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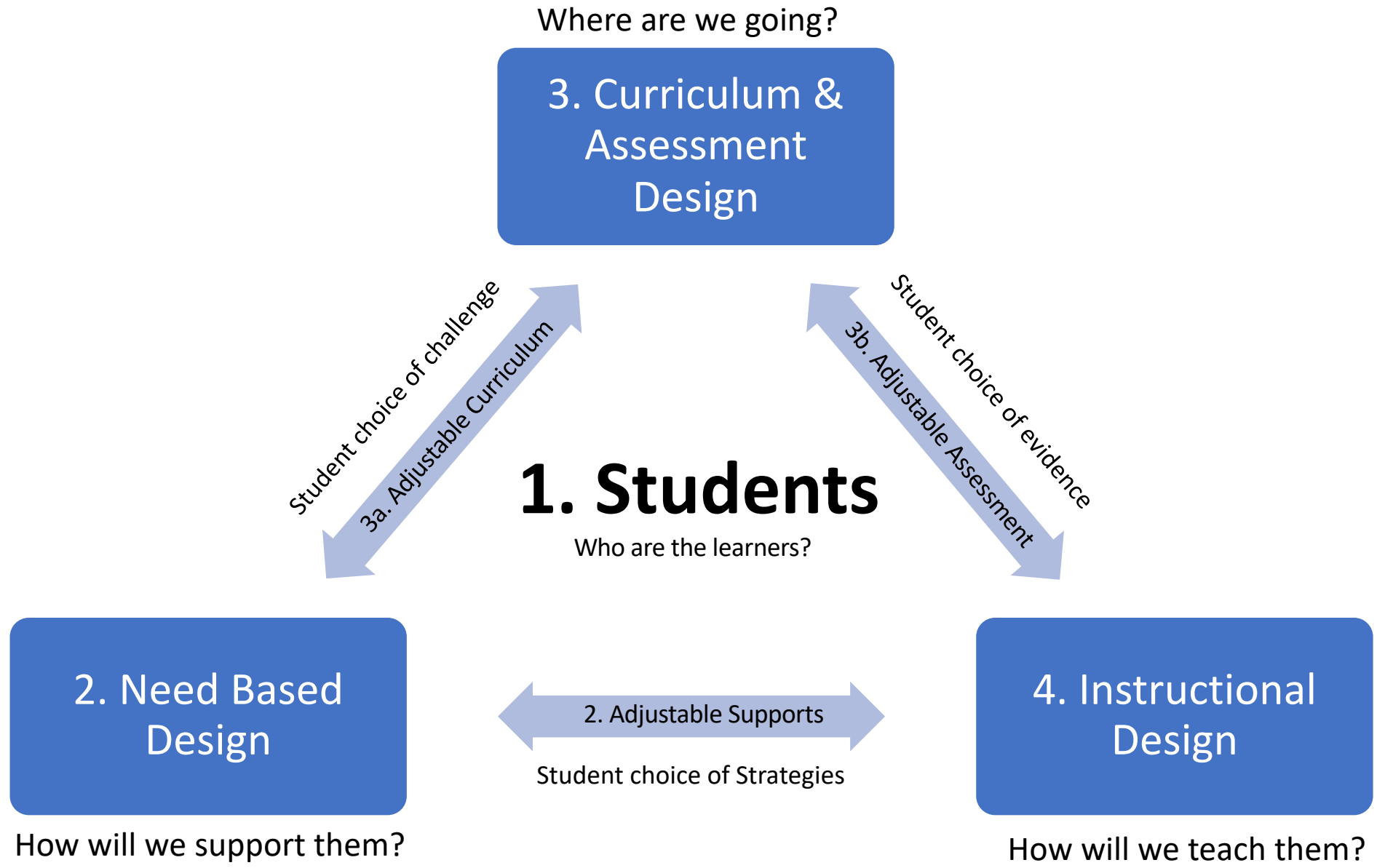
HOW DO WE DESIGN AN ADJUSTABLE CURRICULUM?

- 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

Shelley Moore, 2019



BACKWARDS DESIGN

Backwards Design Big Ideas:

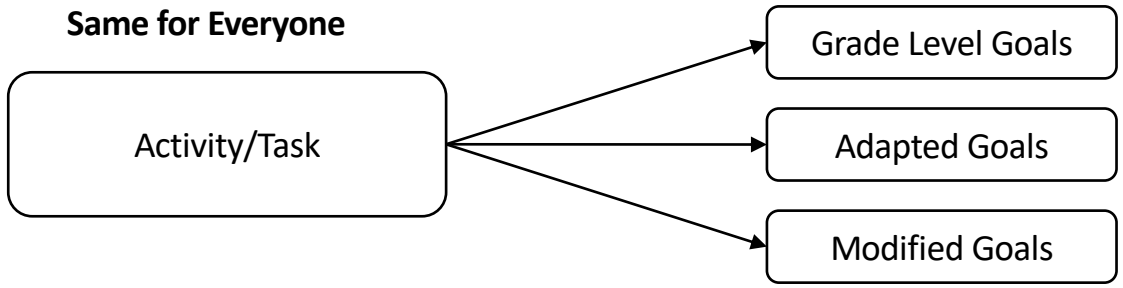
- Every curriculum has curricular goals
- We need to choose goals to teach for every unit
- We organize goals around a big idea/question
- We need to translate those goals into student friendly language
- Students need to know the goals
- Learning activities are EVIDENCE of learning
- We evaluate goals NOT activities
- Student choose their best examples of evidence (triangulation)

