

Illuminating Learning Gaps

Learning gaps result in today's most serious education challenges... retention and dropouts. They lower student achievement in school, on assessments and in life. They undermine our education system by turning learning into a struggle.

Understanding gaps, how they impact, how they form, and how they can be illuminated is critical to student success. By minimizing the learning gaps students carry with them to a course, teachers in the learning continuum have a good opportunity

to succeed in transferring the planned course content without gaps.

The K-12 spread of minimally gapped content transfer to all students across all courses and grades defines effective teaching and learning. It is a key indicator of the quality of a learning system, school and teacher.

Clear learning objectives with reports correlating student achievement and illuminating gaps for elimination form the foundation for competency-based education.

Burden of Gaps Slows Learning Progress

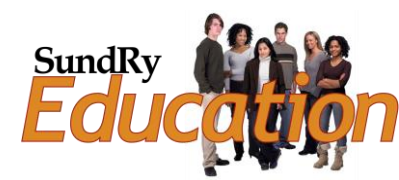
- Learning gaps interfere with mastering new content and can turn learning into a struggle
- In a tractor pull, the effort needed for making forward progress is purposely increased using moving weights to increase friction on the pulled sled to eventually halt advancement
- In education, gaps are like the weight on the sled and their effect is to slow learning advancement
- Like the sled weight, learning gaps are a dynamic force with gap closures reducing the learning friction and new content giving opportunity for gap formation
- The dynamic of learning gaps that cripples advancement is their complicity in creating new gaps when they are part of a cohesive learning sequence and stand in the way of new learning
- Keeping the weight of learning gaps in check maintains forward learning progress and avoids the tractor pull struggle as students move down the education track to graduation



Like a tractor pull, students can struggle to make progress against the weight of learning gaps.

2012 Thurston County Fair, Lacey, WA

What is a Student Learning Gap?



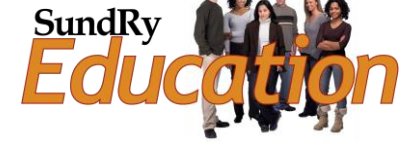
- A student learning gap is simply an unlearned knowledge or skill content item that a student was expected to know or be able to do
 - A complete learning objective includes a cognitive level goal for the knowledge or skill – e.g. Webb’s depth of knowledge (DOK) with a range of 1 to 4
 - A learning gap exists when a student’s learning achievement is below the expected cognitive goal specific to the knowledge or skill item
- Gaps are detected through teacher observations, student work and assessments
 - When a student scores less than an “A” or 100% in coursework, gaps are indicated
 - When performance levels in high stakes tests are less than advanced levels, gaps are indicated
- Core gaps involve critical knowledge and skills
 - Those directly specified as a graduation objective and those needed to support learning them
 - Immediate intervention is indicated, with escalation through closure, for any detected core content gaps
- Non-core gaps involve knowledge and skills that are important, but not critical for a full education

Learning gaps are to education what disease cells are to an otherwise robust organism. Insidious and pernicious, they proliferate silently debilitating the system.

Gaps multiply from grade to grade, feeding off each other, and getting resistant to closure as the years go by. As arithmetic is prerequisite to algebra, the content of each grade lays a foundation for later grades that, if neglected, brings the whole edifice smashing down.

As it exists today, “the system” allows gaps to persist and proliferate, masked by “acceptable” As, Bs and Cs in the conventional grading system.

