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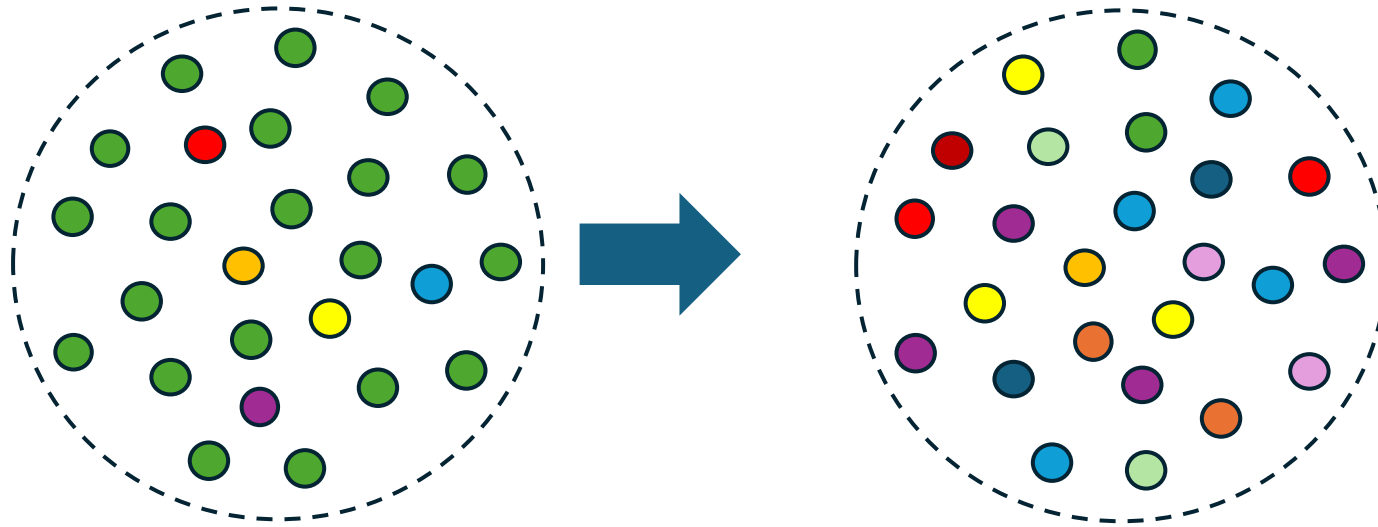


Dr. Shelley Moore



What are you
hoping for today?

inclusion looks like...

