Designing for DIVERSITY

Session 4: Curricular Design Strategies Backwards Design

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Dr. Shelley Moore

Welcome!

Our Plan Together

November 4, 2024: Kick Off - What is Inclusion?

November 4, 2024 : Session 1 - Getting to know students from a strength-based perspective

December 11, 2024: Session 2 - Making decisions to reduce barriers for ALL

January 15, 2024: Session 3 – Designing needs-based classroom support plans

February 5, 2024: Session 4 - Curricular Design Strategies: Backwards Design

February 26, 2024: Session 5 - Curricular Design Strategies: Lesson Design through a UDL lens

February 26, 2024: Session 6 - Inclusive Assessment

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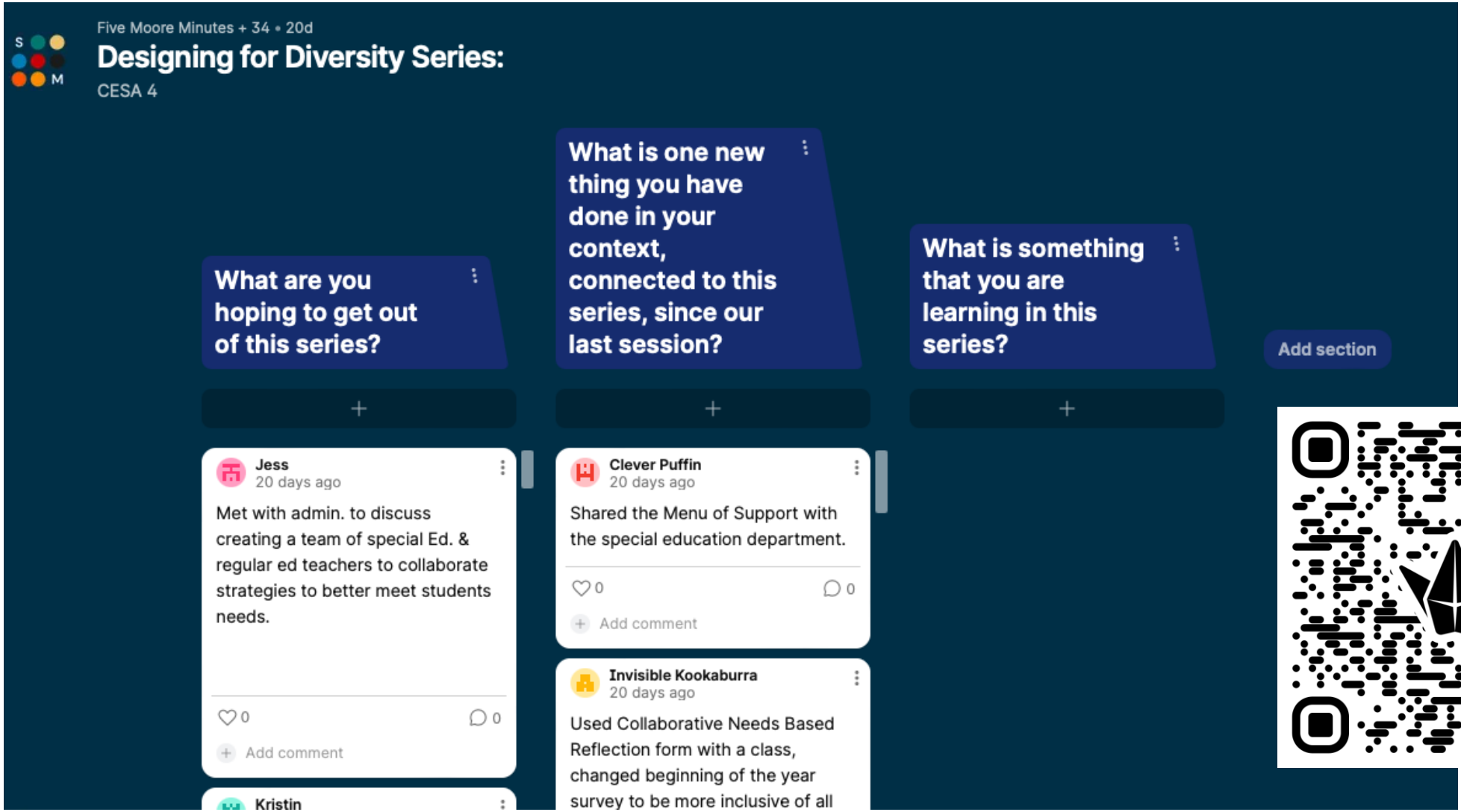
Staying Connected



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

CURRICULUM & ASSESSMENT DESIGN

Student choice of challenge
Adjustable Curriculum

Student choice of evidence
Adjustable Assessment

Students

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

Adjustable Supports & Strategies

Student choice of tools and actions

NEEDS BASED DESIGN

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

INSTRUCTIONAL DESIGN

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

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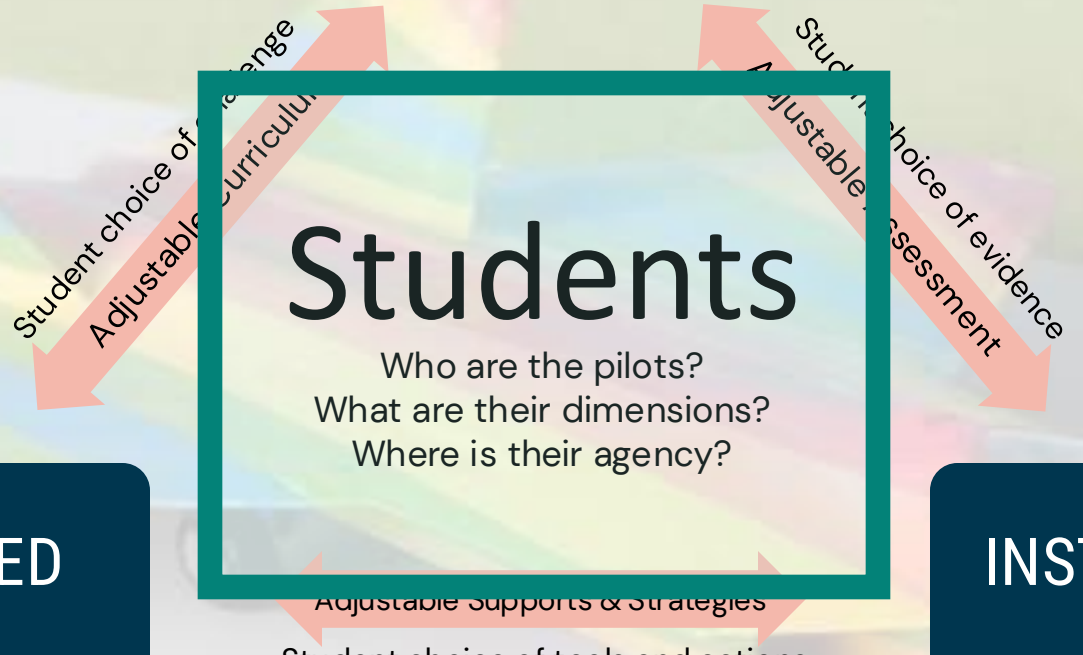
What grade level curriculum are we using?
What are the learning standards?

