S&C Issue	Title of Column	Concepts and Focus
1. Sept 2010	*Doing Science* Probe: Doing Science	"Scientific method"; examine how misuse of the "scientific method" impacts students' ideas about science
2. Oct 2010	*"More A- More B" Rule* Probe: Floating Log	Floating and Sinking; use of intuitive rules to reason about floating and sinking
3. Nov 2010	*Does It Have a Life Cycle?* Probe: Does It Have a Life Cycle?	Life cycles; addressing the limitations of context in the curriculum
4. Dec 2010	*To Hypothesize or Not* Probe: What Is a Hypothesis?	Hypotheses; revealing misconceptions teachers have about the nature of science that can be passed on to students
5. Jan 2011	*How Far Did It Go?* Probe: How Far Did It Go?	Linear measurement; difficulties students have with measurement particularly with a non-zero starting point
6. Feb 2011	*Needs of Seeds* Probe: Needs of Seeds	Needs of living things; engaging in evidence-based argumentation
7. Mar 2011	*The Mitten Problem* Probe: The Mitten Problem	Energy transfer, insulators; teaching for conceptual change and how children's everyday experience affects their thinking
8. Apr 2011	*Is It Living?* Probe: Is It Living?	Characteristics of living things; examine ways to uncover "hidden meanings" students have for some concepts
9. Jul 2011	*With a Purpose* Probe: Several	A variety of probes and techniques show purposeful links to various stages in an assessment, instruction, and learning cycle

10. Sept 2011	*Where Are the Stars?* Probe: Emmy's Moon and Stars	Solar system, relative distances; impact representations in books and other media have on children's ideas
11. Oct 2011	*Pushes and Pulls* Probe: Talking About Forces	Forces; examining common preconceptions and use of language to describe forces and motion
12. Nov 2011	*Teachers as Researchers* Probe: Is It an Animal?	Biological concept of an animal; How formative assessment probes can be used to engage in teacher action research
13. Dec 2011	*Representing Microscopic Life* Probe: Pond Water	Single-celled organisms; use of representations to examine students' ideas

14. Jan 2012	*Daytime Moon* Probe: Objects in the Sky	Objects in the sky; examine reasons why children hold on to the belief that the moon is visible only at night
15. Feb 2012	*Can It Reflect Light?* Probe: Can It Reflect Light?	Reflection; addressing students' preconceptions with first hand experiences that support conceptual change
16. Apr/May 2012	*Food for Plants- A Bridging Concept* Probe: Is It Food for Plants?	Food, photosynthesis, needs of plants; using bridging concepts to address gaps in learning goals
17. Jul 2012	*Where Did the Water Go?* Probe: Where Did the Water Come From?	Condensation, evaporation; linking concepts, practices, and cross-cutting concepts
18. Sept 2012	*Confronting Common Folklore- Catching a Cold* Probe: Catching Cold	Infectious diseases; understanding how "old wives' tales" and common folklore affect student thinking
19. Oct 2012	*Talking About Shadows* Probe: Me and My Shadow	Sun-Earth movement and patterns; using talk moves and establishing a culture of productive talk using friendly talk probes

20. Nov 2012	*Birthday Candles- Visually Representing Ideas* Probe: Birthday Candles	Light, movement of light; using children's drawings to probe for and understand their thinking
21. Dec 2012	*Mountain Age- Creating a Classroom Profile* Probe: Mountain Age	Weathering, landforms; using a classroom profile to analyze and group student responses in order to address commonly held ideas
22. Jan 2013	*Using the P-E-O Technique* Probe: Solids and Holes	Floating and sinking, density; having students predict, provide initial explanations for their predictions, then observe the phenomenon and develop a new explanation
23. Feb 2013	*Labeling vs. Explaining* Probe: Chrysalis	Life cycles, concept of living; labeling diagrams with vocabulary words does not always reveal what students really think about a phenomenon
24. Mar 2013	*When Equipment Gets in the Way* Probe: Battery, Bulb, and Wires	Battery, bulb, complete circuit; when learning gets lost in equipment that "does the work" for students
25. Apr 2013	*Is It a Rock? Continuous Formative Assessment* Probe: Is It a Rock?	Rock, properties of rocks; how assessment is used throughout an instructional cycle from elicitation to reflection
26. Jul 2013	*Is It a Solid? Claim Cards and Argumentation* Probe: Is It a Solid?	Solids, liquids; how the technique of claim cards is used to surface students' ideas and engage them in the practice of argumentation using claims and evidence
27. Sept 2013	*When Is the Next Full Moon? Using K-2 Concept Cartoons* Probe: When Is the Next Full Moon?	Moon phases, patterns; how concept cartoons are used to elicit students' ideas and launch into purposeful investigations
28. Oct 2013	*Pendulums and Porch Swings- Connecting Science and Engineering* Probe: Swinging Pendulum	Patterns of motion, engineering design; how knowledge from a science investigation is used to solve an engineering problem.
29. Nov 2013	*Is It Melting? Formative Assessment for Teacher Learning* Probe: Is It Melting?	Melting, dissolving; how formative assessment probes can be used in a professional development setting to challenge teachers' ideas and work through them

