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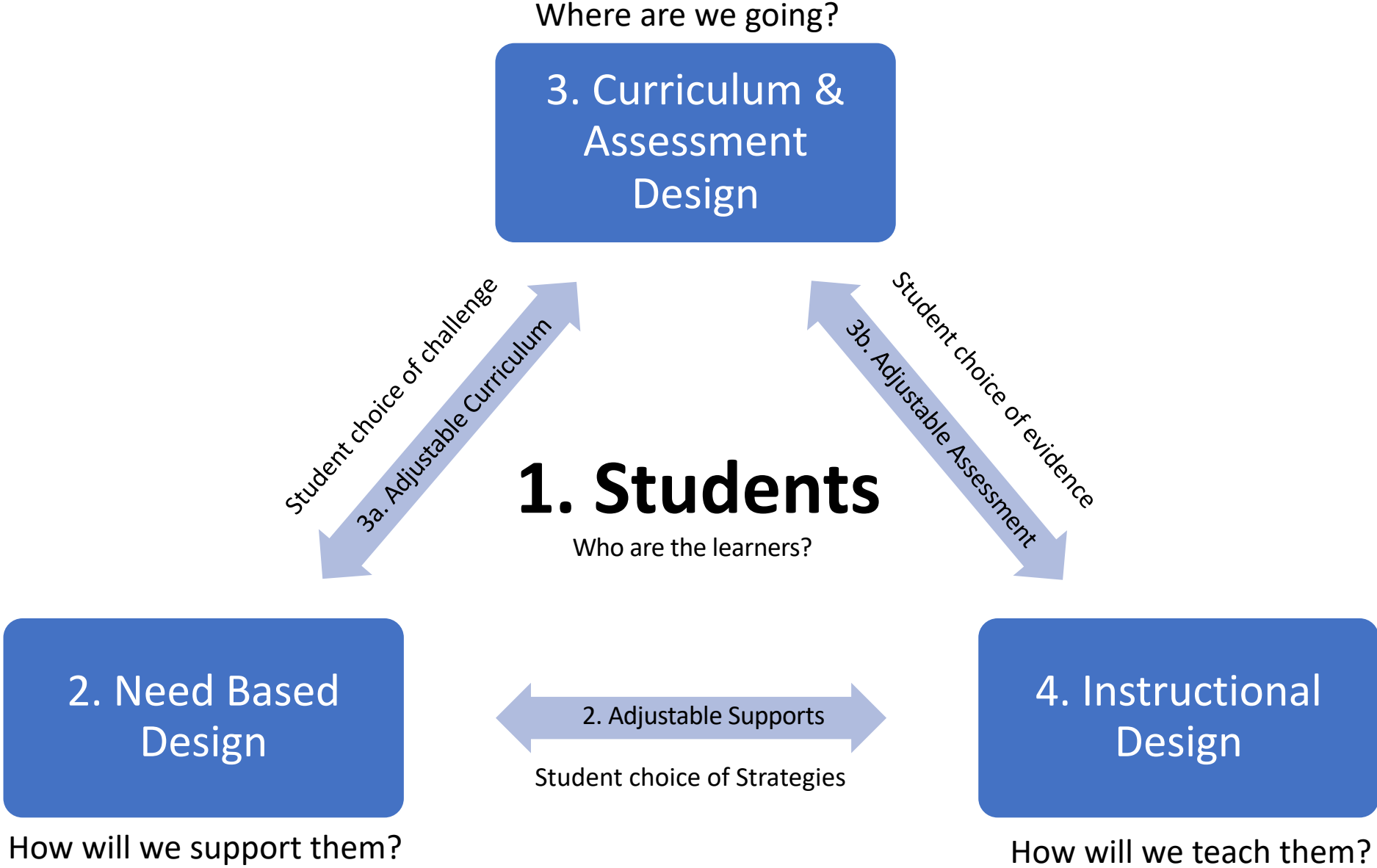
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HOW DO WE DESIGN AN ADJUSTABLE CURRICULUM?

- who are the *students*? what is the range of *diversity*?
- what kind of *curricula* are the students learning?
- How is the curriculum *responsive* to the students dimensions?
- How do the students make the *adjustments* they need to use the curriculum?

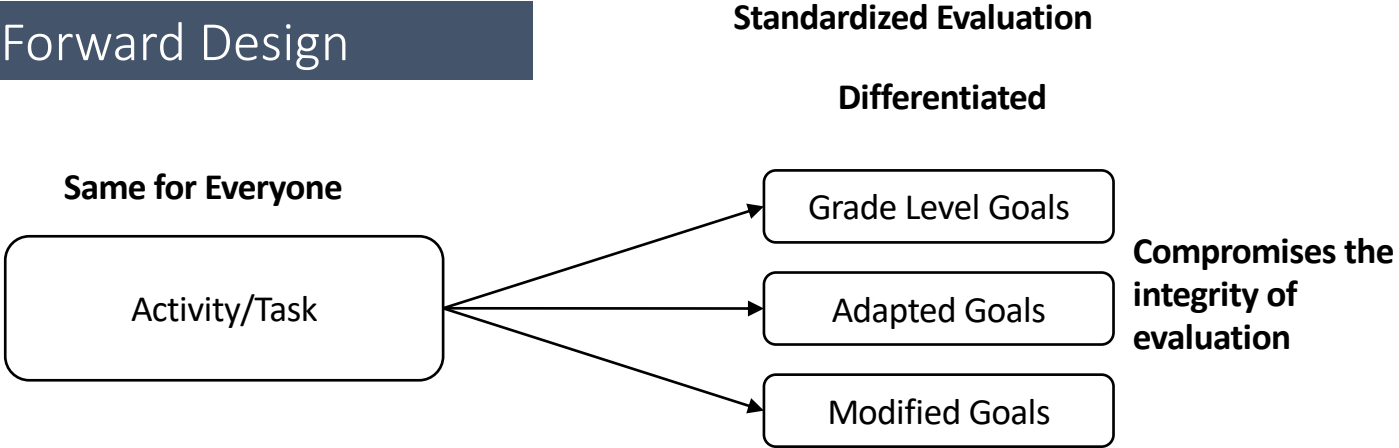
How do we change the system? Design with Equity in Mind