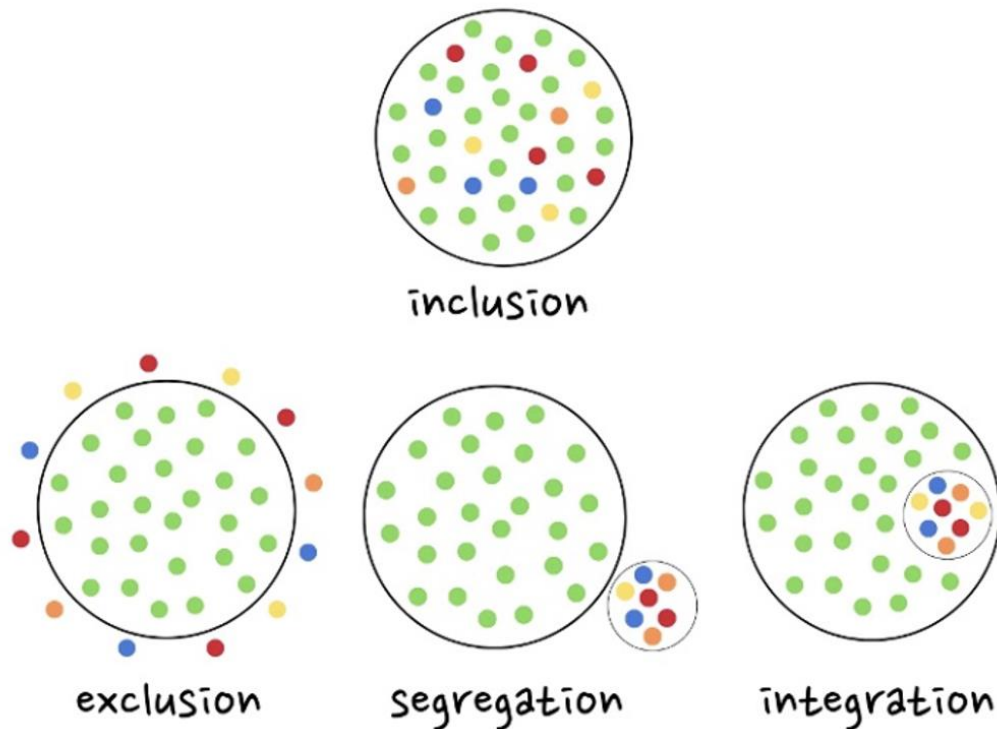


including
'special needs' children in
general education
classrooms

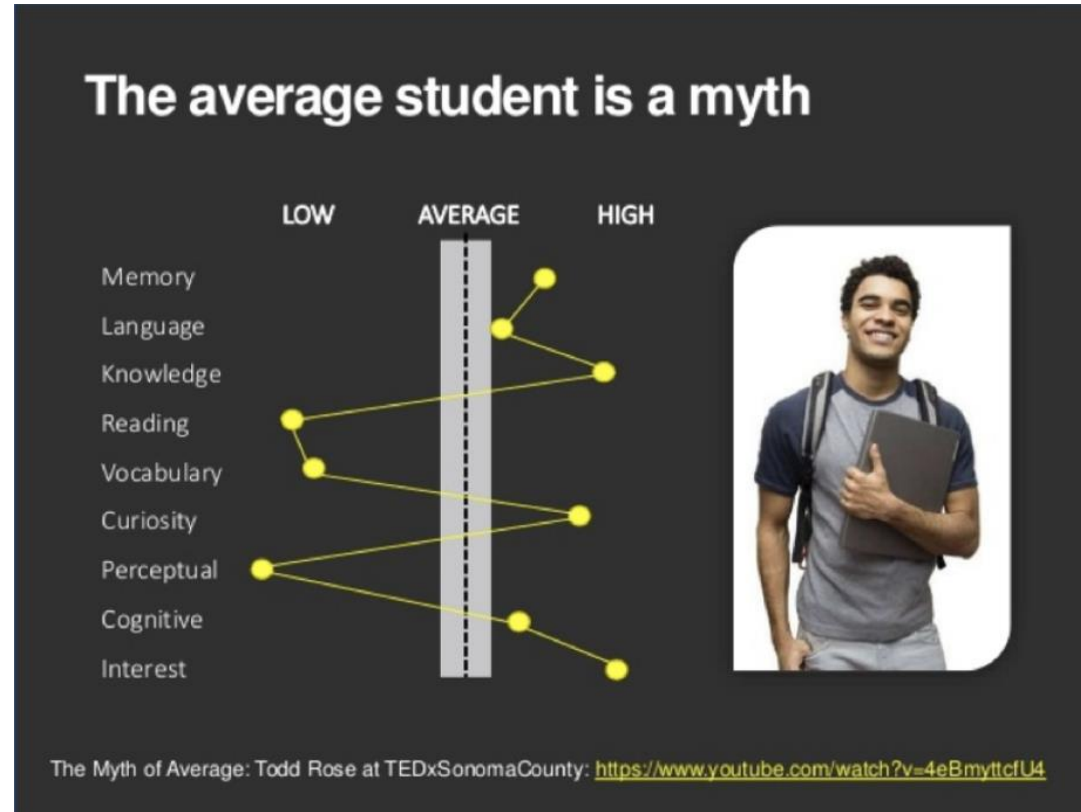
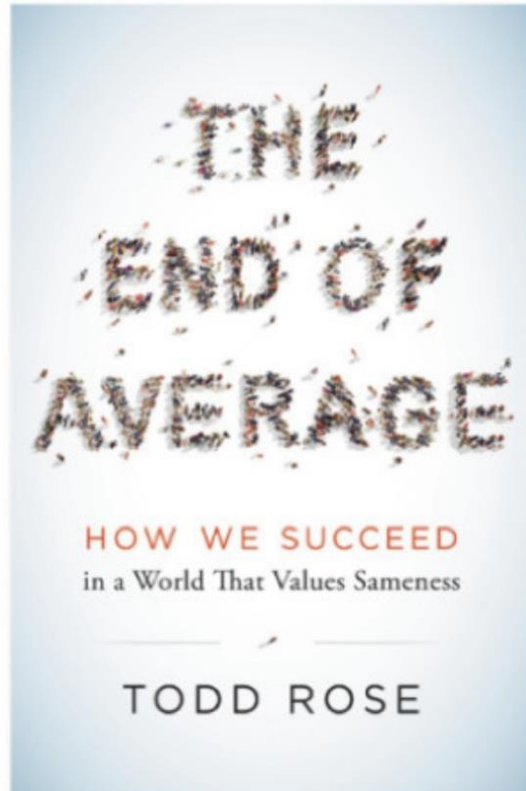
teaching and planning for
diversity
In neighbourhood schools
and classrooms
(where Diversity includes
Disability)

How do we do inclusion ?

Where did green come from?

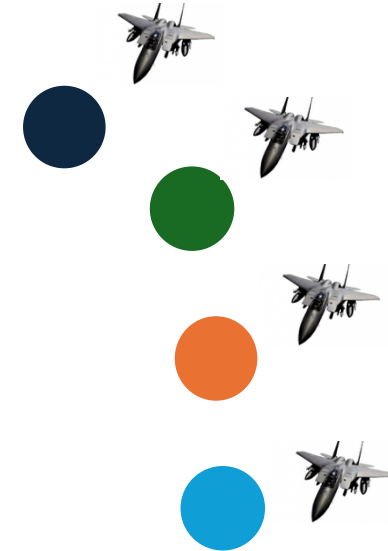
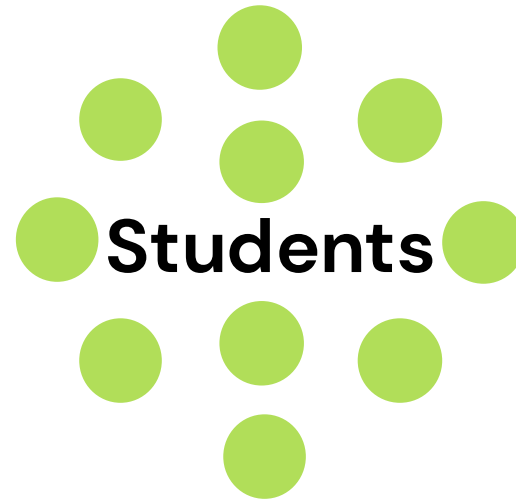
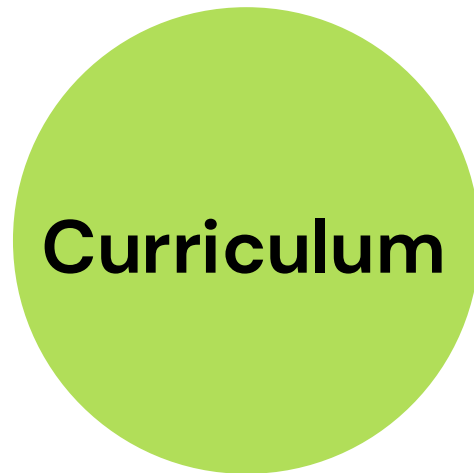


WHAT IS “normal”?

