

Uncovering Student Ideas in Science

These suggested correlations are a resource guide only! All of these probes address NGSSS for Science benchmarks on multiple levels and can be used across multiple grade levels from K-12.

17 of them address FCAT 2.0 Annually Assessed (AA) benchmarks (see benchmark code).

What is Uncovering Student Ideas in Science (USIS)?

The Uncovering Student Ideas in Science books are by Page Keeley, co-authored by Francis Eberle, Chad Dorsey, Joyce Tugel, and Lynn Farrin, and published by NSTA Press. Currently there are several volumes available that cover a plethora of science topics. Each book has 25-45 short formative assessment probes that can be used to investigate students' preconceptions on a science topic. This can help with identifying misconceptions that may need to be addressed before fully delving into your topic.

What is a formative assessment probe?

"[These probes] are assessments *for* learning, not assessments *of* learning. While several of these probes could indeed serve to summatively assess your students' learning, their primary purpose is not to measure the extent to which your students achieved proficiency in science subject matter knowledge, but rather to reveal the types of conceptions your students have about common science concepts before and throughout instruction." [These probes] will enable you to probe for and quickly and efficiently examine a multitude of possible ideas your students' hold, including misconceptions, naïve thoughts, and incomplete ideas." (Keeley, p.3, USIS Volume 1).

It is important to realize that these ideas are not always *wrong*, as most students' ideas are based on logic and everyday experiences that have shaped their prior knowledge.

How do I use these resources?

All of these probes have detailed pictures to help the students' visualize the concept. Used as formative and summative assessments, many of these can also be used as hands-on activities. For example, *Ice Cubes in a Bag* (Vol. 1, p.49), is used to elicit knowledge on conservation of matter. The probe asks the students to visualize recording the mass of ice cubes in a bag. Then, the students think about taking the mass again after the ice cubes have melted inside the bag and how the masses would compare. This is only one example of a probe that can be easily adapted as an engaging hands-on activity with easily available resources and having the students test the question in the classroom. Also, every probe has a detailed Teacher Notes section that explains the science behind the probe, related concepts, and curricular and instructional considerations for elementary, middle, and high school students.

Are these books in my school already?

Yes! Each Science Point of Contact (PoC) has received Volume 1, 2, 3, and 4 for your school. Check in your professional development library or with your Science PoC as to where these may be.

How can I order more copies?

You can order these through NSTA Press at 1-800-277-5300 or VISTA School Resources 1-866-380-9820

Uncovering Student Ideas in Science, Vol. 1: 25 Formative Assessment Probes, 2005 ISBN: 9780873552554

Uncovering Student Ideas in Science, Vol. 2: 25 More Formative Assessment Probes, 2007 ISBN: 9780873552738

Uncovering Student Ideas in Science, Vol. 3: Another 25 Formative Assessment Probes, 2008 ISBN: 9781933531243

Uncovering Student Ideas in Science, Vol. 4: 25 Additional Formative Assessment Probes, 2009 ISBN: 9781935155010

Not correlated here but also available:

Uncovering Student Ideas in Physical Science, 45 NEW Force and Motion Assessment Probes, 2010 ISBN: 9781935155188

Benchmark correlation of: *Uncovering Student Ideas in Science* by Page Keeley, et al. Volumes 1-4, NSTA Press

Submitted by AmberThibedeau, Brevard Public Schools

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Activity	Vol.	Page #	Grade	Benchmark
These are not the only benchmarks that these probes address. Check your standards to see which are applicable to your grade level also!				
Can It Reflect Light?	1	24	3	SC.3.P.10.4
Apple in the Dark	1	31	3	SC.3.P.10.4
Birthday Candles	1	37	3	SC.3.P.10.3
Making Sound	1	43	4	SC.4.P.10.3
Ice Cubes in a Bag	1	49	2	SC.2.P.9.1
Lemonade	1	55	5	SC.5.P.8.2
Cookie Crumbles	1	61	K	SC.K.P.9.1
Seedlings in a Jar	1	67	4	SC.4.P.8.3
Is It Melting?	1	73	5	SC.5.P.10.1(AA)
Is It Matter?	1	79	5	SC.5.P.8.4
Is It Made of Molecules?	1	85	6	SC.6.L.14.1
The Rusty Nails	1	91	4	SC.4.P.9.1
Talking About Gravity	1	97	3	SC.3.E.5.4
The Mitten Problem	1	103	3	SC.3.P.8.1
Objects and Temperature	1	109	2	SC.2.P.8.1
Is It an Animal?	1	117	3	SC.3.L.15.1
Is It Living?	1	123	1	SC.1.L.14.3
Is It Made of Cells?	1	131	6	SC.6.L.14.1
Human Body Basics	1	139	6	SC.6.L.14.2
Functions of Living Things	1	147	6	SC.6.L.14.3
Wet Jeans	1	155	2	SC.2.P.8.4
Beach Sand	1	163	4	SC.4.E.6.4 (AA)
Mountain Age	1	169	4	SC.4.E.6.4 (AA)
Gazing at the Moon	1	177	4	SC.4.E.5.2
Going Through a Phase	1	183	4	SC.4.E.5.2

