

The Hybrid Teaching Model

submitted to

South Dakota Community Foundation

in fulfillment of

Bush Community Grant

by

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PAST Foundation
2016



SANFORD
RESEARCH



**SOUTH DAKOTA
STATE UNIVERSITY**

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Introduction

In 2015, South Dakota Innovation Lab (SDIL) was awarded a Bush South Dakota Community Foundation grant for the purpose of piloting a Hybrid teaching system that incorporates technology and prototypes a model for integrating content and problem-based instructional strategies alongside hybrid delivery for pre-service teachers. The proposal comes from a five year quest to address several critical issues facing education in rural America.

In 2009, South Dakota answered the Race to the Top (RTTT) challenge from the US Department of Education's Director Arnie Duncan and President Barack Obama by designing a number of solutions that addressed

- underserved student populations in rural and reservation instances,
- geographical challenges to 21st century education in rural America,
- need to strengthen the pipeline for STEM workforce development, and
- critical situation regarding the lack of teachers in rural schools.

The proposed solutions were delineated in a proposal for RTTT funding. Although not funded, the South Dakota proposal provided a roadmap for addressing the problems. As a result, a number of partners, including Sanford Health, Mid Central Educational Cooperative, and the PAST Foundation formed a partnership, SDIL to respond to the issues and develop actionable pathway solutions. In 2011, SDIL tackled changing the conversation around instructional strategies and began working with four school districts, Armour, Platte-Geddes, South Central, and Wessington Springs, providing professional development around transdisciplinary problem-based learning (TPBL), a foundational component of STEM education. Sanford *Promise*, provided expertise and science equipment for participating teachers. PAST Foundation, a national leader in STEM, provided professional development. All partners worked with the South Dakota Department of Education (SDDOE) to insure that proposed training and strategies dovetailed with SDDOE goals and established programs. Within two years of initiating the TPBL professional

There is too little focus on “process” in the debate today. Improving system performance ultimately comes down to improving the experience of students
Mourshed et al 2010

There are plenty of success stories in America's schools, but successful efforts that emerge in one locale are too rarely replicated elsewhere.
Jan Rivkin 2014

development, SDIL had reached out to 68 schools across the state.

At the same time that SDIL was changing the conversation around instructional strategies, the group also tackled using transdisciplinary problem-based learning to address relevant issues in communities and workforce as a way of strengthening the pipeline for STEM workforce development. SDIL, as a cooperative effort, built professional development by linking cultural and instructional strategies to help teachers address real problems that resonated with community and workforce. Teachers across South Dakota began to build experiential learning projects that pivoted on real issues and students began creating tangible products to demonstrate learning. After tackling instructional and cultural strategies in schools across South Dakota, SDIL began to prototype models for addressing the last two big problems facing rural education — geographical distance and the critical number of teaching vacancies in rural schools. SDIL and its participating schools developed the teaching model called “Hybrid,” which combined multiple teachers in the same class employing TPBL instructional strategies, relevant community/workforce problems as cultural strategies, and hybrid teaching teams to deliver innovative learning. The first two schools to create hybrid teaching teams were Armour and Bonesteel (South Central). Armour combined Biology and English in a single class. Bonesteel combined an English teacher, a Math teacher, and a Science Paraprofessional to teach Science with the Science teacher from Armour as the ‘Teacher of Record’. Both programs were highly successful as both teachers and students transitioned to the new strategies and delivery.

Armour continued to beta test Hybrid expanding to two schools in the third year and three schools in the fourth. Through lessons learned the SDIL team began to see how employing differing technologies and expanding through pre-service development the Hybrid program could reach greater distances and more schools.

In 2012, PAST Foundation on behalf of SDIL partnered with the Clinton Global Initiative (CGI) to set about changing strategies and delivery in rural schools creating a model that others

...in South Dakota right now is a perfect storm scenario. We're not attracting enough new teachers and we are losing veterans in key areas.

Education News 2014

Teachers represent the largest workforce in the United States but over 45% leave the profession after only 5 years.

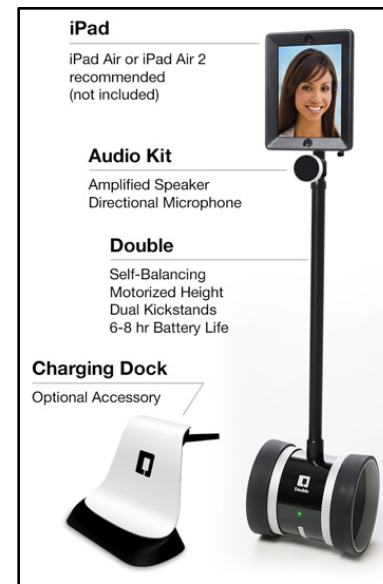
*US Bureau of Labor Statistics
2014*

could emulate. By 2015, former president, Bill Clinton, at the annual CGI America, recognized the work being done in South Dakota schools as a model to follow. The same year President Obama in the White House Summit on Redesigning High School cited the Hybrid program in South Dakota, as a game changer for rural STEM education. Over the short time span of five years SDIL and its programs have tirelessly continued the four critical challenges set forth in 2009.

In 2015, SDIL through its partners the PAST Foundation and South Dakota State University, decided to leverage the lessons learned from the first five years and once again modify Hybrid to reach the final critical challenge — to cost effectively and efficiently deliver rigorous and relevant STEM learning across broad geographical distances while creating a model that can be used in post secondary programs to train new teachers. These ambitious goals also are intended to strengthen the educational workforce pipeline in South Dakota. At this juncture SDIL and its partners turned to the Bush South Dakota Community Foundation for support.

From the \$10,000 award, SDIL was able to plan and implement a model hybrid course for the 9th grade, as well as purchase a DoubleBot™ to facilitate the hybrid delivery and create marketing materials for hybrid to explain how it works.

The 2015/2016 hybrid course reached out to Armour and Mt. Vernon High Schools from the Burke High School 9th grade's Physical Science Course. The course placed one teacher physically in the class and brought in two other teachers, virtually. South Dakota veteran hybrid teachers, Jeff Schneider (Science) and Mary Schneider (ELA/Social Studies) along with PAST mathematics teacher, Heather Kellert made up the Hybrid teaching team. Together they provided the 9th grade with a fully integrated course using TPBL instructional strategies to deliver all content simultaneously. Using Doublebot™, Zoom™, and Swivl™ technologies



In 2012 the PAST Foundation and its partners committed to improve STEM education in rural and Native American reservation schools in South Dakota by equipping 450

all three teachers joined the students and worked with them as a group and individually one-on-one. Other open source freeware, such as Edmodo™, Google™, and private YouTube™ enabled the Hybrid teaching team to post assignments, collaborate, and communicate with students and parents on a regular and efficient basis, regardless of their physical location. The transparency in learning was unprecedented.