CURRICULUM & ASSESSMENT DESIGN



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Class Review:	School Team:	Date:

Class Dimensions

Class Identities	Class Interests	Classroom Strengths	Classroom Stretches

Student Dimensions

Class Needs

Need:	Need:	Need:	Need:	Need:

Prioritized Needs to Target

Team Goals

Some big questions and/or goals that we have for this class:

Collaborative Team Goals

Team Reflections & Decisions

What works well for this class?	What else can we do to reduce barriers for this class?

Collaborative Team Decisions

The Class Review – Brownlie, F & King, J, 2011

adapted by Dr. Shelley Moore 2023

Need: Students in Mind:

What supports & strategies are useful for ONE? (Individualized)

-
-
-

What supports & strategies are useful for SOME? (Choice for ALL)

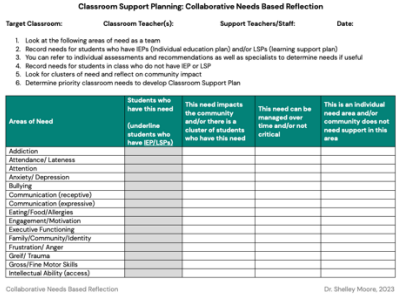
-
-
-
-

What supports & strategies are useful for MOST/ALL?

-
-
-
-
-

Homework

1. Complete a Needs Based Reflection for a class or a student and prioritize <u>1 needs-based area</u> to target
2. Reflect on strategies already in place and add 3-5 strategies to create a needs-based support plan
3. Introduce and teach a needs-based strategy to the class
4. What are you noticing?



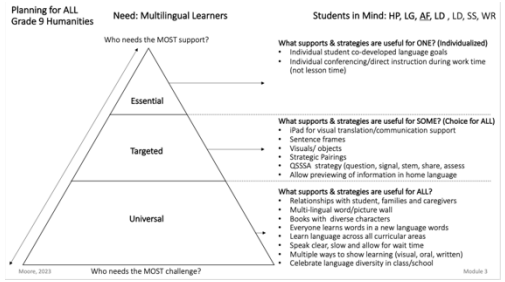
Classroom Support Planning: Collaborative Needs Based Reflection

Target Classroom: Classroom Teacher(s): Support Teachers/Staff: Date:

1. Look at the following areas of need as a team
2. Record needs for students who have IEPs (Individual education plan) and/or LSPs (learning support plan)
3. You can refer to individual assessments and recommendations as well as specialists to determine needs if useful
4. Record needs for students in class who do not have IEP or LSP
5. Look for clusters of need and reflect on community impact
6. Determine priority classroom needs to develop Classroom Support Plan

Areas of Need	Students who have this need (underline students who have IEP/LSPs)	This need impacts the community and/or there is a cluster of students who have this need	This need can be managed over time and/or not critical	This is an individual need area and/or community does not need support in this area
Addiction				
Attendance/ Lateness				
Attention				
Anxiety/ Depression				
Bullying				
Communication (receptive)				
Communication (expressive)				
Eating/Food/Allergies				
Engagement/Motivation				
Executive Functioning				
Family/Community/Identity				
Frustration/ Anger				
Grief/ Trauma				
Gross/Fine Motor Skills				
Intellectual Ability (access)				