Forward Design

Standardized Evaluation

Differentiated

Same for Everyone

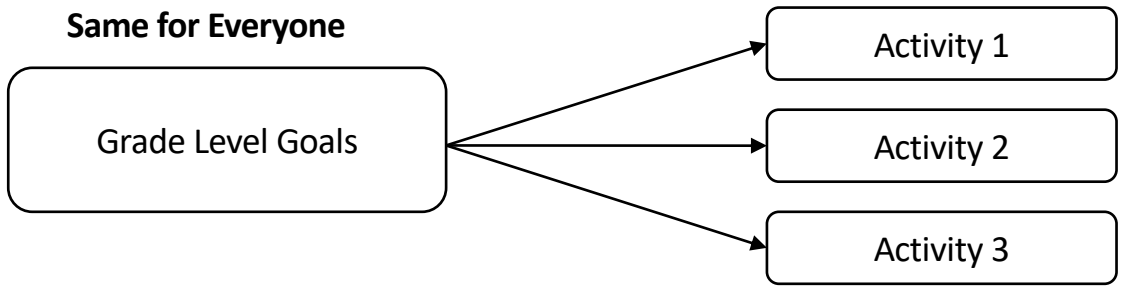


Compromises the integrity of evaluation

Backward Design

Differentiated

Same for Everyone



Does not compromise the integrity evaluation

Standards Based Evaluation

McTigue, 2010

Forward Design

Standardized Evaluation

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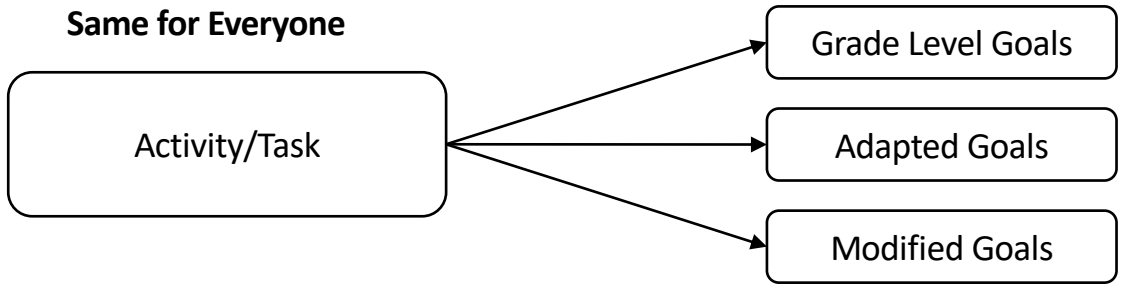

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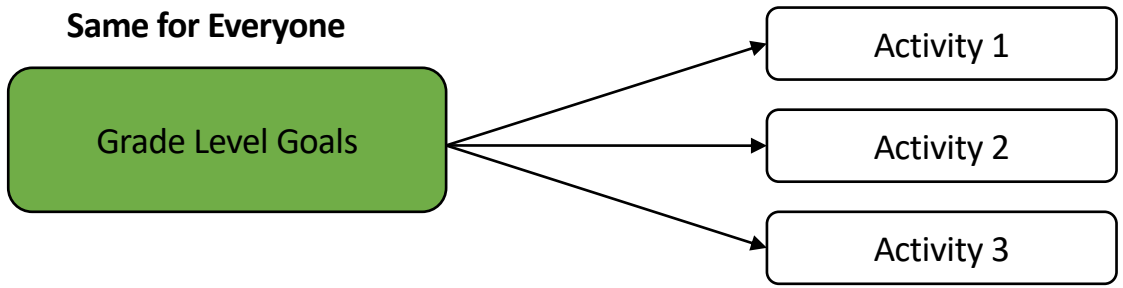


Does not compromise the integrity evaluation

Standards Based Evaluation

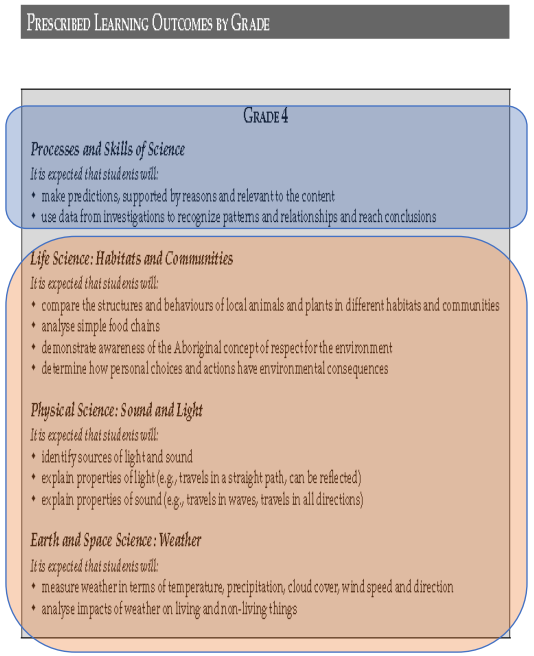
McTigue, 2010

Goals Come From The Curriculum!

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?



PRESCRIBED LEARNING OUTCOMES BY GRADE

GRADE 4

Processes and Skills of Science

It is expected that students will:

- make predictions, supported by reasons and relevant to the content
- use data from investigations to recognize patterns and relationships and reach conclusions

Life Science: Habitats and Communities

It is expected that students will:

- compare the structures and behaviours of local animals and plants in different habitats and communities
- analyse simple food chains
- demonstrate awareness of the Aboriginal concept of respect for the environment
- determine how personal choices and actions have environmental consequences

Physical Science: Sound and Light

It is expected that students will:

- identify sources of light and sound
- explain properties of light (e.g., travels in a straight path, can be reflected)
- explain properties of sound (e.g., travels in waves, travels in all directions)

Earth and Space Science: Weather

It is expected that students will:

- measure weather in terms of temperature, precipitation, cloud cover, wind speed and direction
- analyse impacts of weather on living and non-living things

What do you notice?

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): • **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 constrainst of a form, a problem or materials (2)	**We are creative thinkers because we get new ideas!** I get new ideas by: **(Students choose):** • 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?**
	• I know different types of **forces**		
	• I know what makes a **story**		
	• I can **make** something for a **purpose**		
	• I can **make** a **plan** and **try** out my **ideas**		
	• I can **create** a **story** for an **audience**		
	• I can **create** many things using different art **tools** and **materials**		