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Comparing Cubes	2	19	5	SC.5.P.8.1 (AA)
Floating Logs	2	27	2	SC.2.P.8.1
Floating High and Low	2	33	2	SC.2.P.8.1
Solids and Holes	2	41	2	SC.2.P.8.1
Turning the Dial	2	47	5	SC.5.P.9.1 (AA)
Boiling Time and Temperature	2	53	3	SC.3.P.9.1
Freezing Ice	2	59	3	SC.3.P.9.1
What's in the Bubbles?	2	65	2	SC.2.E.7.3
Chemical Bonds	2	71	6	SC.6.L.14.1
Ice-Cold Lemonade	2	77	5	SC.5.P.10.2 (AA)
Mixing Water	2	83	2	SC.2.P.8.1
Is It a Plant?	2	93	1	SC.1.L.17.1
Needs of Seeds	2	101	1	SC.1.L.17.1
Plants in the Dark and Light	2	107	2	SC.2.L.17.1
Is It Food for Plants?	2	113	3	SC.3.L.17.1
Giant Sequoia Tree	2	121	3	SC.3.L.14.1 (AA)
Baby Mice	2	129	4	SC.4.L.16.2
Whale and Shrew	2	137	6	SC.6.L.14.2
Habitat Change	2	143	5	SC.5.L.15.1
Is It a Rock? (version 1)	2	151	2	SC.2.E.6.1
Is It a Rock? (version 2)	2	157	4	SC.4.E.6.2 (AA)
Mountaintop Fossil	2	165	4	SC.4.E.6.4 (AA)
Darkness at Night	2	171	K	SC.K.E.5.2
Emmy's Moon and Stars	2	177	3	SC.3.E.5.3
Objects in the Sky	2	185	K	SC.K.E.5.4

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Pennies	3	17	5	SC.5.P.8.1 (AA)
Is It a Solid?	3	25	1	SC.1.P.8.1
Thermometer	3	33	4	SC.4.P.10.2
Floating Balloon	3	39	1	SC.1.P.8.1
Hot and Cold Balloons	3	45	3	SC.3.P.9.1
Mirror on the Wall	3	51	3	SC.3.P.10.3
Batteries, Bulbs, and Wires	3	57	5	SC.5.P.11.1
Apple on a Desk	3	63	5	SC.5.P.13.4
Rolling Marbles	3	71	6	SC.6.P.13.3
Dropping Balls	3	77	6	SC.6.P.13.2
Is It a Theory?	3	83	6	SC.6.N.3.1
Doing Science	3	93	4	SC.4.N.1.3
What Is a Hypothesis?	3	101	4	SC.4.N.1.7
Does It Have a Life Cycle?	3	111	2	SC.2.L.16.1
Cells and Size	3	117	6	SC.6.L.14.2
Sam's Puppy	3	125	6	SC.6.L.14.2
Respiration	3	131	5	SC.5.L.14.1 (AA)
Rotting Apple	3	139	4	SC.4.P.9.1
Earth's Mass	3	147	4	SC.4.P.8.3
What Are Clouds Made Of?	3	155	2	SC.2.E.7.3
Where Did the Water Come From?	3	163	3	SC.3.P.9.1
Rainfall	3	171	5	SC.5.E.7.1 (AA)
Summer Talk	3	177	5	SC.5.E.5.3
Me and My Shadow	3	185	3	SC.3.P.10.3
Where Do Stars Go?	3	191	K	SC.K.E.5.1

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Sugar Water	4	11	5	SC.5.P.8.2
Iron Bar	4	17	5	SC.5.P.9.1 (AA)
Burning Paper	4	23	4	SC.4.P.8.3
Nails in a Jar	4	31	4	SC.4.P.8.3
Salt Crystals	4	39	5	SC.5.P.8.4
Ice Water	4	45	3	SC.3.P.8.1
Warming Water	4	53	3	SC.3.E.5.2
Standing on one foot	4	61	K	SC.K.P.8.1
Magnets in Water	4	67	2	SC.2.P.13.2
Is it a Model?	4	73	4	SC.4.N.3.1
Is it a System?	4	81	6	SC.6.L.14.1
Is it Food?	4	91	2	SC.2.L.17.1
Biological Evolution	4	99	(7)	(SC.7.L.15.2)
Chicken Eggs	4	105	(8)	(SC.8.L.18.2)
Adaptation	4	113	5	SC.5.L.17.1 (AA)
Is it "Fitter"?	4	119	5	SC.5.L.15.1
Catching a Cold	4	125	6	SC.6.L.14.6
Digestive System	4	131	5	SC.5.L.14.1 (AA)
Camping Trip	4	137	3	SC.3.E.6.1
Global Warming	4	143	6	SC.6.E.7.4
Where Does Oil Come From?	4	151	4	SC.4.E.6.6
Where Would it Fall?	4	157	5	SC.5.E.7.2
Moonlight	4	161	4	SC.4.E.5.2
Lunar Eclipse	4	167	4	SC.4.E.5.4 (AA)
Solar Eclipse	4	173	4	SC.4.E.5.4 (AA)