Collaborative Needs Based Reflection Dr. Shelley Moore, 2023



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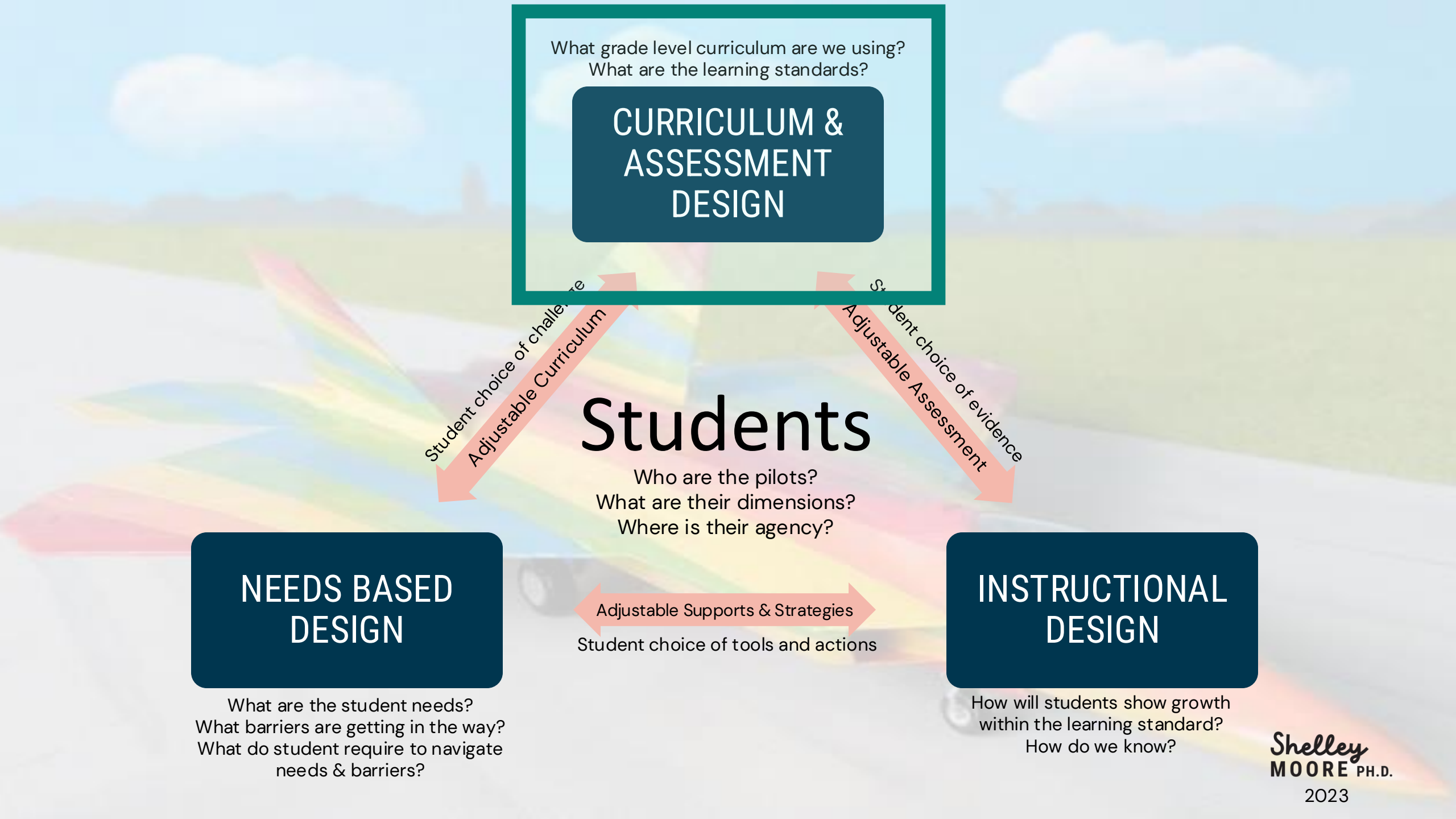
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Reducing Barriers

Supporting Needs

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What are barriers?

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Student Learning

Ramp: UDL

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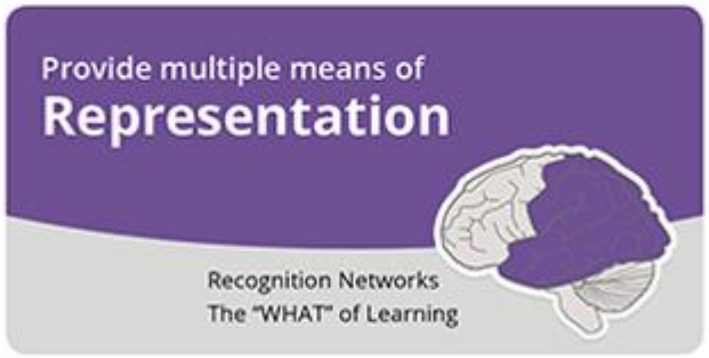
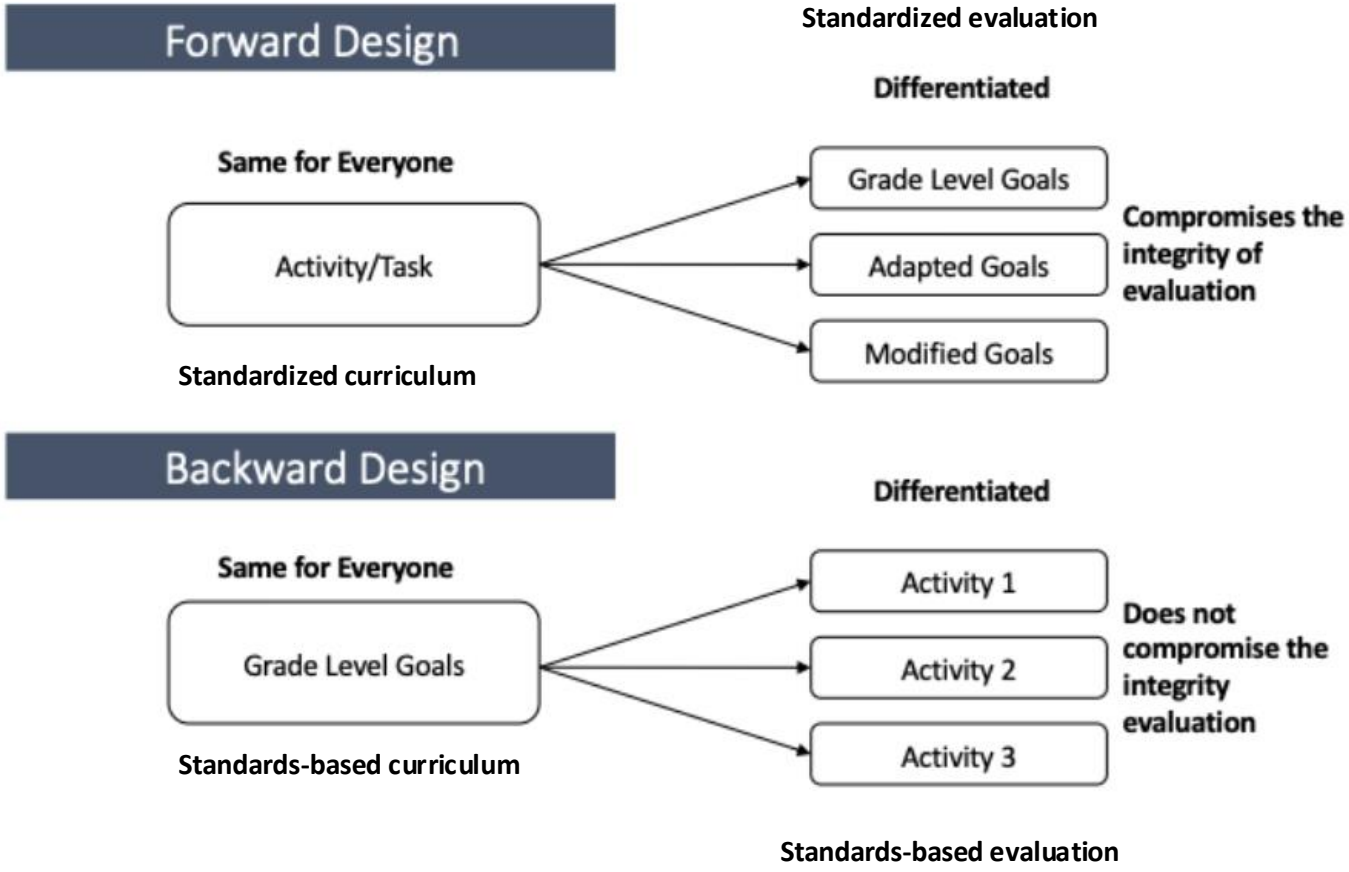
Universal Design for Learning: The Ramp for Learning