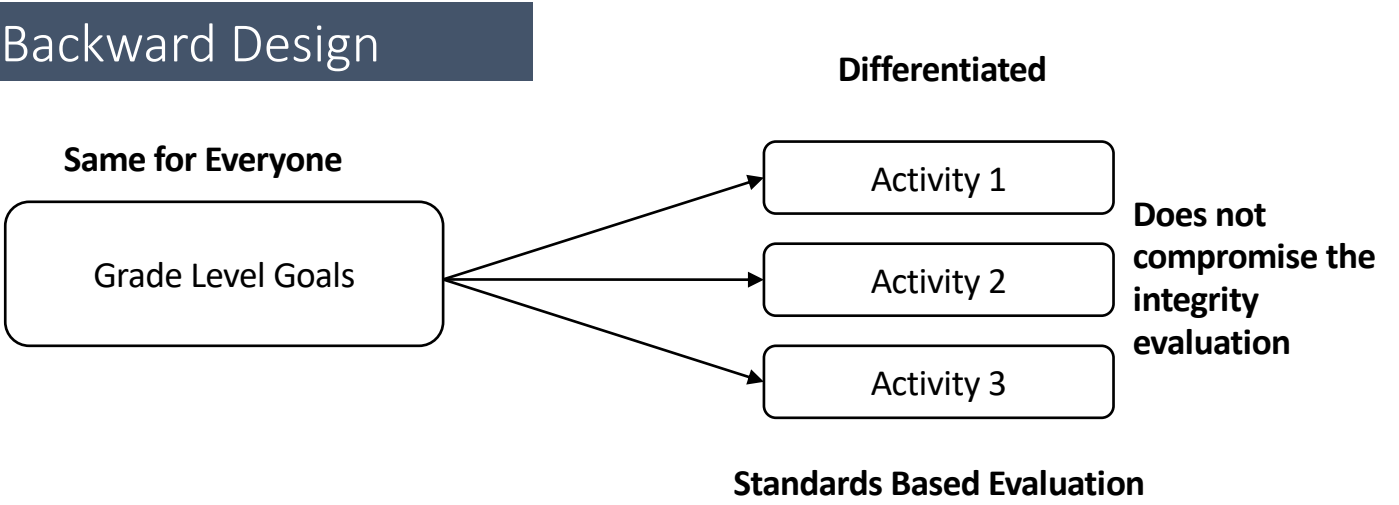
BACKWARDS DESIGN



Forward Design



Backward Design



Backwards Design: Previous Curriculum

What types of goal are in the curriculum?

- **Content**

- What do we need to know?

- **Process**

- What do we need to do?

Backwards Design: What are the GOALS?

- **Backwards Design**
 - **Big Idea**
 - What do we need to understand?
 - **Content**
 - What do we need to know?
 - **Curricular Competencies**
 - What do we need to do?
 - **Core Competencies**
 - Who do we need to become?

Grade:	Subject Area:	Planning Team:
Big Idea(s): What do I need to Understand?		Unit Guiding Question(s):
Key Vocabulary:		
	Curricular Language	Student Friendly Language
What do students need to know? Knowledge Goals		I know
What do students need to do? Skills/Process Goals		I can
What do students need to do? Skills/Process Goals		I can
What do students need to do? Skills/Process Goals		I can
Who do student need to be? Competency Goals	I can become/ I am...	

Backward Design Unit Planning Template: Building the Curricular Air Plane

Class: Ms. P Gr. 2/3		Subject Area(s): Cross Curricular	Planning Team: Ms. P & Shelley
Big Idea(s): <ul style="list-style-type: none"> • Forces influence the motion of an object. (Science) • Everyone has a unique story to share. (Language Arts) 		Unit Guiding Question(s): Who are our monsters? What are their stories ? How can we use forces to help us catch them?	
Unit Goals	Curricular Language		Student friendly language
Content Goal: Science (2)	types of forces		I know different types of forces
Content goal: Language Arts (2/3)	Story/text: elements of a story		I know what makes a story
Curricular Competency Goal: ADST (2/3)	Making: Make a product using known procedures or through modelling of others		I can make something for a purpose
Curricular Competency Goal: Science (2/3)	Safely manipulate materials to test ideas and predictions		I can make a plan and try out my ideas
Curricular Competency Goal: Language Arts (2/3)	Plan and create a variety of communication forms for different purposes and audiences		I can create a story for an audience
Curricular Competency Goal: Art (2/3)	Exploring and creating: Explore elements, processes, materials, movements, technologies, tools, and techniques of the arts		I can create many things using different art tools and materials
Core Competency Goal: (Profile 1/2)	Creative Thinking: I get ideas when I play (1) I can get new idea or build on or combine other people's ideas to create new things within the constraint of a form, a problem or materials (2)		We are creative thinkers because we get new ideas! I get new ideas by: (Students choose): <ul style="list-style-type: none"> • using my senses to explore • changing what I am doing • trying something new • solving a problem in a new way

**Who are our monsters? What are their stories?
How can we use forces to help us catch them?**

Name:		Date:	
I'm still working on it...	My goals	I got it!	How do I know? What is my evidence?
	<ul style="list-style-type: none"> I know different types of forces 		
	<ul style="list-style-type: none"> I know what makes a story 		
	<ul style="list-style-type: none"> I can make something for a purpose 		
	<ul style="list-style-type: none"> I can make a plan and try out my ideas 		
	<ul style="list-style-type: none"> I can create a story for an audience 		
	<ul style="list-style-type: none"> I can create many things using different art tools and materials 		

Grade: 4/5	Subject Area: Math	Planning Team: Kelset Team
Big Ideas:	Unit Guiding questions: Why do we need to learn how to add and subtract? Where in our lives do we use addition and subtraction?	
Content Goal:	addition and subtraction to 10 000	I know how to add and subtract numbers up to 10 000
Content Goal:	addition and subtraction facts to 20 (developing computational fluency)	I know how to add and subtract up to 20 in my head
Curricular Competency Goal:	Develop mental math strategies and abilities to make sense of quantities	I can use mental math to understand “how much/how many?”
Curricular Competency Goal:	Develop and use multiple strategies to engage in problem solving	I can solve problems using different strategies
Curricular Competency Goal:	Communicate mathematical thinking in many ways	I can share my thinking in many ways
Curricular Competency Goal:	Connect mathematical concepts to each other and to other areas and personal interests	I can connect what I am learning in math to me and my life

Grade: 6		Subject Area: Science	Planning Team: Alicia & Shelley
Big Ideas: The solar system is part of the Milky Way , which is one of billions of galaxies .		Unit Guiding questions: <ul style="list-style-type: none"> - How are the solar system and the milky way connected? How are they similar, How are they different? - What are galaxies? How do we know how many galaxies there are? How do we know? 	
Content Goal:	the position, motion , and components(parts) of our solar system in our galaxy	<i>I know the position, motion and parts of our solar system in our galaxy</i>	
Content Goal:	the overall scale, structure , and age of the universe	I know the scale, structure and age of the universe	
Curricular Competency Goal: Questioning and predicting	Demonstrate a sustained (over time) curiosity about a scientific topic or problem of personal interest	I can show curiosity over time about a scientific topic I can show curiosity about a topic that is interesting to me	
Curricular Competency Goal: Processing and analyzing data and information	Identify First Peoples perspectives and knowledge as sources of information	I can find out about First Peoples perspectives (view) and how they understand I can find out how First Peoples get their knowledge	
Curricular Competency Goal: Evaluating	Identify some of the assumptions in secondary sources	I can find assumptions (hidden beliefs) in secondary sources	
Curricular Competency Goal: Evaluating	Demonstrate an understanding and appreciation of evidence	I can use evidence to support my understanding	
Curricular Competency Goal: Applying and innovating	Co-operatively design projects	I can work together with my peers on a project	
Core Competency Goal:	We can be collaborators		