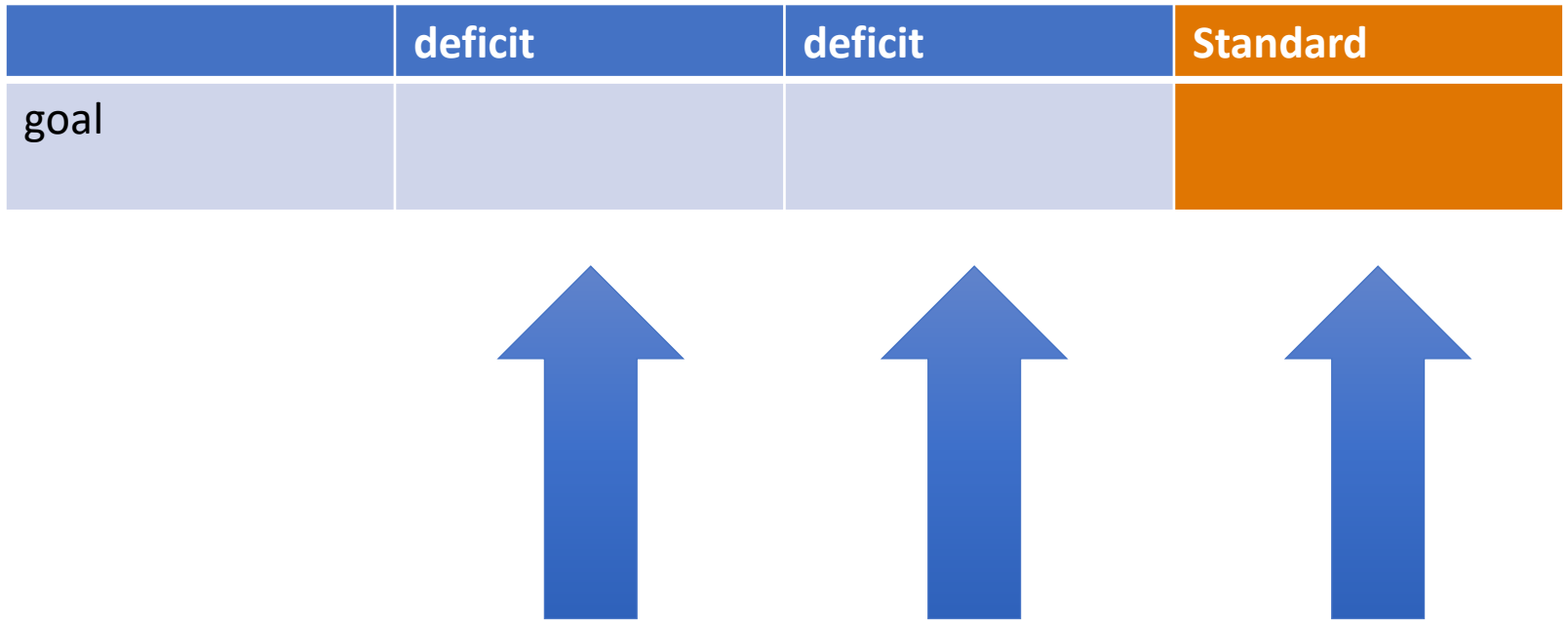
Grade: 4/5	Subject Area: Math	Planning Team: Kelset Team
Big Ideas:		**Unit Guiding questions:** Why do we need to learn how to add and subtract? Where in our lives do we use addition and subtraction?
Content Goal:	addition and subtraction to 10 000	I know how to **add** and **subtract** numbers up to 10 000
Content Goal:	addition and subtraction facts to 20 (developing computational fluency)	I know how to 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:** - **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 know the position, motion and parts of our solar system in our galaxy*
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 use it purposefully		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 *diverse purposes* and from a *variety of sources* and evaluate their *relevance*, *accuracy*, and *reliability*	
Curricular Competency Goal	I can respond to *text* in *personal, creative, and critical ways*	
Curricular Competency Goal	I can use writing and design processes to plan, develop, and create engaging and meaningful *literary and informational texts* for a variety of purposes and *audiences*	
Curricular Competency Goal	I can assess and *refine texts* to improve their clarity, effectiveness, and impact according to purpose, *audience*, and message	
Core Competency Goal	I can be socially responsible by contributing to community and caring for the environment	

Rubrics vs. Learning Maps



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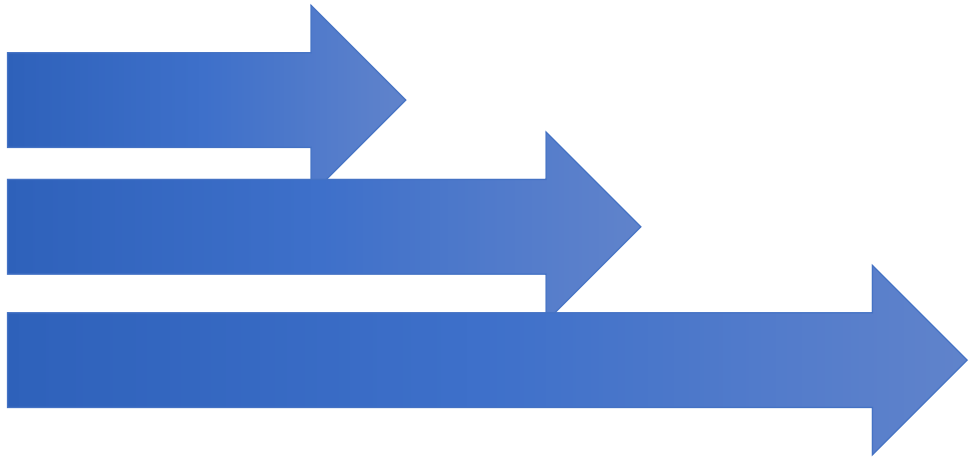
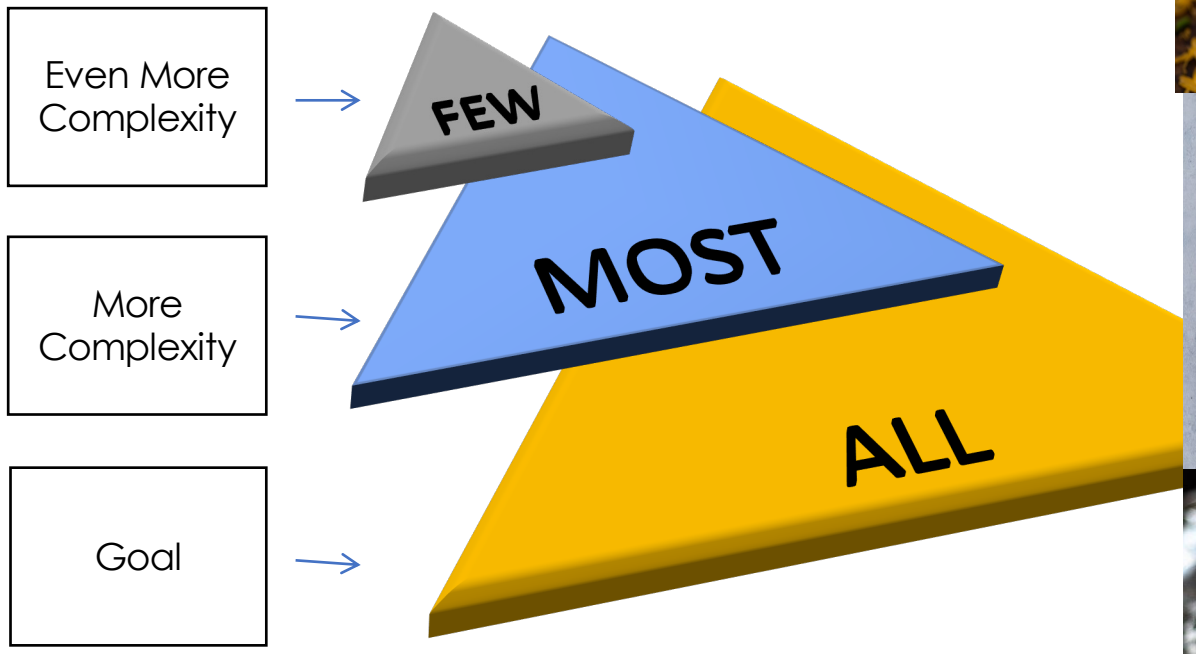
Inclusive Education: It's not more work, it's different work!

