


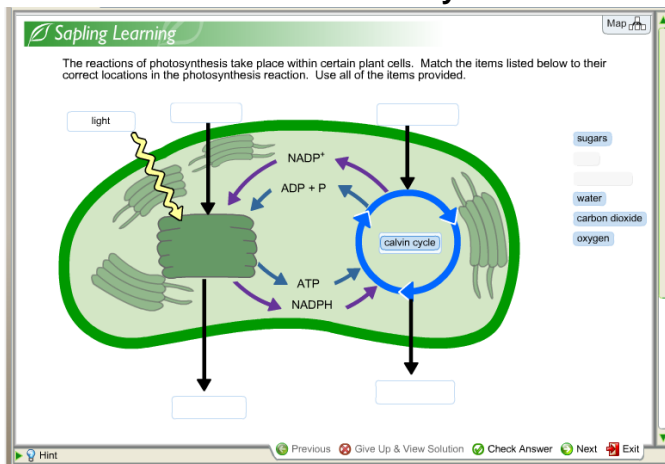
Supplemental Science Evaluation Guide – Sapling Learning

Titles	<p>Sapling Learning High School Biology – Texas Edition ISBN: 978-0-9833859-1-2</p> <p>Sapling Learning High School Chemistry – Texas Edition ISBN: 978-09833859-0-5</p> <p>Sapling Learning High School Physics – Texas Edition ISBN: 978-09833859-2-9</p> <p>Sapling Learning High School Integrated Physics and Chemistry (IPC) – Texas Edition ISBN: 978-09833859-3-6</p>
	
Publisher	Sapling Systems, Inc. (dba Sapling Learning)
HQ location/Ownership	Privately owned Texas company since 1999 located in Austin, TX
URL	http://hs.saplinglearning.com
Hardware	PC, Mac and most major mobile devices
O/S	Supports all major web browsers, operating systems, and mobile devices
Grade Level/Subjects	High School Sciences – Biology, Chemistry, Physics, IPC, Also available: AP Chemistry & AP Physics
References for this Guide	This evaluation guide is based in part on the Supplemental Science rubrics created by Regions 4, 5, 6, 7, 10, 11, 17, and other school district science adoption committees.

Classroom Applications/Uses:

Interactive items/simulations Engaging, 100% TEKS aligned questions, activities, simulations & virtual experiments

Interactive Activity



The reactions of photosynthesis take place within certain plant cells. Match the items listed below to their correct locations in the photosynthesis reaction. Use all of the items provided.

light

NADP⁺

ADP + P

ATP

NADPH

calvin cycle

sugars

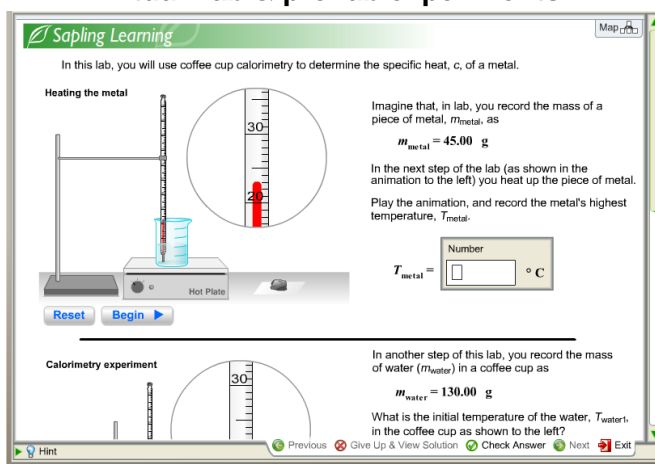
water

carbon dioxide

oxygen

Hint Previous Give Up & View Solution Check Answer Next Exit

Virtual Lab & pre-lab experiments



In this lab, you will use coffee cup calorimetry to determine the specific heat, c , of a metal.

Heating the metal

Imagine that, in lab, you record the mass of a piece of metal, $m_{\text{metal}} = 45.00 \text{ g}$

In the next step of the lab (as shown in the animation to the left) you heat up the piece of metal. Play the animation, and record the metal's highest temperature, T_{metal} .

$T_{\text{metal}} = \text{Number} \text{ } ^\circ \text{C}$

Reset Begin

Calorimetry experiment

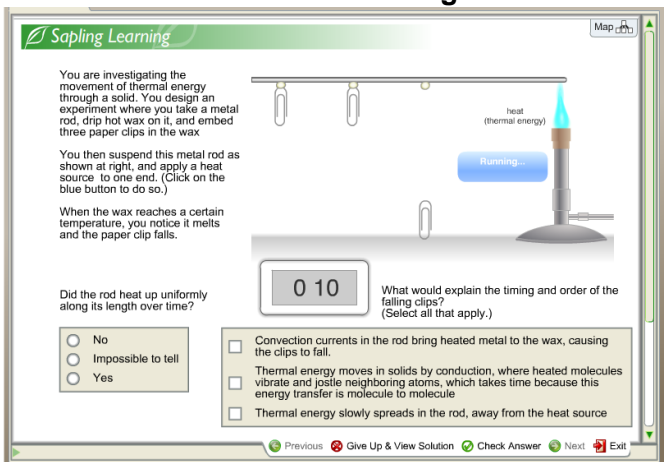
In another step of this lab, you record the mass of water (m_{water}) in a coffee cup as

$m_{\text{water}} = 130.00 \text{ g}$

What is the initial temperature of the water, T_{water} , in the coffee cup as shown to the left?

Hint Previous Give Up & View Solution Check Answer Next Exit

Observation & Investigation



You are investigating the movement of thermal energy through a solid. You design an experiment where you take a metal rod, drip hot wax on it, and embed three paper clips in the wax.