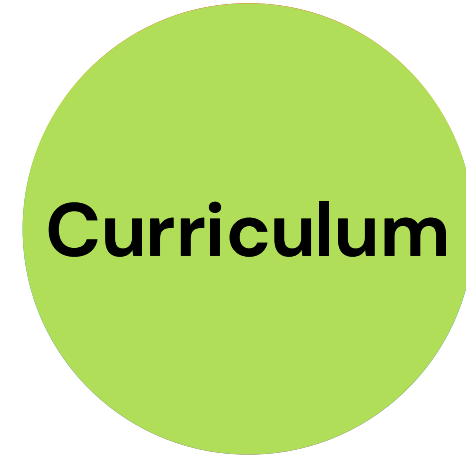
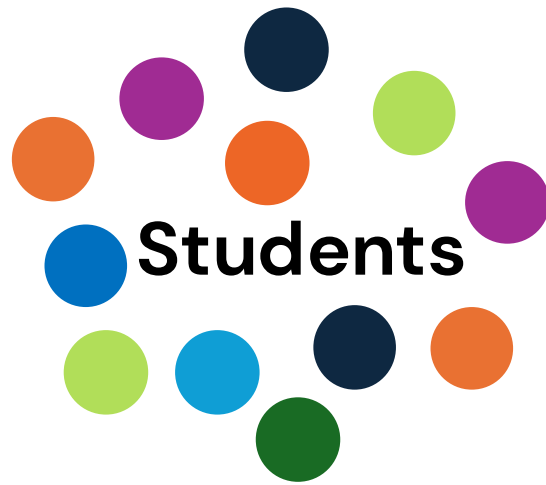


WHAT IS “average”?

WHAT & HOW WE WERE TAUGHT...



WHAT IF WE ANTICIPATED variability



INSTEAD OF homogeneity?

HOW DO WE DESIGN AN ADJUSTABLE PLANE?

- Who are the **pilots**? What are their **dimensions**?
- What kind of **planes** are they flying?
- How is the plane **responsive** to the pilot's dimensions?
- How do the **pilots make the adjustments** they need to fly the plane?



HOW DO WE DESIGN AN ADJUSTABLE PLANE?

- Who are the **students**? What is the range of the **variability**?
- What is the **grade level curriculum** that students need to access?
- How is the grade level curriculum **responsive** to the range of student variability?
- How do we help **students to make the adjustments** they need to access the grade level curriculum?



What grade level curriculum are we using?
What are the learning standards?

CURRICULUM & ASSESSMENT DESIGN

Student choice of challenge
Adjustable Curriculum

Students

Who are the students?
What are their dimensions?
Where is their agency?

Student choice of evidence
Adjustable Assessment

NEEDS BASED DESIGN

What are the student needs?
What barriers are getting in the way?
What do students require to navigate needs & barriers?

Adjustable Supports & Strategies
Student choice of tools and actions

INSTRUCTIONAL DESIGN

How will students show evidence and growth within the learning standard?
How do we know?

What grade level curriculum are we using?
What are the learning standards?

CURRICULUM & ASSESSMENT DESIGN

Student choice of challenge
Adjustable Curriculum

Students

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What are their dimensions?
Where is their agency?

Student choice of evidence
Adjustable Assessment

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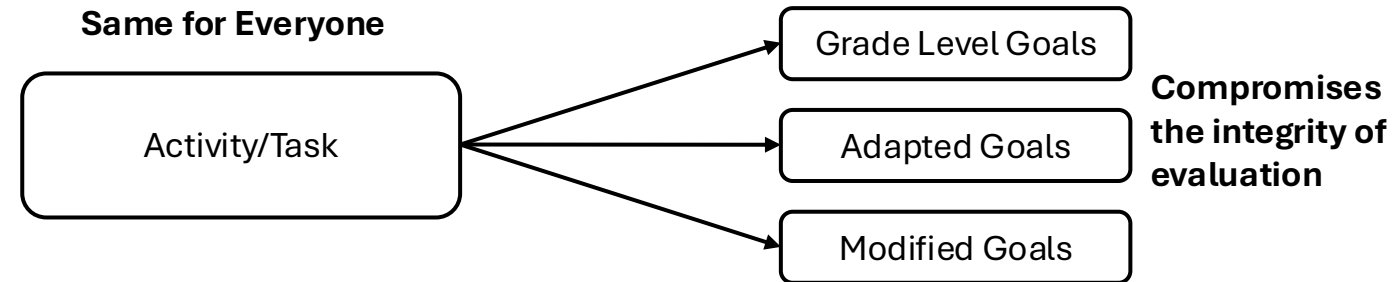
Step 1!



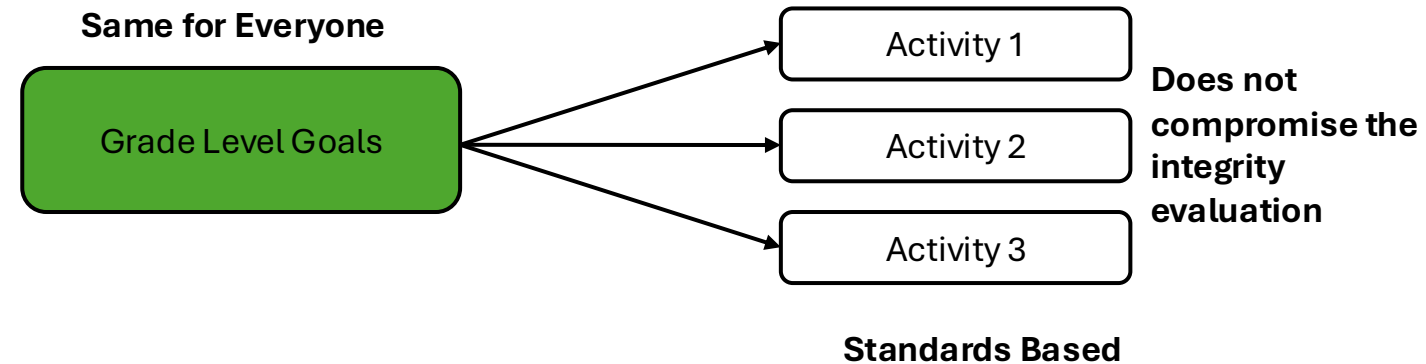
**How I came to
understand
BACKWARDS
DESIGN?**

Determining the Learning Standard

Forward Design



Backward Design



Backwards Design: Determining Learning Goals

The **Grade Level Learning Standards** are we evaluating

The Learning Goals are what we teach to get there

There are different kinds of learning goals:

- What students need to **know?**
- What students need to **do?**

Some subject areas/courses include all of the learning goals

Some subject areas/courses some only focus on a couple learning goals

Backwards Design: Determining Learning Goals

The **Grade Level Learning Standards** are we evaluating

The Learning Goals are what we teach to get there

There are different kinds of learning goals:

- What students need to **understand?**
- What students need to **know?**
- What students need to **do?**
- What capacities/competencies do students need to **develop?**

Backwards Design Planning

- **Big Ideas:** What do students need to understand?
- **Guiding Questions:** Why is this understanding important?
- **Learning Goals:** What do students need to know and do?
- **Competencies:** Who do students need to be?

