uses a common architecture that spans each subject and grade.

As described in *The Guiding Framework* (Alberta Education, 2021, p. 20-21), the architecture and design of the curriculum consists of:

- **Organizing Ideas:** "The organizing idea is a statement of the learning within a given section of a subject area or discipline. The organizing ideas are intended to be logical categories that communicate the goals of education within each section of a subject area. They may span some or all grades."

- **Guiding Questions:** Below the organizing idea are guiding questions, which are "informed by the organizing idea and frame the learning outcome. Questions spark curiosity and wonder, which inspires truth seeking, understanding, and a lifelong love of learning."

- **Learning Outcomes:** Each guiding question has a learning outcome. "The learning outcomes describe what students are required to know, understand, and be able to do by the end of a grade. Student achievement of the learning outcome must be assessed and reported."

- **Knowledge, Understanding, Skills & Procedures ('KUSPs')**
  - **Knowledge:** "Well-sequenced core knowledge is foundational to all learning. Knowledge is learned in order for students to understand and do something. Knowledge, including facts, is not disconnected trivia, but instead builds toward understanding and skills and procedures."
  - **Understanding:** "Understanding is about putting pieces of knowledge into logical and meaningful order with other knowledge. Understanding is more complex than knowledge, showing that a student is learning how to organize knowledge to understand a concept. By understanding, one can apply what

they have learned to new situations in other contexts. Understanding is more than knowledge, but impossible without it."

- ○ **Skills & Procedures:** "Skills and procedures are what students do to demonstrate their knowledge and understanding. They are specific skills, methods, tools, strategies, and processes that students will develop as they achieve the learning outcome."

Methods and Procedures

To provide feedback, it was necessary to establish an objective and rigorous way to analyze curricular expectations in the *2021 Draft K-6 Curriculum*.

Moseley, Elliott, Gregson, & Higgins (2005) reviewed 35 curriculum analysis taxonomies and concluded that two stood out as being "strongly grounded in theory and practice" (Moseley et al., 2004, p. 3) and as being directly useful for all school levels: Bloom/Krathwohl's Revised Taxonomy (2001) and Marzano's New Taxonomy (2007). As the theory and language of Bloom's original work are deeply embedded in educational processes ranging from curriculum and resource development to instructional and assessment practices, Bloom/Krathwohl's Revised Taxonomy was selected as the tool for this curriculum analysis. Both the original (1956) and revised taxonomy (2001) have been used extensively by curriculum developers, educational researchers, classroom teachers, and administrators at all levels of education and are referenced in a global body of literature on educational objectives, curriculum, and human thinking and learning.[1]

The curriculum analysis undertaken by Edmonton Public Schools involved gathering quantitative data (coding process) and qualitative data (focus groups). The following table further illustrates the participants, the work undertaken and the type of data gathered:

Quantitative and Qualitative Data Gathered

Participants	What They Did	Data Gathered
Curriculum Consultants ● K-12 ● All subjects	Coded all learning outcomes and KUSPs using Bloom/Krathwohl's curriculum analysis taxonomy table Participated in subject specific focus groups to provide feedback on implications for implementation	Quantitative Data Qualitative Data
Classroom Teachers ● K-6 programming (English Language Arts, Math, Science) ● Music ● French Immersion: K-6, all subjects	Participated in grade specific focus groups to provide feedback on implications for implementation	Qualitative Data

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[1] For more information about the Bloom/Krathwohl Taxonomy Table, see Appendix I.

| Consultants with specific expertise • Learning Technologies • First Nations, Métis, and Inuit Education • Diversity • Specialized Learning Supports • Assessment | Participated in content specific focus groups to provide feedback on implications for implementation | Qualitative Data |

Quantitative Data Methods and Procedures

The first phase of the curriculum analysis involved classifying and coding each Learning Outcome and KUSP in the *2021 Draft K-6 Curriculum* using Bloom/Krathwohl's Revised Taxonomy.[2] Learning outcomes in a curriculum are generally constructed to include a description of what is to be done (verb) with subject-specific content (noun). Thus, outcomes typically consist of a verb or verb phrase and a noun or noun phrase. The verb generally describes a cognitive (thinking) process, and the noun generally describes the nature of knowledge a student is expected to acquire or construct (Anderson & Krathwohl, 2001). For example, in the hypothetical learning outcome, "students will be able to add two-digit numbers" the verb in the outcome is "add" and the noun is "two-digit numbers."

A list of useful verbs for developing learning outcomes is provided in Appendix II.

Each Learning Outcome and KUSP in the *2021 Draft K-6 Curriculum* was analyzed and classified. Each classification was recorded as a code. This coding process involved 51 CLS Teacher Consultants, representing subject area expertise across Kindergarten to Grade 12.

All items that articulated an expectation of what students should know or be able to do were included in the analysis. The process involved the following:
- identifying the verb or verb phrase to determine the level of cognitive complexity;
- identifying the noun or noun phrase to determine the nature of knowledge; and then
- triangulating the verb and noun and classifying the outcome into a cell in the taxonomy table.

To prepare for the coding process, Teacher Consultants participated in professional learning related to:
- the history of curriculum development in general as well as specific to the Alberta context;
- the architecture and how to navigate the *2021 Draft K-6 Curriculum* on the New Learn Alberta website (as it appeared at the time of this process);
- the history, academic rigour and support for Bloom/Krathwohl's Revised Taxonomy and how to analyze an outcome using the taxonomy table; and
- how to code each outcome and KUSP using the coding process and related supporting materials.

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[2] with the exception of Français langue première et littérature

In order to build inter-coder reliability (the extent to which two researchers agree on how to code the same content), professional learning included facilitated testing environments in which small groups worked together to address challenges, ask questions and refine their coding skills. Consultants were assigned to small groups to ensure sufficient coverage of all grade levels and subject areas.

Qualitative Data Methods and Procedures

The second phase of the curriculum analysis involved gathering qualitative data through a series of focus groups that involved 33 Division Teacher Consultants and 35 Teachers currently working in K-6 classrooms. Division consultants provided expertise in subject discipline, grade level, and specialized areas including assessment, diversity, First Nations, Métis, and Inuit perspectives, specialized learning supports, and learning technologies. Classroom teachers provided expertise in grade level groupings and included the K-6 regular program, French immersion and music.

To elicit meaningful feedback from each focus group about the *2021 Draft K-6 Curriculum*, participants were asked to analyze the content of the draft documents through the lens of their expertise and with consideration to how programs of study might be implemented in classrooms. The Programming Principles outlined in the *ECS to Grade 12 Guide to Education 2021-2022* (Alberta Education, 2021, p. 4) informed the questions posed to focus groups participants. Focus group conversations resulted in 181 pages of feedback.

The Programming Principles provide a variety of processes for ensuring effective implementation of programs of study. These processes include:
- identifying outcomes for learning (based on programs of study and student progress).

- organizing for instruction (including the grade configuration of schools).

- selecting learning activities.

- selecting learning resources.

- assessing student progress.

- evaluating student progress.

- providing time for learning based on student progress.

Focus group participants were asked to consider the processes listed above when responding to the following questions:
- What are the implications for identifying outcomes for learning?

- What are the implications for selecting learning activities and resources?

- What are the implications for assessment and evaluation of student progress?

- What are the implications for providing time for learning based on student progress?

- What are the implications for combined grade groupings and cross curricular teaching and learning?

- What professional learning opportunities or other supports would be required to implement the *2021 Draft K-6 Curriculum*?

- What other considerations surfaced?

ANALYSIS

Quantitative Data

The data from the coding processes is represented using tables with colour-coded heat maps. A heat map is a grid of coloured squares that depicts values of interest at the intersection of two axis variables. The axis variables are divided into ranges, in this case the hierarchy of cognitive processes and type of knowledge. The colour of each cell indicates the value of the main variable in the corresponding cell across a gradient from green (minimum value) to red (maximum value).

Table 1. Heat Map Legend and Table (illustrative example; not real data)

	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
Procedural	0.00%	0.00%	18.52%	1.85%	0.00%	1.85%
Conceptual	0.00%	5.56%	22.22%	18.52%	1.85%	0.00%
Factual	5.56%	7.41%	11.11%	1.85%	0.00%	0.00%

Type of Knowledge (vertical axis) — Type of Cognitive Process (horizontal axis)

Legend:
- Maximum value
- Midpoint value
- Minimum value

The 70 heat map tables included in this report are composites of the codes Teacher Consultants assigned to the Learning Outcomes and KUSPs of the *2021 Draft K-6 Curriculum*. Since the distribution is represented as a percentage number, the "n" (number) value identifying how many codes were used has been included below each chart. Percentage representations are used to make it easier for the reader to compare across examples where the number of codes differed greatly (e.g., Learning Outcomes where n = 438 vs. all KUSPs where n = 11,126, in Tables 3 and 4, respectively).

Each of the items in the Learning Outcomes layer and all individual items in each of the Knowledge, Understanding, and Skills & Procedures (KUSPs) sections of the *2021 Draft K-6 Curriculum* were analyzed and coded.

Looking at the Curriculum as a Whole

The coding process identified 438 Learning Outcomes and 11,049 individual KUSP items in the *2021 Draft K-6 Curriculum* (total = 11,487). Table 2 shows the distribution of all coded Learning Outcomes, Knowledge, Understanding and Skills and Procedures. There were some Learning Outcomes and KUSPs (n=77 or 0.65 per cent) that consultants were "unable to code." If all Learning Outcomes and KUSPs had been coded, this process would have resulted in a total of 438 Learning Outcomes and 11,126 KUSPs (total = 11,564).

Table 2. All Coded Items: Learning Outcomes, Knowledge, Understanding, and Skills and Procedures

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.19%	0.40%	0.55%	0.21%	0.23%	0.14%
	Procedural	1.17%	1.65%	7.50%	1.37%	0.59%	1.16%
	Conceptual	3.23%	14.22%	4.31%	3.23%	0.56%	0.71%
	Factual	44.13%	10.43%	3.03%	0.57%	0.22%	0.22%
		Remember	Understand	Apply	Analyze	Evaluate	Create
				Type of Cognitive Process			

Note. Coded n = 11,487

The analysis of the Learning Outcomes and KUSPs revealed that:

- 68.78 per cent of the curriculum is situated in three low level cells: *Remember/Factual* (44.13 per cent), *Understand/Factual* (10.43 per cent), and *Understand/Conceptual* (14.22 per cent).