"Eggology" - Achievement & Gap Visualization

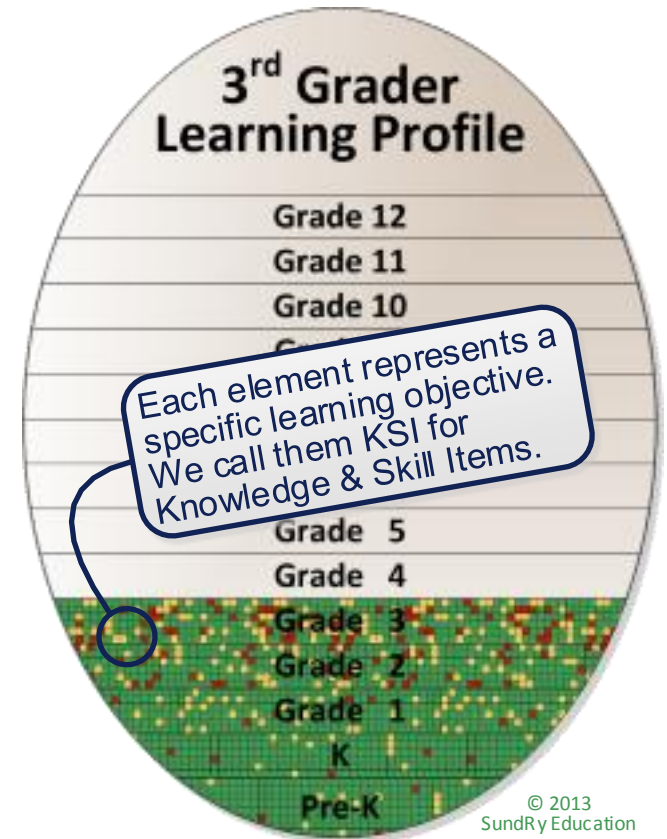
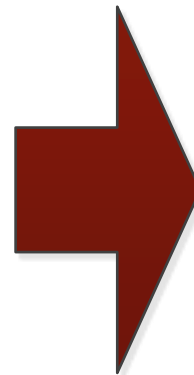


- Each student has a personal, dynamic profile of learning achievement and gaps
- The grid block of content items below shows the cognitive level of learning achievement for individual content items to illustrate the color coding concept
- Depending on the breakdown of content, there could be 4 to 12 thousand content items to be managed, taught, learned and tracked before high school graduation