You then suspend this metal rod as shown at right, and apply a heat source to one end. (Click on the blue button to do so.)

When the wax reaches a certain temperature, you notice it melts and the paper clip falls.

0.10

What would explain the timing and order of the falling clips? (Select all that apply.)

No

Impossible to tell

Yes

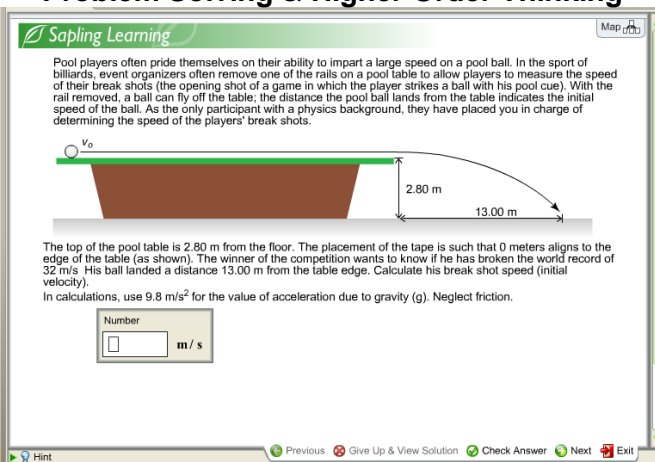
Convection currents in the rod bring heated metal to the wax, causing the clips to fall.

Thermal energy moves in solids by conduction, where heated molecules vibrate and jostle neighboring atoms, which takes time because this energy transfer is molecule to molecule

Thermal energy slowly spreads in the rod, away from the heat source

Hint Previous Give Up & View Solution Check Answer Next Exit

Problem Solving & Higher Order Thinking



Pool players often pride themselves on their ability to impart a large speed on a pool ball. In the sport of billiards, event organizers often remove one of the rails on a pool table to allow players to measure the speed of their break shots (the opening shot of a game in which the player strikes a ball with his pool cue). With the rail removed, a ball can fly off the table, the distance the pool ball lands from the table indicates the initial speed of the ball. As the only participant with a physics background, they have placed you in charge of determining the speed of the players' break shots.

v_0

2.80 m

13.00 m

The top of the pool table is 2.80 m from the floor. The placement of the tape is such that 0 meters aligns to the edge of the table (as shown). The winner of the competition wants to know if he has broken the world record of 32 m/s. His ball landed a distance 13.00 m from the table edge. Calculate his break shot speed (initial velocity).

In calculations, use 9.8 m/s^2 for the value of acceleration due to gravity (g). Neglect friction.

Number

m/s

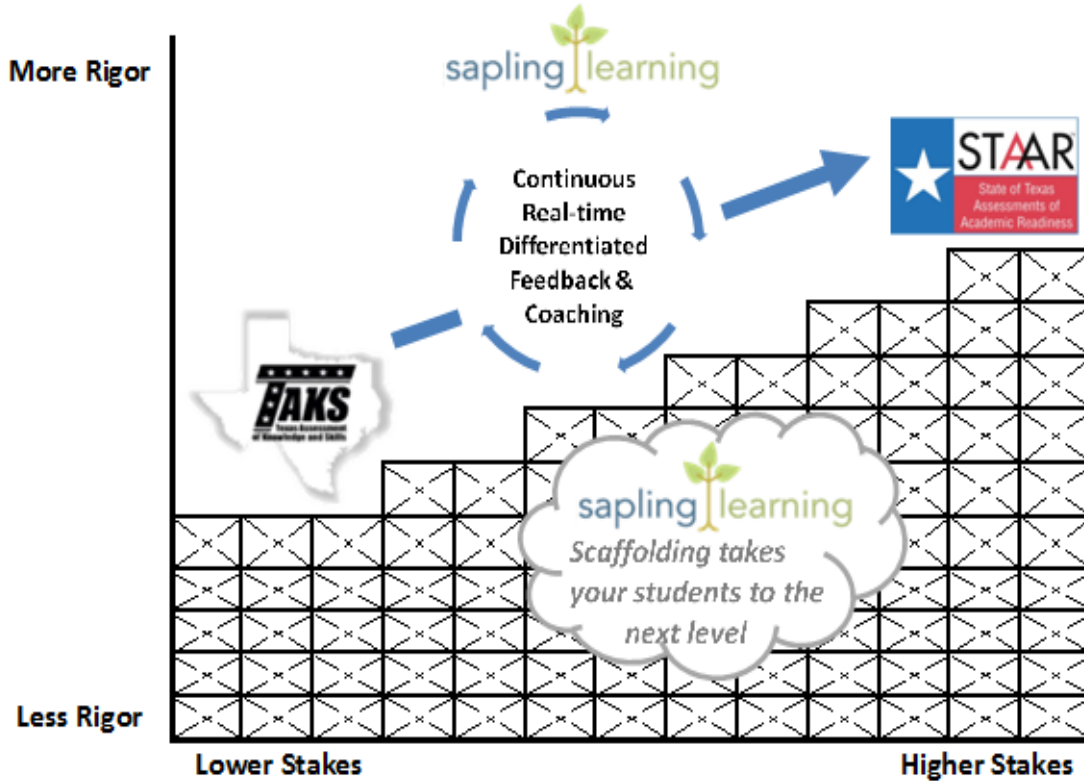
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Supplemental Science Evaluation Guide – Sapling Learning