Backwards Design Planning in ONTARIO

- **Big Ideas:** What do students need to understand?
- **Guiding Questions:** Why is this understanding important?
- **Learning Goals:** What do students need to know and do?
 - **Unit Specific Outcomes**
- **Competencies:** Who do students need to be?
 - **Subject Specific Skills/Processes**
 - **Ontario Transferable Skills**

Backwards Design Planning Using Ontario Curriculum

	Context to learn in: Not assessed or evaluated		Teacher & student assessed Teacher evaluated	Teacher & student assessed	Student assessed
Subject Area	Big Ideas: What do we need to understand?	Guiding Questions: Why is this important?	Unit Learning Goals: What I need to know and do <i>in this unit</i> ?	Subject Learning Goals: What do we need to know and do <i>in this subject area</i> ?	Transferable/Cross Curricular Competencies: Who do we need to be?

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Math					
Social Studies					
Science & Technology					
The Arts					
Health & Physical Education					

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Math					
Social Studies	Big Ideas	Framing Questions	Derive from Specific Expectations	Social Studies Inquiry Process	Ontario Transferable Skills
Science & Technology					
The Arts	Fundamental Concepts		Derive from Specific Expectations	Creative Process & Critical Analysis Process	Ontario Transferable Skills
Health & Physical Education					

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Math			Derive from Specific Expectations	Mathematical Processes	Ontario Transferable Skills
Social Studies	Big Ideas	Framing Questions	Derive from Specific Expectations	Social Studies Inquiry Process	Ontario Transferable Skills
Science & Technology			Derive from Specific Expectations	STEM Skills and Connections	Ontario Transferable Skills
The Arts	Fundamental Concepts		Derive from Specific Expectations	Creative Process & Critical Analysis Process	Ontario Transferable Skills
Health & Physical Education			Derive from Specific Expectations	Social-Emotional Learning Skills	Ontario Transferable Skills

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Math	Derive from Overall Expectation	Derive from Overall Expectation	Derive from Specific Expectations	Mathematical Processes	Ontario Transferable Skills
Social Studies	Big Ideas	Framing Questions	Derive from Specific Expectations	Social Studies Inquiry Process	Ontario Transferable Skills
Science & Technology	Derive from Overall Expectation	Derive from Overall Expectation	Derive from Specific Expectations	STEM Skills and Connections	Ontario Transferable Skills
The Arts	Fundamental Concepts	Derive from Overall Expectation	Derive from Specific Expectations	Creative Process & Critical Analysis Process	Ontario Transferable Skills
Health & Physical Education	Derive from Overall Expectation	Derive from Overall Expectation	Derive from Specific Expectations	Social-Emotional Learning Skills	Ontario Transferable Skills

Step 1 to Inclusive Curriculum Design:

- We MUST know the **learning outcomes!**
- They MUST be **grade-level credit classes**
 - **Not 23,33,46,78,99**
 - **Not K & E**
 - **Not adapted or essential**
 - **Not locally developed**

Grade:		Subject Area:	
Overall Expectation		Big Idea:	
Specific Expectations			
Specific Learning Outcomes			
Subject Specific Skills			
Transferable Skills			

Grade: 9		Subject Area: Math	E. Geometry and Measurement	Planning Team: Jeanin T & Shelley M.
Big Idea(s): E1. Geometric and Measurement Relationships demonstrate an understanding of the development and use of geometric and measurement relationships , and apply these relationships to solve problems , including problems involving real-life situations			Unit Guiding Question(s): Examples: How can we use what we know about shapes and numbers to understand and solve problems in the real world? How are shapes and measurements connected? How can we use what we know to find what we don't know? How can geometry and measurement help us solve real-life problems?	
Curricular Language			Student Friendly Language	
Specific Learning Outcomes	E1.1	research a geometric concept or a measurement system to tell a story about its development and use in a specific culture or community, and describe its relevance in connection to careers and to other disciplines	<i>I know that people have used shapes and measurement for a long time.</i> <i>I know that different cultures and communities have helped develop ideas about shapes and measurement.</i> <i>I know that shapes and measurement are useful in many jobs.</i> <i>I know that shapes and measurement are connected to other subjects.</i> <i>I can find information about how a culture or community used shapes or measurement.</i> <i>I can tell the story of where an idea about shapes or measurement came from.</i> <i>I can show how shapes or measurement are used in a job.</i> <i>I can show how shapes or measurement connect to another subject.</i>	
	E1.2	create and analyse designs involving geometric relationships and circle and triangle properties, using various tools	<i>I know that circles and triangles have different properties.</i> <i>I know that the parts and measurements of shapes are connected.</i> <i>I know that circles and triangles can be used to create designs.</i> <i>I can use what I know about circles and triangles to create a design.</i> <i>I can use different tools to create and measure shapes.</i> <i>I can find geometric relationships in a design.</i> <i>I can show how the shapes and measurements in a design are connected.</i> <i>I can check if the geometry in a design works.</i>	
	E1.3	solve problems involving different units within a measurement system and between measurement systems, including those from various cultures or communities, using various representations and technology, when appropriate	<i>I know that there are different ways to measure things.</i> <i>I know that different measurement systems use different units.</i> <i>I know that cultures and communities may use different ways of measuring.</i> <i>I know that measurements can be changed from one unit or system to another.</i> <i>I can change a measurement from one unit to another.</i> <i>I can solve problems using different measurement systems.</i> <i>I can show measurements in different ways.</i> <i>I can use tools and technology to help me solve measurement problems.</i> <i>I can choose a measurement and unit that makes sense for a problem.</i>	