The following sections provide details of the 2015/2016 Hybrid program as supported by the Bush SD Community Foundation, the logical connectivity of Hybrid and its intended outcomes, as well as recommendations and aspirations for the future. The lessons learned and the established Hybrid systems approach to delivery are now ready to serve as full instructional and cultural model for South Dakota State University's pre-service training. The Hybrid model and recommendations presented in this report provide actionable pathways

- to better prepare new teachers,
- to establish a clear systems approach for taking theory to practice,
- to take full advantage of technologies and open source software for better training and better delivery, and
- to be the driving change agent in STEM learning in South Dakota.

Figure 1: Double Robot



Figure 2: Swivl



Figure3: Using zoom to bring in multiple teachers.

The Efficiencies of Hybrid

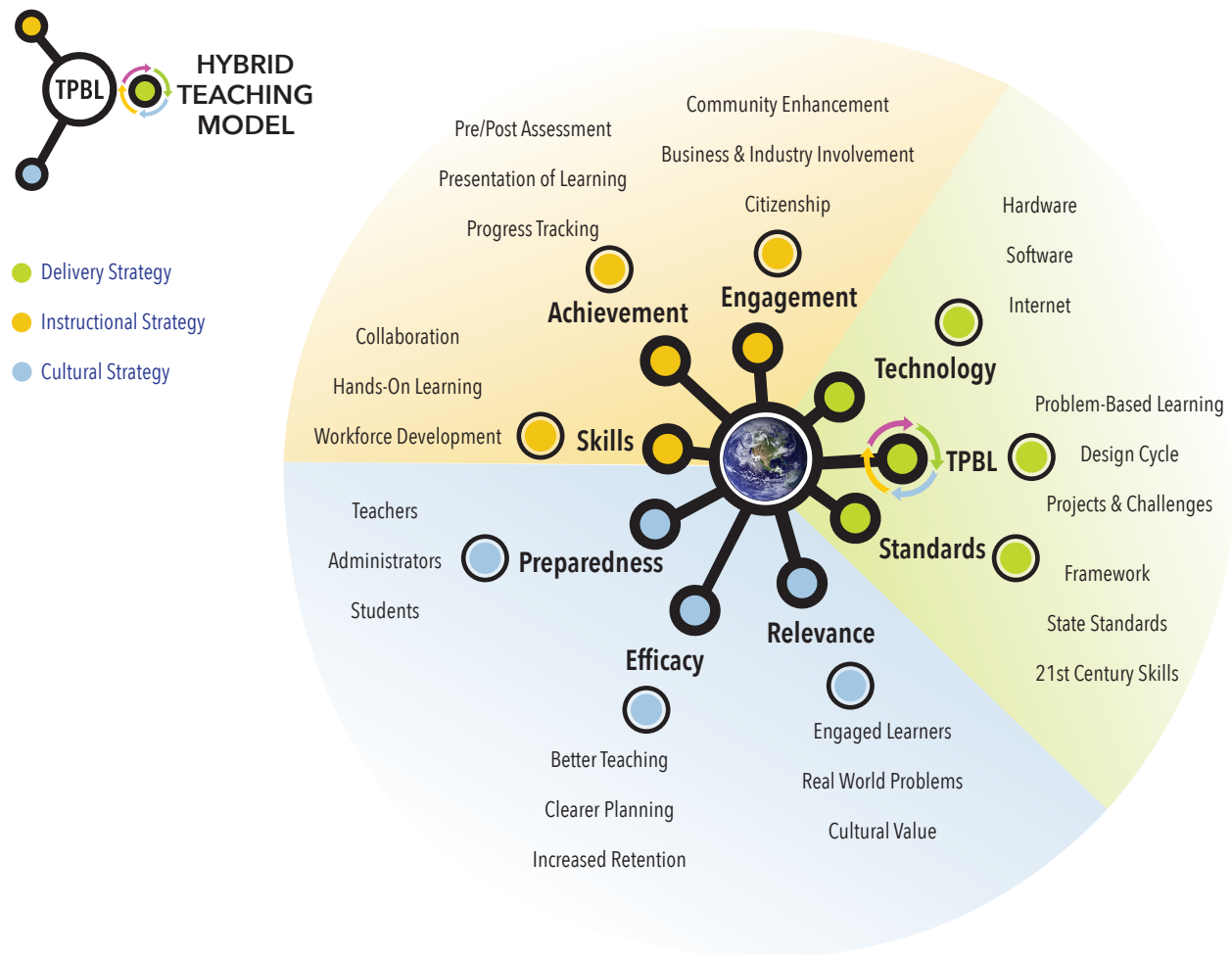


Figure 4: The Hybrid Teaching Model Holistic Approach and Outcomes

Hybrid Course Configuration

The concept of team teaching is not new nor is the use of technology in the classroom, but the South Dakota Hybrid takes known practices and combines them in an innovative way employing instructional strategies and delivery that is innovative and responsive to the needs of rural education.

Those components that make the South Dakota model innovative are the combination of transdisciplinary problem-based learning (TPBL) with multiple teachers simultaneously delivering content by wrapping all learning around problems and issues

that resonate with local communities. The hybrid team can reach across distances by incorporating technology that is both cost effective and easy to use. The model is further enhanced by providing pre-service teachers and para-professionals with opportunities, ongoing professional development, and mentoring that due to distance was not previously available.

In 2015/2016 school year through the Bush grant the hybrid program expanded to reach across three schools (Burke, Armour, and Mt. Vernon) with teachers from three different locations bringing expertise in science, math, social studies and English into a single class.

The class period is 90 minutes, scheduled for every other day. This particular Core Content Hybrid classroom was a completely integrated classroom with special education students as well as advanced study students. Two teachers are in the classroom with one teacher digitally present. Another similar hybrid classroom has one teacher in the classroom and two digitally present. The digital presence is accomplished through a suite of digital tools. The virtual teachers arrive via the use of Zoom™, a web based video conferencing tool that allows for teachers to share screens and communicate with the class or individual students. The class is also video recorded using Swivl™ with each day's recording uploaded to a private YouTube channel for students, staff, parents, and the general public to observe the class and/ or use as reference. Students and educators also utilize other devices for communication and classroom delivery.

