GUIDANCE DOCUMENT

Idaho Secondary Mathematics Pathways & Student Mobility

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ACADEMICS | MATHEMATICS

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BACKGROUND

In the last decade, Idaho has seen an increase in student mobility across the state. Student mobility refers to occurrences where a student moves from one school to another. Recent research indicates that student mobility has a negative effect on student achievement. The impact on student educational success is further impacted by the frequency of the movement. High student mobility affects all students due to the instructional shifts that need to be made to accommodate all students within a classroom. Student mobility does not include movement from one grade level to the subsequent grade level due to promotion (Sparks).

While student mobility can affect any grade level K-12, Idaho secondary schools are seeing a higher impact due to the usage of two different high school math course pathways. Within the State of Idaho, local districts can choose whether to follow a traditional math pathway or an integrated math pathway at the secondary level. This means that a student may complete Algebra I his/her ninth grade year through a traditional pathway, move to a different school within the state, and then take Integrated Math II as a tenth grader; or, vice versa, a student may start in an integrated pathway his/her ninth grade year and then move to a traditional setting where he/she would complete Geometry in his/her tenth grade year.

INSTRUCTIONAL IMPLICATIONS

What does this mean for educators? What content are students missing if they move schools in their high school career? Focusing on ninth and tenth grade, we took a look at the Idaho Content Standards for Mathematics and Appendix A for the standards, and mapped out the content that students will either receive repeat instruction on or completely miss if they are to move schools between their ninth and tenth grade school years.

1. **Student moves from Algebra 1 to Integrated II**

    a. *Repeat Content: Content that was taught in Algebra I and will be taught again in Integrated II*

        i. The Real Number System: N.RN.1, 2 and 3
        ii. See Structure in Expressions: ASSE.1a, 1b, 2, 3a, 3b and 3c
        iii. Arithmetic with Polynomials and Rational Expressions: A.APR.1
        iv. Creating Equations: A.CED.1, 2 and 4
        v. Reasoning with Equations and Inequalities: A.REI.4a, 4b and 7
        vi. Interpreting Functions: F.IF.4, 5, 6, 7a, 7b, 8a, 8b and 9
        vii. Building Functions: F.BF.1a,1b, 3 and 4a
        viii. Linear, Quadratic and Exponential Models: F.LE.3

    b. *Missing Content: Content that was not taught in Algebra I, but was taught in Integrated Math I*

i. Congruence: G.CO.1, 2, 3, 4, 5, 6, 7, 8, 12 and 13
ii. Expressing Geometric Properties with Equations: G.GPE.4, 5 and 7

2. Student moves from Integrated I to Geometry

a. Repeat Content: Content that was taught in Integrated I and will be taught again in Geometry

i. Congruence: G.CO.1, 2, 3, 4, 5, 6, 7, 8, 12 and 13
ii. Expressing Geometric Properties with Equations: G.GPE.4, 5 and 7

b. Missing Content: Content that was not taught in Integrated I but will need to be taught in order to move on to third and fourth year math courses (this content would have been taught in Algebra I on a traditional pathway and Integrated II on an integrated pathway).

i. The Real Number System: N.RN.1, 2 and 3
ii. See Structure in Expressions: ASSE.1a, 1b, 2, 3a, 3b and 3c
iii. Arithmetic with Polynomials and Rational Expressions: A.APR.1
iv. Creating Equations: A.CED.1, 2 and 4
v. Reasoning with Equations and Inequalities: A.REI.4a, 4b and 7
vi. Interpreting Functions: F.IF.4, 5, 6, 7a, 7b, 8a, 8b and 9
vii. Building Functions: F.BF.1a,1b, 3 and 4a
viii. Linear, Quadratic and Exponential Models: F.LE.3

Keep in mind, if a student moves during his/her ninth or tenth grade year, depending on district/school content sequence within each course, students may miss instruction on a greater or lesser amount of the content listed above.

Please see Appendix A for tables of repeat and missing content with content limitations.