Grade: 9		Subject Area: Math
Big Idea(s): E1. Geometric and Measurement Relationships demonstrate an understanding of the development and use of geometric and measurement relationships , and apply these relationships to solve problems , including problems involving real-life situations		
Curricular Language		
Specific Learning Outcomes	E1.1	research a geometric concept or a measurement system to tell a story about its development and use in a specific culture or community, and describe its relevance in connection to careers and to other disciplines
	E1.2	create and analyse designs involving geometric relationships and circle and triangle properties, using various tools
	E1.3	solve problems involving different units within a measurement system and between measurement systems, including those from various cultures or communities, using various representations and technology, when appropriate
	E1.4	show how changing one or more dimensions of a two-dimensional shape and a three-dimensional object affects perimeter/circumference, area, surface area, and volume, using technology when appropriate
	E1.5	solve problems involving the side-length relationship for right triangles in real-life situations, including problems that involve composite shapes
	E1.6	solve problems using the relationships between the volume of prisms and pyramids and between the volume of cylinders and cones, involving various units of measure
STEM Skills & Connections	A3	Communicating: Students communicate for various purposes and for different audiences, such as the teacher, a peer, a group of students, the whole class, a community member or group, or their family. They may use oral, visual, written, or gestural communication. Students also acquire the language of mathematics and develop their communication skills, which includes expressing, understanding, and using appropriate mathematical terminology, symbols, conventions, and models, through meaningful interactions with each other. reasoning and proving Reasoning and proving are integral to mathematics and involve students using their understanding of mathematical knowledge, concepts, and skills to justify their thinking. Proportional reasoning, algebraic reasoning, spatial reasoning, statistical reasoning, and probabilistic reasoning are all forms of mathematical reasoning. Students also use their understanding of numbers and operations, geometric properties, and measurement relationships to reason through solutions to problems. Students develop algebraic reasoning by generalizing understanding of numbers and operations, properties, and relationships between quantities. They develop functional thinking by generalizing patterns and non-numeric sequences and using inverse operations. Students may need to identify assumptions in order to begin working on a solution. Teachers can provide all students with learning opportunities where they must form mathematical conjectures and then test or prove them to verify whether they hold true. Initially, students may rely on the viewpoints of others to justify a choice or an approach to a solution. As they develop their own reasoning skills, they will begin to justify or prove their solutions by providing evidence.
Transferable Skills	Communication	The ability to express meaning in multiple ways, in a variety of contexts, including virtual spaces, and with different audiences Students ask effective questions to acquire knowledge; listen to all points of view and ensure that those views are heard; voice their own opinions; and advocate for ideas

Step 2: Universal Design for Learning

Step 2: Universal Design for Learning

“When a flower doesn’t bloom, you **fix the environment** in which it grows, not the flower.”

What is the Goal?



To grow!

What do they need to grow?

What do all plants need?



All plants
need light



All plants
need moisture



All plants
need space

What is the Goal?

To **learn**!



What do they need to learn?

What do all students need?



All students
need to be
engaged



All students
need to
understand



All students
need to show
learning

Universal Design for Learning (UDL) 3.0

Design Multiple Means of Engagement



Design Multiple Means of Representation



Design Multiple Means of Action & Expression



Access

Design Options for Welcoming Interests & Identities ⁽⁷⁾

- Optimize choice and autonomy (7.1)
- Optimize relevance, value, and authenticity (7.2)
- Nurture joy and play (7.3)
- Address biases, threats, and distractions (7.4)

Design Options for Perception ⁽¹⁾

- Support opportunities to customize the display of information (1.1)
- Support multiple ways to perceive information (1.2)
- Represent a diversity of perspectives and identities in authentic ways (1.3)

Design Options for Interaction ⁽⁴⁾

- Vary and honor the methods for response, navigation, and movement (4.1)
- Optimize access to accessible materials and assistive and accessible technologies and tools (4.2)

Support

Design Options for Sustaining Effort & Persistence ⁽⁸⁾

- Clarify the meaning and purpose of goals (8.1)
- Optimize challenge and support (8.2)
- Foster collaboration, interdependence, and collective learning (8.3)
- Foster belonging and community (8.4)
- Offer action-oriented feedback (8.5)

Design Options for Language & Symbols ⁽²⁾

- Clarify vocabulary, symbols, and language structures (2.1)
- Support decoding of text, mathematical notation, and symbols (2.2)
- Cultivate understanding and respect across languages and dialects (2.3)
- Address biases in the use of language and symbols (2.4)
- Illustrate through multiple media (2.5)

Design Options for Expression & Communication ⁽⁵⁾

- Use multiple media for communication (5.1)
- Use multiple tools for construction, composition, and creativity (5.2)
- Build fluencies with graduated support for practice and performance (5.3)
- Address biases related to modes of expression and communication (5.4)

Executive Function

Design Options for Emotional Capacity ⁽⁹⁾

- Recognize expectations, beliefs, and motivations (9.1)
- Develop awareness of self and others (9.2)
- Promote individual and collective reflection (9.3)
- Cultivate empathy and restorative practices (9.4)

Design Options for Building Knowledge ⁽³⁾

- Connect prior knowledge to new learning (3.1)
- Highlight and explore patterns, critical features, big ideas, and relationships (3.2)
- Cultivate multiple ways of knowing and making meaning (3.3)
- Maximize transfer and generalization (3.4)

Design Options for Strategy Development ⁽⁶⁾

- Set meaningful goals (6.1)
- Anticipate and plan for challenges (6.2)
- Organize information and resources (6.3)
- Enhance capacity for monitoring progress (6.4)
- Challenge exclusionary practices (6.5)

The Universal Design for Learning Guideline 3.0 in Accessible Language: Engagement