Backward Design Unit Planning Template: Building the Curricular Air Plane

Grade: 6/7	Subject Area(s): English	Planning Team: Grand Forks
Big Idea: Developing our understanding of how language works allows us to <u>use it purposefully</u>		Unit Guiding Question(s): What is language? How do we use language purposefully to communicate information about flooding in the Grand Forks and surrounding areas?
Content Goal	I know techniques of persuasion I know presentation techniques	
Curricular Competency Goal	I can access information and ideas for <u>diverse purposes</u> and from a <u>variety of sources</u> and evaluate their <u>relevance</u> , <u>accuracy</u> , and <u>reliability</u>	
Curricular Competency Goal	I can respond to <u>text</u> in <u>personal, creative, and critical ways</u>	
Curricular Competency Goal	I can use writing and design processes to plan, develop, and create engaging and meaningful <u>literary and informational texts</u> for a variety of purposes and <u>audiences</u>	
Curricular Competency Goal	I can assess and <u>refine texts</u> to improve their clarity, effectiveness, and impact according to purpose, <u>audience</u> , and message	
Core Competency Goal	I can be socially responsible by contributing to community and caring for the environment	

Rubrics vs. Learning Maps

	deficit	deficit	Standard
goal			



THE SCRUMPTIOUS RUBRIC REFERENCE

BARELY HANGING ON



The customer wants a refund. Bread alone is not a sandwich. It's like you gave the bread and pop out just to show you were listening.

Translation: You only did the small stuff to suffice turning it in. The artwork is missing all important details and signs of understanding or perseverance.

NEEDS SOME UMPH



Your sandwich disappoints the customer. There's no flavor and not enough meat, if any at all. About the only thing great is the Citrus Drop.

Translation: You are missing important details within your artwork. Expectations are not met. Improvement is needed and lack of understanding is present.

GETS THE POINT



Your sandwich met expectations. It has flavor but nothing too exciting. You included the meat but gee, a side of chips would be nice.

Translation: Your artwork meets expectations, you went as far as the requirements expected and you used what knowledge you had to do so.

RIGHT ON!



Your sandwich went beyond expectations. You threw in some extra flavor and tomatoes and surprised the customer with a side of chips.

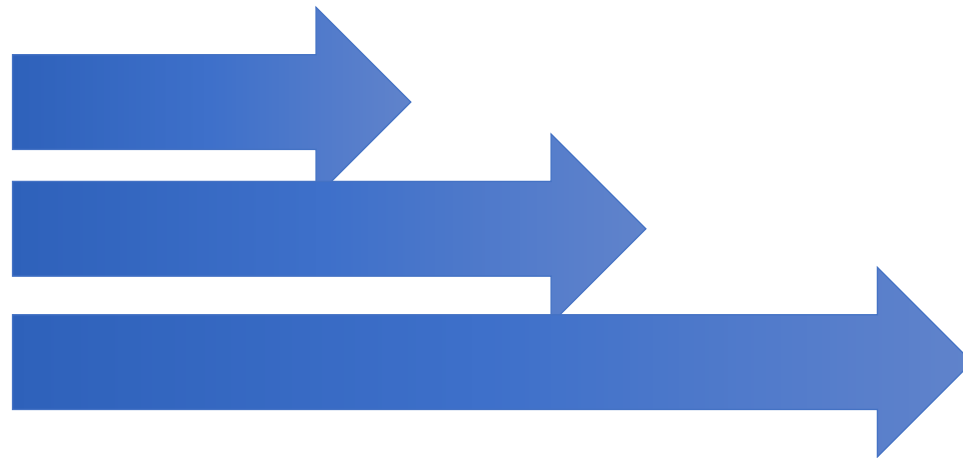
Translation: Your artwork exceeds all expectations; you used creativity, went beyond the basic requirements and showed obvious understanding.

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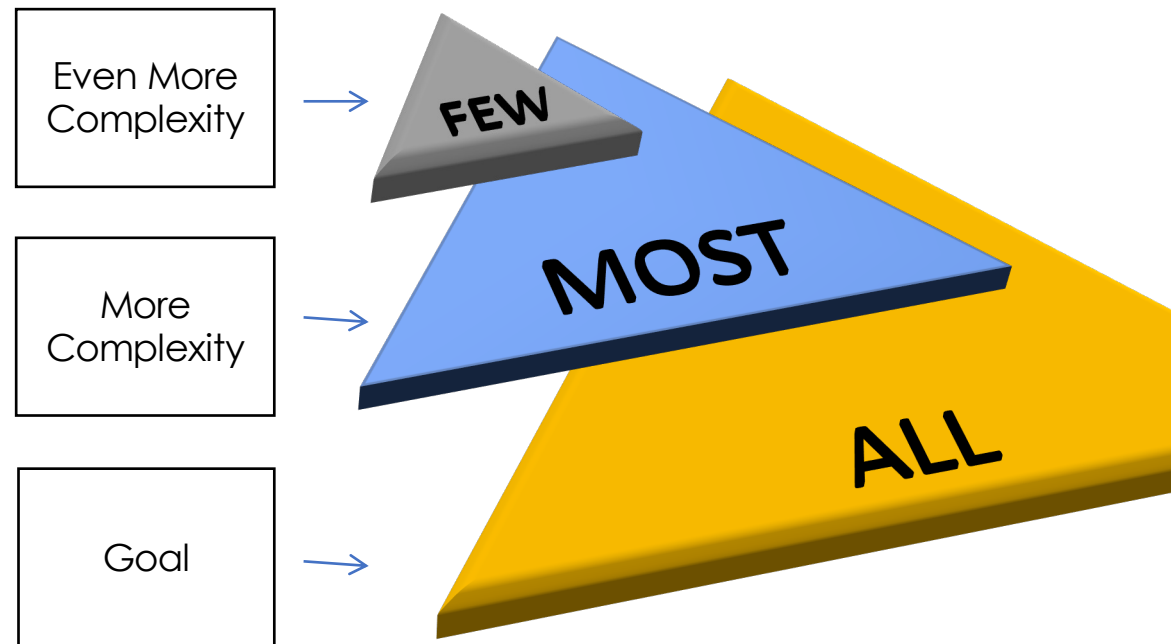
Inclusive Education: It's not more work, it's different work!

