**Accelerating Learning—A 2nd 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**: **2nd Grade, Unit 2 - Properties of Materials**

There are 7 “power” standards bundled together in Unit 2: 2-PS1-1, 2-PS1-2, 2-PS1-3, 2-PS1-4, K-2-ETS1-1, K-2-ETS1-2, and K-2-ETS1-3 which include the following:

* **Crosscutting Concepts:**
  + Patterns
    - Patterns in the natural and human designed world can be observed.
  + Cause and Effect
    - Events have causes that generate observable patterns.
    - Simple tests can be designed to gather evidence to support or refute student ideas about causes.
  + Energy and Matter
    - Objects may break into smaller pieces and be put together into larger pieces, or change shapes.
  + Structure and Function
    - The shape and stability of structures of natural and designed objects are related to their functions.
* **Science & Engineering Practices:**
  + Planning and Carrying Out Investigations
    - Plan and conduct investigations collaboratively to produce data to serve as the basis for evidence to answer a question.
  + Analyzing and Interpreting Data
    - Analyze data from tests of an object to determine if t works as intended
  + Constructing Explanations and Designing Solutions
    - Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena.
  + Engaging in Argument from Evidence
    - Construct an argument with evidence to support a claim.
  + Asking Questions and Defining Problems
    - Ask questions based on observations to find more information about the designed world.
    - Define a simple problem that can be solved through the development of a new or improved object
  + Developing and Using Models
    - Develop a simple model based on evidence to represent a proposed object
* **Disciplinary Core Ideas:**
  + PS1.A: Structures and Properties of Matter
    - Different kinds of matter exist and many of them can be either solid or liquid, depending on temperature. Matter can be described and classified by its observable properties.
    - Different properties are suited to different purposes.
    - A great variety of objects can be built up from a small set of pieces.
  + PS1.B: Chemical Reactions
    - Heating or cooling a substance may cause changes that can be observed. Sometimes these changes are reversible, and sometimes they are not.
  + ETS1.A: Defining and Delimiting Engineering Problems
    - A situation that people want to change or create can be approached as a problem to be solved through engineering. Such problems may have many acceptable solutions.
    - Asking questions, making observations, and gathering information are helpful in thinking about problems
    - Before beginning to design a solution, it is important to clearly understand the problem.
  + ETS1.B: Developing Possible Solutions
    - Designs can be conveyed through sketches, drawings, or physical models. These representations are useful in communicating ideas for a problem’s solutions to other people.
  + ETS1.C: Optimizing the design Solution
    - Because there is always more than one possible solution to a problem, it is useful to compare and test designs.