After an initial introduction of the problem, teachers added content specific direction for the students to utilize in solving the problem. Students worked with the teachers directly or individually to create a rubric and product criteria sheet in order to best design a solution and products to demonstrate completion of the project and an ultimate solution to the problem



Figure 5: Student discussing problem with teacher via Doublebot.



Figure 6: Principles of Design used in problem-solving.

initially posed.

Students worked independently or collaboratively in order to investigate and design a solution to the given problem. Each teacher then worked individually with the students creating an individualized approach to the classroom. Teachers presented digitally and could be moved around the room either on a laptop or through the use of a Double Robot™. The initial goal was that any addressed Transdisciplinary problem can be solved and presented in a two-week rotation.

Students utilized the design cycle in their approach to solving any problem. Students received the problem, created a rubric and produced a criteria list in the brainstorm, and then in groups, or individually, designed and built the solution. Students were then expected to evaluate the solution to the problem, modify and eventually share the solution to an authentic audience.

The two week rotation schedule is flexible in order to accommodate school schedules, but with class time being utilized as work time, the amount of homework or outside of the class needs-to-be-met are limited. The two week rotation creates a sustainable length of time for students to remain at a high level of interest and yet accomplish the goal set forth to master the standards.

Access to the class is done in-person, through ZOOM™ or on the double robot in a 90-minute block schedule format. Students access class materials using Edmodo or Google Drive in a 1:1 classroom. Teachers utilize time before class and immediately following class to confirm and debrief the current day's plan. Most of the curriculum planning

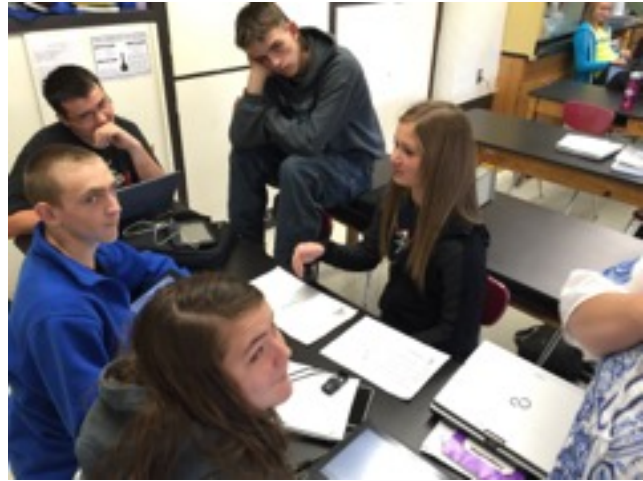


Figure 7: Students working on a project simultaneously with students in other schools

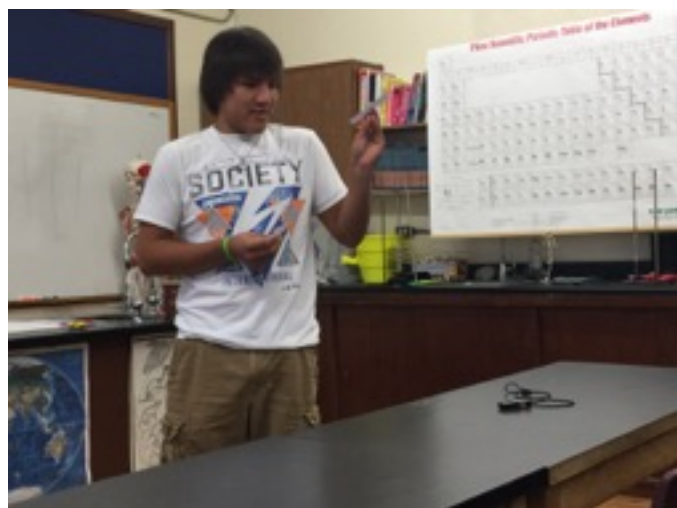


Figure 8: Student presenting project product for all the students across the the 3 schools.

was done during the summer using a back map and two week planners. Instructors also utilize ZOOM during planning time to modify or create lessons. Instructors also keep in contact via email and text messaging.

Workload

The pilot hybrid team spent a week together in early spring 2015 and laid out a general plan with problems for 16 modules, which would cover 32 weeks of school across all four quarters (Appendix A). Regular planning meeting with the three hybrid teachers enabled them to refine each two week module as well as reflect on progress and project modifications to delivery. While the initial planning took place in person, the subsequent planning meetings were virtual.

BACKMAP

THE PAST

FOUNDATION

QUARTER: 1

TEACHER(s): JSchneider, MSchneider, HKeller

SUBJECT(s): SDIL Hybrid 2015-16 AHS

PROBLEM / ISSUE:			
PROJECT: There's a Dead Teacher in the Lab!	PROJECT: What's for Dinner? Plants	PROJECT: How do we maintain a biome?	PROJECT: Super Plant
DATE/WEEK	DATE/WEEK	DATE/WEEK	DATE/WEEK
Observations Lab Notebooks	GMO research	Plot Samples in the Park	Dissect Plants Research plant parts and functions
DATE/WEEK	DATE/WEEK	DATE/WEEK	DATE/WEEK
Scientific Writing Scientific Method	Town Hall Debate on GMOs	Build a Bottle Biome	Design a Super Plant

Figure 9: Backmapped concepts for the first quarter

Unlike traditional instructional strategies where minimal planning is done in advance and correction of worksheets mounts throughout the quarter and year, the majority of

TPBL PROJECT SNAPSHOT		THE PAST FOUNDATION	
INSTRUCTOR:	GRADE LEVEL: 10	OTHER TEACHERS/SUBJECTS:	START DATE:
	SUBJECT: Bio, Humanities, Geometry		PRESENTATION:
Theme: Intro to plant biology and GMOs Overarching Question: Why are GMOs good, bad, or both?		Problem / Issue: How does Liz organize her time, and learn about GMOs?	
PROJECT OVERVIEW		ALIGNED STANDARDS	
PROJECT Activities: - Webquest - Write a summary of plant anatomies and processes - Lab activities - Debate on genetically modified organisms (GMOs) in form of town hall meeting with authentic audience (local members of community, some involved in agriculture) - Opinion essay on GMOs backed by research - Peer evaluations		What are the main arguments for and against GMOs? What information supports the continued use and/or the disuse of GMOs? How can we test the long-term effects of GMO use in our food supply?	
PRODUCTS Evidence of Learning: - Lab notebooks - Written summaries and essays - Debate performance		Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use geometric shapes, their measures, and their properties to describe objects Interpret complicated expressions by viewing one or more of their parts as a single entity Create equations and inequalities in one variable and use them to solve problems Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.	