Rubrics vs. Learning Maps

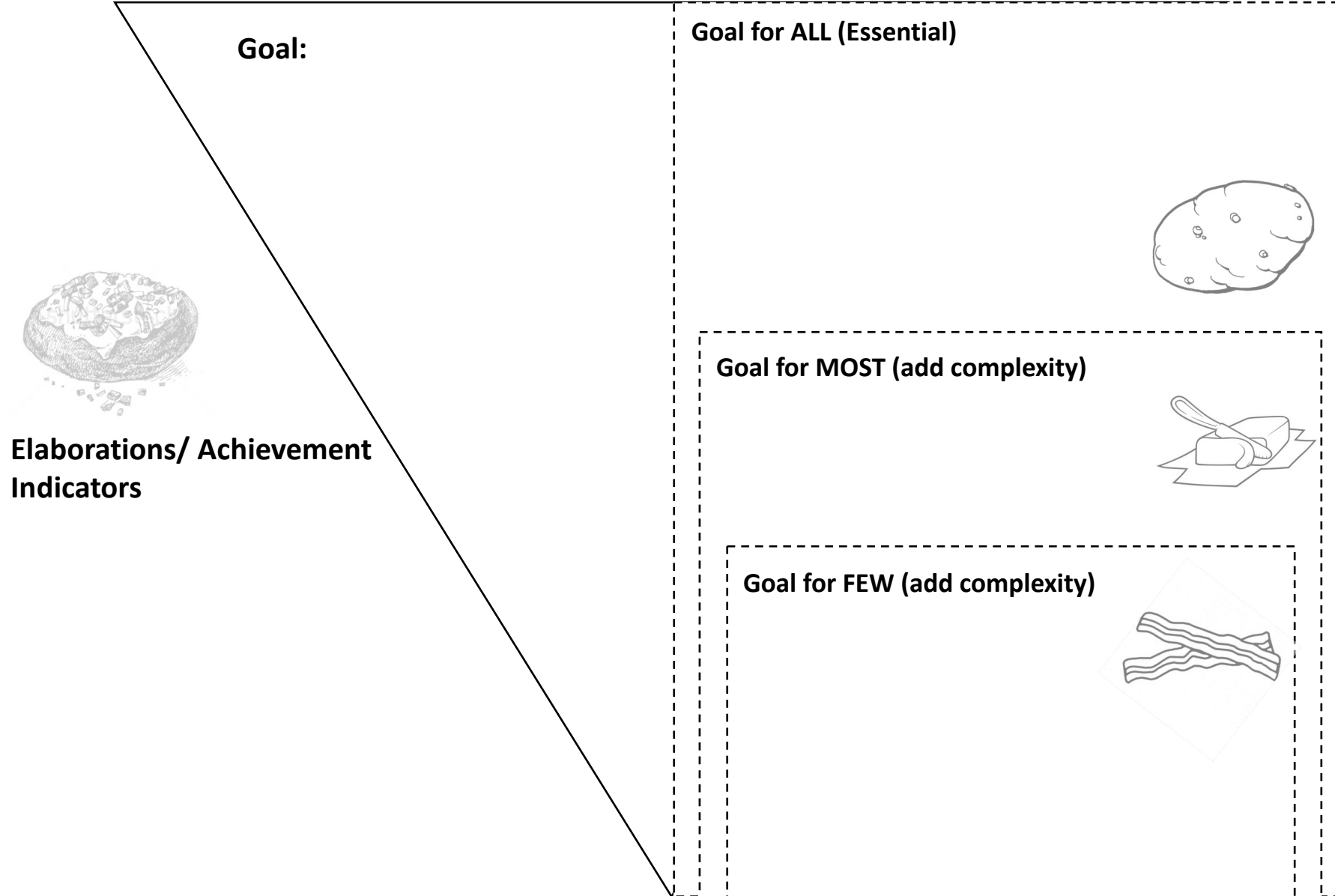
	Essential	More complex	More complex
Learning Outcome			



Planning Pyramid



The Baked Potato Planning Strategy:



Our Co-Planning Journey: Learning Continuums

1. Using the elaborations for each learning outcome, we constructed a **grade-level scaffold** in *student friendly language*

Learning Outcome:				
<i>Student friendly:</i>				
Grade Level				
Approaching	Emerging	Developing	Confident	Extending

2. We started with the **most essential concept** of the outcome and then we **added on complexity**

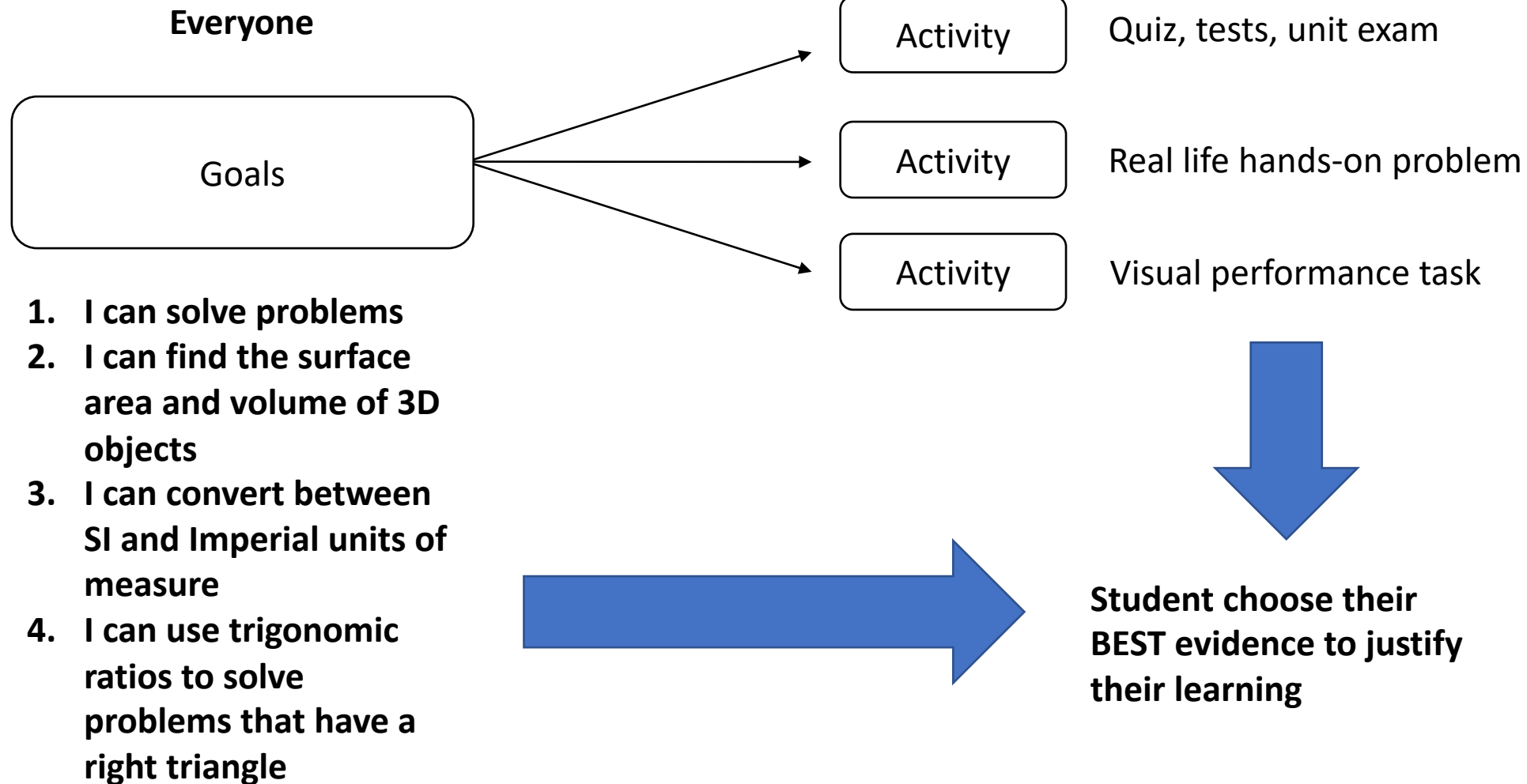
3. We extended the grade level scaffold to include an **access point** and **challenge point**