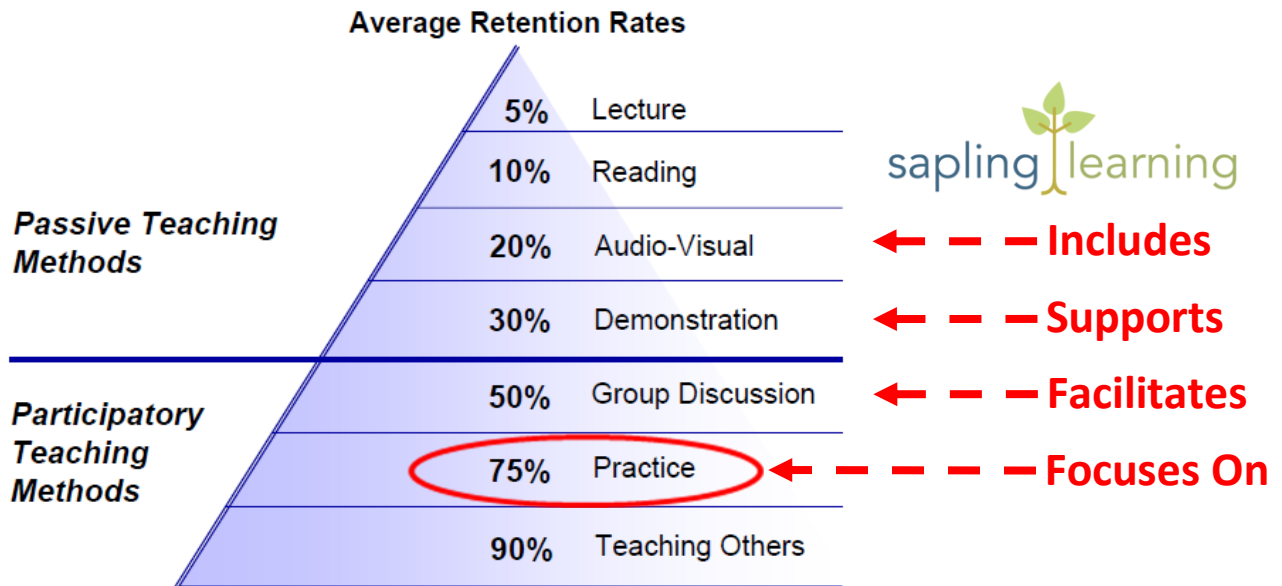
Rigor, Scaffolding, and Retention

RIGOR + SCAFFOLDING = SUCCESS

- Sapling Learning provides continuous feedback & coaching, keeping students engaged in the learning process!



THE LEARNING PYRAMID*



*Adapted from National Training Laboratories. Bethel, Maine

Sapling Learning increases engagement, retention and success

Supplemental Science Evaluation Guide – Sapling Learning

Provides Differentiated Learning Experiences

Differentiated, real-time feedback and coaching = a unique learning path for each student

- Provides context sensitive feedback, coaching and hints
- Students follow their own unique learning paths through the program
- Provides instant, targeted instruction

Multiple attempts w/ coaching:

Multiple Classroom applications and Uses

- Online homework or quiz
- Short-cycle formative assessments
- STAAR End of Course review and practice tests
- Targeted benchmarking of instruction across all High School TEKS – readiness and supporting standards
- Unit of Study pre- and post- tests
- Supplement instruction by textbook, EOC reporting category, TEKS, subject/strand, and district scope & sequence

Program Flexibility

- **Delivered:** 100% online OR free print on demand
- **Assign in:** Practice/review/mastery OR test/assess modes
- **Easily add:** links to web-based instructional resources in student assignments
- **Customize:** edit questions and assignments; author your own questions
- **Supports:** whole class > small group > individual instruction
- **Create:** formative, summative and benchmark assessments using item bank
- **Aligned to:** adopted textbooks, STAAR blueprints, TEKS, and easily aligned to each district's scope and sequence or CSCOPE

