



Visual Vertical Alignment

FOR ELEMENTARY SCIENCE

Sample

Acknowledgments

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Visual Vertical Alignment Tables

The following usage examples represent just a few ways to utilize this tool, whether you are a classroom teacher, librarian, instructional coach, campus administrator, or district representative. These tables can be interpreted independently or in combination with one another. There are many different ways to interpret and use these documents. These pages provide a few examples of how to get started.

Key:

S

Supporting Standard

R

Readiness Standard

Note: In the tables, the corresponding grade level for an entire row will be located somewhere within that row as a reference along with the corresponding student expectation (SE).

Data-Informed Decisions Examples:

- Plot data from any given year to see how the system is functioning by grade level on a particular set of concepts. This view shows data at any given point in time for the student groups in those grade levels.
- Plot data from multiple years by grade level. This view compares progress by grade level across years. Data are from different student groups.
- Plot data by student group across time. This view shows the trends and growth of a student group within any given aligned concept across time.
Example: Use one color for the group of 3rd graders on test results. Use the same color the following year for the same group of students but plot it on the 4th grade SEs. Use the same color the following year for the same group of students but plot it on 5th grade SEs. Use a different color to plot the 4th grade test results. Then use the same 4th grade color for that student group’s test results as 5th graders in the aligned concepts. This can be done prior to 3rd grade with different local and diagnostic assessments, screening inventories, and other assessments.
- Plot subgroups, such as at-risk students, to see how they are progressing with any given concept by grade level or by student group over time.

REPORTING CATEGORY 4: ORGANISMS AND ENVIRONMENTS									
5.9A		5.9B	5.9C	5.9D	5.10A		5.10B	5.10C	
observe the way organisms live and survive in their ecosystem by interacting with the living and nonliving elements		describe how the flow of energy derived from the Sun, used by producers to create their own food, is transferred through a food chain and food web to consumers and decomposers	predict the effects of changes in ecosystems caused by living organisms, including humans, such as the overpopulation of grazers or the building of highways	identify the significance of the carbon-dioxide-oxygen cycle to the survival of plants and animals	compare the structures and functions of different species that help them live and survive such as hooves on prairie animals or webbed feet in aquatic animals		differentiate between inherited traits of plants and animals such as spines on a cactus or shape of beak and learned behaviors such as an animal learning tricks or a child riding a bicycle	describe the differences between complete and incomplete metamorphosis of insects	
88% 74%									
		4.9B			4.9A	4.10A	4.10B	4.10C	
		describe the flow of energy through food webs, beginning with the Sun, and predict how changes in the ecosystem affect the food web such as a fire in a forest			investigate the most producers need sunlight, water, and carbon dioxide to make their own food, while consumers are dependent on other organisms for food	explore how adaptations enable organisms to survive in their environment such as comparing birds' beaks and leaves on plants	demonstrate that some likenesses between parents and offspring are inherited, passed from generation to generation such as eye color in humans or shapes of leaves in plants. Other likenesses are learned such as table manners or reading a book and seals balancing balls on their noses	explore, illustrate, and compare life cycles in living organisms such as butterflies, beetles, radishes, or lima beans	
3.9A		3.9B	3.9C			3.10A	3.10B	3.10C	
observe and describe the physical characteristics of environments and how they support populations and communities within an ecosystem		identify and describe the flow of energy in a food chain and predict how changes in a food chain affect the ecosystem, such as removal of frogs from a pond or bees from a field	describe environmental changes such as floods and droughts where some organisms thrive and others perish or move to new locations			explore how structures and functions of plants and animals allow them to survive in a particular environment	explore that some characteristics, such as the number of limbs on an animal or flower color of organisms, are inherited, and recognize that some behaviors are learned in response to living in a certain environment, such as animals using tools to get food	investigate and compare how animals and plants undergo a series of orderly changes in their diverse life cycles such as tomato plants, frogs, and lady bugs	
92% 73%									
2.9B						2.9A			2.10C
identify factors in the environment, including temperature and precipitation, that affect growth and behavior such as migration, hibernation, and dormancy of living things						identify the basic needs of plants and animals			investigate and record some of the unique stages that insects undergo during their life cycle
2.9C									
compare and give examples of the ways living organisms depend on each other and on their environments such as food chains within a garden, park, beach, lake, and wooded area.						2.10A	2.10B		
						observe, record, and compare how the physical characteristics and behaviors of animals help them meet their basic needs, such as how fins help fish move and balance in the water	observe, record, and compare how the physical characteristics of plants help them meet their basic needs, such as how stems carry water throughout the plant		
1.9B		1.9C					1.10A	1.10B	1.10C
analyze and record example of interdependence found in various situations such as terrariums and aquariums or pet and caregiver		gather evidence of interdependence among living organisms such as energy transfer through food chains and animals using plants for shelter					investigate how the external characteristics of an animal are related to where it lives, how it moves, and what it eats	identify and compare the parts of plants	compare ways that young animals resemble their parents
						1.9A	1.10B	1.10C	1.10D
						sort and classify living and nonliving things based upon whether or not they have basic needs and produce offspring	identify and compare the parts of plants	compare ways that young animals resemble their parents	observe and record life cycles of animals such as a chicken, frog, or fish
						K.9B	K.9A	K.10A	K.10B
						examine evidence that living organisms have basic needs such as food, water, and shelter for animals, and air, water, nutrients, sunlight and space for plants	differentiate between living and nonliving things based upon whether they have basic needs and produce offspring	sort plants and animals into groups based on physical characteristics such as color, size, body covering, or leaf shape	identify parts of plants such as roots, stem, and leaves and parts of animals such as head, eyes, and limbs
								K.10C	K.10D
								identify ways that young plants resemble the parent plant	observe changes that are a part of a simple life cycle of a plant: seed, seedling, plant, flower, fruit

