**Accelerating Learning - A 6th Grade Science Example**

**Can we use the data from pre-assessments, critical junctures, post assessments, and On-The-Fly formative assessments from previous units to guide out pre-unit planning? Focus on the progressions of the Science and Engineering Practices and Crosscutting Concepts as specific Disciplinary Core Ideas are taught within the upcoming unit and pre-assessment data can be used to ascertain that information.**

**Example of Acceleration**: **Grade 6, Unit 5 - Earth, Moon, and Sun**

There are 4 “power” standards bundled together in Unit 2:

06-ESS1-1 06-ESS1-2 06-ESS1-3 07-PS2-4

which include the following:

* **Crosscutting Concepts:**
	+ Patterns
		- Patterns can be used to identify cause-and-effect relationships.
	+ Systems and System Models
		- Models can be used to represent systems and their interactions.
		- Models can be used to represent systems and their interactions — such as inputs, processes and outputs — and energy and matter flows within systems.
	+ Scale, Proportion & Quantity
		- Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.
* **Science & Engineering Practices:**
	+ Developing and Using Models
		- Develop and use a model to describe phenomena.
	+ Analyzing and Interpreting Data
		- Analyze and interpret data to determine similarities and differences in findings.
	+ Engaging in Argument from Evidence
		- 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.
* **Disciplinary Core Ideas:**
	+ ESS1.A: The Universe and Its Stars
		- Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models.
		- Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe.
	+ ESS1.B: Earth and the Solar System
		- This model of the solar system can explain eclipses of the sun and the moon. Earth’s spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year.
		- The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.
		- The solar system appears to have formed from a disk of dust and gas, drawn together by gravity.
	+ PS2.B: Types of Interactions
		- Gravitational forces are always attractive. There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass—e.g., Earth and the sun.

**Before** beginning the unit, compare the 6th grade expectations to the 5th grade expectation. Look for specific alignments in each of the dimension progressions. The variation between the two grade levels identifies your targeted learning. Use data from the pre-assessment to determine which students need extra support in each dimension.