30. Dec 2013	*Is It Made of Parts?- Scaffolding a Formative Assessment Probe* Probe: Is It Made of Parts?	Parts of organisms; identifying sub-ideas in a learning goal and using a probe to elicit these ideas while scaffolding instruction and assessment
31. Jan 2014	*Assessment for All* Probe: Where Do People Live? Big and Small Seeds	Equity, cultural responsive assessment; formative assessment that reflects diversity in the classroom and addresses English language learners
32. Mar 2014	*Habitat Change: Formative Assessment of a Cautionary Word* Probe: Habitat Change	Adaptation; how students/ every day, colloquial use of a word affects their understanding of the scientific use of s word
33. Sept 2014	*Is It a Theory- Speaking the Language of Science* Probe: Is It a Theory?	Theory; how students distinguish scientific theories from the every day use of the word theory and the difference between theories and laws
34. Nov 2014	*Seeds in a Bag* Probe: Seeds in a Bag	Needs of seeds, germination; Use of cause and effect crosscutting concept with seed germination
35. Dec. 2014	*Watermelon and Grape- An Intuitive Rule of Quantity and Proportion* Probe: Watermelon and Grape	Sink and float; how the "More A-More B" intuitive rule affects children's ideas about sinking and floating
36. Jan 2015	*Ice Cubes in a Bag* Probe: Ice Cubes in a Bag	States of matter, phase change, conservation of matter; uncovering students' ideas about open and closed systems
37. Mar 2015	*Soil and Dirt- Same or Different* Probe: Describing Soil	Soil; uncovering students' ideas about properties of soil and whether soil and dirt are the same
38. Jul 2015	*Snap Blocks* Probe: Snap Blocks	Parts and wholes, conservation of matter; uncovering whether students recognize that an object made of pieces weighs the same when it is taken apart

39. Sept 2015	*Where Do I Put the Switch?* Probe: Where Do I Put the Switch?	Circuits; using formative assessment probes during engineering design activities
40. Oct 2015	*Wet Jeans* Probe: Wet Jeans	Evaporation, water cycle; using familiar phenomena to uncover students' thinking
41. Nov 2015	*Constructing Cl-Ev-R Explanations to Formative Assessment Probes* Probe: Lemonade	Conservation of matter, dissolving; using claims, evidence, and reasoning to explain what happens to the weight when sugar is dissolved in water
42. Dec 2015	*Mountaintop Fossil- A Puzzling Phenomenon* Probe: Mountaintop Fossil	Mountain formation, fossils; uncovering students' ideas about how marine fossils can be found on the tops of tall mountains
43. Jan 2016	*Uncovering Students' Concept of Matter* Probe: Is It Matter?	Matter; uncovering young children's ideas about the types of objects, materials, and substances they consider to be matter
44. Mar 2016	*Is It Erosion or Weathering?* Probe: Is It Erosion?	Erosion, weathering, deposition; using a probe before introducing terminology
45. Apr 2016	*Talk Moves* Probe: Watermelon and Grape	Sinking and floating; Using talk moves with probes to engage students in productive science discussions

46. Jul 2016	*Big and Small Seeds* Probe: Big and Small Seeds	Germination; showing how a formative assessment probe supports the scientific practices
47. Sept 2017	*Pre-service Teachers' Ideas about Magnetism & Formative Assessment* Probe: Can You Pick It Up?	Magnetism, formative assessment; how formative assessment probes uncover new teachers' ideas and help them understand the role of formative assessment

48. Oct 2017	*Uncovering Young Children's Concept of a Plant* Probe: Is It a Plant?	Plants; how formative assessment reveals commonly held ideas children have about plants
49. Nov 2017	*Vocabulary in Context- Is It an Amphibian?* Probe: Is It an Amphibian?	Amphibian, structure and function; how context affects how children interpret vocabulary
50. Dec. 2017	*Embedding Formative Assessment into the 5E Model* Probe: Lemonade	Conservation of matter, dissolving; how different formative assessment classroom techniques (FACTs) are used throughout an instructional cycle
51. Jan. 2018	*Uncovering Representations of the Water Cycle* Probe: Wet Jeans	Water, cycle, evaporation; examining how representations affect students' understanding of the water cycle
52. Feb. 2018	*Uncovering Students' Ideas about Inherited Traits* Probe: Baby Mice	Heredity, inherited traits; eliciting students' initial ideas about how they look similar to and different from their parents
53. Mar. 2018	*Uncovering "Maker" Ideas About Sound* Probe: Making Sound	Sound, vibrations; How maker activities can (and sometimes do not) support content learning
54. Apr. 2018	*Uncovering Students' Ideas about Watersheds* Probe: What Is a Watershed?	watershed; how a formative assessment probe reveals students' initial concept of a watershed
55. July 2018	*Using Formative Assessment Probes to Develop Elementary Learning Stations* Probe: Can You Pick It Up with a Magnet?	Magnetism; how to set up learning stations for formative assessment
56. Aug. 2018	*Formative Assessment Probes- Is a Brick a Rock?* Probe: Is a Brick a Rock?	Human made-vs. natural made materials, natural resources; sing the “lines of agreement” argumentation strategy
57. Nov. 2018	*Magnets in Water- Using a TLR Scaffold to Support Productive Talk and Careful Listening*	Magnetism, magnetic interaction; sing a Talk-Listen-Restate scaffold during probe discussions