Rubrics vs. Learning Maps

	Essential	More complex	More complex
Learning Outcome			

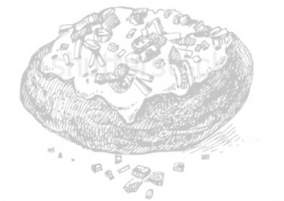


Planning Pyramid



The Baked Potato Planning Strategy:

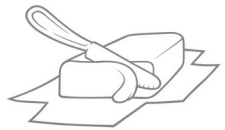
Goal:



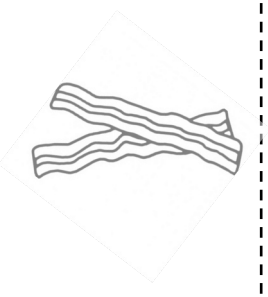
Elaborations/ Achievement Indicators

Goal for ALL (Essential)

Goal for MOST (add complexity)

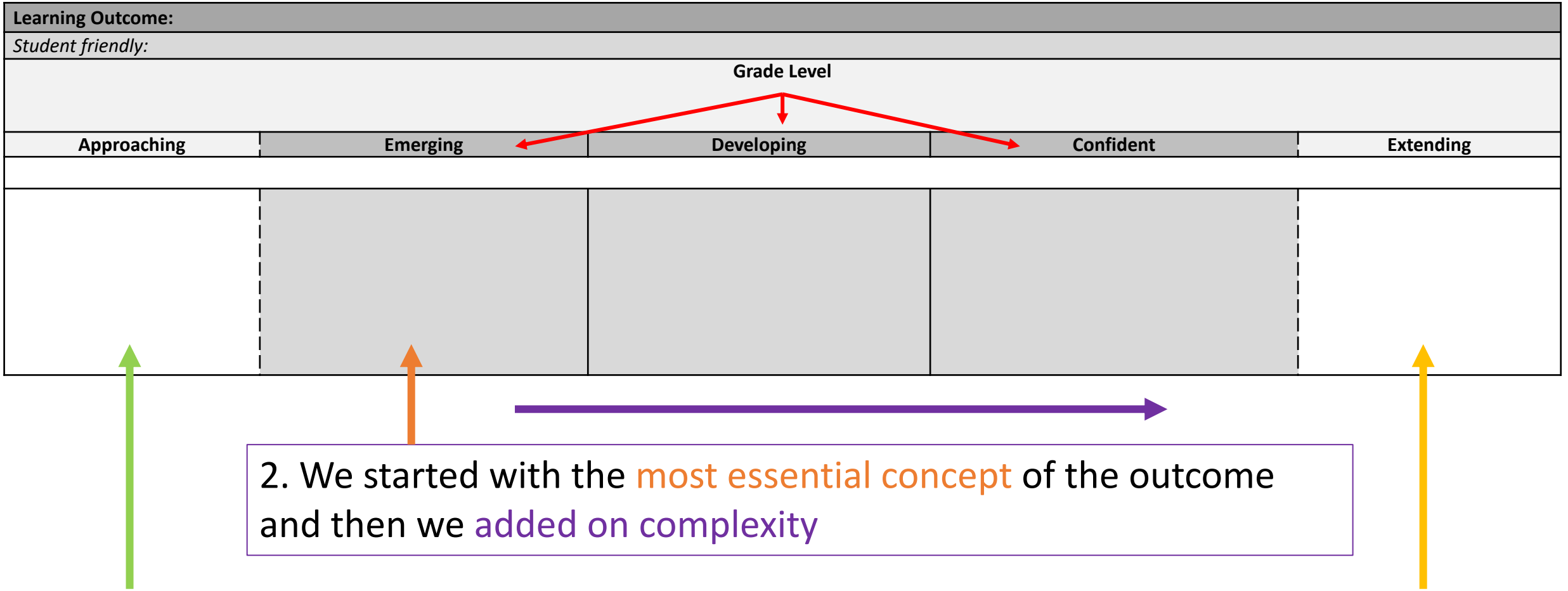


Goal for FEW (add complexity)



Our Co-Planning Journey: Learning Continuums

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

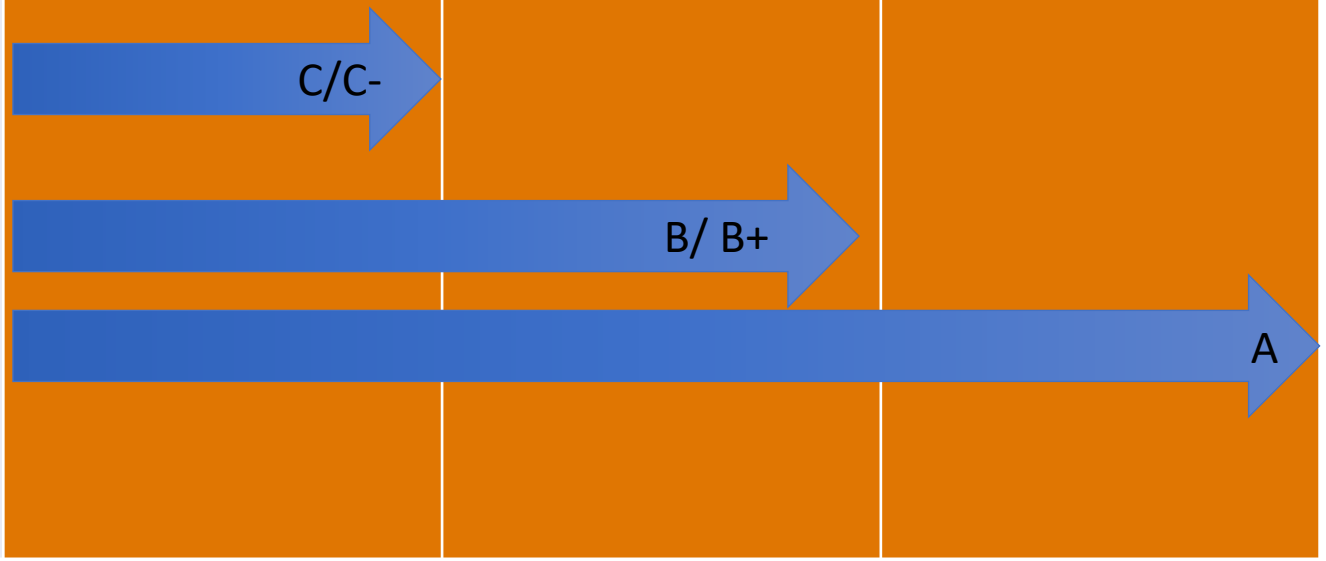


2. We started with the most essential concept of the outcome and then we added on complexity

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



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Backward Design

McTigue, 2010

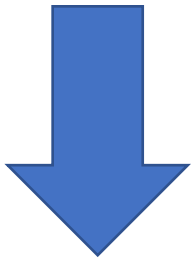
Differentiated Activities: Opportunities to create evidence
(Formative & Summative)