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| **3 Dimensional Progressions for Each Dimension in the Bundled Standards** |
|  | 5th Grade | 6th Grade |
| Patterns | * identify similarities and differences in order to sort and classify natural objects and designed products
* identify patterns related to time, including simple rates of change
* use these patterns to make predictions.
 | * recognize that macroscopic patterns are related to the nature of microscopic and atomic-level structure
* identify patterns in rates of change and other numerical relationships that provide information about natural systems
* use patterns to identify cause and effect relationships
* use graphs and charts to identify patterns in data.
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| Systems and System Models | * understand that a system is a group of related parts that make up a whole and can carry out functions its individual parts cannot.
* describe a system in terms of its components and their interactions.
 | * understand that systems may interact with other systems; they may have sub-systems and be a part of larger complex systems.
* use models to represent systems and their interactions — such as inputs, processes and outputs — and energy, matter, and information flows within systems.
* models are limited in that they only represent certain aspects of the system under study.
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| Scale, Proportion and Quantity | * recognize natural objects and observable phenomena exist from the very small to the immensely large.
* use standard units to measure and describe physical quantities such as weight, time, temperature, and volume.
 | * observe time, space, and energy phenomena at various scales using models to study systems that are too large or too small.
* understand phenomena observed at one scale may not be observable at another scale.
* use proportional relationships (e.g., speed as the ratio of distance traveled to time taken) to gather information about the magnitude of properties and processes.
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| Developing and Using Models | * identify limitations of models.
* collaboratively develop and/or revise a model based on evidence that shows the relationships among variables for frequent and regular occurring events.
* develop a model using an analogy, example, or abstract representation to describe a scientific principle or design solution.
* develop and/or use models to describe and/or predict phenomena.
* develop a diagram or simple physical prototype to convey a proposed object, tool, or process.
* use a model to test cause and effect relationships or interactions concerning the functioning of a natural or designed system.
 | * evaluate limitations of a model for a proposed object or tool.
* modify a model — based on evidence – to match what happens if a variable or component of a system is changed.
* Use a model of simple systems with uncertain and less predictable factors.
* revise a model to show the relationships among variables, including those that are not observable but predict observable phenomena.
* use a model to predict or describe phenomena.
* use a model to generate data to test ideas about phenomena in natural or designed systems, including those representing inputs and outputs, and those at unobservable scales.
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| Analyzing and Interpreting Data | * represent data in tables and/or various graphical displays (bar graphs, pictographs and/or pie charts) to reveal patterns that indicate relationships.
* analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.
* compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.
* analyze data to refine a problem statement or the design of a proposed object, tool, or process.
* use data to evaluate and refine design solutions.
 | * construct, analyze, and/or interpret graphical displays of data to identify linear and nonlinear relationships.
* distinguish between causal and correlational relationships in data.
* analyze and interpret data to provide evidence for phenomena.
* apply concepts of statistics and probability (including mean, median, and mode) to analyze and characterize data, using digital tools when feasible.
* consider limitations of data analysis (e.g., measurement error), and/or seek to improve precision and accuracy of data with better technological tools and methods (e.g., multiple trials).
* analyze and interpret data to determine similarities and differences in findings.
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| Engaging in Argument from Evidence | * compare and refine arguments based on an evaluation of the evidence presented.
* distinguish among facts, reasoned judgment based on research findings, and speculation in an explanation.
* respectfully provide and receive critiques from peers about a proposed procedure, explanation, or model by citing relevant evidence and posing specific questions.
* construct and/or support an argument with evidence, data, and/or a model. Use data to evaluate claims about cause and effect.
* make a claim about the merit of a solution to a problem by citing relevant evidence about how it meets the criteria and constraints of the problem.
 | * compare and critique two arguments on the same topic and analyze whether they emphasize similar or different evidence and/or interpretations of facts.
* respectfully provide and receive critiques about one’s explanations, procedures, models, and questions by citing relevant evidence and posing and responding to questions that elicit pertinent elaboration and detail.
* construct, use, and/or present an oral and written argument 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.
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| ESS1.A: The Universe and Its Stars | Stars range greatly in size anddistance from Earth and thiscan explain their relativebrightness. | The solar system is part of the Milky Way, which is one of many billions of galaxies. |
| ESS1.B: Earth and the Solar System | The Earth’s orbit and rotation,and the orbit of the moonaround the Earth causeobservable patterns. | The solar system contains many varied objects held together by gravity. Solarsystem models explain and predict eclipses, lunar phases, and seasons. |
| PS2.B: Types of Interactions | The effect of unbalanced forces on an object results in a change of motion. Patterns of motion can be used to predict future motion. Some forces act through contact, some forces act even when the objects are not in contact. The gravitational force of Earth acting on an object near Earth’s surface pulls that object toward the planet’s center. | Forces that act at a distance involve fields that can be mapped by their relative strength and effect on an object. |

 **Accelerated Instruction:**

Begin by teaching a whole group lesson on the **grade level standard** with a defined learning intention and success criteria.

Depending on where you are in your instructional pace for the year, you work with your PLC to determine whether you move forward with the full curriculum, use the Amplify @Home condensed units or a combination thereof focusing on the deficiencies identified in the initial assessing.

Based on the formative assessments and initial data collection you may add or emphasize specific dimensions as needed for your class. Do plan on using the critical juncture to further differentiate instruction for the students based on their performance along the Progress Build progressions. This small group approach may prove challenging in a hybrid model so active planning and preparedness are of the utmost importance. For those students who continue to struggle after the differentiation lessons, additional guided instruction may be required.

Make the greatest use you can of the resources you have been provided. Don’t be hesitant to use the pre-recorded activity for additional guidance at home or in a virtual at home setting in order to provide concurrency of instruction.

Use your pre, critical juncture, post assessment to determine growth areas as well as areas which still need to be addressed in additional instructional settings. Remember that the dimensions spiral across the year as well as year to year. Be cognizant of the fact that proficiency in the early part of the year will look different from proficiency at the end of the year as students continue their growth and progress. Decide with your PLC what level of mastery is expected for the point of the year you are in and assess to that level and above. Also be cognizant of the fact that we know the 5th grade exposure has traditionally been less than we would like to see and even more so this year due to the early transition to an NTI instructional approach last March.

**We also strongly believe that teachers need to include independent reading in their units. Students get better at reading by reading.**