- 54.56 per cent of the outcomes and KUSPs were coded at the *Remember/Factual* or *Understand/Factual* levels; this translates into 6,267 facts that students will be expected to remember or understand.

- 24.58 per cent of the curriculum is thinly distributed across the sixteen cells associated with higher order thinking skills *(Apply* through *Create).*

- 9.19 per cent of the curriculum is distributed across the twelve cells associated with critical thinking skills *(Analyze* through *Create).*

- 3.03 per cent of the learning outcomes and KUSPs would see students applying facts.

- 2.22 per cent of the learning outcomes and KUSPs would provide opportunities for students to create.

- 1.71 per cent of the learning outcomes and KUSPs focus on developing metacognitive skills.

- 1.59 per cent of the curriculum focuses on developing students' evaluative thinking skills.

- 0.22 per cent of the learning outcomes and KUSPs ask students to evaluate the facts they are learning.

- 4.58 per cent of the learning outcomes and KUSPs are distributed across twelve cells; each of the twelve cells is represented by less than 1.00 per cent.

Thinking has long been identified as having higher and lower levels of complexity (Anderson & Krathwohl, 2001; Bloom, 1956; Marzano & Kendall, 2007; Nitko & Brookhart, 2011). Bloom/Krathwohl's Revised Taxonomy (2001) has six cognitive processes: remember, understand, apply, analyze, evaluate, and create—in order of increasing complexity. The first two categories of the taxonomy (*Remember* and *Understand*) are generally thought to represent lower order thinking, and the remaining four categories (*Apply* through *Create*) represent higher order thinking. Ennis (2003) stated that the higher levels of the taxonomy (*Analyze* through *Create*) include what he, and others, consider to be critical thinking. Paul and Elder (2010) identified three dimensions of critical thinking: the analytic, evaluative, and creative components, which comprise the three highest categories of the taxonomy.

While developing expertise in an academic discipline and disciplinary ways of thinking is an important goal of education, the danger arises when fact acquisition is the focus rather than critical thinking and transfer. When a curriculum is focused on acquiring and mastering facts, students "do not ever learn to transfer or apply their experiences in the everyday world. This is often labeled the problem of 'inert' knowledge; that is, students often seem to acquire a great deal of factual knowledge, but they do not understand it at a deeper level or integrate or systematically organize it in disciplinary or useful ways" (Bransfor, Brown, & Cockling, 1999 p. 140). The *2021*

Draft K-6 Curriculum narrows students' educational experiences into basic fact acquisition and recall, and will likely result in teachers presenting material as a set of disconnected bites.

When looking at a distribution of learning outcomes and KUSPs that heavily emphasizes lower order thinking skills, it is difficult to see how students will develop the "skills that enable [them] to solve problems, [and] think critically as they become active and informed citizens…" as directed through the *Ministerial Order on Student Learning #028/2020*. Additionally, *The guiding framework for the design and development of kindergarten to Grade 12 provincial curriculum [2020]* states, "We want our children to learn to think clearly and critically" (p. 15), and the *ECS to Grade 12 Guide to Education 2021-2022* suggests that students will "achieve success as engaged thinkers" (p. 4).

Erickson (2017) suggests that the key to intellectual development is the interplay between the factual and conceptual and the integration of cognitive skills. Basic information that is memorized or easily recalled helps students cope with cognitive load as they move through and solve more complex problems. The more diverse and broad a student's background knowledge, the more easily and naturally they can apply that information at higher levels and the more fluidly they will be able to transition across the various levels of the taxonomy. The more opportunities students have to engage with the quality and nature of the learning represented in each of the cells of the taxonomy table, the more cognitive agility students have the potential to be able to acquire. In its current form, the *2021 Draft K–6 Curriculum* does not seem to set up this intellectual synergy.

Learning Outcomes

Table 3. Learning Outcomes

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.23%	1.83%	0.23%	0.46%	0.46%
Procedural	0.00%	1.14%	13.01%	4.11%	0.23%	2.05%
Conceptual	0.91%	17.12%	17.81%	23.52%	1.60%	0.23%
Factual	4.57%	5.48%	3.65%	1.37%	0.00%	0.00%

Type of Cognitive Process

Note. Coded n = 438

The analysis of the Learning Outcomes revealed that:
- 58.45 per cent of the Learning Outcomes are situated in three mid-level cells: *Understand/Conceptual* (17.12 per cent), *Apply/Conceptual* (17.81 per cent) a*nd Analyze/Conceptual* (23.52 per cent).

- 10.05 per cent of the Learning Outcomes ask students to remember or understand factual knowledge: *Remember/Factual* (4.57 per cent) and *Understand/Factual* (5.48 per cent).

- 70.55 per cent of the Learning Outcomes are distributed across the sixteen cells associated with higher order thinking skills (*Apply* through *Create*).

- 34.35 per cent of the Learning Outcomes are distributed across the twelve cells associated with critical thinking skills (*Analyze* through *Create).*

- 18.26 per cent of the Learning Outcomes ask students to engage with procedural knowledge at the *Understand*, *Apply* or *Analyze* levels.

- 58.45 per cent of the Learning Outcomes ask students to engage with conceptual knowledge at the *Understand*, *Apply* or *Analyze* levels.

- 10.50 per cent of the Learning Outcomes ask students to understand, apply or analyze factual knowledge.

- 3.20 per cent of the Learning Outcomes focus on developing students' metacognitive skills.

- 5.02 per cent of theLearning Outcomes focus on developing students' evaluative or creative thinking skills.

- 2.74 per cent of the Learning Outcomes are distributed across eleven cells, with four cells not represented at all (0.00 per cent).

KUSPs

Table 4. Knowledge, Understanding, and Skills and Procedures (KUSPs)

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.20%	0.41%	0.50%	0.21%	0.22%	0.13%
Procedural	1.21%	1.67%	7.29%	1.26%	0.61%	1.12%
Conceptual	3.32%	14.11%	3.77%	2.43%	0.52%	0.72%
Factual	45.70%	10.63%	3.00%	0.54%	0.23%	0.23%

Type of Cognitive Process

Note. Coded n = 11,126

The analysis of the KUSPs revealed that:
- 59.33 per cent of the KUSPs are situated in three low-level cells: *Remember/Factual* (45.70 per cent), *Understand/Factual* (10.63 per cent) and *Understand/Conceptual* (14.11 per cent).

- 56.32 per cent of the KUSPs ask students to remember or understand factual knowledge: *Remember/Factual* (45.70 per cent) and *Understand/Factual* (10.68 per cent).

- 22.76 per cent of the KUSPs are distributed across the sixteen cells associated with higher order thinking skills (*Apply* through *Create*).

- 8.20 per cent of the KUSPs are distributed across the twelve cells associated with critical thinking skills (*Analyze* through *Create*).

- 10.21 per cent of the KUSPs ask students to engage with procedural knowledge at the *Understand*, *Apply* or *Analyze* levels.

- 20.31 per cent of the KUSPs ask students to engage with conceptual knowledge at the *Understand*, *Apply* or *Analyze* levels.

- 14.17 per cent of the KUSPs ask students to understand, apply or analyze factual knowledge.

- 1.66 per cent of the KUSPs focus on developing students' metacognitive skills.

- 3.77 per cent of the KUSPs focus on developing students' evaluative or creative thinking skills.

- 4.50 per cent of the KUSPs are distributed across twelve cells; each of the twelve cells is represented by less than one per cent of the KUSPs.

When comparing the Learning Outcomes (Table 3) to the KUSPs (Table 4), the following observations can be made:

- 4.57 per cent of the Learning Outcomes ask students to remember facts, yet 45.70 per cent of the KUSPs are framed as basic fact acquisition statements.

- 23.52 per cent of the Learning Outcomes ask students to analyze conceptual knowledge, but 2.43 per cent of the KUSPs provide students the opportunity to analyze conceptual knowledge.

- 70.55 per cent of the Learning Outcomes focus on developing higher order thinking skills (*Apply* through *Create*), but 22.76 per cent of the KUSPs focus on higher order thinking skills.

- 34.35 per cent of the Learning Outcomes focus on developing critical thinking skills (*Analyze* through *Create*); but 8.20 per cent of the KUSPs provide opportunities for students to develop these critical thinking skills.

- 10.50 per cent of theLearning Outcomes ask students to understand, apply or analyze factual knowledge; 14.17 per cent of the KUSPs support these learning opportunities.

- 18.26 per cent of the Learning Outcomes ask students to engage with procedural knowledge at the *Understand*, *Apply* or *Analyze* levels, whereas 10.21 per cent of the KUSPs support these learning opportunities.

- 58.45 per cent of the Learning Outcomes ask students to engage with conceptual knowledge at the *Understand*, *Apply* or *Analyze* levels; 20.31 per cent of the KUSPs are focused on these levels.

- 5.02 per cent of the Learning Outcomes and 3.77 per cent of the KUSPs focus on developing students' evaluative or creative thinking skills.

- 3.20 per cent of the Learning Outcomes and 1.66 per cent of the KUSPs focus on developing students' metacognitive skills.

According to Webb (2002), at least 50 per cent of [KUSP-level] objectives and assessment items should be at or above the cognitive level of the outcome. Martone and Sireci (2009) suggest that, "[KUSP-level] learning objective items should not be targeting skills that are below those required by the outcome to which the objective is matched" (p. 1339). When comparing sets of Learning Outcomes with their corresponding KUSPs, few meet this criteria. When viewing the Learning Outcomes only, the *2021 Draft K-6 Curriculum* represents a distribution more closely aligned with higher order and critical thinking skills; once KUSPs are added into this interpretation, the *2021 Draft K-6 Curriculum* skews heavily towards the lower levels of the taxonomy.