An Additive Continuum of Proficiency

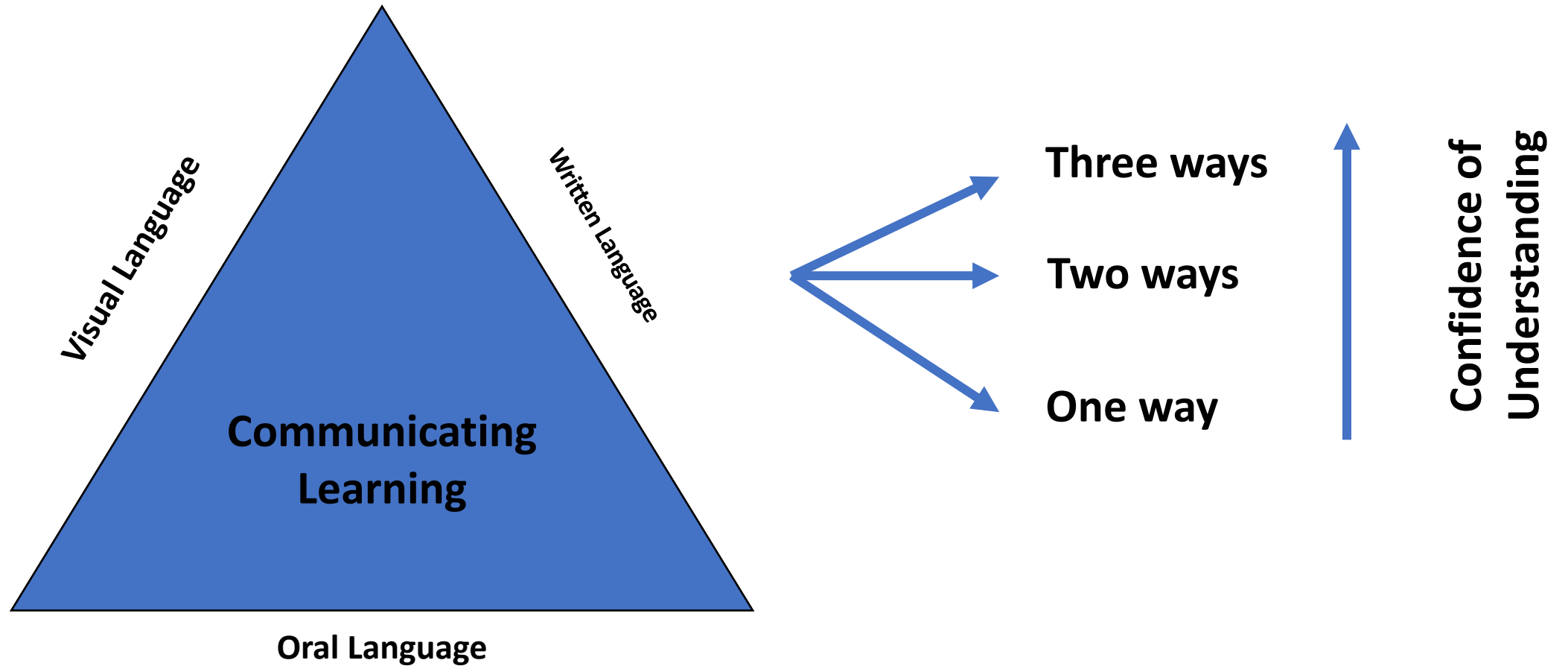
Assessment Language	Grade Level Emerging	Grade Level Developing	Grade Level Confident
Grade Level Learning Standard	Essential Concept	More complexity	More complexity

Backward Design

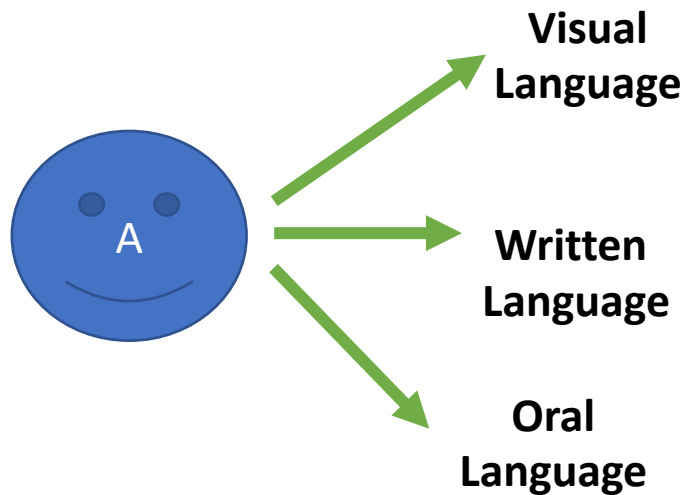
Differentiated Activities: Opportunities to create evidence (Formative & Summative)



How do students show what they know?



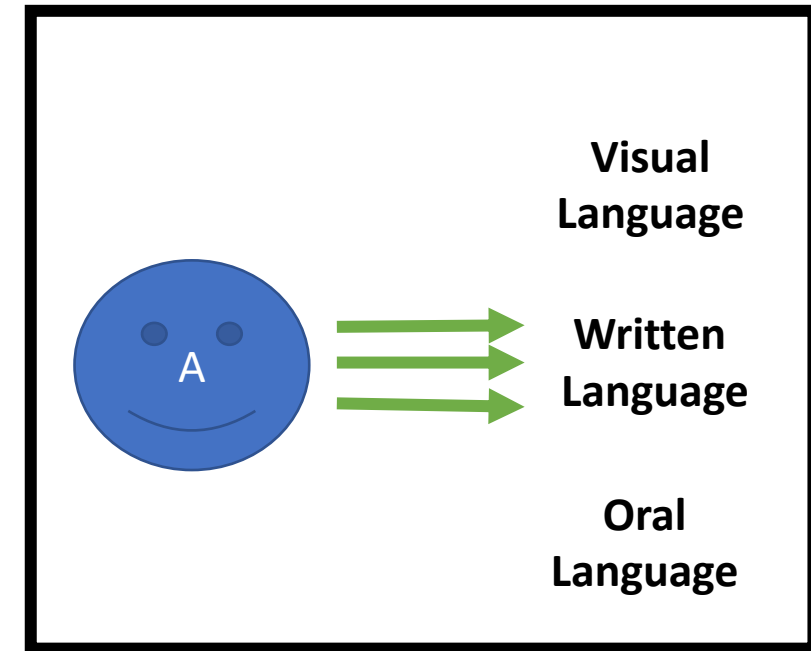
All Languages (in literacy) are Treated Equal!