	Probe: Magnets in Water	
58. Jan. 2019	*Apple in the Dark- Formative Assessment Probes and Metacognition* Probe: Apple in the Dark	Light, vision; using metacognitive strategies to support thinking
59. Feb. 2019	*Balance Beam- Figuring Out a Mathematical Rule* Probe: Balance Beam	Force, balanced forces; using a mathematical rule to balance a balance beam
60. Mar. 2019	*Describing the Motion of a Marble- Staying True to the Purpose of a Formative Assessment Probe* Probe: Marble Roll	Position, motion, describing motion; observing a phenomenon to develop the language of motion rather than explaining the phenomenon which is the goal in later grades

61. Apr. 2019	*Formative Assessment Probes- Our Best Thinking So Far* Probe: Can a Plant Break Rocks?	Weathering, mechanical weathering; changing your language from "right", "correct", or "wrong" answers to "our best thinking so far" or the "best answer"
62. Aug 2019	*Supporting Literacy Capacities of Speaking and Listening* Probe: Solids, Liquids, and Gases	States of matter, properties of matter; using probes in discussion formats to support speaking and listening skills
63. Sept 2019	*Using the 6Es and Formative Assessment Probes to Differentiate Instruction* Probe: No Shadow	Shadows, Earth-Sun system; how inserting an additional E into the 5E model provides for differentiated instruction based on students' ideas.
64. Nov 2019	*Using Probes for Constructive Conversations* Probe: Where Did the Sun Go?	Sun-Earth system, day-night cycle; focus on supporting productive probe discussions
65. Feb 2020	*Doing Science vs. Doing Engineering* Probes: Doing Science, How Engineers Do Their Work	Scientific investigations, engineering design; addresses the similarity between the common misuse of "the" scientific method and "the" engineering design process.
66.	*Uncovering Parents' and Children's Ideas About Science*	Light, shadows; how parents and children can use probes together to investigate phenomena

Apr/May 2020	Probe: Shadow Size	
67. Sept/Oct 2020	*Using Formative Assessment Probes with Real or Virtual Field Trips* Probe: Land or Water?	Water distribution on Earth; focus on how probes can be used to complement museum exhibits and field trips
68. Nov/Dec 2020	*The Day-Night Cycle- Adding Models to Probe Explanations* Probe: What Causes Day and Night?	Day/night cycle, Earth's rotation; focus on how drawings are used as models to support explanations
69. Jan/Feb 2021	*What Is Brainstorming?* Probe: Brainstorming	Engineering design process, brainstorming; focus on how brainstorming is used by engineers and suggestions for developing guidelines for brainstorming based on students' ideas about the process of brainstorming
70. Jul/Aug 2021	*Concept-Based Probes- The Justified List* Probe: Is It Matter?	Concept of Matter; how the justified list format uncovers ideas about concepts in science
71. Nov/Dec 2021	*Is It Food?- Uncovering Scientific vs. Colloquial Meanings of Words* Probe: Is It Food?	Biological concept of food, matter and energy; focus on how students' use of the word "food" in everyday language differs from how they think about food in a biological context.
72. Jan/Feb 2022	*Uncovering Children's Ideas About Using Designs from Nature* Probe: Engineering and Nature	Biomimetics, biomimicry, bio-inspired design; focus on using designs from nature to solve problems
73. Mar/Apr 2022	*Uncovering Students' Ideas About Earth's Defining Feature- The Oceans* Probe: How Many Oceans and Seas?	Concept of one ocean, ocean circulation; focus on understanding the idea that Earth's oceans and seas are connected, not separate bodies of water
74. May/Jun	*Cookie Crumbles- Using P-E-O Probes to Launch into Activities* Probe: Cookie Crumbles	Conservation of matter; Using predictions to deepen students' thinking before investigation

2022		
75. July/Aug 2022	*What Do You Know About Soil? - Using Ideas Inventory Probes* Probe: What Do You Know About Soil?	Soil, Earth materials; Developing a conceptual inventory for formative assessment
76. Nov/Dec 2022	*Eliciting Students' Initial Ideas About the Sun-Earth System* Probe: Sunrise to Sunset	Sunrise, Sunset, Sun's apparent motion, Earth's rotation; using the phenomenon of the Sun's apparent path across the daytime sky and the crosscutting concept of patterns.