Everyone

Goals

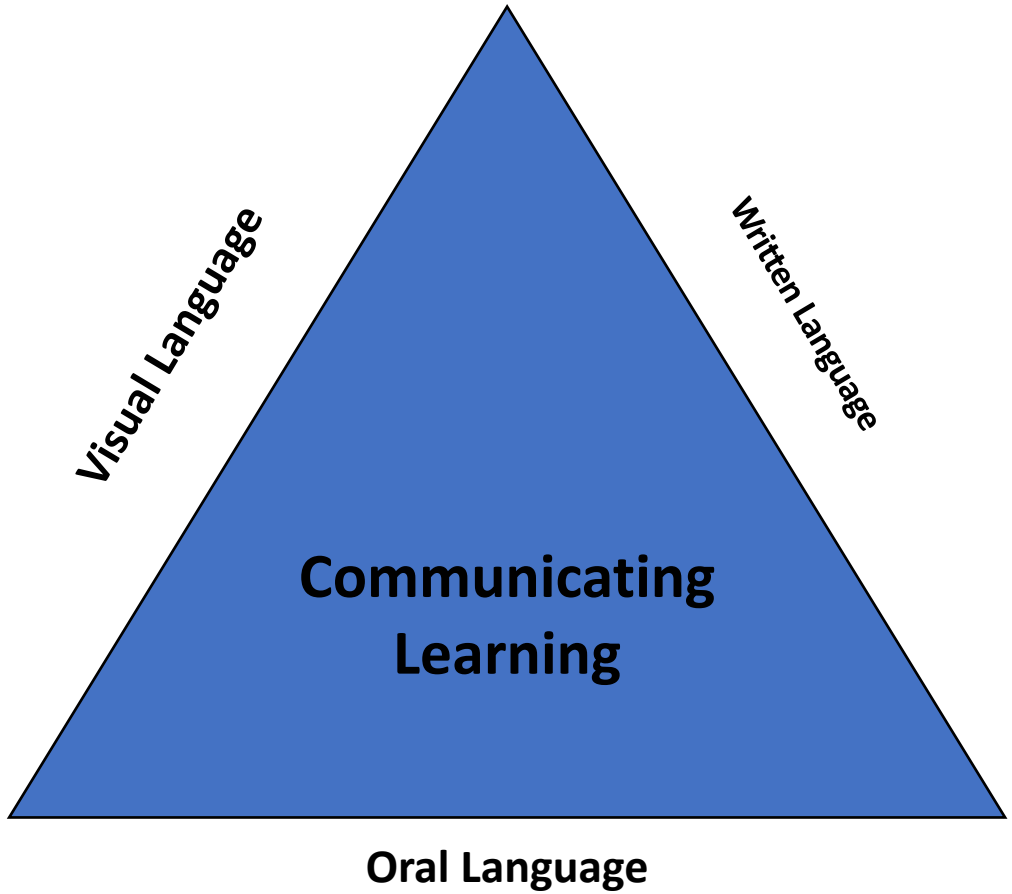
- Activity — Quiz, tests, unit exam
- Activity — Real life hands-on problem
- Activity — Visual performance task

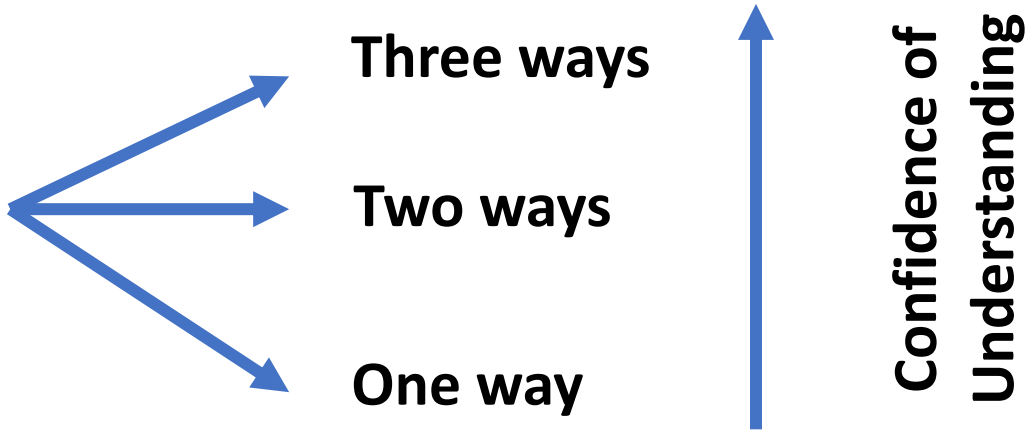
1. **I can solve problems**
2. **I can find the surface area and volume of 3D objects**
3. **I can convert between SI and Imperial units of measure**
4. **I can use trigonomic ratios to solve problems that have a right triangle**



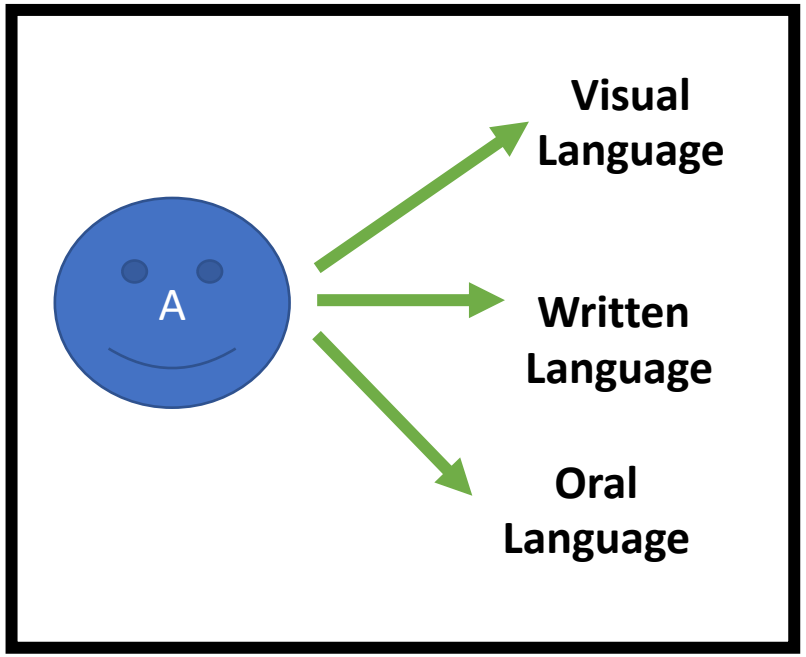
Student choose their BEST evidence to justify their learning

How do student show what they know?