Quantitative data shows that while some KUSPs directly support the learning outcome, many others are narrow, disintegrated, and fragmented. According to our coding process, the *2021 Draft K-6 Curriculum* contains 11,126 individual KUSPs, many of which will require substantial teaching for background and context and time-on-task to explain, explore, and assess. The KUSPs range from being highly specialized and structured, i.e. "Mnemosyne was the ancient Greek goddess of memory, whose nine daughters, the Muses, were the patronesses of the arts. Calliope was one of the daughters of Mnemosyne and the patroness of epic poetry. Ancient Greek epic poems were orally transmitted from generation to generation until written down by Homer. Sources of Greek mythology include Homer's epics", (*Draft English Language Arts and Literature Kindergarten to Grade 6 Curriculum*, Grade 6) to being vague and even puzzling, i.e. "Experience the sense of wonder awakened by timeless stories, fables,

and rhymes featuring childhood experiences or legends from the past" (*Draft Social Studies Kindergarten to Grade 6 Curriculum*, Kindergarten).

A major concern with the KUSPs is the question of whether these highly specific statements will coalesce into broader, more integrated conceptual understandings that are more than the sum of the individual KUSPs. Research has shown that "many students do not make the important connections between and among the facts they learn in classrooms and the larger system of ideas reflected in an expert's knowledge of a discipline" (Bereiter & Scardamalia, 2006).

To view heat map tables for all grades and subjects, see Appendix III.

Qualitative Data

Extensive and thorough qualitative data was gathered from the focus groups. The use of multiple focus groups enables a systematic analysis, in which themes are verified across data sets. Data saturation indicates that further data collection and analysis would reveal similar themes and thus further validate conclusions. When taken into consideration alongside the data from the quantitative study, these responses provide robust feedback and corroborative evidence.

Responses from participants provided nuanced and professional insight about the content in the draft curriculum; these responses are represented in narrative form with both summary comments and individual participant quotations. Responses have been collated and represent recurring themes found across all subject and grade levels.

Unclear wording and confusing verbs

Although participants understood their legal obligation to teach all outcomes in the curriculum, they noted that the wording of the outcomes and KUSPs was often unclear. In many instances, KUSPs were phrased as disciplinary or background knowledge for the teacher, instructional objectives, teaching strategies, or even lesson material. Additionally, the outcomes and KUSPs contain vague and sometimes confusing verbs, leading to uncertainty about how learning should be structured and how it should be assessed. Respondents frequently noted that the verbs in the outcomes were passive, and therefore not assessable. Specifically, the verbs "participate," "listen for changes in," "listen and respond to," and "experience" were identified as particularly problematic. Overall, unclear wording and confusing verbs lead to a lack of clarity around what students are expected to know and be able to do, or how the teacher is to assess their learning. Teachers will require clarification as to whether they are assessing only at the Learning Outcome level, or if assessment of each individual KUSP is also required.

Specifically, Teachers and Teacher Consultants shared the following insights:
- It's unclear, it seems like background knowledge for the teacher in many situations rather than for the student. For example, "Thousands of French settlers were expelled with revolution brewing in the American Thirteen Colonies (known as "Le Grand Dérangement" or "the Great Upheaval"). It was immortalized in Longfellow's poem, Evangeline" (*Draft Social Studies Kindergarten to Grade 6 Curriculum,* Grade 3,). Some teachers might consider this background information while other teachers might think they need to teach the poem.

- There needs to be clarity on what we're evaluating: Knowledge, Understanding, Skills & Procedures, Learning Outcomes, or all? Many of the knowledge outcomes seem like they're speaking to the teacher; are KUSPs an attempt at a teacher resource rather than a student curriculum?

- Meaningful assessment requires triangulation of observations, conversations, and products. The majority of the KUSPs are basic statements of fact. Fact recall can be assessed using multiple choice questions, fill-in-the-blank, labelling diagrams or maps, and true/false type questions. These represent lower level assessments for students to produce as demonstrations of their learning.

> *"Are we assessing at just the learning outcome level, or are we assessing all of the KUSPs as well? If we're not assessing the KUSPs, are they optional to teach?"*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Lack of alignment between the Learning Outcomes and KUSPs

In many instances, there was a lack of alignment between Learning Outcomes and KUSPs; content in the KUSPs did not support or lead to deeper understanding of the Learning Outcome. Rather, the KUSPs felt disconnected from the intent of the Learning Outcome. There were instances where the content of the KUSPs lacked progression or was more advanced in a lower grade level than the content of corresponding KUSPs or Learning Outcome in a higher grade. At times, KUSP material is repeated from year to year.

Specifically, Teachers and Teacher Consultants shared the following insights:
- Often the Learning Outcome is written at a much higher level than the content in the KUSPs. It may be difficult for teachers to teach to and assess the conceptual learning expressed in the Learning Outcome, when all students need to do in the KUSPs is remember facts. Assessing understanding is difficult when students are only memorizing facts. Being able to recall a fact does not provide context of why you should know it or how it integrates with other learning. Focusing on fact memorization will not lead to an integrated understanding of the concept.

- The content of the KUSPs is often fragmented and disconnected from the intent of the learning articulated in the Learning Outcome. In places, the KUSPs do not relate to the Learning Outcomes. If the content of the KUSP content doesn't fit, teachers may want to leave those pieces out. How do you make sure that you're covering them when they don't match? How do you help students to see the connection? For example, "Students investigate how particles of matter behave when heated or cooled and analyze effects on solids, liquids, and gases" (*Draft Science Kindergarten to Grade 6 Curriculum*, Grade 6). Most of the content in the KUSPs is about the particle model of matter and heating and cooling, but then there is an understanding element about bodies of water sustaining life in winter.

> *"The KUSPs are factual. There's a lot of 'recalling facts' but the learning outcome is conceptual. The higher level isn't addressed by the KUSPs."*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Lack of resources

Resources support all aspects of teaching and learning. Resources for teachers need to be readily available and properly vetted. Student resources need to be engaging, age appropriate, culturally sensitive, contextually

relevant, and, where possible, locally developed to be responsive to local contexts. Without a broad resource base, developing learning activities that support a knowledge-based curriculum will be time-intensive.

Specifically, Teachers and Teacher Consultants shared the following insights:
- Teachers will need help when selecting quality resources, or they will have to independently find things in other places. A lot of 'found' resources will likely not match the content in the *2021 Draft K-6 Curriculum*. Who will help to identify resources to teach the new curriculum? It will be problematic if teachers have to rely heavily on unvetted sources or unaccredited websites to find resources.

- A variety of learning activities and resources, not just print, need to be available. Resources need to be user friendly and adaptable to learners' needs, interests, goals and understanding. The material should be presented in a way that is meaningful and relevant to students, and resources should promote student engagement and active learning. Resources should also support a differentiated approach to meet the diverse learning needs of all students. Content in resources needs to be sensitive to the socio-economic, cultural, and linguistic differences of learners, and needs to be available in French and English.

- The curriculum is often a resource in itself; the curriculum should include glossaries of disciplinary and subject-specific terms and illustrative examples. Well-developed front matter grounds the subject matter in the discipline and describes the intent of the learning.

> *"There are [currently] very few resources available for these outcomes, especially when you think about the grade and the reading levels of the students."*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Grade and subject load

Respondents overwhelmingly identified the amount of content as a significant issue, not only in individual subjects, but across grades. The overwhelming number of outcomes and the volume of material in the KUSPs would make maintaining cohesion and coherence between and across subjects challenging. It takes time to plan, teach, re-teach, practice, master, assess, and report student learning. Supporting student learning is deeper than the provision of curricular content.

Specifically, Teachers and Teacher Consultants shared the following insights:
- Teaching the content in a single element of the KUSPs may require multiple classes, depending on the background knowledge and abilities of the students. There is simply too much content to provide an adequate amount of time for students to learn and then transfer learning into new situations. Without applying or doing something new with their learning, students may not see the value in the learning.

- Students attend school for fewer than 200 days per year. With the number of outcomes and KUSPs to be covered in the curriculum, there will be no time to deeply engage with concepts or to build understanding.

- The amount of content in the KUSPs is overwhelming for both teachers and students, especially having to implement all subjects at once. To get through the content, teachers will need to spend all of their time teaching students new facts to remember. There will be no time to go back to review, or go into more depth. Teachers will not have time to cover all of this while still providing opportunities for students to deepen their understanding by applying their learning into new situations.

- The *Draft English Language Arts and Literature Kindergarten to Grade 6 Curriculum* is overloaded with outcomes that focus on grammar, vocabulary, and conventions. Teaching English Language Arts is a process, and many outcomes must be undertaken and addressed simultaneously throughout the year. The way the draft curriculum disaggregates the subject is problematic as a more fluid and process-oriented approach is necessary to teach this subject.

> *"There's just too much to get through in a single year. I feel like students and teachers are going to drown."*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Lack of consideration for all learners

All students deserve access to appropriate programming that enables and improves their learning. The nature of the content combined with the quantity of material to be covered creates tension when considering the needs of all learners. Students have diverse learning needs and ways of demonstrating their learning; students who require modified programming will need learning outcomes to be significantly different and specifically selected to meet their educational needs.

Specifically, Teachers and Teacher Consultants shared the following insights:
- Neurodiverse learners who find it difficult to memorize facts or procedures and will require additional support. The prescriptive nature of this knowledge-based curriculum reduces teacher choice with respect to supporting students with diverse learning styles.

- High ability students may not be able to engage with the content of this curriculum in ways that challenge them at their point of need. High ability students benefit from near-ability or above-ability interactions.

- The *2021 Draft K-6 Curriculum* makes it difficult to provide differentiated instruction, accommodations, and supports so students can learn in their optimal way and have their individual needs met.

- Teachers will require extensive time to review and understand new content in order to create and prepare differentiated lessons and assessments for students with diverse needs. The Skills & Procedures activities appear to operate under the assumption all students are starting at the same level of understanding and ability. Students who struggle may have difficulty keeping up with the demands of a knowledge-based curriculum.