Thus, there is no more to the workload of the hybrid teacher, the flow of the workload is different. Evidence over a number of years reveals that the workload better fits the energy level of teachers as they enter a new year.

Hybrid teaching provides a significant cost savings to any school district. It alters the configuration and type of teacher in the classroom. In schools that have adequate

numbers of teachers for their student population, hybrid teams add efficiencies and effectiveness to the delivery of content. In schools that do not have adequate coverage among their teachers, the hybrid model enables those schools to hire a pre-service teacher or para-professional to physically manage the classroom and work in collaboration with hybrid teams delivering the content. This is cost effective and allows schools to provide rigorous education regardless of their geographical location or available resources.

For schools delivering the hybrid content, the model can provide a source of income that offsets teacher salaries (Figure 11). In some schools, the cost of substitutes is radically reduced when the hybrid model is employed, as there is always a teacher in the classroom. Thus, the cost savings for reduced substitute teachers can be used elsewhere, such as off-setting the cost of planning.

However, regular and ongoing planning is a greater cost of time than money and requires schools to re-think scheduling and teacher time allotment. The highest level of success in planning for the hybrid course is a combination of initial multi-day PD for laying down the backbone plan of the following year, followed by weekly virtual meetings throughout the school year, and quarterly PDs during the school year that can be coordinated physically or virtually to solidify the upcoming 4 modules per quarter.

Marketing

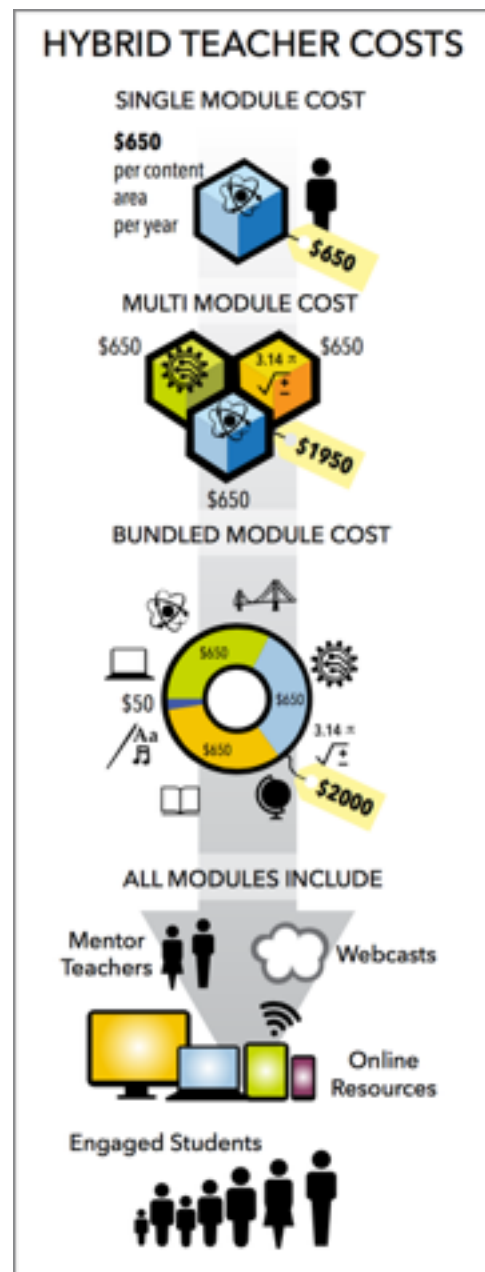


Figure 11: South Dakota cost for Hybrid program per student.

Marketing for Hybrid began almost immediately upon receipt of the grant and continued to be refined. In planning for marketing three important factors were defined as posing constraints to marketing.

1. How to visually show a Hybrid schedule to administrators,
2. How to present cost effectiveness of the hybrid model, and
3. How connect real people to the model so that administrators, teachers, and parents would not immediately jump to the conclusion that robots were supplanting teachers.