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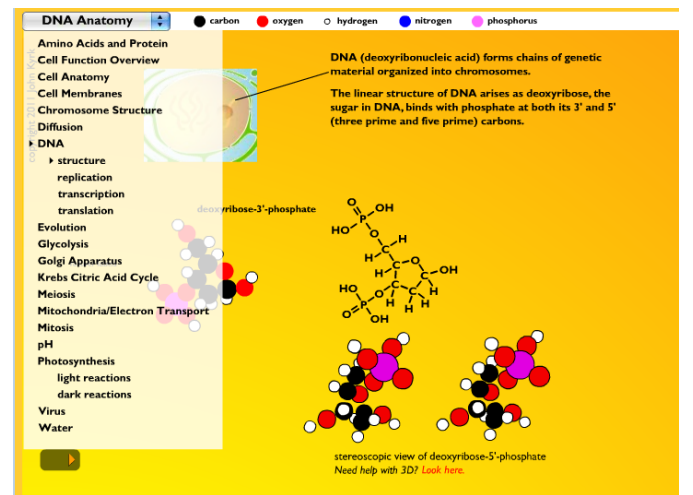
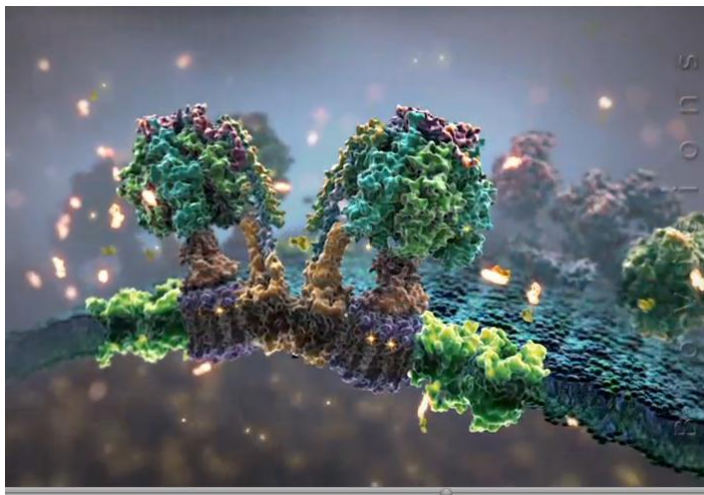
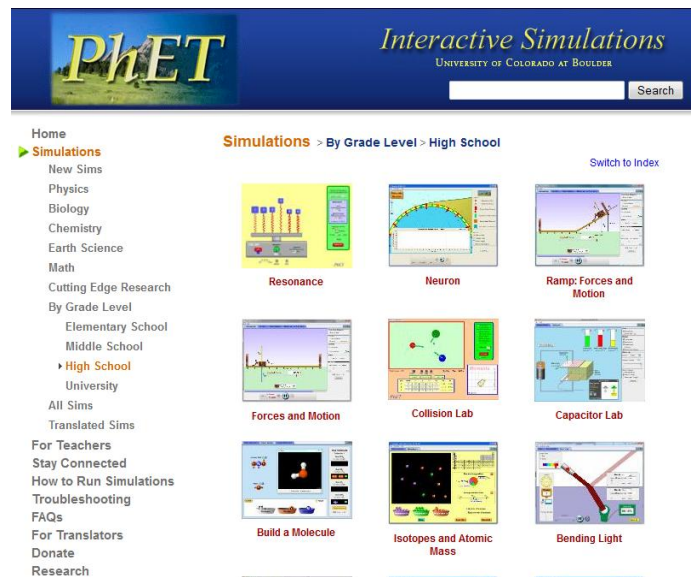
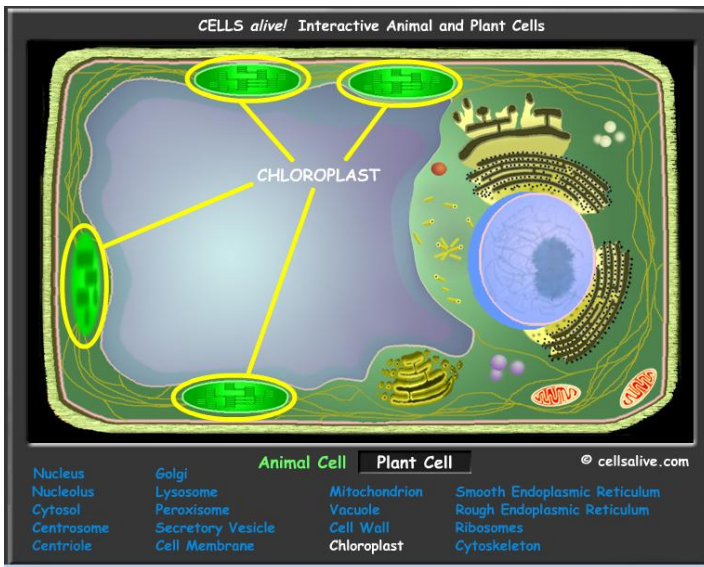
Video and Interactive Media Instructional Support Resources

Provides access to the broadest and deepest array of high quality scientific videos and interactive activities:

Program includes videos, animations, and multi-media components providing students with an interactive and engaging experience in the learning process.

The Sapling teacher's forum provides access to a curated resource of hundreds of hand selected science videos and interactive lessons from a professional network of teachers, professors, and scientists organized by subject and strand which can be downloaded and viewed locally. Includes publishers such as:

- The BBC
- Harvard
- MIT Open Courseware
- University of Colorado
- Kahn Academy
- iTunesU



- ✓ Library always being updated with new, high quality video and interactive resources
- ✓ Teachers can recommend and refer new sites and resources for inclusion in Sapling's Freesources site

Supplemental Science Evaluation Guide – Sapling Learning

Addresses the transition from TAKS to the more rigorous, higher stakes STAAR EOC Assessments:

<p>Content Aligned to the STAAR Blueprints</p>	<p>Content, activities, and problems are organized by STAAR Blueprint reporting category</p> <ul style="list-style-type: none"> ➤ Scientific Process Skills content included in at least 40% of questions ➤ Identifies both Readiness and Supporting standards ➤ Includes 2 complete sets of practice and review problems/interactive activities for each Blueprint reporting category in Biology, Chemistry, and Physics 																																																																						
<p>Includes Practice EOC assessment</p>	<p>Includes a Practice EOC assessment for Biology, Chemistry, and Physics aligned to the current TEA blueprints</p> <table border="1" data-bbox="500 569 1468 1136"> <tr> <td colspan="5">Scientific Process Skills is not a separate reporting category. These skills will be incorporated into at least 40% of the test questions from reporting categories 1–5 and will be identified along with the content standards.</td> </tr> <tr> <th>Reporting Categories</th> <th colspan="2">Number of Standards</th> <th colspan="2">Number of Questions</th> </tr> <tr> <td rowspan="3">Reporting Category 1: Matter and the Periodic Table</td> <td>Readiness Standards</td> <td>4</td> <td rowspan="3">12</td> <td rowspan="3"></td> </tr> <tr> <td>Supporting Standards</td> <td>3</td> </tr> <tr> <td>Total</td> <td>7</td> </tr> <tr> <td rowspan="3">Reporting Category 2: Atomic Structure and Nuclear Chemistry</td> <td>Readiness Standards</td> <td>2</td> <td rowspan="3">9</td> <td rowspan="3"></td> </tr> <tr> <td>Supporting Standards</td> <td>6</td> </tr> <tr> <td>Total</td> <td>8</td> </tr> <tr> <td rowspan="3">Reporting Category 3: Bonding and Chemical Reactions</td> <td>Readiness Standards</td> <td>5</td> <td rowspan="3">14</td> <td rowspan="3"></td> </tr> <tr> <td>Supporting Standards</td> <td>5</td> </tr> <tr> <td>Total</td> <td>10</td> </tr> <tr> <td rowspan="3">Reporting Category 4: Gases and Thermochemistry</td> <td>Readiness Standards</td> <td>2</td> <td rowspan="3">8</td> <td rowspan="3"></td> </tr> <tr> <td>Supporting Standards</td> <td>6</td> </tr> <tr> <td>Total</td> <td>8</td> </tr> <tr> <td rowspan="3">Reporting Category 5: Solutions</td> <td>Readiness Standards</td> <td>4</td> <td rowspan="3">9</td> <td rowspan="3"></td> </tr> <tr> <td>Supporting Standards</td> <td>6</td> </tr> <tr> <td>Total</td> <td>10</td> </tr> <tr> <td>Readiness Standards</td> <td>Total Number of Standards</td> <td>17</td> <td>60%–65%</td> <td>31–34</td> </tr> <tr> <td>Supporting Standards</td> <td>Total Number of Standards</td> <td>26</td> <td>35%–40%</td> <td>18–21</td> </tr> <tr> <td colspan="4">Total Number of Questions on Test</td> <td>47 Multiple Choice 5 Griddable 52 Total</td> </tr> </table>	Scientific Process Skills is not a separate reporting category. These skills will be incorporated into at least 40% of the test questions from reporting categories 1–5 and will be identified along with the content standards.					Reporting Categories	Number of Standards		Number of Questions		Reporting Category 1: Matter and the Periodic Table	Readiness Standards	4	12		Supporting Standards	3	Total	7	Reporting Category 2: Atomic Structure and Nuclear Chemistry	Readiness Standards	2	9		Supporting Standards	6	Total	8	Reporting Category 3: Bonding and Chemical Reactions	Readiness Standards	5	14		Supporting Standards	5	Total	10	Reporting Category 4: Gases and Thermochemistry	Readiness Standards	2	8		Supporting Standards	6	Total	8	Reporting Category 5: Solutions	Readiness Standards	4	9		Supporting Standards	6	Total	10	Readiness Standards	Total Number of Standards	17	60%–65%	31–34	Supporting Standards	Total Number of Standards	26	35%–40%	18–21	Total Number of Questions on Test				47 Multiple Choice 5 Griddable 52 Total
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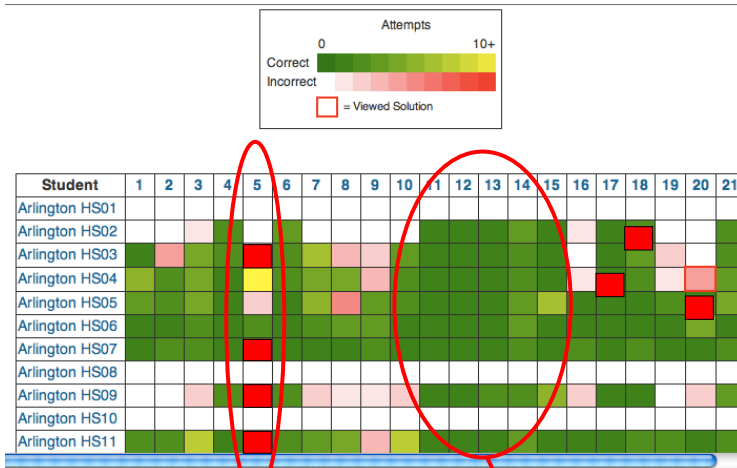
Student and Class Progress and Performance Reports:

Individual Student STAAR EOC report sample

Grade Item	Grade	Range	Percentage	Feedback
Austin ISD - Lanier High School - Chemistry				
Practice				
Practice	- 66	0.0–100.0	-	
Category total	-	0.0–100.0	-	
Prerequisites				
Math	- 81	0.0–100.0	-	
Category total	-	0.0–100.0	-	
EOC				
Scientific Process Skills	- 68	0.0–100.0	-	
Scientific Process Skills 2	- 73	0.0–100.0	-	
Matter and the Periodic Table	- 81	0.0–100.0	-	
Matter and the Periodic Table 2	- 86	0.0–100.0	-	
Atomic Structure and Nuclear Chemistry	- 58	0.0–100.0	-	
Atomic Structure and Nuclear Chemistry 2	- 79	0.0–100.0	-	
Bonding and Chemical Reactions	- 84	0.0–100.0	-	
Bonding and Chemical Reactions 2	- 92	0.0–100.0	-	
Gases and Thermochemistry	- 70	0.0–100.0	-	
Gases and Thermochemistry 2	- 86	0.0–100.0	-	
Solutions	- 75	0.0–100.0	-	
Solutions 2	- 89	0.0–100.0	-	
Practice EOC Exam	- 80	0.0–100.0	-	
Category total	-	0.0–100.0	-	
Course total	-	0.0–100.0	-	

Sample Class Mastery Report

- ✓ Provides meaningful analysis of real-time individual and group performance
- ✓ Allows for just-in-time teaching and targeted remediation



Many students are struggling with item #5

Most students have mastered items 11, 12, 13, 14 & 15

Supplemental Science Evaluation Guide – Sapling Learning

Addresses the transition from TAKS to the more rigorous, higher stakes STAAR EOC Assessments:

<p>Supports the 5-E Model</p>	<p>Engagement - activities are interactive and engage the student into an active learning process. Activities can be graded, with points contributing to a course grade providing effective student motivation.</p> <p>Exploration - provides a wide variety of activities and exercises. In some cases it directs the student to explore a topic using external resources such as the internet. In other cases it provides the opportunity for the student to explore a concept through a video or animation embedded within a question.</p> <p>Explanation – Students can be assigned graded essays or be placed in graded discussion groups that are assigned the task of explaining a scientific concept. Each activity includes detailed explanations should the student be unable to solve the problem. This includes real-time differentiated coaching and feedback that provides context sensitive tips and hints to students as they work through problems as well as detailed solutions.</p> <p>Elaboration – Multiple activities can be assigned with varying difficulty level, such that students can apply knowledge gained from the first one to a more challenging follow-up activity. Teachers can provide links to high quality external learning resources organized by topic/concept area as additional learning resources. Students can be assigned participation in graded discussion groups where they elaborate on learned concepts.</p> <p>Evaluation – The homework-style activities are learning experiences that both assess student knowledge and teach through specific feedback and coaching. Sapling can deliver quizzes and tests for formative, summative, and benchmark assessments. The grade-book and performance dashboard gives teachers the ability to evaluate the strengths and weaknesses of each student, as well as their class as a whole, affording intervention and just-in-time teaching. Sapling covers 100% of the HS Science TEKS. Students also get feedback on their performance, and can be given additional opportunities to improve their score and comprehension.</p>																																				
<p>Includes Griddable response questions (Chemistry & Physics)</p>	<p>Includes several practice problems to help students master the NEW Griddable response question format delivered online or in printed form:</p> <div data-bbox="641 1270 1218 1690" style="border: 1px solid gray; padding: 10px;"> <p style="text-align: center;">Suppose that you've done a calculation and the answer is: 0.534 Fill in that answer in the space provided as if this were a paper-and-pencil exam.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>+</td> <td>0</td> <td>.</td> <td>/</td> <td>%</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>⊕</td> <td>⊖</td> <td>⊙</td> <td>⊘</td> <td>⊚</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>⊖</td> <td>⊕</td> <td>⊙</td> <td>⊘</td> <td>⊚</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> </tr> <tr> <td></td> <td>⊕</td> <td>⊙</td> <td>⊘</td> <td>⊚</td> <td>8</td> <td>9</td> <td></td> <td></td> </tr> </table> </div>	+	0	.	/	%					⊕	⊖	⊙	⊘	⊚	0	1	2	3	⊖	⊕	⊙	⊘	⊚	4	5	6	7		⊕	⊙	⊘	⊚	8	9		
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Supplemental Science Evaluation Guide – Sapling Learning

Program Features/Benefits:

ELL/ESL Support

Pre-requisite knowledge and teacher support materials to facilitate differentiated instruction and support for a diverse student population. Provides access to high quality publicly available vocabulary translation tools like this **Vocabulary translation tool**:



College & Career Readiness

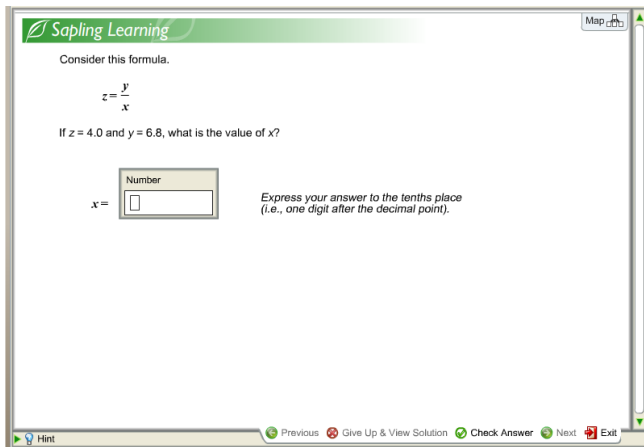
Sapling clearly understands the requirements and expectations of freshmen entering college. Since 2000, Sapling has been one of the leading providers of online supplemental science solutions for higher education. **Sapling's higher education science programs have been adopted by** professors at hundreds of Universities across the country including:

- The University of Texas Austin
- Texas A&M
- Baylor University
- University of North Texas
- Duke University
- Arizona State University
- Florida State University

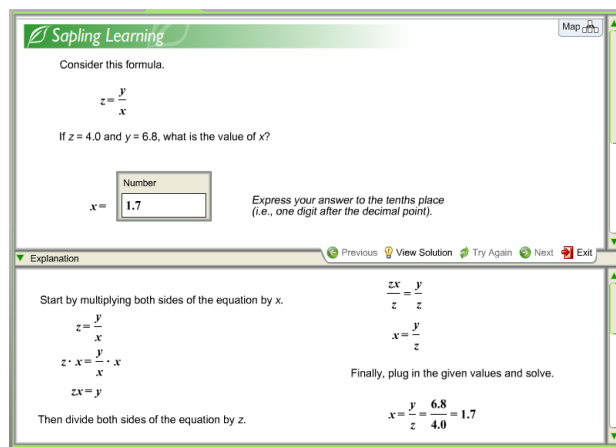
Pre-requisite Math Skills

Includes a pre-requisite **Math Skills Assessment** that can be used to assess each student's math skills and provide review/remediation if necessary.