**Before** beginning the unit, compare the 2nd grade expectations to the 1st grade expectations. 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** | | |
|  | 1st Grade | 2nd Grade |
| Patterns | * recognize that patterns in the natural and human designed world can be observed and used to describe phenomena | * recognize that patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence |
| Cause and Effect | * learn that events have causes that generate observable patterns * design simple tests to gather evidence to support or refute their own ideas about causes | * learn that events have causes that generate observable patterns * design simple tests to gather evidence to support or refute their own ideas about causes |
| Energy and Matter |  | * observe objects may break into smaller pieces, be put together into larger pieces, or change shapes. |
| Structure and Function | * observe the shape and stability of structures of designed objects are related to their function(s). | * observe the shape and stability of structures of designed objects are related to their function(s). |
| Planning and Carrying Out Investigations | * plan and conduct an investigation in collaboration with peers * plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question * make observations (firsthand or from media) to collect data that can be used to make comparisons * make observations (firsthand or from media) of a proposed object to determine if it solves a problem or meets a goal * make predictions based on prior experiences | * plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. * evaluate different ways of observing and/or measuring a phenomenon to determine which way can answer a question. * make observations (firsthand or from media) and/or measurements to collect data that can be used to make comparisons. * make observations (firsthand or from media) and/or measurements of a proposed object or tool or solution to determine if it solves a problem or meets a goal. * make predictions based on prior experiences. |
| Analyzing and Interpreting Data | * record information * use and share pictures or drawings of observations * use observations (firsthand or from media) to describe patterns in the designed world in order to answer scientific questions and solve problems * analyze data from tests of an object to determine if it works as intended | * record information (observations, thoughts, and ideas). * use and share pictures, drawings, and/or writings of observations. * use observations (firsthand or from media) to describe patterns and/or relationships in the natural and designed world(s) in order to answer scientific questions and solve problems. * compare predictions (based on prior experiences) to what occurred (observable events). * analyze data from tests of an object or tool to determine if it works as intended. |
| Constructing Explanations and Designing Solutions | * make observations(firsthand or frommedia) to construct an evidence-based account for natural phenomena. * use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem. * generate and/or compare multiple solutions to a problem. | * make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. * use tools and/or materials to design and/or build a device that solves a specific problem or a solution to a specific problem. * generate and/or compare multiple solutions to a problem. |
| Engaging in Argument from Evidence | * identify arguments that are supported by evidence. * distinguish between explanations that account for all gathered evidence and those that do not. * distinguish between opinions and evidence in one’s own explanations. * make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence. | * identify arguments that are supported by evidence. * distinguish between explanations that account for all gathered evidence and those that do not. * analyze why some evidence is relevant to a scientific question and some is not. * distinguish between opinions and evidence in one’s own explanations. * listen actively to arguments to indicate agreement or disagreement based on evidence, and/or to retell the main points of the argument. * construct an argument with evidence to support a claim. * make a claim about the effectiveness of an object, tool, or solution that is supported by relevant evidence. |
| Asking Questions and Defining Problems | * ask questions based on observations to find more information about the designed world * identify questions that can be answered by an investigation. * define a simple problem that can be solved through the development of a new or improved object | * ask questions based on observations to find more information about the natural and/or designed world(s). * ask and/or identify questions that can be answered by an investigation. * Define a simple problem that can be solved through the development of a new or improved object or tool. |
| Developing and Using Models | * distinguish between a model and the actual object the model represents * develop a simple model based on evidence to represent a proposed object | * distinguish between a model and the actual object, process, and/or events the model represents. * compare models to identify common features and differences. * develop and/or use a model to represent amounts, relationships, relative scales (bigger, smaller), and/or patterns in the natural and designed world(s). * develop a simple model based on evidence to represent a proposed object or tool. |
| PS1.A: Structures and Properties of Matter |  | * Matter exists as different substances that have observable different properties. * Different properties are suited to different purposes. * Objects can be built up from smaller parts. |
| PS1.B: Chemical Reactions |  | Heating and cooling substances cause changes that are sometimes reversible and sometimes not. |
| ETS1.A: Defining and Delimiting Engineering Problems | Engineering design introduces students to “problems” as situations that people want to change. They can use tools and materials to solve simple problems, use different  representations to convey solutions, and compare different solutions to a problem and determine which is best. Students in all grade levels are not expected to come up with original solutions, although original solutions are always welcome. Emphasis is on thinking through the needs or goals that need to be met, and which solutions best meet those needs and goals. | Engineering design introduces students to “problems” as situations that people want to change. They can use tools and materials to solve simple problems, use different  representations to convey solutions, and compare different solutions to a problem and determine which is best. Students in all grade levels are not expected to come up with original solutions, although original solutions are always welcome. Emphasis is on thinking through the needs or goals that need to be met, and which solutions best meet those needs and goals. |
| ETS1.B: Developing Possible Solutions |
| ETS1.C: Optimizing the design Solution |

**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 Progress Build progressions to measure acquisition of proficiency. Active planning and preparedness are of the utmost importance. For those students who struggle, 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 activities for additional guidance at home or in a virtual at home setting in order to provide ongoing instruction.

Use your pre, critical juncture, post assessments 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.

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