> *"How do we support learners who are just not able to remember all these facts?"*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Challenges for combined grade classes

Teachers and Teacher Consultants noted that combined grade programming, a frequent reality in K-6 schools, would be challenging when implementing the *2021 Draft K-6 Curriculum*. Participants frequently commented that subject content and grade load yielded limited opportunities for making connections within and between grades.

Specifically, Teachers and Teacher Consultants shared the following insights:

- Presenting subjects as sets of discrete facts from multiple grades and subjects does not seem to be conducive to teaching in cross-curricular or combined grade contexts. Teaching focus will be on fact acquisition and memorization rather than focusing on integrating conceptual understanding.

- A combined class requires students to be able to self-regulate and self-pace through independent or collaborative work. KUSPs are fact-oriented and teacher-directed; this means teachers will need to facilitate separate learning experiences across multiple grades simultaneously.

> *"A single grade with its volume of KUSPs is going to be difficult,*
> *managing two grades-worth would be impossible."*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Lack of diverse perspectives

Many participants commented on the lack of diverse perspectives. It was noted that overall, the dominant perspective articulated in the *2021 Draft K-6 Curriculum* represents a western and Eurocentric stance, and that diversity, pluralism, and inclusivity should be prioritized across all grades and subjects of the *2021 Draft K-6 Curriculum*.

Specifically, Teachers and Teacher Consultants shared the following insights:

- The *2021 Draft K-6 Curriculum* does not seem to strongly reflect the calls to action articulated in the *Truth and Reconciliation Commission of Canada: Calls to Action*. In the province that had the most residential schools, it is important to move forward with atonement and reconciliation by developing personal and professional foundational knowledge. With so many knowledge outcomes, there is a concern that teachers will overlook those with an explicit Indigenous focus. In addition, outcomes involving Indigenous people are shallow and lack context to explain the importance of why students are learning this information and its relevance. Most of the time there is only a list of Indigenous 'things' to know.

- The *2021 Draft K-6 Curriculum* is written from a western world view and lacks the balance of an inclusive perspective. Building understandings around reconciliation requires building vocabulary together. Wording used in the draft represents an antiquated understanding, formed on Eurocentric ideologies which continue to advance western colonial narratives. The perspectives articulated in the *2021 Draft K-6 Curriculum* risks what is often referred to as "othering" and marginalizing Indigenous communities.

- It was noted that Sikhs are referred to as "them" in the *Draft Social Studies Kindergarten to Grade 6 Curriculum*, echoing the same concerns that surfaced about content about Indigenous peoples; a stance that would be distinctly White and Eurocentric.

- Representation of contemporary Francophone culture is lacking. When French Canadians are addressed, they are addressed as historical. While the past should be addressed, there should also be a focus on Francophones in Alberta and in the present.

> *"Not all students will see themselves in the curriculum or be represented equally."*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Problematic content

Throughout the grades and subjects, respondents found many examples of errors, inaccuracies and omissions in the Learning Outcomes and the KUSPs. Some respondents expressed that content in some subject areas would not make it through a rigorous vetting process that would flag gender bias, religious connotations, and any ethnocentric focus that marginalizes minority groups. It was also pointed out that the *2021 Draft K-6 Curriculum* includes subjective language such as "truth", "beauty", "great" and "goodness", which may indicate bias.

Specifically, Teachers and Teacher Consultants shared the following insights:
- The content of many KUSPs is beyond the emotional and intellectual maturity of an elementary school-aged child. The nature of the content poses a problem not only for student readiness, but much of it goes beyond the scope of understanding for an elementary generalist teacher. Some wording and content appears to be inappropriate for the target age group; at times it seems that content intended for adults has been placed into the KUSPs. For example:
  - The focus on legal and illegal substances (*Draft Physical Education and Wellness Kindergarten to Grade 6 Curriculum,* Grade 2), seems inappropriate for this age level. Furthermore, the draft doesn't specify which substances should be addressed here, so more information is needed. Substances aren't addressed again until Grade 6 where the focus is on risk and making decisions about healthy peer relationships.
  - The *2021 Draft K-6 Curriculum* states that physical growth can be a measured increase in the size or mass of the body. Trying to be healthy by measuring yourself is problematic. We don't want to promote a practice that is harmful; we want to come from a place of harm reduction.
- It places teachers in an awkward position when the knowledge component is inaccurate or incorrect. Examples of this include:
  - "Two or more angles that compose 90° are complementary angles" (*Draft Mathematics Kindergarten to Grade 6 Curriculum*, Grade 4).
  - "A shape is symmetrical if it can be decomposed into matching halves" (*Draft Mathematics Kindergarten to Grade 6 Curriculum*, Grade 1).
  - "Federalism: Canada has 10 provinces and the US has 50 states, plus territories" (*Draft Social Studies Kindergarten to Grade 6 Curriculum*, Grade 6).

> *"Students and parents and teachers will be frustrated with this curriculum.*
> *Students won't like being at school and parents will wonder why their children*
> *aren't meeting outcomes."*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Need for professional supports

Teachers require significant support to successfully implement any new curriculum. Participants noted that teachers will need time for collaboration with specialists and colleagues in order to further develop their professional capacities. Teachers will require ongoing and extensive professional learning opportunities on new and revised content, supports for planning, and access to resources and guidance on how to assess student learning. Additionally, teachers will need detailed subject introductions and front matter, scope and sequence

documents, and abundant and multiple sources of subject-specific content resources and teaching guides in the language of instruction.

Specifically, Teachers and Teacher Consultants shared the following insights:

- The *2021 Draft K-6 Curriculum* places the responsibility on individual teachers to have a strong understanding of how to address Indigenous ways of knowing; which could lead to misinterpretation and have unintended consequences. Some teachers may still need to build a robust understanding of First Nations, Métis, and Inuit perspectives to address these topics meaningfully and accurately with students.

- A basis of professional learning would be required to build teachers' knowledge in several areas, including computational science, significant changes to the math curriculum, and other new areas of content.

- Alarmingly, participants expressed feeling defeated, overwhelmed and even sad after engaging in professional learning and analysis of the *2021 Draft K-6 Curriculum* over a two-day period. It will be challenging for any potential professional development to overcome this reaction.

> *"We are going to need time to collaboratively plan. We need time to plan at the*
> *school level, at our catchment level, and at the division level."*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

Concurrent implementation

Respondents expressed concerns about implementing the *2021 Draft K-6 Curriculum* and the challenges of implementing a knowledge-heavy curriculum across all subject areas simultaneously.

Specifically, Teachers and Teacher Consultants shared the following insights:

- If all grades are implemented at the same time, older students will not have the required knowledge to be successful. The challenge with a knowledge-based curriculum is to ensure all students have a common starting point.

- There are many factors to consider when planning for implementation of any curriculum, but the proposed timeline for implementation is extremely tight. Delaying the implementation of the curriculum would better serve students and teachers, and support us to be more successful.

> *"How are we going to implement the new curriculum simultaneously across all*
> *subject areas? There are too many new things to attend to all at once.*
> *It would be good to make changes gradually."*
> *(Participant, curriculum analysis, Edmonton Public Schools)*

RECOMMENDATIONS

The analysis of both quantitative and qualitative data sets across all subject areas yielded a number of themes which have been further articulated here as a series of recommendations. The following recommendations are further explained in this section of the report:

- Distribute Learning Outcomes and KUSPs to support strong student learning.

- Reduce the number of KUSPs.

- Revise learning outcomes to address assessment concerns.

- Address problematic content.

- Strengthen diverse perspectives.

- Review for vertical and horizontal alignment.

- Ensure outcomes are well-constructed.

- Establish curricular supports.

- Delay implementation.

Recommendation: Distribute Learning Outcomes and KUSPs to support strong student learning

A taxonomy table is a visual tool to map out and understand the expectations of student learning across a curriculum. Seeing how outcomes and KUSPs are distributed in a taxonomy table can present a high level view of the overall strengths and weaknesses of a curriculum. The quality of learning outcomes is linked to the overall goal of that curriculum and to student achievement. If the overall goal of learning is knowledge retention, a significant portion of the curriculum will be concentrated in the *Remember* or *Understand* columns. If the overall goal of the learning is problem solving and transfer, a taxonomy table would show a significant emphasis in the *Apply* through *Create* columns. Empty or underrepresented cells in a taxonomy table can be viewed as "missed opportunities" (Anderson & Krathwohl, 2001, p. 241) and should trigger a revision of the distribution of learning outcomes.

Optimally, learning outcomes in a curriculum are present in all cells across the taxonomy table and focus on the overall goals of the curriculum. A curriculum that requires students to operate at more complex levels of thinking (i.e., critical and creative thinking, problem solving, and transfer) would be represented in a heat map similar to Table 5.

Table 5. Example of a table showing distribution in alignment with research

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive						
	Procedural						
	Conceptual						
	Factual						

Type of Cognitive Process

Recommendation: Reduce the number of KUSPs

White (2000) documented teachers as they encountered day-to-day teaching and assessment issues and described the pedagogical choices teachers made in response to challenges as "web-like". This description supports the notion that good teaching draws upon multiple approaches, as teachers move between and amongst teaching approaches. How a teacher would present a fact is different from how a teacher would support deep analytical or evaluative thinking about that same fact. With a curriculum predominantly about accumulating knowledge in the form of disconnected facts, the ways in which teachers approach classroom instruction narrows and becomes pedagogically shallow.

This concern extends to the challenge of triangulating evidence of student learning for assessment purposes; with a predominance of outcomes that are highly specific and fact-based, there are limited opportunities for students to represent their learning in different ways. In addition, the use and reliance of oversimplified assessment may result as a response to the sheer volume of KUSPs.

Teacher Consultants and Classroom Teacher respondents identified the issue of an overly heavy knowledge item load as a significant problem, not only in individual subjects, but across all grades. Experienced teachers understand that supporting student learning is a complex endeavour; it is more than simply transmitting curricular content. Participants in the curriculum analysis expressed a desire to enable rich learning experiences for students and raised concerns about the amount of time required to support learners with the amount of content associated with each knowledge-based outcome.
- In limiting the KUSPs to "knowledge" and "understanding'' (low-level cognitive domains) opportunities for deeper and more complex engagement, both for teachers and students, are limited.