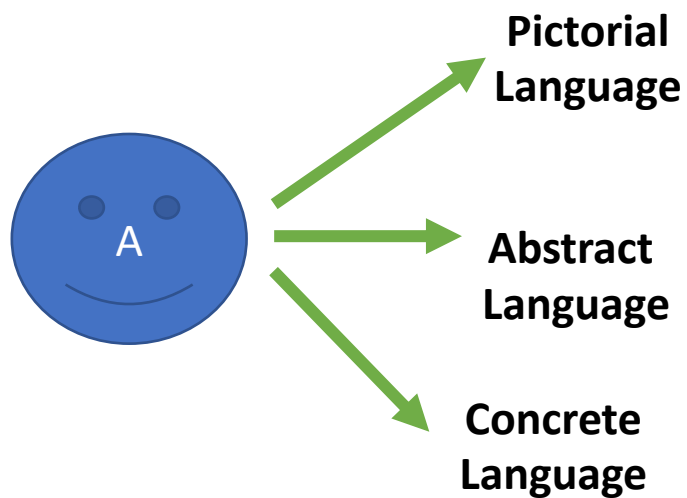
The **MORE WAYS** students can demonstrate learning, the more confident we are of meeting a goal

Instead of

The **NUMBER OF TIMES**, a student can show their learning in one way, the more confident we are of meeting a goal



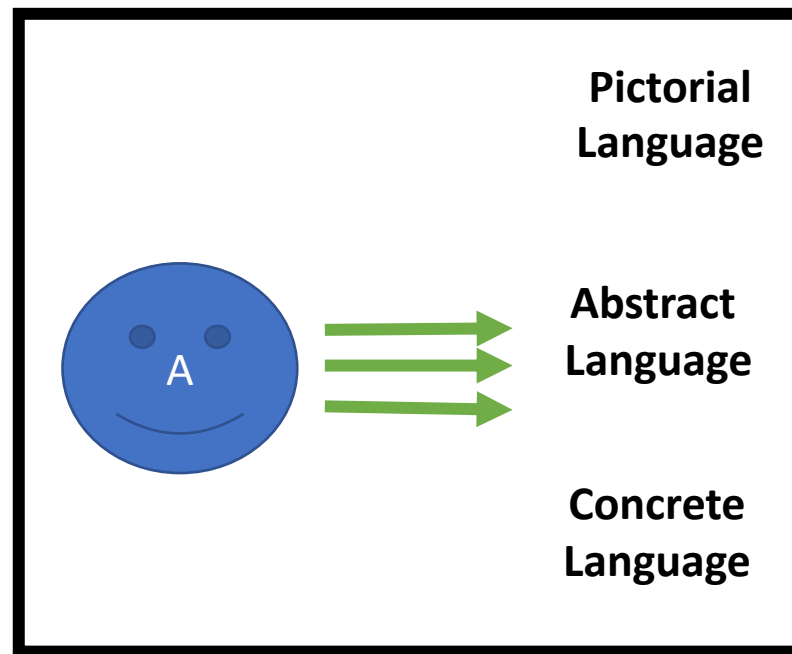
All Languages (in numeracy) are Treated Equal!



The **MORE WAYS** students can demonstrate learning, the more confident we are of meeting a goal

Instead of

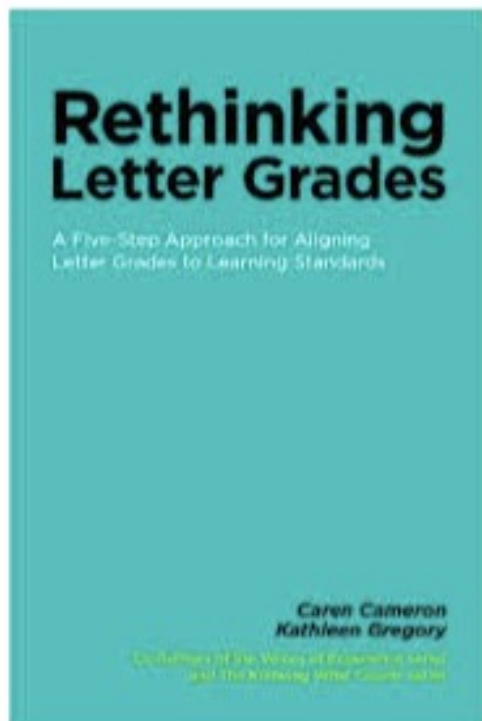
The **NUMBER OF TIMES**, a student can show their learning in one way, the more confident we are of meeting a goal



Unit Guiding Question: What is spatial sense? What is proportional reasoning? How are they connected?

Goals	My evidence of learning	Showing my Learning			I Need Support	I Need Challenge
	Actvtivities/ tasks	concrete	pictorial	abstract		
1. I can solve problems by: <ul style="list-style-type: none"> • Using different units of measure • Estimating • Using measurement strategies 						
2. I can find the surface area and volume of 3D objects including: <ul style="list-style-type: none"> • Right cones • Right cylinders • Right prism • Right pyramids • Spheres 						
3. I can convert between SI and Imperial units of measure						
4. I can use trigonomic ratios to solve problems that have a right triangle						

Rethinking Letter Grades



1. Standards based vs. standardized curriculum

Kristine Nanni YoungTeacherLove

Standards Based Grading

...helps teachers:

Give quality feedback

In the traditional grade book, Katie and her parents would see her grades and think she is getting by just fine.

But standards based grading reveals that she has not completely mastered the standards.

Traditional Grade Book

Name	Homework	Quiz 1	Quiz 2	Chapter 2 Test
Katie	90%	88%	82%	80%
Joe	60%	75%	88%	70%
Sara	10%	90%	98%	100%
John	100%	50%	60%	54%

Standards Based Grade Book

Name	Standard 1: use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	Standard 2: Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.	Standard 3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.
Katie	4	2	2
Joe	2	3	1