How I came to understand BACKWARDS DESIGN

UBD: Determining the Learning Standard

Adapted from McTigue, 2010



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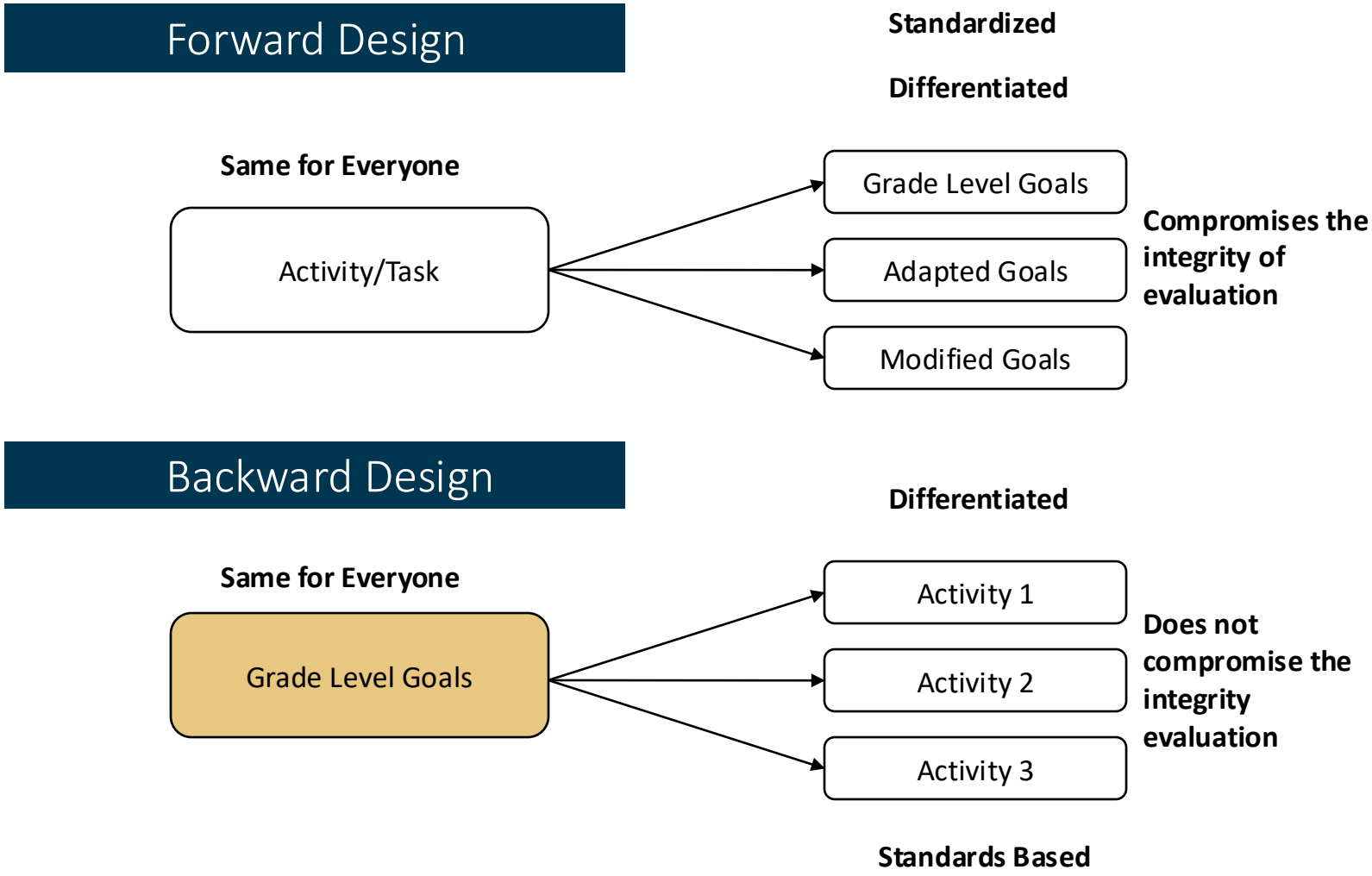


McTigue, 2010

Backwards Design

What do we need to UNDERSTAND?

What do we need to KNOW?

What do we need to DO?