Recommendation: Revise learning outcomes to address assessment concerns

Assessment provides information about the range and depth of student learning. A question repeated in all stages of data collection was, "Are we assessing at just the learning outcome level, or are we also assessing all KUSPs?" Participants expressed a need for clarity on the expectation of teachers to assess student learning for each of the following curricular elements:
- Knowledge

- Understanding

- Skills & Procedures

- Learning Outcome

Participants also surfaced concerns about curricular elements that seem inappropriate for the work of assessment and evaluation, as several outcomes seem to be directing the work of the teacher, and are worded as directives one might find in a resource manual for teachers. The removal or rewording of such outcomes would be beneficial to support assessment.

Instruction that focuses largely on supporting students to acquire knowledge as discrete facts requires methods that will assess how well students have learned those facts. In order to be valid, an assessment must be congruent with the content in the outcome. Low-level outcomes require low-level assessments. Assessments for

the *Remember* and *Understand* levels of the taxonomy can be efficiently assessed, as the range of student responses is very limited. Student responses converge on answers that skew to one correct response. Conversely, assessment methods and strategies for the *Apply* through *Create* levels of the cognitive dimension are more complex and require more time for the teacher to construct and evaluate and for the student to complete. Assessments designed for the top four levels of the taxonomy provide richer information about student learning.

The ultimate goal of assessment and evaluation is to improve student learning. Assessment, evaluation, and reporting must be valid and reliable and should lead to the improvement of student learning and the deepening of teacher practice. With a curriculum predominantly skewed towards low-level rote learning and memorization, assessment practices will need to be adjusted accordingly.

Recommendation: Address problematic content

The issue of problematic content has been outlined in the Qualitative Data section of this report. While the feedback provided is not exhaustive, it does highlight specific areas of concern. Across subject areas and grades, participants surfaced concerns with curriculum content, including developmental appropriateness, problematic language use, errors and inaccuracies, and implicit bias.

Overall, concerns surfaced throughout the feedback process reflect specific concerns and criticisms that have been shared by other school jurisdictions, professional organizations, post-secondary reviews and various subject-area experts.

Recommendation: Strengthen diverse perspectives

It was noted by many participants that the *2021 Draft K-6 Curriculum* has problematic content related to diversity. Specific concerns include:

- An overall lack of alignment with the intent of Section 10.iii of Calls to Action set forth by the *Truth and Reconciliation Commission of Canada: Calls to Action* (TRC) in which governments are called to "[develop] culturally appropriate curricula" (Truth and Reconciliation Commission of Canada: Calls to Action, p. 2, Section 10.iii). Participants with perspectives relevant to First Nations, Métis, and Inuit education expressed that overall, the *2021 Draft K–6 Curriculum* does not reflect the importance of "using the programs of study to provide opportunities for all students to develop a knowledge and understanding of, and respect for, the histories, cultures, languages, contributions, perspectives, experiences, and contemporary contexts of First Nations, Métis, and Inuit" (*Teaching Quality Standard*, 2020, p. 5).

- The *2021 Draft K-6 Curriculum* reflects a western world view and lacks the balance of an inclusive curriculum. At times, participants perceived language used in the draft ranging from insensitive to racist.

- A perspective relevant to Francophone culture was found to be weak, as it was frequently framed as historical, and not a contemporary focus on Francophones in Alberta.

Recommendation: Review for vertical and horizontal alignment

When approaching a revision of the *2021 Draft K-6 Curriculum*, it may be helpful for curriculum writers to start by addressing both the vertical and horizontal alignment across Kindergarten to Grade 6. Participants responded positively overall to the idea of a common architecture, but the current curricular items do not lend themselves well to leveraging this common structure.

Viewing curricular outcomes as being part of a nested arrangement of inter-related questions, concepts, and themes lends itself well to a sophisticated approach to instructional design. Instructional design (the mindful creation of learning experiences that meet students needs) can move from the teacher presenting discrete units of study towards a more integrated approach to teaching and learning. The fluidity of the architecture of the *2021 Draft K-6 Curriculum* makes it easy to see cross-curricular opportunities, particularly when considering that Organizing Ideas may span multiple grades and subjects.

The architecture of the curriculum could be leveraged in more effective ways. Specifically:
- The architecture should visually funnel the content from high-level disciplinary constructs into more concrete statements of learning. Optimally, there should be clear distinctions in language and cogency in each layer, and each layer should feed into and support the layers above and below.

- Organizing Ideas should:
  - be global in nature.
  - be broadly stated.
  - represent complex, multifaceted ideas that require substantial time and instruction to accomplish.
  - encompass a number of more specific and related questions and outcomes.
  - represent conceptual constructs that are perpetually fluid and out of reach; the nature of the construct implies that they are something to strive for, move towards, or become.

- Guiding Questions should:
  - break the organizing idea into a more focused form.
  - provide organizational structure and context to the learning outcome and other elements that support it.

- Learning Outcomes should:
  - use active, assessable verbs to describe what the student should know and be able to do.
  - aim to develop student capacities at all cognitive levels.
  - be written to the highest level of cognitive development appropriate for the intended learning.

Addressing vertical alignment could entail:
- revising Learning Outcome statements in each subject area to reflect learning for conceptual understanding.

- ensuring the KUSPs directly and meaningfully support student learning as it relates to the Learning Outcome.

Addressing horizontal alignment could entail:
- examining each Learning Outcome and list of KUSPs across all subject areas in a grade to ensure cross-curricular alignment; teachers should be able to design learning experiences for students that weave together concepts from different subject areas with ease.

- reducing the number of KUSPs, as the current volume of material in the KUSPs does not strongly support cohesion and coherence across subjects.

Recommendation: Ensure outcomes are well-constructed

Well-constructed outcomes are key to effective planning for high-quality student learning and assessment of that student learning. (Anderson & Krathwohl, 2001) suggests that in order to be considered well-constructed, outcomes:

- convey an open, rich sense of intended student learning.

- use active language (verbs in particular) to express clear expectations.

- emphasize "student-oriented, learning-based, explicit and assessable statements of intended cognitive outcomes" (p. 23).

- describe an intended learning result, not "idiosyncratic learning activities or behaviours that seemingly lead to the 'end'" (p. 105).

Curricular elements that use passive verbs are problematic as they are internal, unassessable and can be interpreted in different ways. Active verbs, on the other hand, are observable and measurable (Potter & Kustra, 2012). Low-level outcomes should, when possible, be re-written to the highest level of cognitive complexity inherent in the intended learning.

The KUSPs, in particular, are a confusing element in the *2021 Draft K-6 Curriculum* as they represent a list of statements that begin with passive verbs, active verbs, statements that may contain a verb but are declarative in nature (stating a fact), and some KUSPs lack verbs entirely. As referenced elsewhere in this report, clarity is required as to whether KUSPs are considered to be expectations for student learning or simply provide supporting information.

Recommendation: Establish curricular supports

A range of supports can be established to support curriculum implementation, including detailed front matter for each subject and guides to implementation.

Detailed front matter
Subject overviews that accompany the *2021 Draft K-6 Curriculum* lack critical information necessary for teachers to understand key disciplinary tenets, theories of knowledge, and ways of organizing the subject for instruction. Generally, curriculum documents include front matter that supports its implementation. Items commonly found in front matter include the following sections: statement of philosophy; program rationale; statement of learner expectations; glossaries of disciplinary and subject-specific terms and suggestions for organizing instruction and assessment.

Guides to implementation
Guides to implementation provide practical supports for teachers such as planning considerations, detailed explanations of learning outcomes and objectives, sample assessment tools, suggested instructional approaches, sample year plans and unit plans, illustrative examples, sample assessment templates, and resource lists.

Recommendation: Delay implementation

The implementation of any new curriculum has traditionally been a significant undertaking that is both time and resource-intensive. With that in mind, it is important to note that the education system in Alberta has never concurrently implemented curriculum across seven grades and a minimum of six subject areas. Within the current timelines, every Kindergarten to Grade 6 teacher in Alberta will be required to implement new curriculum across almost every subject area in less than one year. The revised curriculum is anticipated to be released in the spring of 2022, leaving thousands of teachers and school leaders with only a few months to prepare for unprecedented system change.

Given the issues identified during the curriculum analysis process, it is our recommendation that Alberta Education delay the implementation of the *2021 Draft K-6 Curriculum*. Delaying implementation would provide time to:

- Conduct a pilot using a revised *2021 Draft K-6 Curriculum*, scheduled to be released in 2022. It is recommended that this pilot involves:
  - a minimum of 10 per cent of students in the province.
  - all subject areas that have a draft curriculum.
  - all grade levels from Kindergarten to Grade 6, including combined grade classes.
  - representation from public schools from various geographical areas in the province.
  - representation from public schools in urban, suburban, and rural areas.
  - diverse student populations within single piloting schools
    - criteria of what is considered to be diverse student populations.
  - French immersion programs that also meet the criteria mentioned above.

- Address problematic content in each subject area and receive ongoing feedback from experts and classroom teachers.

- Provide sufficient professional development for teachers and school leaders in Kindergarten to Grade 6 to learn about the new curriculum that includes:
  - identification of new as well as familiar content across all subject areas.
  - provision of processes and models to plan in a cross-curricular manner across subject areas using the common curricular architecture.
  - identification of appropriate resources to use for new content.
  - supported collaborative planning time for instruction and assessment.

CONCLUDING REMARKS

Teachers know that to support students' academic success they need to design learning experiences that are challenging, engaging and inspiring. To enable these types of learning experiences, teachers need to use curriculum that is grounded in recent, research-based evidence of strong curriculum design, involves the input of teachers working with a diverse range of students, and that has been thoroughly vetted through classroom field testing. In effect, students in Alberta would benefit from a curriculum that has been constructed based on the vision first articulated in *Inspiring Education*.