UDL Language	Plain Language	Student Friendly Language
Design Multiple Means of Engagement		
Access: Design options for Welcoming Interests and Identities		
Optimize choice and autonomy (7.1)	We can provide meaningful choices in how students learn, participate, and show what they know.	I need to be able to make choices about what I learn about
Optimize relevance, value, and authenticity (7.2)	We can connect learning to students' interests, goals, experiences, and real-life situations	I need to be able to see how my learning connects to my life, interests, and future goals.
Nurture joy and play (7.3)	We can create opportunities for curiosity, creativity, exploration, and enjoyment in learning.	I need to be able to have fun while I learn, explore ideas, and be creative.
Address biases, threats, and distractions (7.4)	We can create a safe, inclusive environment that reduces barriers, stress, and distractions.	I need to be able to learn in a space where I feel safe, respected, and focused.
Support: Design Options for Sustaining Effort & Persistence		
Clarify the meaning and purpose of goals (8.1)	We can make learning goals clear and help students understand why they matter.	I need to be able to understand what I am learning and why it is important.
Optimize challenge and support (8.2)	We can provide the right balance of challenge and support to help all students succeed.	I need to be able to work on challenging tasks with the support I need to be successful.
Foster collaboration, interdependence, and collective learning (8.3)	We can create opportunities for students to learn with and from one another.	I need to be able to work with others, share ideas, and learn together.
Foster belonging and community (8.4)	We can build a learning community where every student feels valued and included.	I need to be able to feel like I belong and that I am an important part of my learning community.
Offer action-oriented feedback (8.5)	We can provide feedback that helps students understand next steps and improve their learning	I need to be able to receive feedback that helps me know what to do next.
Executive Function: Design Options for Emotional Capacity		
Recognize expectations, beliefs, and motivations (9.1)	We can help students understand how their thoughts, beliefs, and motivations affect learning	I need to be able to understand what motivates me and how my thinking affects my learning.
Develop awareness of self and others (9.2)	We can support students in understanding their strengths, needs, emotions, and relationships with others.	I need to be able to understand myself, my feelings, and how I interact with others.
Promote individual and collective reflection (9.3)	We can provide opportunities for students to reflect on their learning and growth individually and with others.	I need to be able to think about my learning, celebrate growth, and learn from my experiences.
Cultivate empathy and restorative practices (9.4)	We can foster empathy, understanding, and positive ways to repair and strengthen relationships.	I need to be able to understand others' perspectives and help build positive relationships when challenges occur.

The Universal Design for Learning Guideline 3.0 in Accessible Language: Representation

UDL Language	Plain Language	Student Friendly Language
Design Multiple Means of Representation		
Design Options for Perception		
Support opportunities to customize the display of information (1.1)	We can give learners different ways to adjust how information is shown so it works best for them.	I need to be able to choose how I see information, such as changing the size, colour, layout, or format to help me learn
Support multiple ways to perceive information (1.2)	We can provide information in different formats so all learners can access and understand it	I need to be able to learn information in different ways, such as reading it, listening to it, watching it, or using images and diagrams
Represent a diversity of perspectives and identities in authentic ways (1.3)	We can include a variety of cultures, experiences, identities, and viewpoints in meaningful and accurate ways	I need to be able to see people, cultures, experiences, and ideas that reflect the real world to help me understand different perspectives
Design Options for Language & Symbols		
Clarify vocabulary, symbols, and language structures (2.1)	We can help learners understand the words, symbols, and language patterns used in learning.	I need to be able to get support to understand new words, symbols, and the way language is used
Support decoding of text, mathematical notation, and symbols (2.2)	We can help learners understand written text, math symbols, formulas, and other symbols.	I need to be able to get support to understand words, symbols, numbers, and mathematical ideas
Cultivate understanding and respect across languages and dialects (2.3)	We can value and support different languages, ways of speaking, and cultural background	I need to be able to see that my language, culture, and way of speaking are respected, and I need to learn about others' too
Address biases in the use of language and symbols (2.4)	We can help learners recognize and challenge unfair assumptions, stereotypes, or exclusion in language and symbols	I need to be able to learn about how to notice when words, images, or symbols might be unfair or leave people out
Illustrate through multiple media (2.5)	We can use different types of media to explain ideas and support understanding	I need to be able to learn through pictures, videos, audio, demonstrations, models, and other formats
Executive Function: Design Options for Building Knowledge		
Connect prior knowledge to new learning (3.1)	We can help learners link what they already know to new ideas and experiences.	I need to be able to connect new learning to things I already know, have done, or have experienced
Highlight and explore patterns, critical features, big ideas, and relationships (3.2)	We can help learners identify important ideas, patterns, connections, and relationships.	I need to be able to find important ideas, notice patterns, and make connections between things I am learning
Cultivate multiple ways of knowing and making meaning (3.3)	We can encourage learners to understand and express ideas in different ways, drawing on diverse perspectives and experiences	I need to be able to learn, think about, and show my understanding in different ways
Maximize transfer and generalization (3.4)	We can help learners apply what they have learned in new situations and contexts.	I need to be able to use what I have learned in different situations and for new challenges

The Universal Design for Learning Guideline 3.0 in Accessible Language: Expression

UDL Language	Plain Language	Student Friendly Language
Design Multiple Means of Action & Expression		
Access: Design Options for Interaction		
Vary and honor the methods for response, navigation, and movement (4.1)	We can provide different ways for learners to participate, move through learning, and show what they know.	I need to be able to choose different ways to participate, move, and respond during learning
Optimize access to accessible materials and assistive and accessible technologies and tools (4.2)	We can ensure learners can access and use the tools, technologies, and resources they need to learn	I need to be able to use tools and technology that help me access and engage with my learning
Support: Design Options for Expression & Communication		
Use multiple media for communication (5.1)	We can provide different ways for learners to communicate their ideas and understanding.	I need to be able to share my ideas using different formats, such as speaking, writing, drawing, recording, or creating
Use multiple tools for construction, composition, and creativity (5.2)	We can provide a range of tools and resources for learners to create, build, and express ideas.	I need to be able to use different tools and resources to create, design, and show my thinking
Build fluencies with graduated support for practice and performance (5.3)	We can provide support that helps learners build skills and confidence over time.	I need to be able to get the support I need to practise, improve, and become more confident in my learning
Address biases related to modes of expression and communication (5.4)	We can recognize and value different ways of communicating and expressing understanding.	I need to be able to see that my ways of communicating and showing learning are valued and respected
Executive Function: Design Options for Strategy Development		
Set meaningful goals (6.1)	We can help learners create goals that are relevant, purposeful, and important to them.	I need to be able to set goals that matter to me and help me grow
Anticipate and plan for challenges (6.2)	We can help learners think ahead and prepare strategies for overcoming difficulties.	I need to be able to think about challenges I might face and plan ways to deal with them
Organize information and resources (6.3)	We can support learners to manage information, materials, time, and resources effectively.	I need to be able to organize my information, resources, and learning tasks so I can be successful.
Enhance capacity for monitoring progress (6.4)	We can help learners track, reflect on, and evaluate their progress toward goals.	I need to be able to check my progress, reflect on my learning, and make improvements
Challenge exclusionary practices (6.5)	We can identify and address barriers, rules, or practices that unfairly exclude people from learning opportunities	I need to be able to be a part of creating a learning environment where everyone feels included, valued, and able to participate

High Impact Universal Design for Learning Strategies!