Resource: Editorial Projects in Education Research Center. (2016, August 11). Issues A-Z: Student Mobility: How It Affects Learning. *Education Week.* Retrieved Month Day, Year from http://www.edweek.org/ew/issues/student-mobility/

Appendix I: Repeat & Missing Mathematics Content between Pathways

Domains	Standard(s)	Content Limits
The Real Number System	N.RN.1, 2	
	N.RN.3	
See Structure in Expressions	A.SSE.1a, 1b, 2, 3a, 3b, 3c	Quadratic and exponential
Arithmetic with Polynomials and Rational Expressions	A.APR.1	Polynomials that simplify to quadratics
Creating Equations	A.CED.1, 2, 4	Linear, exponential and quadratic
Reasoning with Equations and Inequalities	A.REI.4a, 4b	Quadratic with real coefficients
	A.REI.7	Linear-quadratic systems
Interpreting Functions	F.IF.4, 5, 6	Quadratic
	F.IF.7a, 7b, 8a, 8b, 9	Quadratic, absolute value, step, piecewise-defined; possibly linear and exponential depending on a district's scope and sequence of mathematics content
Building Functions	F.BF.1a, 1b	Quadratic; possibly exponential depending on a district's scope and sequence of mathematics content
	F.BF.3, 4a	Quadratic and absolute value
Linear, Quadratic and Exponential Models	F.LE.3	Quadratic; possibly linear and exponential depending on a district's scope and sequence of mathematics content
Congruence	G.CO.1, 2, 3, 4, 5	Experiment with transformations in the plane
	G.CO.6, 7, 8	Build on ridged motions as a familiar starting point for development of concept of geometric proof
	G.CO. 12, 13	Formalize and explain processes
Expressing Geometric Properties with Equations	G.GPE.4, 5, 7	Include distance formula; relate to Pythagorean theorem

Table 1: Student mobility from Algebra I to Integrated II

Key: Table 1

Color	Description
Yellow	**Repeat Content:** Content that was taught in Algebra I and will be taught AGAIN in Integrated Math II.
ue	**Missing Content:** Content that is taught in Integrated Math I (integrated pathway) or Geometry (traditional pathway). This content will be missing from instruction for a student who moves from a traditional pathway to an integrated pathway between his/her first and second years of secondary school.

Domains	Standard(s)	Content Limits
The Real Number System	N.RN.1, 2	
	N.RN.3	
See Structure in Expressions	A.SSE.1a, 1b, 2, 3a, 3b, 3c	Quadratic and exponential
Arithmetic with Polynomials and Rational Expressions	A.APR.1	Polynomials that simplify to quadratics
Creating Equations	A.CED.1, 2, 4	Quadratic
Reasoning with Equations and Inequalities	A.REI.4a, 4b	Quadratic with real coefficients
	A.REI.7	Linear-quadratic systems
Interpreting Functions	F.IF.4, 5, 6	Quadratic
	F.IF.7a, 7b, 8a, 8b, 9	Quadratic, absolute value, step, piecewise-defined; possibly linear and exponential depending on a district's scope and sequence of mathematics content
Building Functions	F.BF.1a, 1b	Quadratic; possibly exponential depending on a district's scope and sequence of mathematics content
	F.BF.3, 4a	Quadratic and absolute value
Linear, Quadratic and Exponential Models	F.LE.3	Quadratic
Congruence	G.CO.1, 2, 3, 4, 5	Experiment with transformations in the plane
	G.CO.6, 7, 8	Build on ridged motions as a familiar starting point for development of concept of geometric proof
	G.CO. 12, 13	Formalize and explain processes
Expressing Geometric Properties with Equations	G.GPE.4, 5, 7	Include distance formula; relate to Pythagorean theorem

Table 2: Student mobility from Integrated I to Geometry

Key: Table 2

Color	Description
Yellow	**Repeat Content:** Content that is taught in Integrated I and will be taught AGAIN in Geometry.
Blue	**Missing Content:** Content that is taught in Algebra I (traditional pathway) or Integrated Math II (integrated pathway). This content will be missing from instruction for a student who moves from an integrated pathway to an traditional pathway between his/her first and second years of secondary school.