Instructional Implications Examples:

- Recognize the amount of time and experience a student or group of students has with a concept, and analyze whether that experience has built up to various readiness and supporting standards. If there is evidence of 6 years of concept building, for example, but data points show it is a weak area, it warrants further investigation. Why is there a mismatch given that there is so much time building this concept over multiple years? Do we need to seek additional support or learning on teaching certain concepts? Do we need to seek additional resources or calibrate our existing resources? Are we focusing on one aspect of the concept and perhaps leaving out other portions of the SEs? Are we teaching through best practice and in conjunction with the process skills needed to be at an appropriate level of rigor? Do we need support and professional development with regard to content, delivery, or differentiation?
- Recognize when certain skills and concepts are targeted to one or two grade levels. The instructors in these grade levels would then need appropriate support for those targeted skills and concepts. This support may include professional learning or additional resources specific to instructors for that grade level.
- Recognize the connections and big ideas to inform practices in the campus library, including mini-lessons, classroom extension support, and book/media purchasing that is relevant to and supportive of the curriculum.

REPORTING CATEGORY 1: MATTER AND ENERGY					
5.5A classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy		5.5B identify the boiling and freezing/melting points of water on the Celsius scale		5.5C demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand	5.5D identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water
4.5A measure, compare, and contrast physical properties of matter, including size, mass, volume, states (solid, liquid, gas), temperature, magnetism, and the ability to sink or float		4.5B predict the changes in the state of matter caused by heating and cooling		4.5C compare and contrast a variety of mixtures and solutions such as rocks in sand, sand in water, or sugar in water	
3.5A measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float		3.5C predict, observe, and record changes in the state of matter caused by heating and cooling		3.5D explore and recognize that a mixture is created when two materials are combined such as gravel and sand and metal and plastic paper clips	SOLUTIONS IS A NEW CONCEPT. LOOK AT THE TARGET FOR 5TH GRADE (INGREDIENTS) WHAT NEEDS EXIST TO ENSURE STUDENTS UNDERSTAND THIS IN A RELATIVELY SHORT TIME?
3.5B describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container					
2.5A classify matter by physical properties, including shape, relative mass and relative temperature, texture, flexibility, and whether a material is a solid or liquid	2.5C demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting	2.5D combine materials that when put together can do things that they cannot do by themselves, such as building a tower or a bridge and justify the selection of those materials based on their physical properties	2.5B compare changes in materials caused by heating and cooling	Second	
1.5A classify objects by observable properties of the materials from which they are made such as larger and smaller, heavier and lighter, shape, color, and texture	PROPERTIES OF MATTER IS EXTREMELY IMPORTANT AND FOUNDATIONAL FOR CONTENT THROUGH HIGH SCHOOL AND BEYOND.		1.5B predict and identify changes in materials caused by heating and cooling such as ice melting	First	
K.5A observe and record properties of objects, including relative size and mass, such as bigger or smaller and heavier or lighter, shape, color, and texture	WHY IS IT A STRUGGLE? LET’S LOOK AT OUR MEANS OF INSTRUCTION AND OUR TOOLS.		K.5B observe, record, and discuss how materials can be changed by heating and cooling	Kindergarten	

Budget Considerations Examples:

Recognize various areas of need to make informed purchases now and be able to plan purposefully when creating new initiatives, their corresponding budgets, and long-term goals.