Backwards Design

What do we need to UNDERSTAND?
Big Ideas

What do we need to KNOW?
Knowledge

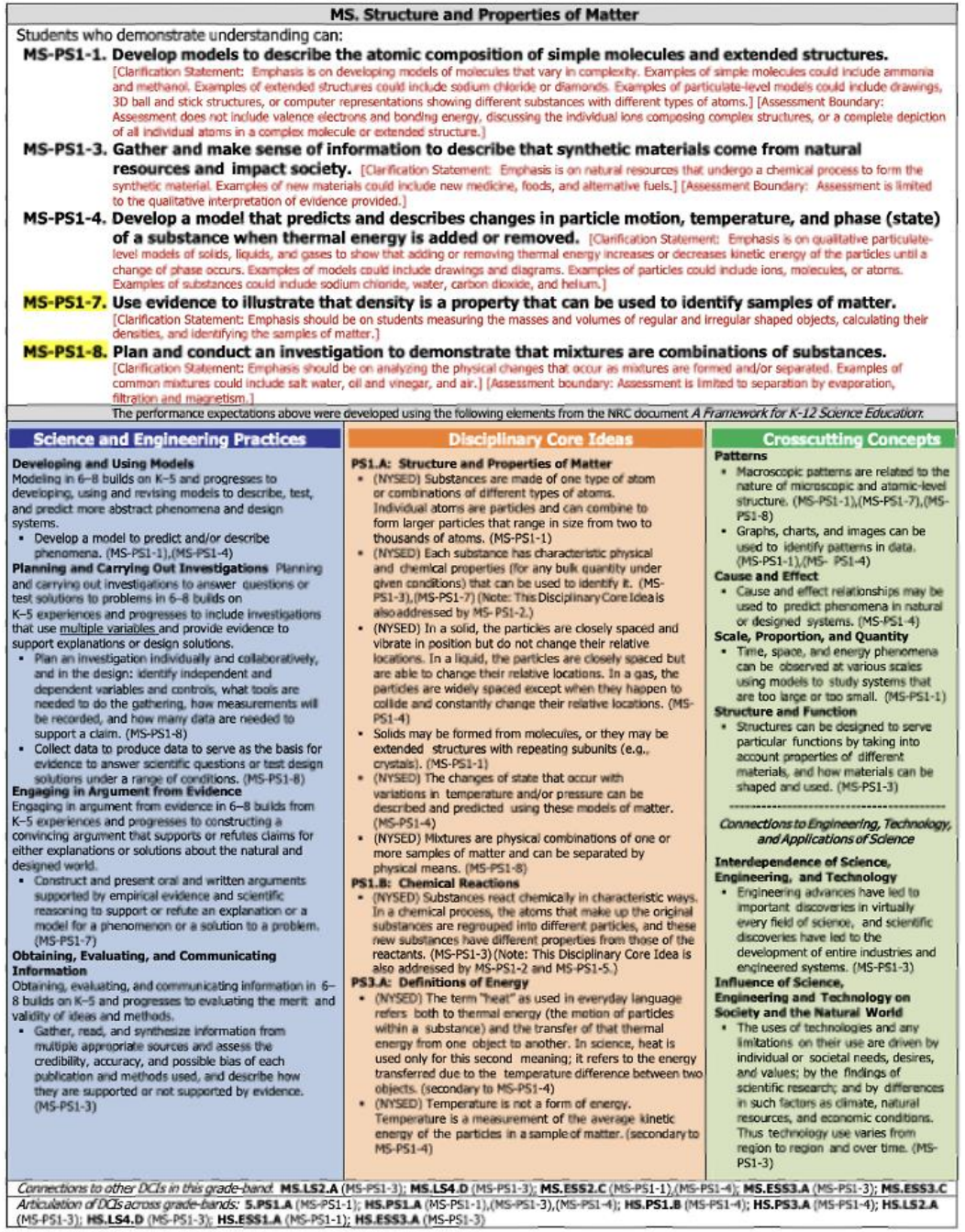
What do we need to DO?
Skills

Next Generation Science Standards (NGSS)

What do we need to UNDERSTAND?
Big Ideas

What do we need to KNOW?
Knowledge

What do we need to DO?
Skills



MS. Structure and Properties of Matter

Students who demonstrate understanding can:

MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures. [Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of particulate-level models could include drawings, 3D ball and stick structures, or computer representations showing different substances with different types of atoms.] [Assessment Boundary: Assessment does not include valence electrons and bonding energy, discussing the individual ions composing complex structures, or a complete depiction of all individual atoms in a complex molecule or extended structure.]

MS-PS1-3. Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. [Clarification Statement: Emphasis is on natural resources that undergo a chemical process to form the synthetic material. Examples of new materials could include new medicine, foods, and alternative fuels.] [Assessment Boundary: Assessment is limited to the qualitative interpretation of evidence provided.]

MS-PS1-4. Develop a model that predicts and describes changes in particle motion, temperature, and phase (state) of a substance when thermal energy is added or removed. [Clarification Statement: Emphasis is on qualitative particulate-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of phase occurs. Examples of models could include drawings and diagrams. Examples of particles could include ions, molecules, or atoms. Examples of substances could include sodium chloride, water, carbon dioxide, and helium.]

MS-PS1-7. Use evidence to illustrate that density is a property that can be used to identify samples of matter. [Clarification Statement: Emphasis should be on students measuring the masses and volumes of regular and irregular shaped objects, calculating their densities, and identifying the samples of matter.]

MS-PS1-8. Plan and conduct an investigation to demonstrate that mixtures are combinations of substances. [Clarification Statement: Emphasis should be on analyzing the physical changes that occur as mixtures are formed and/or separated. Examples of common mixtures could include salt water, oil and vinegar, and air.] [Assessment boundary: Assessment is limited to separation by evaporation, filtration and magnetism.]

The performance expectations above were developed using the following elements from the NRC document *A Framework for K-12 Science Education*.

Science and Engineering Practices

Developing and Using Models
Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems.
- Develop a model to predict and/or describe phenomena. (MS-PS1-1),(MS-PS1-4)

Planning and Carrying Out Investigations Planning and carrying out investigations to answer questions or test solutions to problems in 6–8 builds on K–5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or design solutions.
- Plan an investigation individually and collaboratively, and in the design: identify independent and dependent variables and controls, what tools are needed to do the gathering, how measurements will be recorded, and how many data are needed to support a claim. (MS-PS1-8)
- Collect data to produce data to serve as the basis for evidence to answer scientific questions or test design solutions under a range of conditions. (MS-PS1-8)

Engaging in Argument from Evidence
Engaging in argument from evidence in 6–8 builds from K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world.
- Construct and present oral and written arguments supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem. (MS-PS1-7)

Obtaining, Evaluating, and Communicating Information
Obtaining, evaluating, and communicating information in 6–8 builds on K–5 and progresses to evaluating the merit and validity of ideas and methods.
- Gather, read, and synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. (MS-PS1-3)

Disciplinary Core Ideas

PS1.A: Structure and Properties of Matter
- (NYSED) Substances are made of one type of atom or combinations of different types of atoms. Individual atoms are particles and can combine to form larger particles that range in size from two to thousands of atoms. (MS-PS1-1)
- (NYSED) Each substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-3),(MS-PS1-7) (Note: This Disciplinary Core Idea is also addressed by MS-PS1-2.)
- (NYSED) In a solid, the particles are closely spaced and vibrate in position but do not change their relative locations. In a liquid, the particles are closely spaced but are able to change their relative locations. In a gas, the particles are widely spaced except when they happen to collide and constantly change their relative locations. (MS-PS1-4)
- Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS-PS1-1)
- (NYSED) The changes of state that occur with variations in temperature and/or pressure can be described and predicted using these models of matter. (MS-PS1-4)
- (NYSED) Mixtures are physical combinations of one or more samples of matter and can be separated by physical means. (MS-PS1-8)

PS1.B: Chemical Reactions
- (NYSED) Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different particles, and these new substances have different properties from those of the reactants. (MS-PS1-3) (Note: This Disciplinary Core Idea is also addressed by MS-PS1-2 and MS-PS1-5.)