The findings in this report from Edmonton Public Schools' curriculum analysis process reflects a sincere effort to offer feedback and recommendations to Alberta Education about the *2021 Draft K-6 Curriculum*. The Division thanks the many Teachers and Teacher Consultants who contributed their expertise to the curriculum analysis process. Their passion for supporting student success both now and in the future was evident throughout the process.

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A Model of Learning Objectives - based on A Taxonomy for Learning, Teaching, ad Assessing: A Revision of Bloom's Taxonomy of Educational Objectives by Rex Heer, Centre for Excellence in Learning and Teaching, Iowa State University is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

APPENDIX II: USEFUL VERBS FOR DEVELOPING LEARNING OUTCOMES

This list of useful verbs for creating learning outcomes is arranged according to Bloom's Taxonomy of Educational Objectives, which identifies different cognitive domains associated with levels of learning. Bloom's taxonomy was developed in 1956, and was revised in 2001 by Bloom's colleagues, Lorin Anderson and David Krathwahl.

Adapted from: Anderson, L.W. (Ed.), Krathwohl, D.R. (Ed.), Airasian, P.W., Cruikshank, K.A., Mayer, R.E., Pintrich, P.R., Raths, J., & Wittrock, M.C. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's Taxonomy of Educational Objectives* (Complete edition). New York: Longman. ISBN 0-8013-1903-X

REMEMBER: Retrieve relevant knowledge from long-term memory

arrange; cite; collect; define; describe; duplicate; enumerate; find; identify; locate; memorize; record; recognize; match; relate; select; name; label; list; order; quote; recall; repeat; reproduce; select; show; state

UNDERSTAND: Construct meaning from instructional messages, including oral, written, and graphic communication

associate; classify; compare; contrast; convert; describe; estimate; explain; extend; generalize; give examples; identify; interpret; justify; locate; outline; paraphrase; predict; recognize; report; restate; review; select; summarize; trace; translate

APPLY: Carry out or use a procedure in a given situation

apply; calculate; chart; choose; classify; complete; compute; construct; contribute; develop; discover; dramatize; employ; experiment; extend; illustrate; implement; instruct; interpret; modify; operate; participate; practice; predict; show; solve; teach; text; use

ANALYZE: Break material into its constituent parts and determine how the parts relate to one another and the overall structure or purpose

advertise; analyze; break down; categorize; classify; collect; compare; connect; contrast; correlate; criticize; diagram; differentiate; distinguish; divide; establish; explain; identify; illustrate; infer; investigate; order; outline; prioritize; question; select; separate; verify

EVALUATE: Make judgments based on criteria and standards

appraise; argue; assess; choose; conclude; convince; criticize; critique; debate; decide, defend; determine; discriminate; evaluate; grade; integrate; interpret; judge; justify; predict; prioritize; rate; recommend; reframe; score; select; support; value

CREATE: Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure

adapt; anticipate; arrange; assemble; collect; combine; compile; construct; decide; design; develop; facilitate; formulate; generate; generalize; imagine; incorporate; individualize; integrate; invent; modify; negotiate; organize; plan; propose; rearrange; reconstruct; reorganize; revise; select; structure; substitute; validate

APPENDIX III: ADDITIONAL TABLES

The data from the coding processes is represented using tables with colour-coded heat maps. A heat map is a grid of coloured squares that depicts values of interest at the intersection of two axis variables. The axis variables are divided into ranges, in this case the hierarchy of cognitive processes and type of knowledge, and each cell's color indicates the value of the main variable in the corresponding cell across a gradient from green (minimum value) to red (maximum value).

Heat Map Legend and Table (illustrative example; not real data)

	Maximum value
	Midpoint value
	Minimum value

Example

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	3.70%
Procedural	0.00%	0.00%	18.52%	1.85%	0.00%	1.85%
Conceptual	0.00%	5.56%	22.22%	18.52%	1.85%	0.00%
Factual	5.56%	7.41%	11.11%	1.85%	0.00%	0.00%

Type of Cognitive Process
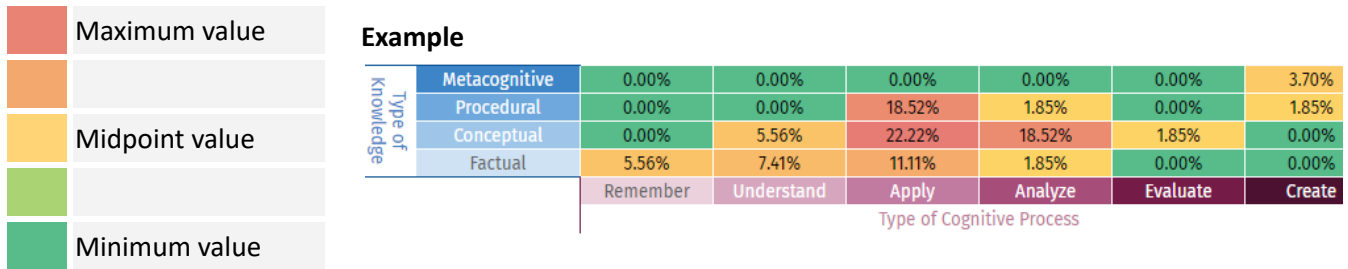
The coding process identified 438 learning outcomes and 11,049 KUSPs in the *2021 Draft K-6 Curriculum* (total = 11,487). There were some learning outcomes and KUSPs (n=77 or 0.65 per cent) that consultants were "unable to code."

The following tables are provided for furth3wer clarity:
- Grade Level Codes
- Subject Level Codes
- Learning Outcomes and KUSPs Level Codes
- Grade Level and Subject Comparison Codes

Grade Level Codes

The following tables include all coded Learning Outcomes and KUSPs for each grade level.

Kindergarten

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.11%	0.00%	0.00%	0.00%	0.00%
Procedural	0.53%	0.11%	1.37%	0.00%	0.00%	0.00%
Conceptual	3.36%	11.34%	3.78%	0.84%	0.00%	0.11%
Factual	59.87%	12.39%	4.62%	0.42%	0.00%	0.00%

Type of Cognitive Process

Coded n = 952

Grade 1

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.07%	0.13%	0.00%	0.20%	0.07%	0.13%
Procedural	1.05%	0.53%	5.85%	0.59%	0.13%	0.85%
Conceptual	9.73%	17.88%	7.69%	2.89%	0.33%	1.58%
Factual	40.96%	6.57%	1.78%	0.13%	0.00%	0.07%

Type of Cognitive Process

Coded n = 1,521

Grade 2

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.12%	0.18%	0.00%	0.06%
Procedural	0.96%	1.02%	3.71%	0.00%	0.00%	0.42%
Conceptual	2.51%	16.63%	5.44%	2.09%	0.12%	0.84%
Factual	42.76%	13.82%	6.88%	0.72%	0.00%	0.66%

Type of Cognitive Process

Coded n = 1,672

Grade 3

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.34%	0.73%	0.56%	0.17%	0.06%	0.00%
Procedural	1.23%	1.17%	7.15%	0.61%	0.22%	0.39%
Conceptual	1.84%	14.19%	3.13%	3.35%	0.56%	0.73%
Factual	40.89%	16.42%	4.53%	0.73%	0.22%	0.56%

Type of Cognitive Process

Coded n = 1,790

Grade 4

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.37%	0.64%	0.90%	0.37%	0.53%	0.27%
Procedural	1.01%	3.67%	9.40%	0.96%	0.96%	1.81%
Conceptual	3.19%	16.42%	4.52%	3.19%	0.64%	0.80%
Factual	37.67%	8.77%	2.23%	0.64%	0.53%	0.11%

Type of Cognitive Process

Coded n = 1,882

Grade 5

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.22%	0.54%	0.87%	0.33%	0.16%	0.16%
Procedural	1.74%	1.91%	7.96%	1.96%	1.14%	2.13%
Conceptual	2.29%	11.93%	3.60%	4.63%	1.14%	0.54%
Factual	48.12%	5.01%	1.36%	0.98%	0.16%	0.05%

Type of Cognitive Process

Coded n = 1,835

Grade 6

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.21%	0.42%	0.94%	0.10%	0.58%	0.26%
Procedural	1.26%	1.99%	12.92%	4.34%	1.20%	1.73%
Conceptual	0.73%	10.15%	2.30%	4.13%	0.73%	0.21%
Factual	43.78%	10.36%	0.73%	0.26%	0.42%	0.00%

Type of Cognitive Process

Coded n = 1,912

Subject Level Codes

The following tables include all coded Learning Outcomes, Knowledge, Understanding, and Skills and Procedures for each subject area taught in our Division.

English Language Arts and Literature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.10%	0.10%	0.46%	0.36%	0.31%	0.46%
Procedural	2.20%	1.48%	5.93%	1.43%	0.97%	1.94%
Conceptual	1.79%	10.38%	3.89%	3.58%	0.41%	1.02%
Factual	44.60%	9.31%	7.62%	0.66%	0.20%	0.46%

Type of Cognitive Process

Coded n = 1,955

Fine Arts

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.03%	0.00%	0.10%	0.13%	0.20%	0.10%
Procedural	0.27%	1.04%	10.30%	1.54%	0.37%	1.64%
Conceptual	2.88%	8.66%	4.65%	2.24%	0.30%	1.27%
Factual	52.99%	8.93%	1.60%	0.13%	0.00%	0.13%

Type of Cognitive Process

Coded n = 2,991

Français immersion et littérature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.82%	1.83%	2.22%	0.39%	0.19%	0.00%
Procedural	3.24%	2.08%	6.37%	0.24%	0.14%	0.00%
Conceptual	6.47%	15.74%	5.79%	1.64%	0.53%	0.39%
Factual	37.81%	7.15%	4.06%	0.68%	0.53%	0.10%

Type of Cognitive Process

Coded n = 2,071

Mathematics

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.79%	3.17%	16.74%	3.26%	1.06%	0.62%
Conceptual	1.76%	18.94%	3.44%	3.17%	0.35%	0.44%
Factual	33.30%	11.01%	1.06%	0.09%	0.26%	0.35%

Type of Cognitive Process

Coded n = 1,135

Physical Education and Wellness

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.09%	0.37%	0.46%	0.37%	0.55%	0.00%
Procedural	0.09%	1.39%	4.52%	0.65%	0.46%	0.74%
Conceptual	3.79%	25.48%	6.00%	5.17%	0.55%	0.00%
Factual	34.72%	12.10%	1.29%	0.46%	0.00%	0.28%

Type of Cognitive Process

Coded n = 1,083

Science

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.07%	0.15%	0.00%	0.00%	0.22%	0.29%
Procedural	0.37%	2.06%	4.13%	2.36%	1.18%	2.21%
Conceptual	2.95%	18.94%	2.95%	5.16%	1.11%	0.52%
Factual	41.78%	10.76%	1.47%	0.74%	0.00%	0.15%

Type of Cognitive Process

Coded n = 1,357

Social Studies

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.10%	0.10%	0.00%
Procedural	0.10%	0.72%	1.13%	0.21%	0.21%	0.10%
Conceptual	1.54%	10.08%	1.65%	3.91%	1.13%	0.31%
Factual	52.26%	20.47%	2.16%	1.95%	0.72%	0.10%

Type of Cognitive Process

Coded n = 972

Learning Outcomes and KUSPs Level Codes

The following tables separate the codes for the learning outcomes, knowledge, understanding, and skills and procedures across all grade levels and subject areas.