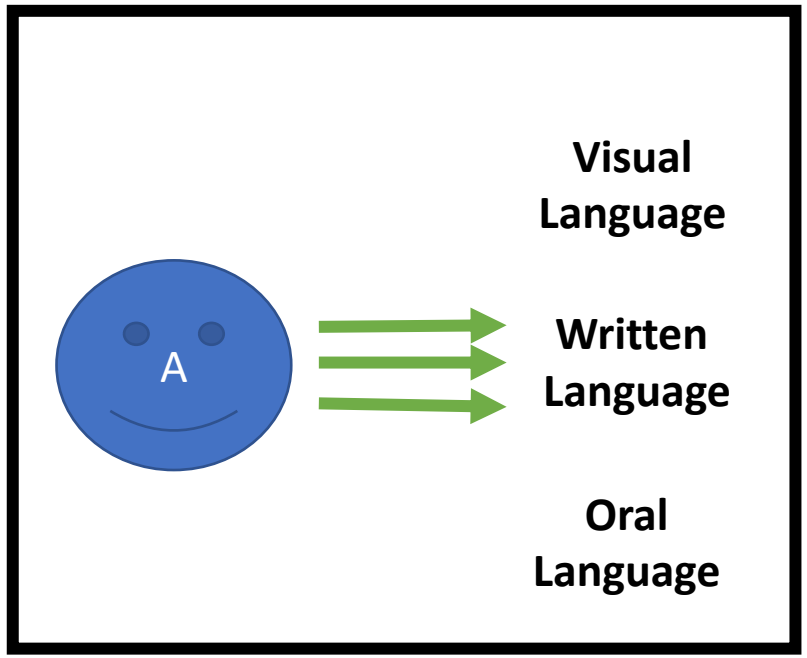
All Languages (in literacy) are Treated Equal!



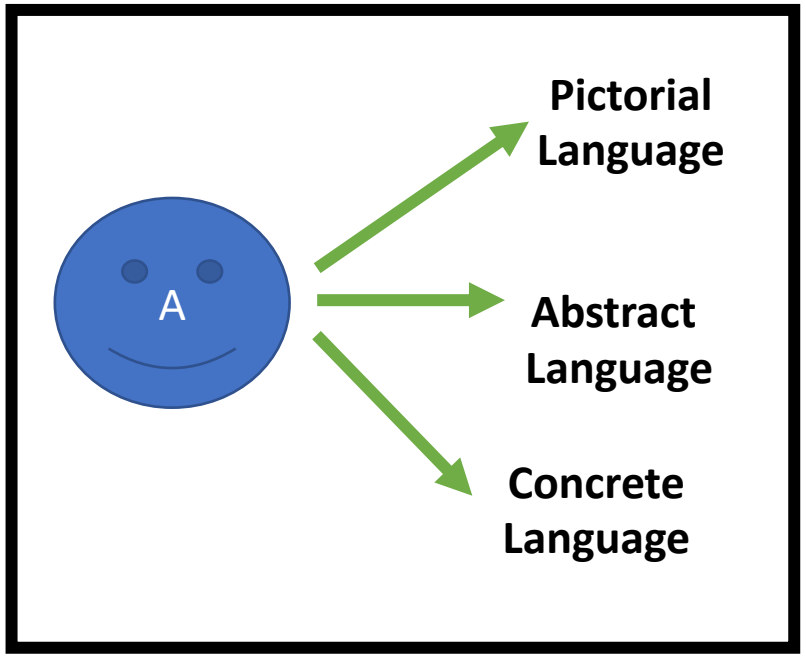
The MORE WAYS students can demonstrate learning, the more confident we are of meeting a goal

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!



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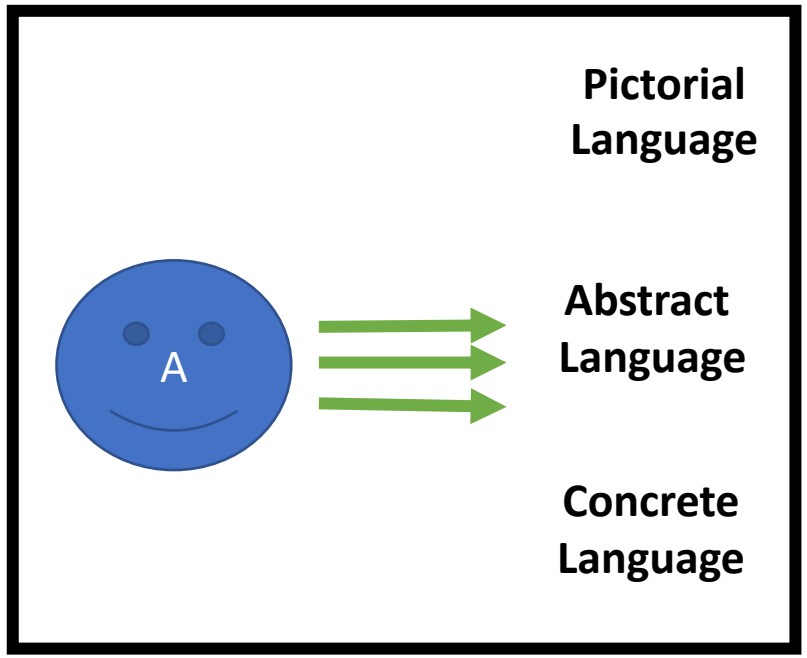
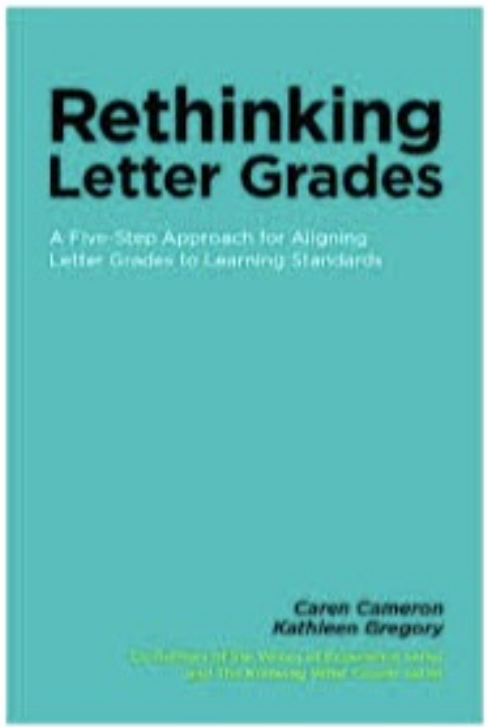