MATH ASSESS:



MATH REVIEW:



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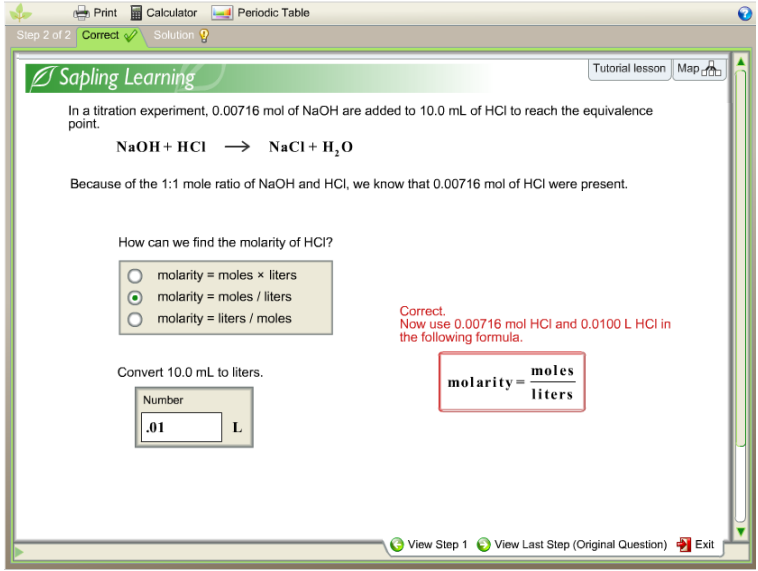
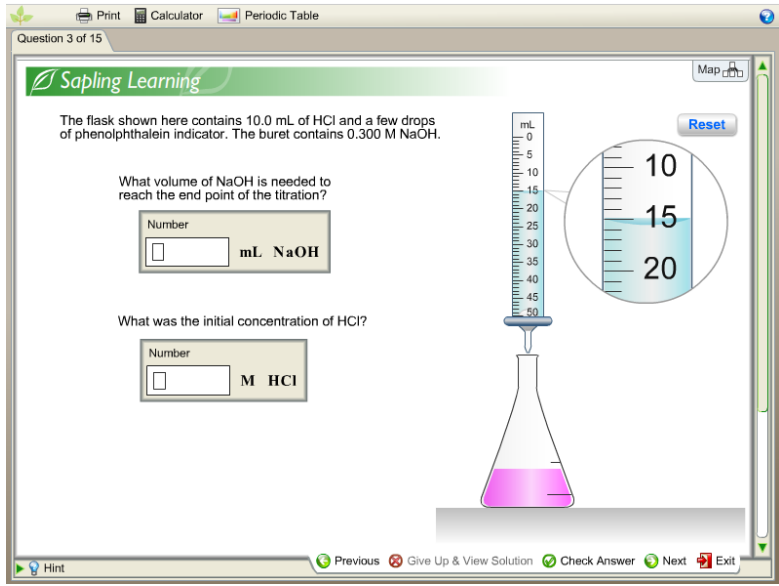
Classroom Applications/Uses:

<p>Review</p>	<ul style="list-style-type: none"> ➤ Ideal for Exemplars – Teachers Introduce or Review Concepts ➤ Multiple hints and coaching can be turned on so the program can provide a guided review and practice for the students
<p>Promotes higher order thinking and Problem Solving skills</p>	<ul style="list-style-type: none"> ➤ Program is focused on developing problem solving skills ➤ Includes Socratic style scaffolding and context sensitive coaching and hints while enabling students to learn each topic regardless of where they are in the learning process
<p>Pre-lab Preparation</p>	<ul style="list-style-type: none"> ➤ Review TEKS standards and concepts being covered in the lab ➤ Includes interactive animations simulating a lab experience
<p>Instructional Support</p>	<ul style="list-style-type: none"> ➤ Teacher materials, lesson plans, class notes, and other support materials can all be uploaded into Sapling’s application, so the students have access to all of the course material in one location 24 x 7. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>1 Year-Long Resources</p> <p>Material specific to units of chemistry we are studying can be found further down this webpage. These resources will be vital to your success throughout the entire year.</p> <p>Welcome to Academic Chemistry</p> <ul style="list-style-type: none"> Academic Chemistry Syllabus Policies and Procedures All About You <p>Laboratory</p> <ul style="list-style-type: none"> Laboratory Safety Contract Laboratory Report Grading Criteria and Rubric <p>General References</p> <ul style="list-style-type: none"> SI Dimensions, Units, and Symbols Math Review </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>2 First Six Weeks</p> <p>Unit 1: Matter</p> <p>We will start Chemistry by exploring the properties and building blocks of matter.</p> <p>Introduction</p> <ul style="list-style-type: none"> States of Matter Simple Phase Change Animation Phase Change Simulations: Molecular Views Introduction to Matter <p>Density</p> <ul style="list-style-type: none"> Density Demonstration Density Problems </div>

Content:

<p>Easy to comprehend</p>	<p>Although rigorous by design, the Sapling application is interactive, engaging and has built-in scaffolding/hints and coaching to support students who are struggling while facilitating the learning process.</p>
<p>Aligned with the most recent - 2010 TEKS</p>	<p>Sapling’s content was built specifically for the 2010 TEKS.100% alignment to all High School Science TEKS in Biology, Chemistry, Physics, and Integrated Chemistry & Physics (IPC).</p>
<p>Requires active learning on the part of student</p>	<p>The content is engaging, interactive and requires action and higher level thinking on the student’s part. Student progression and choice selections are reported for each item.</p>

Supplemental Science Evaluation Guide – Sapling Learning

<p>Tutorials</p>	<p>Includes multi-step tutorial lessons</p> 
<p>Drill & Practice</p>	<p>Multiple applications including:</p> <ul style="list-style-type: none"> ➤ Online homework or quiz ➤ Short-cycle formative assessments ➤ STAAR End of Course review and practice tests ➤ Targeted benchmarking of instruction across all High School TEKS – readiness and supporting standards ➤ Unit of Study pre- and post- tests ➤ Supplement instruction by textbook, EOC reporting category, TEKS, subject/strand, and district scope & sequence
<p>Simulations</p>	<p>Interactive items/simulations Engaging TEKS aligned questions with interactive simulations and virtual experiments</p> 

Supplemental Science Evaluation Guide – Sapling Learning

Interactive features including observations and experiments

Requires active learning on the part of student

The content is engaging, interactive and requires action and higher level thinking on the student's part. Student progression and choice selections are reported for each item.