Biology 20-1: Energy and Matter Exchange in the Biosphere

<p>Our Unit Questions</p> <ul style="list-style-type: none"> • How are carbon, oxygen, <u>nitrogen</u> and phosphorus cycled in the biosphere? • How is the flow of energy balanced in the biosphere? • How have human activities and technological advances affected the balance of energy and matter in the biosphere?
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General Learning Outcome: Students will understand the constant flow of energy through the biosphere and ecosystems.		
Unit Goals: Curricular Language	Student Friendly Language	
<p>Knowledge</p> <p>20–A1.1k Students will: explain, in general terms, the one-way flow of energy through the biosphere and how stored energy in the biosphere, as a system, is eventually “lost” as heat</p> <p>20–A1.2k Students will: explain how energy in the biosphere can be perceived as a balance between both photosynthetic and chemosynthetic activities and cellular respiratory activities</p> <p>20–A1.3k Students will explain the structure of ecosystem trophic levels, using models such as food chains and food webs</p> <p>20–A1.4k Students will explain, quantitatively, the flow of energy and the exchange of matter in aquatic and terrestrial ecosystems, using models such as pyramids of numbers, <u>biomass</u> and energy</p>	<p>Knowledge</p> <p>I know how energy is used in a biosphere (stored, transferred, lost)</p> <p>I know that energy in different biospheres is balanced and cycles</p> <p>I know how biospheres are interconnected</p> <p>I know what an ecosystem is and how it is organized</p> <p>I know how energy moves in an ecosystem</p> <p>I know how to represent the movement of energy in ecosystems using a model</p>	
	<p>STS</p> <p>20–A1.1sts Students will: explain that the process of scientific investigation includes analyzing evidence and providing explanations based upon scientific theories and concepts</p>	<p>STS</p> <p>I can connect what I am learning about biospheres to real life examples and events</p>
	<p>Specific Outcomes for Skills</p> <p>Initiating and Planning</p> <p>20–A1.1s Students will: formulate questions about observed relationships and plan investigations of questions, ideas, problems, and issues</p> <p>Performing and Recording</p> <p>20–A1.2s Students will: conduct investigations into relationships among observable variables and use a broad range of tools and techniques to gather and record data and information perform an experiment</p> <p>Analyzing and Interpreting</p> <p>20–A1.3s Students will: analyze data and apply mathematical and conceptual models to develop and assess possible solutions</p> <p>Communication</p> <p>20–A1.4s Students will: work collaboratively in addressing problems and apply the skills and conventions of science in communicating information and ideas and in assessing results</p>	<p>Specific Outcomes for Skills</p> <p>I can initiate and plan by:</p> <ul style="list-style-type: none"> • by asking questions about what I observe in my environment • by making predicting based on what I observe <p>I can investigate and record my observations by:</p> <ul style="list-style-type: none"> • using different tools and techniques to gather data • complete an experiment <p>I can analyze and interpret by:</p> <ul style="list-style-type: none"> • looking for patterns in my data to help me understand what is happening • connecting my data to other scenarios and contexts • coming up with some possible solutions or explanations for what is happening • organizing and displaying my data in ways that make sense to me <p>I can communicate my findings by:</p> <ul style="list-style-type: none"> • using SI units and Sig Digs • presenting my findings so it makes sense to others (modes representation)

Learning Outcome Progressions: Bio 20-1

What do I need to know?

20–A1.1k: I know how energy is used in a biosphere (stored, transferred, lost)				
Approaching	Emerging	Developing	Confident	Extending
The sun and plants work together to form energy	I know what photosynthesis and chemosynthesis and cellular respiration is and examples of each	I know how photosynthesis, chemosynthesis and cellular respiration are connected	I know how energy is transferred by conduction, radiation, and convection, and examples	I know limitations and problems of how energy is used in existing and/or potential biospheres

20–A1.2k I know that energy in different biospheres is balanced and cycles; I know how biospheres are interconnected				
Approaching	Emerging	Developing	Confident	Extending
I know why I need the sun and plants I know why plants need me	I know the products of photosynthesis, chemosynthesis, and cellular respiration	I know that there can be balance or imbalance between photosynthesis, chemo synthesis and cellular respiration	I know the impact of imbalance in photosynthesis and chemosynthesis and cellular respiration (global warming)	I know the pros/cons to possible solutions in imbalances of photosynthesis and chemosynthesis and cellular respiration

20–A1.3k I know what an ecosystem is and how it is organized				
Approaching	Emerging	Developing	Confident	Extending
I know what a food chain is	I know trophic levels and examples in the world	I know how to show trophic levels on different models	I know how trophic levels are connected to each other	I know the impact of deleting a trophic level

1 General Learning Outcome	1. Student will explain the constant flow of energy through the biosphere and ecosystems																										Unit Evaluation				Self Evaluation																												
2 Specific Learning Outcome	20-A1.1k					20-A1.2k					20-A1.3k					20-A1.4k					20-A1.1sts					20-A1.1s					20-A1.2s					20-A1.3s					20-A1.4s					Total	Out of	%	Letter Grade	Targeted Attitudes									
3 Learning Outcome Progressions	Approaching	Emerging	Developing	Confident	Extending	Approaching	Emerging	Developing	Confident	Extending	Approaching	Emerging	Developing	Confident	Extending	Approaching	Emerging	Developing	Confident	Extending	Approaching	Emerging	Developing	Confident	Extending	Approaching	Emerging	Developing	Confident	Extending	Approaching	Emerging	Developing	Confident	Extending	Approaching	Emerging	Developing	Confident	Extending	Approaching	Emerging	Developing	Confident	Extending														
4 Assessment	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4	IE/EP	2	3	3.5	4				
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Standards Based Grade Book – Math 10 C: Measurement

Essential Understanding: Students understand spatial sense and proportional reasoning

Learning Outcomes	1. I can solve problems by: <ul style="list-style-type: none"> Using different units of measure Estimating Using measurement strategies 					2. I can find the surface area and volume of 3D objects including: <ul style="list-style-type: none"> Right cones Right cylinders Right prism Right pyramids Spheres 					3. I can convert between SI and Imperial units of measure					4. I can use trigonometric ratios to solve problems that have a right triangle				
Levels of Complexity	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending
Student																				
Student																				
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Levels of Complexity	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending
Student	•	•				•	•				•	•				•				
Student	•					•					•	•				•				
Student	•	•	•	•		•	•				•	•								
Student	•	•	•			•										•				
Student	•					•	•				•	•	•							

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Levels of Complexity	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending
	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW
Student	•	•				•	•				•	•				•				
Student	•					•					•	•				•				
Student	•	•	•	•		•	•				•	•								
Student	•	•	•			•										•				
Student	•					•	•				•	•	•							

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Learning Outcomes	1. I can solve problems by: <ul style="list-style-type: none"> Using different units of measure Estimating Using measurement strategies 					2. I can find the surface area and volume of 3D objects including: <ul style="list-style-type: none"> Right cones Right cylinders Right prism Right pyramids Spheres 					3. I can convert between SI and Imperial units of measure					4. I can use trigonometric ratios to solve problems that have a right triangle				
Levels of Complexity	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending
	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW
Student	•	•				•	•				•	•				•				
Student	•					•					•	•				•				
Student	•	•	•	•		•	•				•	•								
Student	•	•	•			•										•				
Student	•					•	•				•	•	•							

Standards Based Grade Book – Math 10 C: Measurement

Essential Understanding: Students understand spatial sense and proportional reasoning

Learning Outcomes	1. I can solve problems by: <ul style="list-style-type: none"> Using different units of measure Estimating Using measurement strategies 					2. I can find the surface area and volume of 3D objects including: <ul style="list-style-type: none"> Right cones Right cylinders Right prism Right pyramids Spheres 					3. I can convert between SI and Imperial units of measure					4. I can use trigonometric ratios to solve problems that have a right triangle				
Levels of Complexity	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting / Developing	Fully Meeting / Proficient	Extending
	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW
Student	•	•				•	•				•	•				•				
Student	•	■				•	■				•	•				•				
Student	•	•	•	•		•	•				•	•			■	■				
Student	•	•	•			•	■				■	■				•				
Student	•	■				•	•				•	•	•		■	■				

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	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW
Student	•	•				•	•				•	•				•				
Student	•	•				•	•				•	•				•				
Student	•	•	•	•		•	•				•	•				•	•			
Student	•	•	•			•	•				•	•				•	•			
Student	•	•				•	•				•	•	•			•	•			

1. Standards based vs. standardized curriculum

Kristine Nanni YoungTeacherLove

Standards Based Grading

...helps teachers:

Give quality feedback

In the traditional grade book, Katie and her parents would see her grades and think she is getting by just fine.