Name:	Math 10 C	Date:	Topic: Measurement

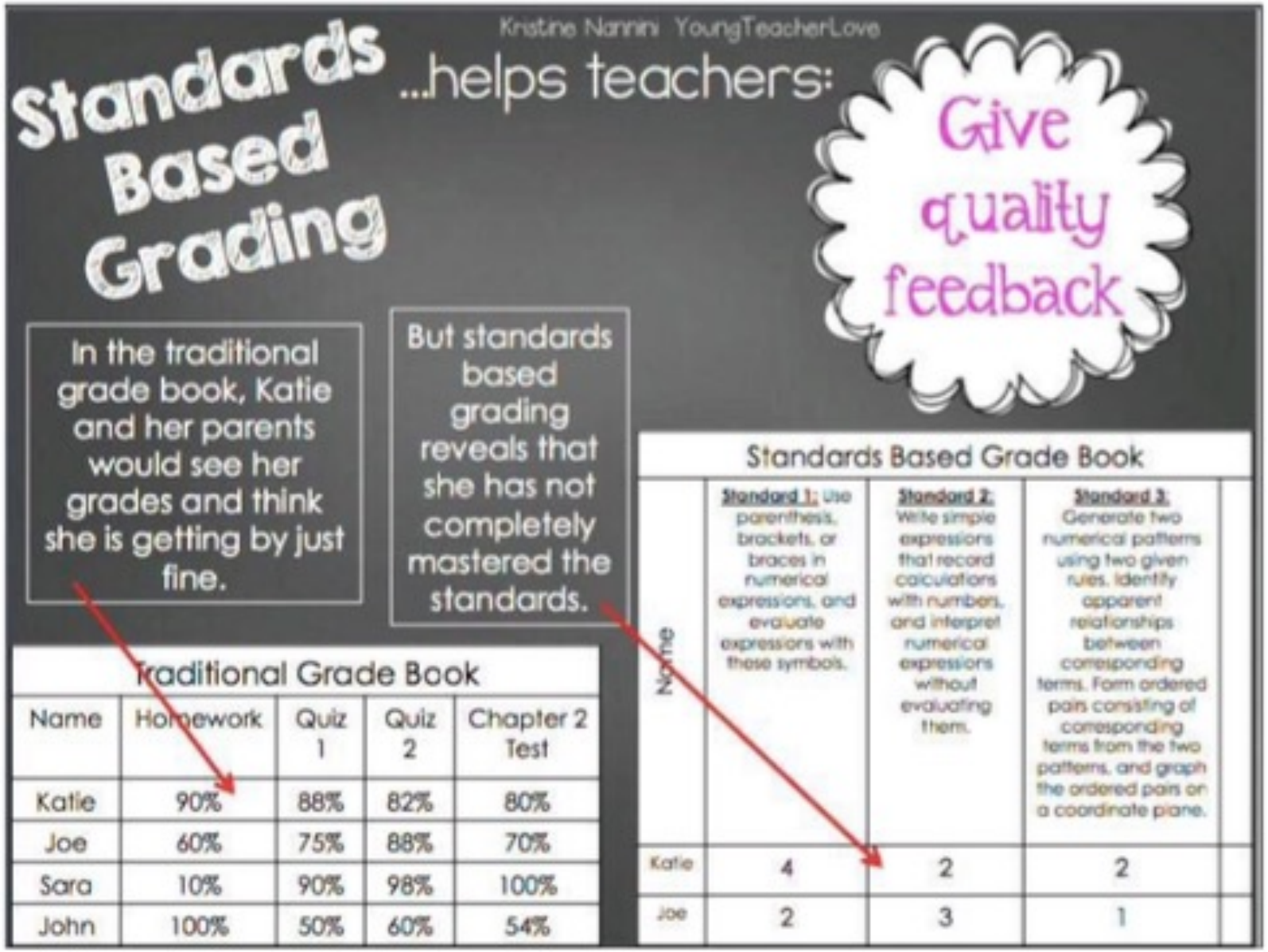
Unit Guiding Question: What is spatial sense? What is proportional reasoning? How are they connected?

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: • Using different units of measure • Estimating • Using measurement strategies						
2. I can find the surface area and volume of 3D objects including: • 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



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

Our Unit Questions

- How are carbon, oxygen, nitrogen 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?

General Learning Outcome: Students will understand the constant flow of energy through the biosphere and ecosystems.

	Unit Goals: Curricular Language		Student Friendly Language
Knowledge	**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	Knowledge	I know how energy is used in a biosphere (stored, transferred, lost)
	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		I know that energy in different biospheres is balanced and cycles I know how biospheres are interconnected
	20–A1.3k Students will explain the structure of ecosystem trophic levels, using models such as food chains and food webs		I know what an ecosystem is and how it is organized
	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, biomass and energy		I know how energy moves in an ecosystem I know how to represent the movement of energy in ecosystems using a model
STS	**20–A1.1sts** Students will: explain that the process of scientific investigation includes analyzing evidence and providing explanations based upon scientific theories and concepts	STS	I can connect what I am learning about biospheres to real life examples and events
Specific Outcomes for Skills	**Initiating and Planning** **20–A1.1s** Students will: formulate questions about observed relationships and plan investigations of questions, ideas, problems, and issues	Specific Outcomes for Skills	I can **initiate** and **plan** by: • by asking questions about what I observe in my environment • by making predicting based on what I observe
	Performing and Recording **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		I can **investigate** and **record my observations** by: • using different tools and techniques to gather data • complete an experiment
	Analyzing and Interpreting **20–A1.3s** Students will: analyze data and apply mathematical and conceptual models to develop and assess possible solutions		I can **analyze** and **interpret** by: • 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
	Communication **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		I can **communicate** my findings by: • 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 tropic level