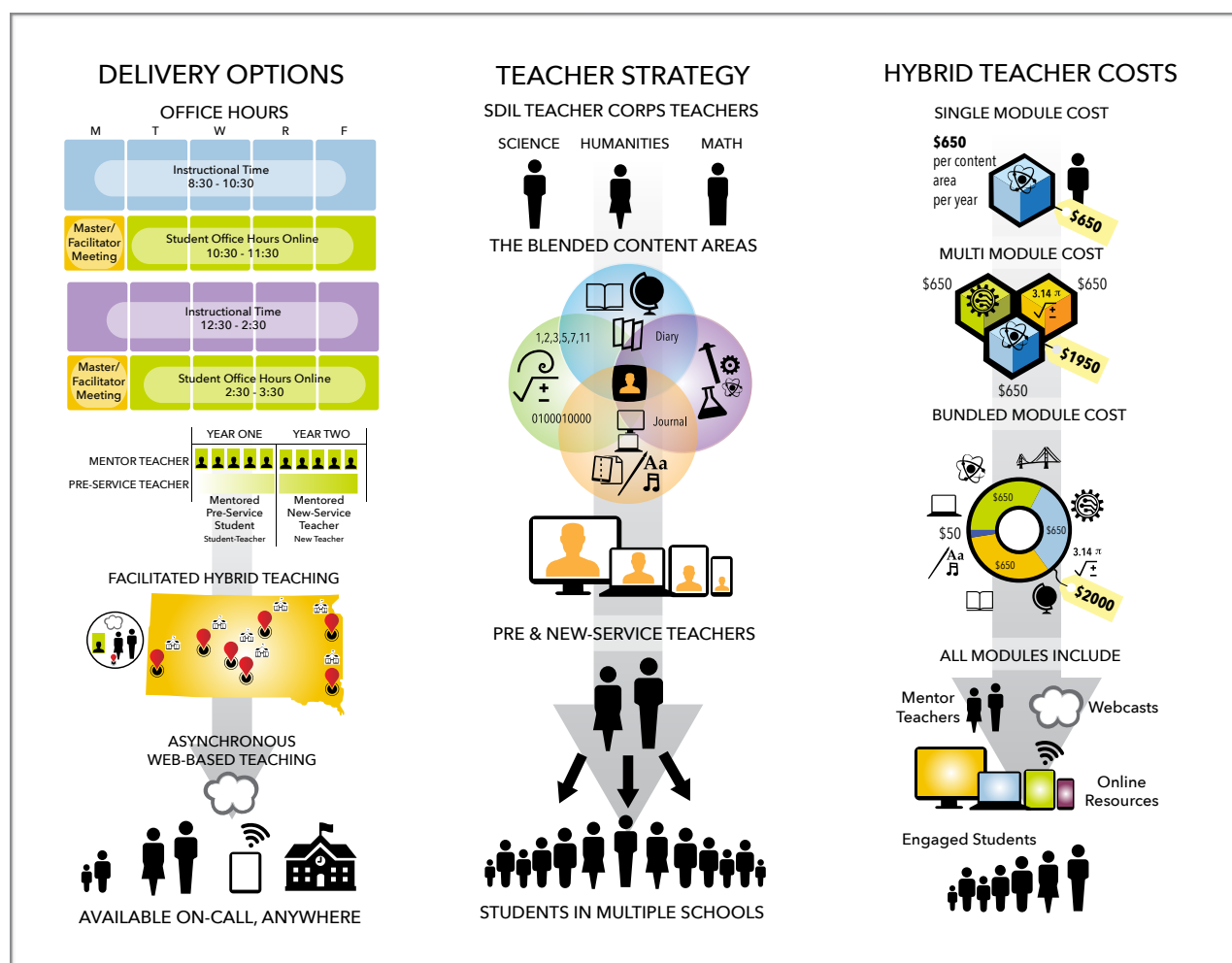


Figure 12: Hybrid marketing handout.

Impact

Evidence of impact was collected throughout each

and every project by regularly assessing the students through pre/post quizzes, the products produced at the conclusion of each project, regular standards-based testing, and finally a qualitative survey at the end of the year (Appendix B). PAST Foundation's research division worked with the teachers to design questions that would garner information that provides actionable pathways for continued refinement of the hybrid model and future responses to perceived constraints by students.

The results of the survey are summarized in Table 1, illuminating what students from the 2015/2016 program found most helpful and those things they struggled with as they transitioned from a traditional instructional strategy of textbook/lecture to problem-based instructional strategies and from a single silo content delivery to multiple contents and multiple teachers. Some of the most revealing comments centered around "no longer being able to hide in the class" and the rigor of problem-based learning where "getting used to modifying my work," posed a real challenge to students (2016 Survey). Some comments revealed the habits that students struggled to change, such as rote memorization. On the other hand if we look at the skills industry is looking for in today's workforce, such as problem solving and motivation then we also see through the survey responses that mastery of these skills were some of the proudest accomplishments the students noted.

It was hard because I was good at memorizing but PBL expanded my comfort zone.

I found myself doing extra work and I felt good about it.

Although the students noted that it took getting used to speaking to a person on a robot or computer they were not overly concerned with the use of technology. In truth, it was more difficult for them to use computers to do research and upload assignments, even though most of the schools in South Dakota have a 1:1 ratio of computers to students in high school. This reveals that a lot of school work is still being done on worksheets with paper and pencil, thus we are not preparing our students to use the tools they will need in their careers or how to use them effectively and efficiently.

Finally, a majority of student recognized the added complexity of looking at problems from multiple perspectives. For some this meant that all of their work was graded more closely, in that all content areas were examined through an ELA lens as well as a math, science, and social studies perspective. Obviously this was a new occurrence for many of them. For others, this new complexity and hands-on approach challenged their established status as “A” students. Problem solving required more and deeper thinking, which in some cases promoted other students who historically were lower test scorers.

Questions	Student Responses	
n = 29 responses		
What 3 things did you like about having multiple teachers in your classroom		
Could get help whenever you needed it and more than one student could get help	100%	
Could get multiple ideas by asking each teacher for help. Each teacher had a different skill that could be greatly used for help.	76%	
There were multiple points of view	59%	
What 3 things were hard to get used to about having multiple teachers in your classroom		
The assignments were more complex with multiple teachers. the variation of assignments.		76%
Paying attention to multiple opinions and asking multiple teachers questions for a single class		45%
The background noise can be a little overwhelming at times		38%
	Easy	Difficult
How easy or difficult was it for you to shift from a textbook-based class to problem-based class and why	37.5%	62.5%
	Yes	No
Nationally, there’s a known “wobble” when teachers and students change from textbook-based to problem-based learning. Do you think you’ve passed the “wobble” yet? For example is there a unit your particularly felt good about?	62%	38%

Table 1: Top results of student survey.

It is critically important that the greatest impact of the program relates to the students, but there were collateral impacts that need to be noted. For instance, by posting the daily classes on private YouTube, both students and their families could revisit what was gone over in class. A number of students noted that this was a positive feature of the Hybrid class. An equal number of parents brought up the YouTube feature in the parent

teacher conferences as being very helpful in their interactions with their children and understanding of what was being taught in class. As an evaluative feature, the recordings provide a transparency for administrative evaluation that is rare in education.

Another impact from Hybrid is the cost savings to schools. Although Burke declined to award their students credit for all the content areas, the students successfully mastered multiple contents in the single class. Thus, a single school or combination of schools through Hybrid can provide a full class of students with all four core content through as few as three teachers. Variations on the 2015/2016 hybrid pilot utilized pre-service teachers, new service teachers and para professionals to physically manage the classrooms while bringing in the core content from hybrid teachers in other classrooms. In addition to the cost saving for districts in salaries there is often a cost savings in the number of substitute teachers needed throughout the year. Recent studies show that the average American teacher takes over seven days off per year over and above holidays and other scheduled days off (Kronholz 2013). Although many rural schools chose to not use substitutes and instead shuffle students around when a teacher is absent, this is also alleviated with the Hybrid model. Students noted that there was never a day when one of the teachers wasn't present and they liked being able to continue working on their projects instead of "meaningless worksheets."

Finally, the opportunity to further refine the Hybrid model and create a roadmap for training future teachers, is a very important outcome of the project. Both Jeff and Mary Schneider leveraged the experience of creating a viable Hybrid model that can be taken to scale and attained Master degrees in STEM Instruction from Dakota Wesleyan University, while Heather Kellert is taking the experience into her doctoral work in mathematics at the Ohio State University. The outcomes of this project will resonate as Jeff and Mary join the faculty of South Dakota State University's Education Department and begin mentoring young pre-service teachers using the strategies and delivery mechanisms developed through the Hybrid model. This alone will have a lasting impact on South Dakota education.

Recommendations

The Hybrid model developed in South Dakota is hailed as one of the most innovative strategies on educational landscape, yet as Jan Rivkin noted in the *Time to Reinvent Business-Education Partnerships in America* report of 2014, many successful strategies are being developed around the nation but not replicated and modified to address the growing needs of education.