- Benefits all students
- Reducing many barriers at the same time
- Responds to multiple needs at the same time
- Small adjustments that make big differences to student learning
- Does not compromise evaluation of grade level standards*

High Impact Curricular UDL Strategies

1. Translating learning goals into student friendly language
2. Co-creating guiding & inquiry-oriented unit questions
3. Building grade level learning continuums/ progressions
4. Extending grade level for access* and challenge

High Impact Curricular UDL Strategies

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Strategy: Translating into student friendly language

8.1: Clarify the Meaning and Purpose of Goals

8.3: Foster collaboration, interdependence, and collective learning

- We know the learning outcomes
- We know the learning goals (KUSPS)
- How do we clarify learning goals, so students and families understand?
- How do we create a learning community where we are sharing a learning journey together?

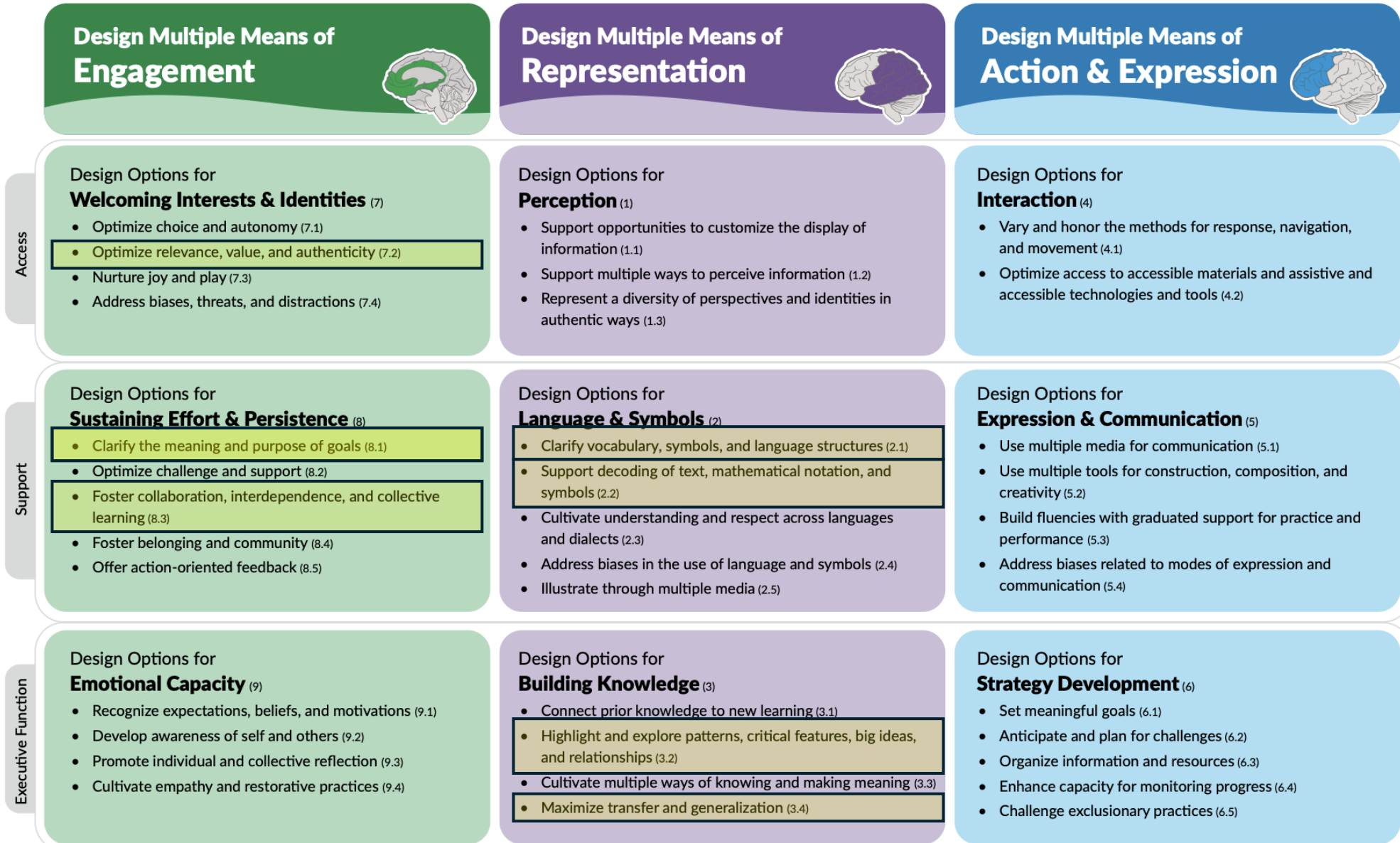
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Access: Design options for Welcoming Interests and Identities		
Optimize choice and autonomy (7.1)	We can provide meaningful choices in how students learn, participate, and show what they know.	I need to be able to make choices about what I learn about
Optimize relevance, value, and authenticity (7.2)	We can connect learning to students' interests, goals, experiences, and real-life situations	I need to be able to see how my learning connects to my life, interests, and future goals.
Nurture joy and play (7.3)	We can create opportunities for curiosity, creativity, exploration, and enjoyment in learning.	I need to be able to have fun while I learn, explore ideas, and be creative.
Address biases, threats, and distractions (7.4)	We can create a safe, inclusive environment that reduces barriers, stress, and distractions.	I need to be able to learn in a space where I feel safe, respected, and focused.
Support: Design Options for Sustaining Effort & Persistence		
Clarify the meaning and purpose of goals (8.1)	We can make learning goals clear and help students understand why they matter.	I need to be able to understand what I am learning and why it is important.
Optimize challenge and support (8.2)	We can provide the right balance of challenge and support to help all students succeed.	I need to be able to work on challenging tasks with the support I need to be successful.
Foster collaboration, interdependence, and collective learning (8.3)	We can create opportunities for students to learn with and from one another.	I need to be able to work with others, share ideas, and learn together.
Foster belonging and community (8.4)	We can build a learning community where every student feels valued and included.	I need to be able to feel like I belong and that I am an important part of my learning community.
Offer action-oriented feedback (8.5)	We can provide feedback that helps students understand next steps and improve their learning	I need to be able to receive feedback that helps me know what to do next.
Executive Function: Design Options for Emotional Capacity		
Recognize expectations, beliefs, and motivations (9.1)	We can help students understand how their thoughts, beliefs, and motivations affect learning	I need to be able to understand what motivates me and how my thinking affects my learning.
Develop awareness of self and others (9.2)	We can support students in understanding their strengths, needs, emotions, and relationships with others.	I need to be able to understand myself, my feelings, and how I interact with others.
Promote individual and collective reflection (9.3)	We can provide opportunities for students to reflect on their learning and growth individually and with others.	I need to be able to think about my learning, celebrate growth, and learn from my experiences.
Cultivate empathy and restorative practices (9.4)	We can foster empathy, understanding, and positive ways to repair and strengthen relationships.	I need to be able to understand others' perspectives and help build positive relationships when challenges occur.