Learning Outcome

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.23%	1.83%	0.23%	0.46%	0.46%
Procedural	0.00%	1.14%	13.01%	4.11%	0.23%	2.05%
Conceptual	0.91%	17.12%	17.81%	23.52%	1.60%	0.23%
Factual	4.57%	5.48%	3.65%	1.37%	0.00%	0.00%

Type of Cognitive Process

Coded n = 438

Knowledge

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.28%	0.16%	0.00%	0.00%	0.00%	0.00%
Procedural	1.77%	0.60%	0.12%	0.04%	0.00%	0.00%
Conceptual	3.81%	6.00%	0.08%	0.14%	0.00%	0.00%
Factual	79.94%	6.40%	0.02%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 4,966

Understanding

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.16%	0.58%	0.05%	0.00%	0.05%	0.11%
Procedural	0.32%	3.01%	0.37%	0.00%	0.00%	0.00%
Conceptual	5.18%	34.74%	0.53%	0.26%	0.00%	0.05%
Factual	34.58%	19.46%	0.05%	0.05%	0.05%	0.00%

Type of Cognitive Process

Coded n = 1,891

Skills and Procedures

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.12%	0.61%	1.26%	0.54%	0.54%	0.28%
Procedural	0.94%	2.27%	18.55%	3.21%	1.57%	2.90%
Conceptual	1.87%	14.15%	9.44%	6.00%	1.34%	1.85%
Factual	9.96%	11.43%	7.73%	1.38%	0.56%	0.59%

Type of Cognitive Process

Coded n = 4,269

Grade Level and Subject Comparison Codes

The following tables show all codes across each grade and subject as examples of how this coding can be further disaggregated.

Kindergarten Subject Comparison Codes

Kindergarten - English Language Arts and Literature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	1.47%	0.00%	0.00%	0.00%
Conceptual	0.49%	3.92%	2.94%	0.00%	0.00%	0.00%
Factual	71.08%	10.78%	9.31%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 204

Kindergarten - Fine Arts

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Conceptual	0.00%	0.00%	1.16%	0.00%	0.00%	0.00%
Factual	87.26%	10.81%	0.77%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 259

Kindergarten - Français immersion et littérature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.56%	0.00%	0.00%	0.00%	0.00%
Procedural	2.82%	0.00%	1.13%	0.00%	0.00%	0.00%
Conceptual	13.56%	22.03%	6.78%	0.56%	0.00%	0.00%
Factual	31.07%	10.73%	6.78%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 177

Kindergarten - Mathematics

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Conceptual	1.47%	16.18%	4.41%	0.00%	0.00%	0.00%
Factual	51.47%	25.00%	1.47%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 68

Kindergarten - Physical Education and Wellness

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	7.61%	0.00%	0.00%	0.00%
Conceptual	0.00%	34.78%	6.52%	4.35%	0.00%	0.00%
Factual	28.26%	16.30%	1.09%	1.09%	0.00%	0.00%
	Remember	Understand	Apply	Analyze	Evaluate	Create
			Type of Cognitive Process			

Coded n = 92

Kindergarten - Science

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	1.14%	0.00%	0.00%	0.00%	0.00%
Conceptual	2.27%	17.05%	5.68%	3.41%	0.00%	0.00%
Factual	50.00%	10.23%	7.95%	2.27%	0.00%	0.00%
	Remember	Understand	Apply	Analyze	Evaluate	Create
			Type of Cognitive Process			

Coded n = 88

Kindergarten - Social Studies

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	1.56%	0.00%	0.00%	0.00%
Conceptual	6.25%	4.69%	1.56%	0.00%	0.00%	1.56%
Factual	60.94%	12.50%	3.13%	1.56%	0.00%	0.00%
	Remember	Understand	Apply	Analyze	Evaluate	Create
			Type of Cognitive Process			

Coded n = 64

Grade 1 - English Language Arts and Literature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.65%	0.00%	0.65%
Procedural	0.65%	0.65%	8.79%	0.33%	0.00%	1.63%
Conceptual	3.58%	23.13%	7.49%	6.19%	0.33%	1.95%
Factual	39.09%	2.61%	0.98%	0.65%	0.00%	0.33%

Type of Cognitive Process

Coded n = 307

Grade 1 - Fine Arts

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.22%	0.00%	0.00%	0.22%	0.22%	0.00%
Procedural	0.00%	0.22%	7.19%	0.00%	0.22%	1.57%
Conceptual	8.54%	5.17%	9.21%	1.57%	0.45%	4.04%
Factual	53.48%	6.52%	1.12%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 445

Grade 1 - Français immersion et littérature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	5.24%	1.50%	2.25%	0.00%	0.00%	0.00%
Conceptual	13.86%	33.71%	8.24%	0.37%	0.00%	0.00%
Factual	20.22%	6.74%	4.87%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 267

Grade 1 - Mathematics

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	6.15%	6.15%	0.00%	0.00%
Conceptual	4.62%	29.23%	5.38%	6.15%	0.00%	0.00%
Factual	35.38%	5.38%	0.00%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 130

Grade 1 - Physical Education and Wellness

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	4.10%	0.00%	0.00%	0.00%
Conceptual	25.41%	13.93%	13.93%	0.82%	0.00%	0.00%
Factual	38.52%	2.46%	0.82%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 122

Grade 1 - Science

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	1.42%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.71%	7.80%	0.00%	0.71%	0.71%
Conceptual	11.35%	12.06%	4.26%	4.26%	0.00%	0.00%
Factual	44.68%	9.22%	2.84%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 141

Grade 1 - Social Studies

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Conceptual	8.26%	14.68%	0.92%	1.83%	1.83%	0.00%
Factual	50.46%	20.18%	0.92%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 109

Grade 2 Subject Comparison Codes

Grade 2 - English Language Arts and Literature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.00%	0.32%	0.00%	0.00%	0.00%
Conceptual	0.00%	3.21%	2.24%	0.00%	0.00%	0.96%
Factual	53.21%	13.14%	23.40%	0.64%	0.00%	1.28%

Type of Cognitive Process

Coded n = 312

Grade 2 - Fine Arts

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.45%	0.67%	0.00%	0.22%
Procedural	0.00%	0.45%	7.14%	0.00%	0.00%	0.67%
Conceptual	0.22%	18.30%	6.03%	5.58%	0.00%	1.34%
Factual	37.72%	16.74%	2.90%	0.22%	0.00%	0.67%

Type of Cognitive Process

Coded n = 448

Grade 2 - Français immersion et littérature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	4.78%	2.39%	3.07%	0.00%	0.00%	0.00%
Conceptual	13.99%	43.69%	7.85%	0.00%	0.00%	0.00%
Factual	10.92%	6.14%	3.75%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 293

Grade 2 - Mathematics

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.80%	5.60%	11.20%	0.00%	0.00%	0.00%
Conceptual	0.00%	16.00%	3.20%	2.40%	0.00%	1.60%
Factual	27.20%	23.20%	6.40%	0.80%	0.00%	1.60%

Type of Cognitive Process

Coded n = 125

Grade 2 - Physical Education and Wellness

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.69%	1.39%	0.00%	0.00%	0.69%
Conceptual	0.00%	13.89%	15.97%	2.08%	1.39%	0.00%
Factual	47.22%	13.89%	2.78%	0.00%	0.00%	0.00%

Type of Cognitive Process

Grade 2 - Science

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Procedural	0.57%	0.00%	1.70%	0.00%	0.00%	1.70%
	Conceptual	0.00%	8.52%	2.84%	1.14%	0.00%	1.70%
	Factual	59.66%	15.91%	3.41%	2.27%	0.00%	0.57%

Type of Cognitive Process

Grade 2 - Social Studies

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Procedural	0.00%	0.00%	0.57%	0.00%	0.00%	0.00%
	Conceptual	0.00%	1.72%	1.15%	1.15%	0.00%	0.00%
	Factual	81.03%	11.49%	0.00%	2.30%	0.00%	0.57%

Type of Cognitive Process

Grade 3 Subject Comparison Codes

Grade 3 - English Language Arts and Literature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.33%	0.00%	0.00%
Procedural	0.33%	0.00%	3.91%	0.65%	0.00%	0.33%
Conceptual	0.00%	13.03%	4.56%	7.17%	1.30%	1.95%
Factual	27.69%	23.13%	13.36%	0.65%	0.65%	0.98%

Type of Cognitive Process

Coded n = 307

Grade 3 - Fine Arts

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.23%	0.46%	9.63%	0.69%	0.46%	1.38%
Conceptual	2.98%	7.57%	3.21%	2.06%	0.46%	0.69%
Factual	55.50%	10.55%	3.21%	0.46%	0.00%	0.00%