- The egg shape illustrates a realistic top-level view of a student's learning profile with all content represented

Green	Green	Green	Green	Green
Green	Red	Yellow	Red	Green
Yellow	Green	Green	Green	Red
Green	Yellow	Green	Yellow	Green
Yellow	Green	Yellow	Yellow	Green
Green	Red	Green	Green	Red
Yellow	Green	Red	Green	Green
Green	Green	Green	Yellow	Green
Red	Green	Yellow	Red	Yellow
Green	Green	Green	Green	Red

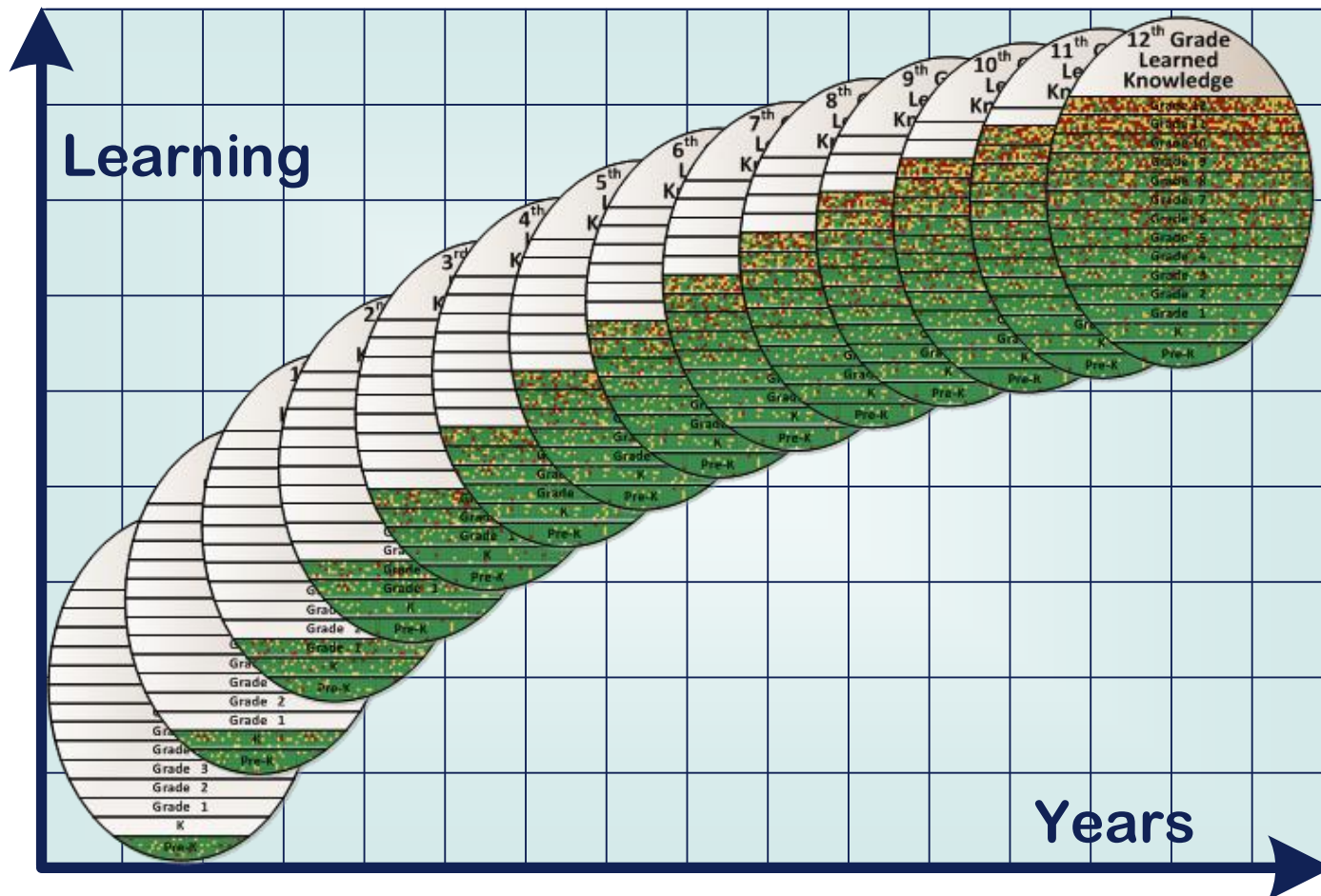
Color Legend for Cognitive Goal Achievement