Strategy: Translating into student and family friendly language

- **Keep the intention, simplify the language.** Change the wording, not the learning expectation.
- **Focus on one idea at a time.** Break long outcomes into smaller, connected goals.
- **Keep the important verbs and vocabulary.** Preserve the thinking students are expected to do while making unfamiliar terms explicit.
- **Describe the learning, not the activity.** Focus on what students will understand, know, or be able to do—not the task they will complete.

High Impact UDL Strategies in Curricular Design



Grade: 9		Subject Area: Math	E. Geometry and Measurement	Planning Team: Jeanin T & Shelley M.
Big Idea(s): E1. Geometric and Measurement Relationships demonstrate an understanding of the development and use of geometric and measurement relationships , and apply these relationships to solve problems , including problems involving real-life situations			Unit Guiding Question(s): Examples: How can we use what we know about shapes and numbers to understand and solve problems in the real world? How are shapes and measurements connected? How can we use what we know to find what we don't know? How can geometry and measurement help us solve real-life problems?	
Curricular Language			Student Friendly Language	
Specific Learning Outcomes	E1.1	research a geometric concept or a measurement system to tell a story about its development and use in a specific culture or community, and describe its relevance in connection to careers and to other disciplines	<i>I know that people have used shapes and measurement for a long time.</i> <i>I know that different cultures and communities have helped develop ideas about shapes and measurement.</i> <i>I know that shapes and measurement are useful in many jobs.</i> <i>I know that shapes and measurement are connected to other subjects.</i> <i>I can find information about how a culture or community used shapes or measurement.</i> <i>I can tell the story of where an idea about shapes or measurement came from.</i> <i>I can show how shapes or measurement are used in a job.</i> <i>I can show how shapes or measurement connect to another subject.</i>	
	E1.2	create and analyse designs involving geometric relationships and circle and triangle properties, using various tools	<i>I know that circles and triangles have different properties.</i> <i>I know that the parts and measurements of shapes are connected.</i> <i>I know that circles and triangles can be used to create designs.</i> <i>I can use what I know about circles and triangles to create a design.</i> <i>I can use different tools to create and measure shapes.</i> <i>I can find geometric relationships in a design.</i> <i>I can show how the shapes and measurements in a design are connected.</i> <i>I can check if the geometry in a design works.</i>	
	E1.3	solve problems involving different units within a measurement system and between measurement systems, including those from various cultures or communities, using various representations and technology, when appropriate	<i>I know that there are different ways to measure things.</i> <i>I know that different measurement systems use different units.</i> <i>I know that cultures and communities may use different ways of measuring.</i> <i>I know that measurements can be changed from one unit or system to another.</i> <i>I can change a measurement from one unit to another.</i> <i>I can solve problems using different measurement systems.</i> <i>I can show measurements in different ways.</i> <i>I can use tools and technology to help me solve measurement problems.</i> <i>I can choose a measurement and unit that makes sense for a problem.</i>	

Grade: 9		Subject Area: Math	E. Geometry and Measurement	Planning Team: Jeanin T & Shelley M.
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Curricular Language			Student Friendly Language	
Specific Learning Outcomes	E1.4	show how changing one or more dimensions of a two-dimensional shape and a three-dimensional object affects perimeter/circumference, area, surface area, and volume, using technology when appropriate	<i>I know that changing the size of a shape can change its perimeter and area.</i> <i>I know that changing the size of an object can change its surface area and volume.</i> <i>I know that changing one measurement can affect other measurements.</i> <i>I can change the dimensions of a shape or object and see what happens to its measurements.</i> <i>I can show how changing a shape affects its perimeter or circumference and area.</i> <i>I can show how changing an object affects its surface area and volume.</i> <i>I can use technology to explore and show these changes.</i> <i>I can explain patterns I notice when dimensions change.</i>	
	E1.5	solve problems involving the side-length relationship for right triangles in real-life situations, including problems that involve composite shapes	<i>I know what a right triangle is.</i> <i>I know that the side lengths of a right triangle are connected.</i> <i>I know that right triangles can be part of larger, more complex shapes.</i> <i>I can find a missing side length of a right triangle.</i> <i>I can find right triangles within larger shapes.</i> <i>I can use right triangles to find missing measurements in a larger shape.</i> <i>I can solve real-life problems using the side lengths of right triangles.</i>	
	E1.6	solve problems using the relationships between the volume of prisms and pyramids and between the volume of cylinders and cones, involving various units of measure	<i>I know that prisms and pyramids have related volumes.</i> <i>I know that cylinders and cones have related volumes.</i> <i>I know that volume can be measured using different units.</i> <i>I can find the volume of prisms and pyramids.</i> <i>I can find the volume of cylinders and cones.</i> <i>I can use the relationship between these shapes to solve volume problems.</i> <i>I can solve volume problems using different units of measure.</i> <i>I can choose a volume unit that makes sense for the problem.</i>	