Question 2 of 17

Sapling Learning

A flower is a reproductive organ of some seed plants. The flower consists of specialized structures that aid in plant reproduction. Label the image of the flower shown below with the correct names provided.

Structure Names:

- anther
- stigma
- sepal
- filament

Previous Give Up & View Solution Check Answer Next Exit

Question 2 of 18

Sapling Learning

A radiometer is a common physics novelty item. Light shines through both the air and the glass and causes the paddles to spin. When light strikes the white side of the paddles, it is reflected. When light strikes the black side of the paddles, it is absorbed, causing the black surface to heat up. The black heated surface heats up nearby air molecules, which then move faster and bounce off the black surface with greater speed and momentum, pushing on the paddle.

Investigate light changes in radiometry behavior by turning the flashlights on and off. Record your observational data below:

both off one on both on

slow rotation no rotation fast rotation

What conclusion can you draw based upon your data? (Select all that apply.)

- The amount of thermal energy that is converted to the kinetic energy of the radiometer vane is dependent upon the amount of thermal radiation.
- Thermal radiation can be transmitted through both gases (the air) and solids (the glass of the radiometer).
- The amount of thermal energy that is converted to the kinetic energy of the radiometer vane is unaffected by the amount of thermal radiation.

Which kind of thermal energy is being transmitted from the flashlight to the radiometer?

- conduction
- radiation
- convection

Previous Give Up & View Solution Check Answer Next Exit

Sapling Learning

Use volume displacement to determine the volume of this metal sample. Be sure to report your volumes to the nearest 0.1 mL.

Number

$V_{\text{initial}} =$ mL

Number

$V_{\text{final}} =$ mL

Number

$V_{\text{metal}} =$ mL

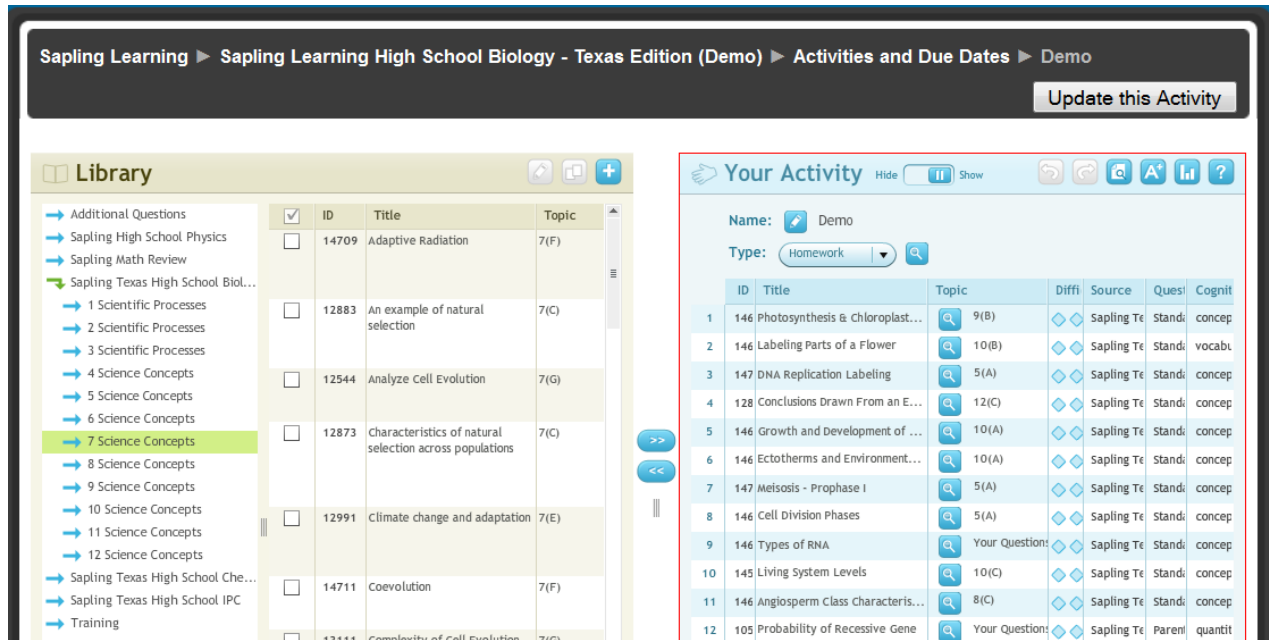
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Supplemental Science Evaluation Guide – Sapling Learning

Formative Assessment

Use Sapling’s existing content for formative, summative and benchmark assessments.

- Daily, weekly, and/or periodic short-cycle formative assessments with reports
- Hints and coaching are turned off to measure differentiated instruction effectiveness and cumulative progress monitoring of student & class TEKS and EOC mastery
- Create custom assessments and author your own content within the Sapling application



Ease of Use:

Easy Navigation	Intuitive user interface
Students can exit with saved information at anytime	Students access through their browser to access their continuing path in Sapling Learning. All work is saved upon their exit and students may return to their work upon their next login to the internet portal.
Immediate Positive & Corrective Feedback	The Sapling program provides positive feedback and has unique scaffolding/hinting capabilities based on specific choices made by the student to help students who may be struggling with specific concepts.
Flexible Instruction Capabilities Whole Class Small Group Individual	<ul style="list-style-type: none"> ➤ Assign in: Practice/review/mastery OR test/assess modes ➤ Easily add: links to other web-based instructional resources to student assignments ➤ Supports: whole class > small group > individual Instruction ➤ Create: formative, summative and benchmark assessments for the individual, class or subject scope and sequence using our extensive item bank ➤ Model: through group discussion the process, concepts and articulation of best answer choices