Example: 3rd grade science teachers are primarily responsible for teaching the solar system, and they report that they are in need of a variety of quality models. Do they have a variety of quality models?

There are also tools and manipulatives that multiple grade levels must use while other tools may not be as obvious and are used by just one or two grade levels.

- Are items needed by multiple grade levels in adequate or ideal supply?
- How does the area of need align with where the concept falls within the curriculum?
- If one or two grade levels would use the tools at a time, you would be able to begin with fewer tools and work toward the ideal supply.
- Is there an appropriate inventory if most or all grade levels need access to the same tools on an on-going basis or at the same general time within their curriculum?
- How can we begin to purchase needed items now and make a plan to build an appropriate inventory over time?
- Recognize the difference between what is needed and what it would be nice to have as a beginning point so that the absolute needs are met before creating a plan for adding supplemental resources.

REPORTING CATEGORY 3: EARTH AND SPACE															
5.7A		5.7B		5.7C		5.7D		5.8C		5.8D		5.8A		5.8B	
explore the processes that led to the formation of sedimentary rocks and fossil fuels		recognize how landforms such as deltas, canyons, and sand dunes are the result of changes to Earth's surface by wind, water, and ice		identify alternative energy resources such as wind, solar, hydroelectric, geothermal, and biofuels		identify fossils as evidence of past living organisms and the nature of the environments at the time using models		demonstrate that Earth rotates on its axis once approximately every 24 hours causing the day/night cycle and the apparent movement of the Sun across the sky		identify and compare the physical characteristics of the Sun, Earth, and Moon		differentiate between weather and climate		explain how the Sun and the ocean interact in the water cycle	
R		R		R		S		R		S		S		S	
		4.7B				4.7C						4.8A		4.8B	
		observe and identify slow changes to the Earth's surface caused by weathering, erosion, and deposition from wind, water, and ice				identify and classify the Earth's renewable resources, including air, plants, water, and animals; and nonrenewable resources, including coal, oil, and natural gas; and the importance of conservation		examine properties of soils, including color and texture, capacity to retain water, and ability to support the growth of plants		collect and analyze data to identify sequences and predict patterns of change in shadows, tides, seasons, and the observable appearance of the Moon over time				measure and record changes in weather and make predictions using weather maps, weather symbols, and a map key	
		S				S		S		S		S		S	
		3.7B		3.7C		3.7D				3.8C		3.8D		3.8A	
		investigate rapid changes in the Earth's surface such as volcanic eruptions, earthquakes, and landslides		identify and compare different landforms, including mountains, hills, valleys, and plains		explore the characteristics of natural resources that make them useful in products and materials such as clothing and furniture and how resources may be conserved		explore and record how soils are formed by weathering of rock and the decomposition of plant and animal remains		construct models that demonstrate the relationship of the Sun, Earth, and Moon, including orbits and positions		identify the planets in Earth's solar system and their position in relation to the Sun		observe, measure, record, and compare day-to-day weather changes in different locations at the same time that include air temperature, wind direction, and precipitation	
		S								3RD GRADE FOCUS - WHAT DOES THIS GRADE LEVEL NEED SPECIFICALLY FOR THIS CONCEPT?		S			
2.7A				2.7B		2.7C				2.8D				2.8A	
observe and describe rocks by size, texture, and color				identify and compare the properties of natural resources of freshwater and salt water		distinguish between natural and man-made resources				observe, describe, and record patterns of objects in the sky, including the appearance of the Moon				measure, record, and graph weather information, including temperature, wind conditions, precipitation, and cloud coverage, in order to identify patterns in the data	
								NO SOIL						2.8B	
														identify the importance of weather and seasonal information to make choices in clothing, activities, and transportation	
														2.8C	
														explore the processes in the water cycle, including evaporation, condensation, and precipitation, as connected to weather conditions	
				1.7B		1.7C		1.7A		1.8B		1.8C		1.8A	
				identify and describe a variety of natural sources of water, including streams, lakes, and oceans		gather evidence of how rocks, soil, and water help to make useful products		observe, compare, describe, and sort components of soil by size, texture, and color		observe and record changes in the appearance of objects in the sky such as clouds, the Moon, and stars, including the Sun		identify characteristics of the seasons of the year and day and night		record weather information, including relative temperature, such as hot or cold, clear or cloudy, calm or windy, and rainy or icy	
														1.8D	
														demonstrate that air is all around us and observe that wind is moving air	
K.7A				K.7B		K.7C				K.8C		K.8B		K.8A	
observe, describe, compare, and sort rocks by size, shape, color, and texture				observe and describe physical properties of natural sources of water, including color and clarity		give examples of ways rocks, soils, and water are useful		NOTICE THE BLANK SPACES THROUGHOUT THIS REPORTING CATEGORY INDICATING POTENTIAL GAPS IN CONCEPTS AND UNDERSTANDING		observe, describe, and illustrate objects in the sky such as the clouds, Moon, and stars, including the Sun		identify events that have repeating patterns, including seasons of the year and day and night		observe and describe weather changes from day to day and over seasons	
														Kindergarten	