The Hybrid model piloted in 2015/2016 has great potential and is highly versatile in way it can be formed to address the specific needs of community. The following recommendations are two fold;

1. Scale the pre-service program using the technology and strategies to prepare young teachers to deliver rigorous and relevant content, and
2. Scale the Hybrid model across schools in rural locations by offering an incentive year of support that partners K12 with Post Secondary and community partners as well as provide to participating administrators and teachers the professional development and support needed to make successful transitions and collect evidence that informs the process.

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Appendix A: TPBL Integrated Curriculum for 2015/2016 Hybrid Pilot

QUARTER: 1

TEACHER(s): J.Schneider, M.Schneider, H.Kellert

SUBJECT(s): SDIL Hybrid 2015-16 AHS

PROBLEM / ISSUE:

PROJECT:

There's a Dead Teacher in the Lab!

PROJECT:

What's for Dinner? Plants

PROJECT:

How do we maintain a biome?

PROJECT:

Super Plant

DATE/WEEK

DATE/WEEK

DATE/WEEK

DATE/WEEK

 Observations
Lab Notebooks

GMO research

Plot Samples in the Park

 Dissect Plants
Research plant parts and functions

DATE/WEEK

DATE/WEEK

DATE/WEEK

DATE/WEEK

 Scientific Writing
Scientific Method

Town Hall Debate on GMOs

Build a Bottle Biome

Design a Super Plant

QUARTER: 2

TEACHER(s): J.Schneider, M.Schneider, H.Kellert

SUBJECT(s): SDIL Hybrid 2015-16 AHS

PROBLEM / ISSUE:

PROJECT:

What is a cell?

PROJECT:

What is a cell?

PROJECT:

What is a Dichotomous Key?

PROJECT:

Genetics

DATE/WEEK

DATE/WEEK

DATE/WEEK

DATE/WEEK

Cell as City Analogy

 Mitosis - Meiosis
Staining Slides

 Dichotomous key - Animals
Dichotomous key - Norns
Dichotomous key -
Pamishan creatures

 Pedigree Survey
Punnett Squares

DATE/WEEK

DATE/WEEK

DATE/WEEK

DATE/WEEK

Cell as City Analogy

Cheek Cell lab

 AHS Inheritable Traits Study &
Build a Dichotomous Key

 Pedigree Survey
Alleles & Sex-linked Inheritance

QUARTER: 3

TEACHER(s): J.Schneider, M.Schneider, H.Kellert

SUBJECT(s): SDIL Hybrid 2015-16 AHS

PROBLEM / ISSUE:

PROJECT:

Genetics

Where did I come from?

PROJECT:

PROJECT:

PROJECT:

DATE/WEEK

DATE/WEEK

DATE/WEEK

DATE/WEEK

Pedigree Survey

Inheritable Traits Study

Big Numbers Minichallenge

Taxonomy & Evolution

Body Systems

DATE/WEEK

DATE/WEEK

DATE/WEEK

DATE/WEEK

 Pedigree Survey
Trait Analysis

 Mystery Fossil
Cladogram

The Isle of Dr. Moreau

QUARTER: 4

TEACHER(s): J.Schneider, M.Schneider, H.Kellert

SUBJECT(s): SDIL Hybrid 2015-16 AHS

PROBLEM / ISSUE:

PROJECT:	PROJECT:	PROJECT:	PROJECT: The Germiest Place in School
DATE/WEEK	DATE/WEEK	DATE/WEEK	DATE/WEEK
Body Cavities	Anatomy Murals	Golden Ratio	Plate germ samples
DATE/WEEK	DATE/WEEK	DATE/WEEK	DATE/WEEK
		Bones & Muscles	Diseases & How they spread

Mini Challenge Sheet

Design

Materials:

Name: _____

Date: _____

Period: _____

Problem Scenario:

There's been a terrible (and gross) lab accident! A CSI investigator observe, record & figure out what happened to the victim

Question/Issue:

What Happened?

Students act as CSI investigators

2. Design:



Explains that students need to figure out what happened, how it happened, and how to prevent a similar occurrence in the future. Ask the students to identify as many facts and observations as possible, to come up with relevant questions and state some preliminary hypotheses. All of this information is recorded by student volunteers on the board or on large poster-pads, as well as by each student in their notebooks. After 10 minutes or so, the victim "comes to" and is taken out of the room for first-aid. Student volunteers identify key information and making hypotheses based on these facts and formulating questions with the rest of the class. However, before s/he can allow the students to enter the taped-off area, they must be wearing goggles, gloves and close-toed shoes, with any loose hair tied back;

The students volunteers and the CSI will conduct "tests" on the unknown substances on the table, recording those findings as facts and formulating hypotheses from there. Tests include:

- Describe the smell (via wafting), appearance and measure the amount of liquid in the beaker and the Erlenmeyer flask, after taking its temperature to see if it is too hot to touch.
- Describe the smell (via wafting), appearance and texture of the white powder.
- Describe the smell (via wafting), appearance and guesstimated amount of foamy substance in the beaker that the victim was holding before they woke up.

1. Brainstorm:

Students will enter the classroom and observe a scene:

Students enter the classroom and see a crime scene in the middle of the room. The area is blocked off with yellow caution tape and a victim is passed out on the floor. The victim is holding a beaker that has in it a small amount of an unknown, clear liquid (white vinegar). There is a red smudge of what might be blood on the hand holding the beaker and on the beaker edge itself, and the person is frothing at the mouth. The victim is not wearing any safety equipment (gloves, mask, goggles, etc.), though there are such items located prominently and in proximity; rather, s/he is wearing shorts, sandals and either a sleeveless shirt or shirt with too-long sleeves. On the lab table nearest to the victim, there are tongs, a Bunsen burner setup connected to a (turned-off) gas line, test tubes, an open can of soda, an open bag of chips, and several unlabeled containers holding unknown non-toxic substances:

4

3. Build:

Testing all elements the students attempt to identify the substances and cause of "death".
Write in lab notebook all observations

7

5. Modify:

students will compare actual samples to samples on table to see accuracy of scientific research

4

4. Evaluate:

Class discussion and small group discussion. Observation and close group questioning and answering.