Green	AT or above cognitive goal
Yellow	NEAR cognitive goal
Red	BELOW cognitive goal



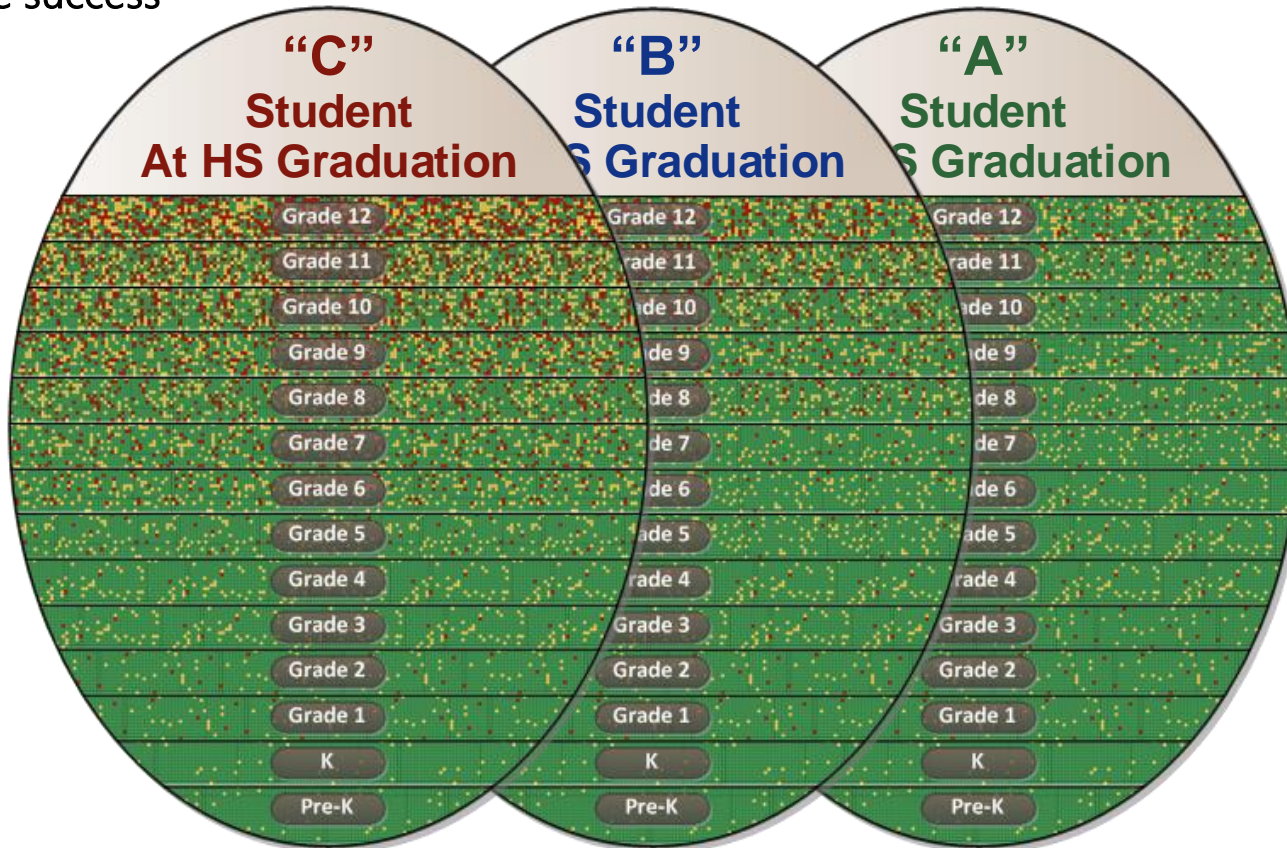
Gaps Make Learning Harder and Harder

- Students learn rapidly in early grades, but as gaps accumulate, learning slows
- Identifying and fixing learning gaps early can minimize their crippling effect
- The waning rate of learning illustrates the student's struggle - like a tractor pull



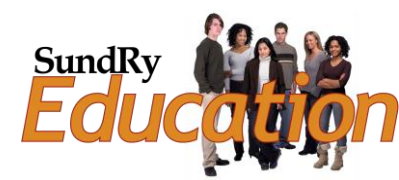
Learning Gaps Exist for All Students

- Every student graduating high school has their own set of learning achievements and gaps to serve and impede them after high school graduation
- Student's letter grades during their 13-year education are quickly put into the past concealing the illustrated red and yellow learning gaps that remain as unattended threats to future success



- Gaps could be minimized with real-time reports of student achievement and gaps from Pre-K to 12th grade to inform teachers, encourage students and engage parents

Seeing Learning Gaps In Real-Time



- Awareness of a gap enables and encourages actions for removal, and continuous clear reporting spurs persistence until accomplished
- While the high-level egg view of achievement and gaps is important, the drilldown into data behind the egg view reveals the actionable information
- Clearly defined and transparent learning objectives are critical to tracking and managing student achievement using reports like the illustrated Student Learning Profile
- Reports of learning achievement and gaps inform at directly actionable levels to empower teachers, students and parents to close these gaps immediately and avoid the compounding effect of blocking cohesive learning sequences
- Clear learning objectives with reports correlating student achievement form the foundation for competency-based education

Student Learning Profile

Student ID: 2888

Robinson, Isabella M.

Class ID: 2012-575

Achievement	Content ID	Knowledge/Skill Item (KSI)	Cognitive Target	Content Type	Data Points
Kindergarten - Language Arts - Phonemic Awareness					
At Plan	K-ELA-PA-001	Given a spoken word, produce another word that rhymes with the given word.	DOK 2	Core	3
Near Plan	K-ELA-PA-002	Orally blend isolated sounds into a spoken one-syllable word.	DOK 3	Core	2
...					
No Data	K-ELA-PA-009	Given prompting with a picture, isolate and repeat the initial sound of a one-syllable word.	DOK 3	Core	0
Kindergarten - Mathematics - Numbers and Number Sense					
At Plan	K-M-NNS-001	Recognize and write numbers 1 to 31.	DOK 2	Core	3
Below Plan	K-M-NNS-002	Count and write the number of objects in a set.	DOK 3	Core	1
...					
Near Plan	K-M-NNS-015	Given a number, identify one more, one less.	DOK 2	Core	1