Communication Examples:

- Use the tool as a starting block for needed conversations between and among grade levels, teachers, curriculum specialists, campus administrators, special education support staff, or other personnel. What are the connections, needs, and differences?
- Use the tool as a way to take subjectivity out of curriculum conversations, to look at what the standards actually say as opposed to long-standing units that may no longer apply.
- Use the tool as a study guide that allows teachers and other staff to become increasingly familiar with their standards both as a grade level and as part of a larger system working for students.
- Use the tool to raise awareness of potential gaps in learning, such as when a concept has a “year off” and skips a grade or two. Students must sustain their learning. This leads to conversations that may include teaching strategies to dive deeper into real understanding for sustained learning and application rather than “moving forward” into another grade’s concepts when students appear to “have it.”

REPORTING CATEGORY 1: MATTER AND ENERGY

5.5A			5.5B	5.5C	5.5D
classify matter based on physical properties, including mass, magnetism, physical state (solid, liquid, gas), relative density (sinking and floating), solubility in water, and the ability to conduct or insulate thermal energy or electric energy			identify the boiling and freezing/melting points of water on the Celsius scale	demonstrate that some mixtures maintain physical properties of their ingredients such as iron filings and sand	identify changes that can occur in the physical properties of the ingredients of solutions such as dissolving salt in water or adding lemon juice to water
Fifth			S	S	S
4.5A			4.5B	4.5C	
measure, compare, and contrast physical properties of matter, including size, mass, volume, states (solid, liquid, gas), temperature, magnetism, and the ability to sink or float			predict the changes caused by heating and cooling such as ice becoming liquid water and condensation forming on the outside of a glass of ice water	compare and contrast a variety of mixtures and solutions such as rocks in sand, sand in water, or sugar in water	
Fourth			3.5C	3.5D	Third
3.5A				explore and recognize that a mixture is created when two materials are combined such as gravel and sand and metal and plastic paper clips	
measure, test, and record physical properties of matter, including temperature, mass, magnetism, and the ability to sink or float					
3.5B			S		
describe and classify samples of matter as solids, liquids, and gases and demonstrate that solids have a definite shape and that liquids and gases take the shape of their container					
2.5A	2.5C	2.5D	2.5B	Second	
classify matter by physical properties, including shape, relative mass and relative temperature, texture, flexibility, and whether a material is a solid or liquid	demonstrate that things can be done to materials to change their physical properties such as cutting, folding, sanding, and melting	combine materials that when put together can do things that they cannot do by themselves, such as building a tower or a bridge and justify the selection of those materials based on their physical properties	compare changes in materials caused by heating and cooling		
1.5A	First		1.5B		
classify objects by observable properties of the materials from which they are made such as larger and smaller, heavier and lighter, shape, color, and texture			predict and identify changes in materials caused by heating and cooling such as ice melting, water freezing, and water evaporating		
K.5A	Kindergarten		K.5B		
observe and record properties of objects, including relative size and mass (such as bigger or smaller and heavier or lighter) shape, color, and texture			observe, record, and discuss how materials can be changed by heating and cooling		