7

6. Share:

class discussion and observation of lab notebooks

TPBL PROJECT SNAPSHOT

THE PAST FOUNDATION

INSTRUCTOR:

GRADE LEVEL: 09-10

OTHER TEACHERS/SUBJECTS:

START DATE:

SUBJECT: Science, Humanities, Math

PRESENTATION:

Theme: Class norms, lab safety, data collection Overarching Question: How did the teacher die or become injured?	Problem / Issue: As a CSI investigator, record and figure out what happened to the victim.
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: Mini-challenge: Dead teacher scene is set up, and students have to figure out how the death/injury happened and how to prevent it in the future. Student identify and record as many observations and facts as possible, and come up with relevant hypothesis and questions. Students conduct "tests" on unknown substances on table by observing smells by wafting, taking temperature, describing textures, colors, foamy substance, etc. Students compare actual substances to labeled samples on table to modify hypothesis and try to come up with a solution.	Apply scientific reasoning and evidence — from observations — Make observations to construct an evidence-based account of a scenario Interpret the structure of expressions Create equations that describe numbers or relationships Represent data with plots on the real number line (dot plots, histograms, and box plots) Distinguish between correlation and causation Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers)
PRODUCTS Evidence of Learning: Lab notebooks Informal assessment of behavior regarding safety and class norms Class discussion	



FORMATIVE ASSESSMENT TOOLS

CHOOSE SHORT CYCLE ASSESSMENT

SHORT CYCLE ASSESSMENT

- ☐ Exit tickets
- ☒ Think, Pair, and Share
- ☐ Concept or Web Maps
- ☒ One Sentence Summary
- ☒ Observation
- ☐ Turn to Your Partner
- ☒ Journal Entry
- ☐ Hand Signals
- ☒ Defend / Justify Answer
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____


VOCABULARY

Tests basic understanding of a concept.


COMPARE & CONTRAST

Assesses real-world application of knowledge.


EXTENDED ANSWER

Requires synthesis of knowledge in multiple applications.

What approach would you use to document evidence at a crime scene?

How would you use evidence prove a conclusion from your observation

What evidence could be useful at a crime scene?

You take the temperature of a liquid five times and record 26, 26.5, 24, 25, and 17 degrees celsius. How would you interpret these results, and would the liquid be too hot to touch with your bare hands?

INSTRUCTOR:

 GRADE LEVEL: **10**

OTHER TEACHERS/SUBJECTS:

START DATE:

SUBJECT: Bio, Humanities, Geometry

PRESENTATION:

Theme: Intro to plant biology and GMOs

Overarching Question: Why are GMOs good, bad, or both?

Problem / Issue: How does Liz organize her time, and learn about GMOs?

PROJECT OVERVIEW
ALIGNED STANDARDS
PROJECT Activities:

- Webquest
- Write a summary of plant anatomies and processes
- Lab activities
- Debate on genetically modified organisms (GMOs) in form of town hall meeting with authentic audience (local members of community, some involved in agriculture)
- Opinion essay on GMOs backed by research
- Peer evaluations

What are the main arguments for and against GMOs?

What information supports the continued use and/or the disuse of GMOs?

How can we test the long-term effects of GMO use in our food supply?

PRODUCTS Evidence of Learning:

- Lab notebooks
- Written summaries and essays
- Debate performance

- Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone.

- Use geometric shapes, their measures, and their properties to describe objects

- Interpret complicated expressions by viewing one or more of their parts as a single entity

- Create equations and inequalities in one variable and use them to solve problems

- Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

Grading rubric for group GMO presentation:

	0			5
Teamwork	Did not work with others			Always working with others to create products
Quality of presentation/ Project	Poor, ill-prepared, incomplete			Neat, complete, concise, appropriate figures/diagrams, not all slides are text
	Inaccurate information			Accurate information
	No new application of information			New application of information
Group discussion	Did not participate			Constant participation
	Does not integrate opinion or materials with discussion			Integrates individual opinion and materials with unfamiliar topics in discussion
				Participated while adding new information or viewpoints to the debate
Presentation	Did not participate			Participation on many topics, only used notes to properly cite references
Preparedness	Unprepared for all aspects of product			Prepared with work and all other aspects of the project and unit

Grading rubric for group GMO presentation: Gracie, Jamin, Paige

	0			5
Teamwork	Did not work with others			Always working with others to create products
Quality of presentation/ Project	Poor, ill-prepared, incomplete			Neat, complete, concise, appropriate figures/diagrams, not all slides are text
	Inaccurate information			Accurate information
	No new application of information			New application of information
Group discussion	Did not participate			Constant participation
	Does not integrate opinion or materials with discussion			Integrates individual opinion and materials with unfamiliar topics in discussion
				Participated while adding new information or viewpoints to the debate
Presentation	Did not participate			Participation on many topics, only used notes to properly cite references
Preparedness	Unprepared for all aspects of product			Prepared with work and all other aspects of the project and unit

Rubric for individual essay assignment:

ESSAY RUBRIC	0	1	3	5
Addressed all assigned issues/questions	Did not address any points			Addressed all points (5 total)
Discussed a point of view different from their presentation	No			Discussed a completely different viewpoint from what student had presented
Presented evidence supporting their point of view	No evidence presented _____		_____	Presented significant evidence from 4 or more sources
Writing Mechanics	Lacks proper sentence structure, grammar, and spelling			Has no spelling or grammatical errors.
References Cited properly	_____ No, improper or no citations		_____ _____	Citations present with no errors

Grading rubric for group GMO presentation: Gracie, Jamin, Paige

	0			5
Teamwork	Did not work with others			Always working with others to create products
Quality of presentation/ Project	Poor, ill-prepared, incomplete			Neat, complete, concise, appropriate figures/diagrams, not all slides are text
	Inaccurate information			Accurate information
	No new application of information			New application of information
Group discussion	Did not participate			Constant participation
	Does not integrate opinion or materials with discussion			Integrates individual opinion and materials with unfamiliar topics in discussion
				Participated while adding new information or viewpoints to the debate
Presentation	Did not participate			Participation on many topics, only used notes to properly cite references
Preparedness	Unprepared for all aspects of product			Prepared with work and all other aspects of the project and unit

Grading rubric for group GMO presentation: Alex, Issabelle, Taylor

	0			5
Teamwork	Did not work with others			Always working with others to create products
Quality of presentation/ Project	Poor, ill-prepared, incomplete			Neat, complete, concise, appropriate figures/diagrams, not all slides are text
	Inaccurate information	Information didn't have much researched information to support it		Accurate information
	No new application of information			New application of information
Group discussion	Did not participate			Constant participation
	Does not integrate opinion or materials with discussion			Integrates individual opinion and materials with unfamiliar topics in discussion
		Lost focus on the lens you were supposed to be looking through.		Participated while adding new information or viewpoints to the debate
Presentation	Did not participate			Participation on many topics, only used notes to properly cite references
Preparedness	Unprepared for all aspects of product			Prepared with work and all other aspects of the project and unit