A1 | General Learning Outcome

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY
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									
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	Total	Out of	%	Letter Grade	
4	Assessment	IE/IEP	2	3	3.5	4	IE/IEP	2	3	3.5	4	IE/IEP	2	3	3.5	4	IE/IEP	2	3	3.5	4	IE/IEP	2	3	3.5	4	IE/IEP	2	3	3.5	4	IE/IEP	2	3	3.5	4	IE/IEP	2	3	3.5	4	IE/IEP	2	3	3.5	4					Targeted Attitudes
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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:** • Using different units of measure • Estimating • Using measurement strategies					**2. I can find the surface area and volume of 3D objects including:** • 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**				
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																				
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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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	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	•					•	•				•	•	•							

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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	•					•	•				•	•	•							

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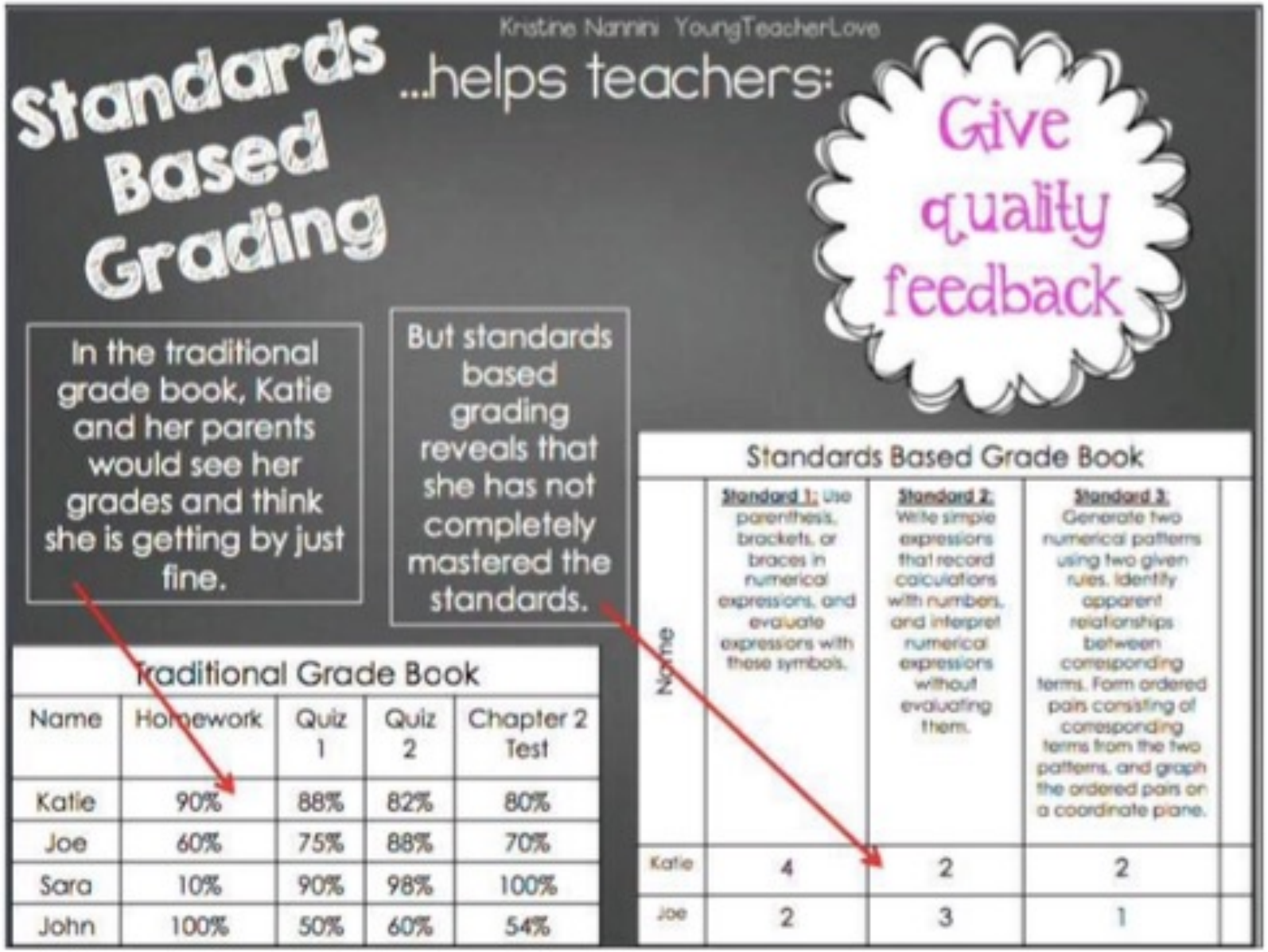
	ALL	**ALL**	**MOST**	**SOME**	**FEW**	**ALL**	**ALL**	**MOST**	**SOME**	**FEW**	**ALL**	**ALL**	**MOST**	**SOME**	**FEW**	**ALL**	**ALL**	**MOST**	**SOME**	**FEW**
Student	•	•				•	•				•	•				•				
Student	•	•				•	•				•	•				•				
Student	•	•	•	•		•	•				•	•				•				
Student	•	•	•			•	•									•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

1. Standards based vs. standardized curriculum



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

Our Unit Questions

- How are carbon, oxygen, nitrogen 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?

General Learning Outcome: Students will understand the constant flow of energy through the biosphere and ecosystems.

	Unit Goals: Curricular Language		Student Friendly Language
Knowledge	**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	Knowledge	I know how energy is used in a biosphere (stored, transferred, lost)
	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		I know that energy in different biospheres is balanced and cycles I know how biospheres are interconnected
	20–A1.3k Students will explain the structure of ecosystem trophic levels, using models such as food chains and food webs		I know what an ecosystem is and how it is organized
	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, biomass and energy		I know how energy moves in an ecosystem I know how to represent the movement of energy in ecosystems using a model
STS	**20–A1.1sts** Students will: explain that the process of scientific investigation includes analyzing evidence and providing explanations based upon scientific theories and concepts	STS	I can connect what I am learning about biospheres to real life examples and events
Specific Outcomes for Skills	**Initiating and Planning** **20–A1.1s** Students will: formulate questions about observed relationships and plan investigations of questions, ideas, problems, and issues	Specific Outcomes for Skills	I can **initiate** and **plan** by: • by asking questions about what I observe in my environment • by making predicting based on what I observe
	Performing and Recording **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		I can **investigate** and **record my observations** by: • using different tools and techniques to gather data • complete an experiment
	Analyzing and Interpreting **20–A1.3s** Students will: analyze data and apply mathematical and conceptual models to develop and assess possible solutions		I can **analyze** and **interpret** by: • 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
	Communication **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		I can **communicate** my findings by: • 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 tropic 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	20	20		
	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW	ALL	ALL	MOST	SOME	FEW				
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+