PS3.A: Definitions of Energy
- (NYSED) The term "heat" as used in everyday language refers both to thermal energy (the motion of particles within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary to MS-PS1-4)
- (NYSED) Temperature is not a form of energy. Temperature is a measurement of the average kinetic energy of the particles in a sample of matter. (secondary to MS-PS1-4)

Crosscutting Concepts

Patterns
- Macroscopic patterns are related to the nature of microscopic and atomic-level structure. (MS-PS1-1),(MS-PS1-7),(MS-PS1-8)
- Graphs, charts, and images can be used to identify patterns in data. (MS-PS1-1),(MS- PS1-4)

Cause and Effect
- Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4)

Scale, Proportion, and Quantity
- Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-1)

Structure and Function
- Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used. (MS-PS1-3)

Connections to Engineering, Technology, and Applications of Science

Interdependence of Science, Engineering, and Technology
- Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. (MS-PS1-3)

Influence of Science, Engineering and Technology on Society and the Natural World
- The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time. (MS-PS1-3)

Connections to other DCIs in this grade-band: **MS.LS2.A** (MS-PS1-3); **MS.LS4.D** (MS-PS1-3); **MS.ESS2.C** (MS-PS1-1),(MS-PS1-4); **MS.ESS3.A** (MS-PS1-3); **MS.ESS3.C**

Articulation of DCIs across grade-bands: **5.PS1.A** (MS-PS1-1); **HS.PS1.A** (MS-PS1-1),(MS-PS1-3),(MS-PS1-4); **HS.PS1.B** (MS-PS1-4); **HS.PS3.A** (MS-PS1-4); **HS.LS2.A** (MS-PS1-3); **HS.LS4.D** (MS-PS1-3); **HS.ESS1.A** (MS-PS1-1); **HS.ESS3.A** (MS-PS1-3)

*The performance expectations marked with an asterisk integrate traditional science content with engineering through a Practice or Disciplinary Core Idea. The text in the "Disciplinary Core Ideas" section is reproduced verbatim from A Framework for K-12 Science Education: Practices, Cross-Cutting Concepts, and Core Ideas unless it is preceded by (NYSED).

Shelley Moore, 2024

Backwards Design Planning

Backwards Design Facet	Science (NGSS)	Math	English	Social St.
Big Idea (I understand)	Cross Cutting Concepts			
Knowledge (I know)	Disciplinary Core Ideas			
Skills (I can)	Science & Engineering Practices			

Backwards Design Planning: Wisconsin Standards for Mathematics (Elementary)

Kindergarten Content Standards
Counting and Cardinality (K.CC)

Cluster Statement	Notation	Standard
A. Know number names and the count sequence.	M.K.CC.A.1	Count to 100 by ones and by tens.
	M.K.CC.A.2	Count forward beginning from a given number within the known sequence (instead of having to begin at 1).
	M.K.CC.A.3	Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).
B. Tell the number of objects.	M.K.CC.B.4	Understand the relationship between numbers and quantities; connect counting to cardinality. a. When counting objects, say the number names in the standard order, pairing each object with one and only one number name and each number name with one and only one object (one to one correspondence). b. Understand that the last number name said tells the number of objects counted (cardinality). The number of objects is the same regardless of their arrangement or the order in which they were counted (number conservation). c. Understand that each successive number name refers to a quantity that is one larger and the previous number is one smaller (hierarchical inclusion).
	M.K.CC.B.5	Quickly recognize and name the quantity of up to 5 objects briefly shown in structured or unstructured arrangements without counting (perceptual subitizing).

Standards for Mathematical Practice

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments, and appreciate and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Backwards Design Planning

Backwards Design Facet	Science (NGSS)	Math	Social Studies	Phys Ed
Big Idea (I understand)	Cross Cutting Concepts	- Standard		
Knowledge (I know)	Disciplinary Core Ideas	- Cluster statement		
Skills (I can)	Science & Engineering Practices	- Standard - Standards for mathematical practice		

Backwards Design Planning: Wisconsin Standards for PE (Elementary)

Content Area: Physical Education (PE)

Standard 3: The student will demonstrate the knowledge and skills to achieve a health-enhancing level of physical activity and fitness.

Performance Indicators (by Grade)

Learning Priority	Kindergarten	1st Grade	2nd Grade	3rd Grade	4th Grade	5th Grade
PE.S3.E1 Physical Activity Knowledge	PE.S3.E1.K Identify active play opportunities in and out of school.	PE.S3.E1.1 Explain the importance of daily physical activity.	PE.S3.E1.2 Discuss the benefits of being active, playing, and exercising.	PE.S3.E1.3 A. Identify risks associated with physical inactivity. B. Understand the physical activity recommendations for youth.	PE.S3.E1.4 Identify factors that motivate or deter daily participation in physical activity.	PE.S3.E1.5 Describe how daily physical activity recommendations lead to a healthy body.

NOTE: This standard continued on next page.