Type of Cognitive Process

Coded n = 436

Grade 3 - Français immersion et littérature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	1.44%	3.74%	2.30%	0.57%	0.29%	0.00%
Procedural	5.17%	1.72%	9.48%	0.57%	0.00%	0.00%
Conceptual	2.59%	4.60%	4.60%	1.44%	0.00%	0.57%
Factual	48.85%	4.89%	4.31%	2.01%	0.00%	0.57%

Type of Cognitive Process

Coded n = 348

Grade 3 - Mathematics

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	5.08%	14.21%	2.03%	0.51%	0.00%
Conceptual	1.02%	28.93%	4.06%	6.60%	0.00%	0.00%
Factual	23.86%	11.17%	1.02%	0.00%	1.02%	0.51%

Type of Cognitive Process

Coded n = 197

Grade 3 - Physical Education and Wellness

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	1.26%	0.00%	0.00%	0.00%
	Procedural	0.00%	0.00%	3.77%	0.00%	0.63%	0.00%
	Conceptual	1.26%	15.72%	0.63%	3.14%	0.00%	0.00%
	Factual	40.25%	26.42%	4.40%	0.63%	0.00%	1.89%
		Remember	Understand	Apply	Analyze	Evaluate	Create
				Type of Cognitive Process			

Coded n = 159

Grade 3 - Science

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.49%	0.00%	0.00%	0.00%	0.00%	0.00%
	Procedural	0.49%	0.00%	3.45%	0.00%	0.00%	0.00%
	Conceptual	2.96%	23.65%	1.48%	0.99%	0.49%	0.99%
	Factual	44.33%	19.21%	0.00%	0.49%	0.00%	0.49%
		Remember	Understand	Apply	Analyze	Evaluate	Create
				Type of Cognitive Process			

Coded n = 203

Grade 3 - Social Studies

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Procedural	0.71%	2.14%	0.00%	0.00%	0.00%	0.00%
	Conceptual	0.71%	25.00%	0.00%	2.86%	2.14%	0.00%
	Factual	24.29%	40.71%	1.43%	0.00%	0.00%	0.00%
		Remember	Understand	Apply	Analyze	Evaluate	Create
				Type of Cognitive Process			

Coded n = 140

Grade 4 Subject Comparison Codes

Grade 4 - English Language Arts and Literature

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.37%	0.75%	2.25%	0.75%	1.50%	1.50%
	Procedural	0.37%	3.37%	5.24%	1.87%	1.87%	4.49%
	Conceptual	2.62%	11.99%	1.87%	1.87%	0.00%	1.50%
	Factual	39.70%	12.36%	2.25%	0.75%	0.37%	0.37%

Type of Cognitive Process

Coded n = 267

Grade 4 - Fine Arts

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.21%
	Procedural	1.07%	2.35%	14.50%	1.07%	0.21%	1.92%
	Conceptual	5.33%	12.79%	5.97%	1.07%	0.43%	1.49%
	Factual	45.42%	3.84%	1.49%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 469

Grade 4 - Français immersion et littérature

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	1.68%	2.79%	2.79%	1.12%	0.28%	0.00%
	Procedural	2.79%	3.07%	10.34%	0.00%	0.00%	0.00%
	Conceptual	5.31%	4.47%	4.75%	2.79%	0.84%	0.56%
	Factual	47.77%	3.91%	3.91%	0.28%	0.56%	0.00%

Type of Cognitive Process

Coded n = 358

Grade 4 - Mathematics

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Procedural	0.00%	4.35%	14.78%	0.43%	2.17%	1.74%
	Conceptual	3.04%	16.96%	5.22%	1.74%	0.87%	0.87%
	Factual	40.00%	6.96%	0.00%	0.00%	0.43%	0.43%

Type of Cognitive Process

Coded n = 230

Grade 4 - Physical Education and Wellness

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.52%	0.00%	1.04%	0.00%
	Procedural	0.52%	3.11%	7.25%	0.52%	1.55%	0.00%
	Conceptual	0.52%	44.56%	4.15%	9.84%	0.00%	0.00%
	Factual	12.44%	11.40%	0.00%	0.52%	0.00%	0.00%

Type of Cognitive Process

Coded n = 193

Grade 4 - Science

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.00%	0.93%	0.00%
	Procedural	0.93%	9.26%	4.17%	2.78%	1.85%	3.70%
	Conceptual	0.46%	30.56%	2.78%	6.94%	1.85%	0.00%
	Factual	26.85%	6.48%	0.00%	0.46%	0.00%	0.00%

Type of Cognitive Process

Coded n = 216

Grade 4 - Social Studies

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.67%	0.67%	0.00%
	Procedural	0.00%	1.34%	0.67%	0.00%	0.00%	0.67%
	Conceptual	0.00%	6.71%	6.04%	1.34%	0.67%	0.00%
	Factual	30.20%	32.21%	10.07%	4.70%	4.03%	0.00%

Type of Cognitive Process

Coded n = 149

Grade 5 - English Language Arts and Literature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.36%	0.00%	1.09%	0.72%	0.36%	0.36%
Procedural	6.88%	3.62%	12.32%	2.54%	2.90%	3.99%
Conceptual	3.26%	5.80%	3.26%	3.99%	0.36%	0.00%
Factual	44.93%	0.72%	1.45%	1.09%	0.00%	0.00%

Type of Cognitive Process

Coded n = 276

Grade 5 - Fine Arts

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.20%	0.81%	8.08%	2.83%	0.20%	2.22%
Conceptual	1.41%	5.45%	4.24%	2.83%	0.40%	0.81%
Factual	66.26%	1.41%	1.21%	0.20%	0.00%	0.20%

Type of Cognitive Process

Coded n = 495

Grade 5 - Français immersion et littérature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.93%	2.17%	3.42%	0.62%	0.62%	0.00%
Procedural	0.93%	2.80%	7.14%	0.62%	0.62%	0.00%
Conceptual	0.31%	5.28%	4.35%	1.86%	1.55%	0.62%
Factual	48.76%	10.25%	3.11%	1.24%	0.62%	0.00%

Type of Cognitive Process

Coded n = 322

Grade 5 - Mathematics

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	5.03%	5.03%	19.50%	1.89%	2.52%	1.89%
Conceptual	2.52%	10.06%	2.52%	3.14%	1.26%	0.63%
Factual	38.99%	4.40%	0.63%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 159

Grade 5 - Physical Education and Wellness

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	1.78%	1.18%	1.18%	0.00%	0.00%
Procedural	0.00%	1.18%	1.78%	1.78%	0.00%	2.96%
Conceptual	2.96%	32.54%	3.55%	4.73%	1.78%	0.00%
Factual	35.50%	5.92%	0.00%	1.18%	0.00%	0.00%

Type of Cognitive Process

Coded n = 169

Grade 5 - Science

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.74%
	Procedural	0.37%	0.74%	3.70%	2.59%	2.22%	3.33%
	Conceptual	5.56%	22.96%	3.70%	9.63%	2.59%	0.37%
	Factual	34.44%	3.70%	1.11%	0.37%	0.00%	0.00%
		Remember	Understand	Apply	Analyze	Evaluate	Create
				Type of Cognitive Process			

Coded n = 270

Grade 5 - Social Studies

Type of Knowledge		Remember	Understand	Apply	Analyze	Evaluate	Create
	Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Procedural	0.00%	0.00%	3.47%	0.00%	0.00%	0.00%
	Conceptual	0.69%	18.06%	1.39%	10.42%	0.69%	1.39%
	Factual	40.97%	15.97%	0.69%	4.86%	0.69%	0.00%
		Remember	Understand	Apply	Analyze	Evaluate	Create
				Type of Cognitive Process			

Coded n = 144

Grade 6 - English Language Arts and Literature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.35%	0.71%
Procedural	7.09%	2.84%	8.87%	4.61%	2.13%	3.19%
Conceptual	2.48%	9.22%	4.26%	4.61%	0.71%	0.35%
Factual	44.68%	1.77%	1.06%	0.71%	0.35%	0.00%

Type of Cognitive Process

Coded n = 282

Grade 6 - Fine Arts

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.23%	0.00%	1.14%	0.23%
Procedural	0.23%	2.51%	21.41%	5.47%	1.37%	2.96%
Conceptual	0.46%	7.74%	1.14%	1.59%	0.23%	0.00%
Factual	38.50%	14.58%	0.23%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 439

Grade 6 - Français immersion et littérature

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.98%	2.29%	5.56%	0.00%	0.00%	0.00%
Procedural	0.98%	1.96%	7.19%	0.33%	0.33%	0.00%
Conceptual	0.98%	6.54%	5.23%	3.59%	0.98%	0.65%
Factual	47.06%	9.48%	2.94%	0.65%	2.29%	0.00%

Type of Cognitive Process

Coded n = 306

Grade 6 - Mathematics

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	0.44%	33.19%	9.29%	0.88%	0.00%
Conceptual	0.00%	15.04%	0.44%	1.33%	0.00%	0.00%
Factual	27.43%	11.95%	0.00%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 226

Grade 6 - Physical Education and Wellness

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.49%	0.49%	0.00%	0.98%	1.96%	0.00%
Procedural	0.00%	2.94%	5.88%	1.47%	0.49%	0.98%
Conceptual	0.98%	20.10%	1.96%	7.84%	0.49%	0.00%
Factual	42.65%	9.31%	0.49%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 204

Grade 6 - Science

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.38%	0.76%
Procedural	0.00%	1.52%	6.08%	7.22%	1.90%	3.42%
Conceptual	0.00%	12.93%	1.90%	6.08%	1.14%	0.38%
Factual	43.35%	12.55%	0.00%	0.38%	0.00%	0.00%

Type of Cognitive Process

Coded n = 263

Grade 6 - Social Studies

Type of Knowledge	Remember	Understand	Apply	Analyze	Evaluate	Create
Metacognitive	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Procedural	0.00%	1.04%	1.56%	1.04%	1.04%	0.00%
Conceptual	0.00%	2.60%	0.52%	6.77%	2.08%	0.00%
Factual	70.31%	10.94%	0.00%	0.00%	0.00%	0.00%

Type of Cognitive Process

Coded n = 192