But standards based grading reveals that she has not completely mastered the standards.

Traditional Grade Book

Name	Homework	Quiz 1	Quiz 2	Chapter 2 Test
Katie	90%	88%	82%	80%
Joe	60%	75%	88%	70%
Sara	10%	90%	98%	100%
John	100%	50%	60%	54%

Standards Based Grade Book

Name	Standard 1: use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	Standard 2: Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.	Standard 3: Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane.
Katie	4	2	2
Joe	2	3	1

Biology 20-1: Energy and Matter Exchange in the Biosphere

<p>Our Unit Questions</p> <ul style="list-style-type: none"> How are carbon, oxygen, <u>nitrogen</u> and phosphorus cycled in the biosphere? How is the flow of energy balanced in the biosphere? How have human activities and technological advances affected the balance of energy and matter in the biosphere?
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General Learning Outcome: Students will understand the constant flow of energy through the biosphere and ecosystems.		
Unit Goals: Curricular Language	Student Friendly Language	
<p>Knowledge</p> <p>20–A1.1k Students will: explain, in general terms, the one-way flow of energy through the biosphere and how stored energy in the biosphere, as a system, is eventually “lost” as heat</p> <p>20–A1.2k Students will: explain how energy in the biosphere can be perceived as a balance between both photosynthetic and chemosynthetic activities and cellular respiratory activities</p> <p>20–A1.3k Students will explain the structure of ecosystem trophic levels, using models such as food chains and food webs</p> <p>20–A1.4k Students will explain, quantitatively, the flow of energy and the exchange of matter in aquatic and terrestrial ecosystems, using models such as pyramids of numbers, <u>biomass</u> and energy</p>	<p>Knowledge</p> <p>I know how energy is used in a biosphere (stored, transferred, lost)</p> <p>I know that energy in different biospheres is balanced and cycles</p> <p>I know how biospheres are interconnected</p> <p>I know what an ecosystem is and how it is organized</p> <p>I know how energy moves in an ecosystem</p> <p>I know how to represent the movement of energy in ecosystems using a model</p>	
	<p>STS</p> <p>20–A1.1sts Students will: explain that the process of scientific investigation includes analyzing evidence and providing explanations based upon scientific theories and concepts</p>	<p>STS</p> <p>I can connect what I am learning about biospheres to real life examples and events</p>
	<p>Specific Outcomes for Skills</p> <p>Initiating and Planning</p> <p>20–A1.1s Students will: formulate questions about observed relationships and plan investigations of questions, ideas, problems, and issues</p> <p>Performing and Recording</p> <p>20–A1.2s Students will: conduct investigations into relationships among observable variables and use a broad range of tools and techniques to gather and record data and information perform an experiment</p> <p>Analyzing and Interpreting</p> <p>20–A1.3s Students will: analyze data and apply mathematical and conceptual models to develop and assess possible solutions</p> <p>Communication</p> <p>20–A1.4s Students will: work collaboratively in addressing problems and apply the skills and conventions of science in communicating information and ideas and in assessing results</p>	<p>Specific Outcomes for Skills</p> <p>I can initiate and plan by:</p> <ul style="list-style-type: none"> by asking questions about what I observe in my environment by making predicting based on what I observe <p>I can investigate and record my observations by:</p> <ul style="list-style-type: none"> using different tools and techniques to gather data complete an experiment <p>I can analyze and interpret by:</p> <ul style="list-style-type: none"> looking for patterns in my data to help me understand what is happening connecting my data to other scenarios and contexts coming up with some possible solutions or explanations for what is happening organizing and displaying my data in ways that make sense to me <p>I can communicate my findings by:</p> <ul style="list-style-type: none"> using SI units and Sig Digs presenting my findings so it makes sense to others (modes representation)

Learning Outcome Progressions: Bio 20-1

What do I need to know?

20–A1.1k: I know how energy is used in a biosphere (stored, transferred, lost)				
Approaching	Emerging	Developing	Confident	Extending
The sun and plants work together to form energy	I know what photosynthesis and chemosynthesis and cellular respiration is and examples of each	I know how photosynthesis, chemosynthesis and cellular respiration are connected	I know how energy is transferred by conduction, radiation, and convection, and examples	I know limitations and problems of how energy is used in existing and/or potential biospheres

20–A1.2k I know that energy in different biospheres is balanced and cycles; I know how biospheres are interconnected				
Approaching	Emerging	Developing	Confident	Extending
I know why I need the sun and plants I know why plants need me	I know the products of photosynthesis, chemosynthesis, and cellular respiration	I know that there can be balance or imbalance between photosynthesis, chemo synthesis and cellular respiration	I know the impact of imbalance in photosynthesis and chemosynthesis and cellular respiration (global warming)	I know the pros/cons to possible solutions in imbalances of photosynthesis and chemosynthesis and cellular respiration

20–A1.3k I know what an ecosystem is and how it is organized				
Approaching	Emerging	Developing	Confident	Extending
I know what a food chain is	I know trophic levels and examples in the world	I know how to show trophic levels on different models	I know how trophic levels are connected to each other	I know the impact of deleting a trophic level

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Levels of Complexity	Approaching	Minimally Meeting / Emerging	Meeting/ Developing	Fully Meeting/ Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting/ Developing	Fully Meeting/ Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting/ Developing	Fully Meeting/ Proficient	Extending	Approaching	Minimally Meeting / Emerging	Meeting/ Developing	Fully Meeting/ Proficient	Extending	Total	Out of	%	Letter Grade
	2.5	3	4	5	2.5	3	4	5	2.5	3	4	5	2.5	3	4	5	2.5	3	4	5	20	20		
	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	20	20		
Student	•	•				•	•				•	•				•	•				10	20	50%	Pass
Student	•	•	•	•		•	•	•	•		•	•	•	•		•	•	•	•		16	20	80%	A-
Student	•	•	•	•		•	•				•	•				•	•	•			IEA	20		IEA
Student	•	•	•	•		•	•	•	•	•	•	•	•			•	•	•			15	20	75%	B
Student	•	•	•	•		•	•				•	•	•			•	•	•	•		13.5	20	68%	C+

Questions and Directions

- What questions are coming up?
- What would be helpful to focus on today?