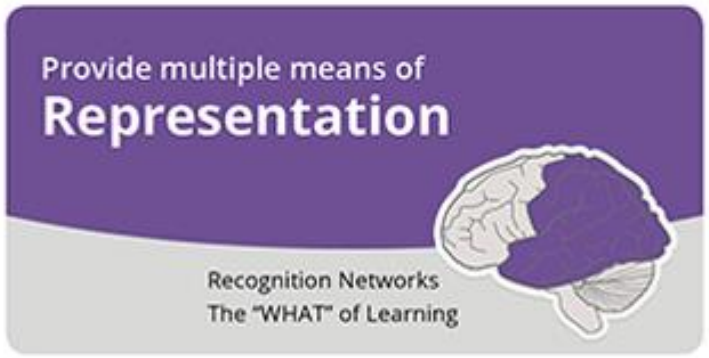
Backwards Design Planning

Backwards Design Facet	Science (NGSS)	Math	Social Studies	Phys Ed
Big Idea (I understand)	Cross Cutting Concepts	-Derived from Standard	Standard	Standard
Knowledge (I know)	Disciplinary Core Ideas	- Derived from Cluster statement	Learning Priority	Learning Priority
Skills (I can)	Science & Engineering Practices	- Derived from Standard - Standards for mathematical practice	Performance Indicators	Performance Indicators

Your job:

- **Choose another subject area:**
  - **Take a look at the curricular framework and determine the kinds of goals within the subject area, and what they are called:**
    - **Are there:**
      - **Big Ideas? Knowledge goal and/or Skill goals?**
    - **What are the:**
      - **Big ideas called**
      - **Knowledge goals called**
      - **Skill goals called**

Universal Design for Learning: The Ramp for Learning



Grade:	Course/Subject Area:	Planning Team:	
Context for Learning:		**Unit Guiding Question(s):** **Teacher provocations:**	**Inquiry Guided Question(s):** **Student generated questions:**
Key Vocabulary:			

	Learning Goals **Curricular Language**	**Learning Goals** **Student Friendly Language**
What do students need to <u>understand</u>?		
What do students need to <u>know</u>?		
What do students need to <u>do</u>?		
Who do student need to <u>be</u>?		

Grade:	Course/Subject Area:	Planning Team:	
Context for Learning: 7.2, 7.4, 8.3, 3.2		Unit Guiding Question(s): Teacher provocations: 7.2, 8.3, 3.2, 3.4	Inquiry Guided Question(s): Student generated questions: 7.1, 7.2, 7.3, 8.3, 9.1, 3.1, 3.2, 3.4, 6.1
Key Vocabulary: 2.1			
	Learning Goals Curricular Language all UDL indicators		Learning Goals Student Friendly Language 8.1, 8.5, 9.1, 9.3, 3.3, 3.4, 6.4
What do students need to understand?			
What do students need to know?			
What do students need to do?			
Who do student need to be?			

Backwards Design Planning

Backwards Design Facet	Science (NGSS)	Math	English, Socials etc.	PE
Big Idea (I understand)	Cross Cutting Concepts	-Derived from Standard	Standard	Standard
Knowledge (I know)	Disciplinary Core Ideas	- Derived from Cluster statement	Derived from Learning Priority	Derived from Learning Priority
Skills (I can)	Science & Engineering Practices	- Derived from Standard - Standards for mathematical practice	Performance Indicators	Performance Indicators

Backwards Design Planning

Grade:	Subject Area: Science	Strand/Topic:	
Learning Standard:		Unit Guiding Question(s): Teacher provocations:	Student generated:
Key Vocabulary:			

Learning Goals	Curricular Language What do Students need to Know and Do?	Student Friendly Language
Science and Engineering Practices		
Disciplinary Core Ideas		
Crosscutting Concepts		

Grade: 9	Subject Area: Science	Strand/Topic:
Learning Standard: HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells		**Unit Guiding Question(s):** **What is the structure of DNA? What is DNA? What does DNA look like? What does DNA do?** **How are the structures of DNA and the structures of proteins related?** **How can I use evidence to explain how the structure of DNA impacts that structure of proteins?** **How are the structure of proteins and related to the essential functions of life?** **What is the role the systems of specialized cells?**
Key Vocabulary: theories and laws, evidence, natural world, **structure of DNA, DNA, proteins, essential functions of life, life, systems of specialized cells,** organisms		

Learning Goals	Curricular Language What do Students need to Know and Do?	Student Friendly Language
Science and Engineering Practices (skills)	Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past , present, future.	I can explain using evidence that there are theories and laws that describe the natural world - I know what evidence is - I know what science and theories and laws* are - I know what the natural world is
Disciplinary Core Ideas (knowledge)	Disciplinary Core Ideas LS1.A: Structure and Function Systems of specialized cells within organisms help them perform the essential functions of life. All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.	I know that the systems of specialized cells inside organisms perform essential functions of life • I know what systems of specialized cells are • I know what organisms are • I know what the essential* functions of life are I know that cells have genetic information in DNA molecules I know that genes are parts of DNA that are instructions for how proteins are formed I know how cells work
Crosscutting Concepts (Big Idea)	Structure and Function Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.	I understand that structures are made of many different components that are connected and have specific functions.

Grade:	Subject Area:	Strand/Topic:	
Learning Standard:		Unit Guiding Question(s): Teacher provocations:	Student generated:
Key Vocabulary:			

Learning Goals	Curricular Language What do Students need to Know and Do?	Student Friendly Language
Understand		
Know		
Do		
Do: Standards for Mathematical Practice	**Standards for Mathematical Practice** 1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments, and appreciate and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning.	

Grade: K	Subject Area: Math	Strand/Topic: Counting & Cardinality	
Learning Standard A: Students will Know number names and the count sequence		**Unit Guiding Question(s):** **Teacher provocations:** What are numbers? Where can I see numbers in my world? How do I count? What does "how many" mean?	**Student generated:**
Key Vocabulary:			

Learning Goals	Curricular Language What do Students need to Know and Do?	Student Friendly Language
Understand		I understand that
Know	**Know number names** **Know the count sequence**	I know what numbers are called I know the names of numbers
Do	M.K.CC.A.1 Count to 100 by ones and by tens. M.K.CC.A.2 Count forward beginning from a given number within the known sequence (instead of having to begin at 1). M.K.CC.A.3 Write numbers from 0 to 20. Represent a number of objects with a written numeral 0-20 (with 0 representing a count of no objects).	I can count to 100 I can count by 10 to 100 I can count forward from any number I can write number up to 20 I can show how much a number is up to 20
Do: Standards for Mathematical Practice	Make sense of problems and persevere in solving them	I can work hard to understand and not give up when math gets hard

Backwards Design Planning

Grade: 5	Subject Area: PE	Strand/Topic: Standard 3	
Learning Standard: Student will demonstrate the knowledge and skills to achieve a health-enhancing level of activity and fitness		**Unit Guiding Question(s):** **Teacher provocations:** How does regular physical activity not only impact your physical health but also influence your mental and emotional well-being?	**Student generated:**
Key Vocabulary:			

Learning Goals	Curricular Language What do Students need to Know and Do?	Student Friendly Language
Understandings	Physical activity and fitness will enhance our health	I understand that being physically active will help me to be healthy
Knowledge	PE.S3.E1 Physical Activity Knowledge	I know what physical activity is and why it is important
Skills	PE.S3.E1.5: Describe how daily physical activity recommendation lead to a healthy body	I can explain and show how daily physical activity can help me be healthy

Backwards Design Planning

Grade: 5	Subject Area: Science	Strand/Topic: Structure and Properties of Matter
Learning Standard: 5-PS1-1. Develop a model to describe that matter is made of particles too small to be seen		**Unit Guiding Question(s):** How can I use a model to help me understand that some matter is made up of particles that are too small to see?
Content Vocabulary: model, matter, particles, idea, bulk matter		**Skills Vocabulary: create, build, change, solve a problem, observe**
Learning Goals	**Curricular Language** **What do Students need to Know and Do?**	**Student Friendly Language**
Science and Engineering Practices (skills)	**Developing and Using Models** building and revising simple models and using models to represent events and design solutions. Use models to describe phenomena.	• I can create and improve a model • I can use a model to show an idea • I can use a model to solve a problem
Disciplinary Core Ideas (knowledge)	**PS1.A: Structure and Properties of Matter** Matter of any type can be subdivided into particles that are too small to see matter still exists and can be detected by other means. A model showing that gases are made from matter particles that are too small to see and are moving freely around in space can explain many observations including the inflation and shape of a balloon and the effects of air on larger particles or objects.	• I know that matter can be broken apart into tiny particles that are too small to see • I know that even if tiny particles are too small for my eyes to see, there are other ways to observe them • I know that a model is a way to observe tiny particles too small to see • I know some examples of models that can help me observe tiny particles that are too small to see
Crosscutting Concepts (understanding)	**Scale, Proportion, and Quantity** Natural objects exist from the very small to the immensely large.	I understand that there are things that are very tiny and very large

Grade: 9	Subject Area: Science	Strand/Topic:
Learning Standard: HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells		**Unit Guiding Question(s):** **What is the structure of DNA? What is DNA? What does DNA look like? What does DNA do?** **How are the structures of DNA and the structures of proteins related?** **How can I use evidence to explain how the structure of DNA impacts that structure of proteins?** **How are the structure of proteins and related to the essential functions of life?** **What is the role the systems of specialized cells?**
Key Vocabulary: theories and laws, evidence, natural world, **structure of DNA, DNA, proteins, essential functions of life, life, systems of specialized cells,** organisms		

Learning Goals	Curricular Language What do Students need to Know and Do?	Student Friendly Language
Science and Engineering Practices (skills)	Construct an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past , present, future.	I can explain using evidence that there are theories and laws that describe the natural world - I know what evidence is - I know what science and theories and laws* are - I know what the natural world is
Disciplinary Core Ideas (knowledge)	Disciplinary Core Ideas LS1.A: Structure and Function Systems of specialized cells within organisms help them perform the essential functions of life. All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.	I know that the systems of specialized cells inside organisms perform essential functions of life • I know what systems of specialized cells are • I know what organisms are • I know what the essential* functions of life are I know that cells have genetic information in DNA molecules I know that genes are parts of DNA that are instructions for how proteins are formed I know how cells work
Crosscutting Concepts (Big Idea)	Structure and Function Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.	I understand that structures are made of many different components that are connected and have specific functions.

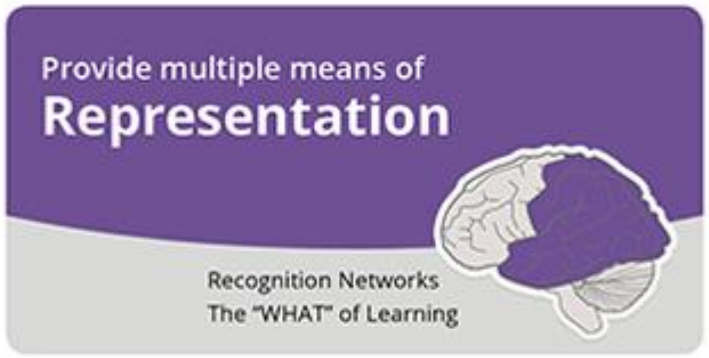
Name:	Date:

Performance Expectation: HS-LS1-1. Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells

Important words to know and use: theories and laws, evidence, natural world, structure of DNA, DNA, proteins, essential functions of life, life, systems of specialized cells, organisms

I still need support	Learning Goals	I need some challenge
	• I can explain using evidence that there are theories and laws that describe the natural world	
	• I know that the systems of specialized cells inside organisms perform essential functions of life • I know that cells have genetic information in DNA molecules • I know that genes are parts of DNA that are instructions for how proteins are formed • I know how cells work	
	• I understand that structures are made of many different components that are connected and have specific functions.	

Universal Design for Learning relies on Backwards Design



Grade:	Course/Subject Area:	Planning Team:	
Context for Learning: 7.2, 7.4, 8.3, 3.2		Unit Guiding Question(s): Teacher provocations: 7.2, 8.3, 3.2, 3.4	Inquiry Guided Question(s): Student generated questions: 7.1, 7.2, 7.3, 8.3, 9.1, 3.1, 3.2, 3.4, 6.1
Key Vocabulary: 2.1			
	Learning Goals Curricular Language all UDL indicators		Learning Goals Student Friendly Language 8.1, 8.5, 9.1, 9.3, 3.3, 3.4, 6.4
What do students need to understand?			
What do students need to know?			
What do students need to do?			
Who do student need to be?			

Your job:

- **Choose a subject area:**
  - **Take a look at the curricular framework and determine the <u>kinds of goals</u> within the subject area, and what they are called:**
    - **Are there:**
      - **Big Ideas? Knowledge Goals and/or Skill Goals?**
      - **What are they called?**

    - **Choose some learning goals that you want to target in a unit**
    - **Practice translating those goals into student friendly language**
    - **Draw out important vocabulary to know and use**
    - **Try to organize the learning goals around a guiding and inquiry provoking question**

What is one useful idea?

What is one thing you want to try?

What is one thing you want to think about?

What is one thing you want to learn more about?

What is one ting you want to share with someone who is not here today?

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