Grading rubric for group GMO presentation: Trevor, Erica, Haley

	0			5
Teamwork	Did not work with others			Always working with others to create products
Quality of presentation/ Project	Poor, ill-prepared, incomplete	Citing of appropriate sources was lacking		Neat, complete, concise, appropriate figures/diagrams, not all slides are text
	Inaccurate information			Accurate information
	No new application of information			New application of information
Group discussion	Did not participate			Constant participation
	Does not integrate opinion or materials with discussion			Integrates individual opinion and materials with unfamiliar topics in discussion
				Participated while adding new information or viewpoints to the debate
Presentation	Did not participate			Participation on many topics, only used notes to properly cite references
Preparedness	Unprepared for all aspects of product			Prepared with work and all other aspects of the project and unit

Grading rubric for group GMO presentation: Trevor, Erica, Haley

	0			5
Teamwork	Did not work with others			Always working with others to create products
Quality of presentation/ Project	Poor, ill-prepared, incomplete	Citing of appropriate sources was lacking		Neat, complete, concise, appropriate figures/diagrams, not all slides are text
	Inaccurate information			Accurate information
	No new application of information			New application of information
Group discussion	Did not participate			Constant participation
	Does not integrate opinion or materials with discussion			Integrates individual opinion and materials with unfamiliar topics in discussion
				Participated while adding new information or viewpoints to the debate
Presentation	Did not participate			Participation on many topics, only used notes to properly cite references
Preparedness	Unprepared for all aspects of product			Prepared with work and all other aspects of the project and unit

Grading rubric for group GMO presentation: Ty, Hunter, Mason

	0			5
Teamwork	Did not work with others			Always working with others to create products
Quality of presentation/ Project	Poor, ill-prepared, incomplete			Neat, complete, concise, appropriate figures/diagrams, not all slides are text
	Inaccurate information			Accurate information
	No new application of information			New application of information
Group discussion	Did not participate			Constant participation
	Does not integrate opinion or materials with discussion			Integrates individual opinion and materials with unfamiliar topics in discussion
				Participated while adding new information or viewpoints to the debate
Presentation	Did not participate			Participation on many topics, only used notes to properly cite references
Preparedness	Unprepared for all aspects of product			Prepared with work and all other aspects of the project and unit

Grading rubric for group GMO presentation: Daniel, Parker, Riley

	0			5
Teamwork	Did not work with others			Always working with others to create products
Quality of presentation/ Project	Poor, ill-prepared, incomplete			Neat, complete, concise, appropriate figures/diagrams, not all slides are text
	Inaccurate information	info may have been accurate, but not as substantiated as I would like		Accurate information
	No new application of information			New application of information
Group discussion	Did not participate			Constant participation
	Does not integrate opinion or materials with discussion			Integrates individual opinion and materials with unfamiliar topics in discussion
				Participated while adding new information or viewpoints to the debate
Presentation	Did not participate			Participation on many topics, only used notes to properly cite references
Preparedness	Unprepared for all aspects of product			Prepared with work and all other aspects of the project and unit

TPBL PROJECT SNAPSHOT

THE PAST  FOUNDATION

INSTRUCTOR:

GRADE LEVEL: 10

OTHER TEACHERS/SUBJECTS:

START DATE:

SUBJECT: Bio, Humanities, Geometry

PRESENTATION:

Theme: Plant biology continued

Overarching Question: How do we maintain a biome?

Problem / Issue: How can we model the real world with a plant biome?

PROJECT OVERVIEW

ALIGNED STANDARDS

PROJECT Activities:

- Construct, measure, and dissect plot samples
- Extracted and analyzed plants from plot samples
- Biome construction
- Biome analysis

PRODUCTS Evidence of Learning:

- Lab notebooks
- Plot samples
- Biome!

- Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .

- Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

- Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and cone. Use dissection arguments, Cavalieri's principle, and informal limit arguments.

- Give an informal argument using Cavalieri's principle for the formulas for the volume of a sphere and other solid figures.

- Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*

- Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.



FORMATIVE ASSESSMENT TOOLS

CHOOSE SHORT CYCLE ASSESSMENT

SHORT CYCLE ASSESSMENT

- ☐ Exit tickets
- ☐ Think, Pair, and Share
- ☐ Concept or Web Maps
- ☐ One Sentence Summary
- ☐ Observation
- ☐ Turn to Your Partner
- ☐ Journal Entry
- ☐ Hand Signals
- ☐ Defend / Justify Answer
- ☐ Other: _____
- ☐ Other: _____
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- ☐ Other: _____


VOCABULARY

Tests basic understanding of a concept.


COMPARE & CONTRAST

Assesses real-world application of knowledge.


EXTENDED ANSWER

Requires synthesis of knowledge in multiple applications.

The diagram below shows a bottle cylinder with one half-spheres on the bottom end [include dimensions on diagram]. Describe the process for calculating how much water you would need (in the appropriate unit) to fill the water 8 inches up from the bottom of the bottle.

TPBL PROJECT SNAPSHOT

THE PAST  FOUNDATION

INSTRUCTOR:

GRADE LEVEL: 10

OTHER TEACHERS/SUBJECTS:

START DATE:

SUBJECT: Bio, Humanities, Geometry

PRESENTATION:

Theme: Plant biology continued

Overarching Question: How do we maintain a biome?

Problem / Issue: How can we model the real world with a plant biome?

PROJECT OVERVIEW

ALIGNED STANDARDS

PROJECT Activities:

- Construct, measure, and dissect plot samples
- Extracted and analyzed plants from plot samples
- Biome construction
- Biome analysis

PRODUCTS Evidence of Learning:

- Lab notebooks
- Plot samples
- Biome!

- Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .

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- Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.*

- Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects.



FORMATIVE ASSESSMENT TOOLS

CHOOSE SHORT CYCLE ASSESSMENT

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- ☒ Exit tickets
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VOCABULARY

Tests basic understanding of a concept.


COMPARE & CONTRAST

Assesses real-world application of knowledge.


EXTENDED ANSWER

Requires synthesis of knowledge in multiple applications.

The diagram below shows a bottle cylinder with one half-spheres on the bottom end [include dimensions on diagram]. Describe the process for calculating how much water you would need (in the appropriate unit) to fill the water 8 inches up from the bottom of the bottle.

TPBL PROJECT SNAPSHOT

THE PAST FOUNDATION

INSTRUCTOR:

GRADE LEVEL: 10

OTHER TEACHERS/SUBJECTS:

START DATE:

SUBJECT: Bio, Humanities, Geometry

PRESENTATION:

Theme: Plant biology continued Overarching Question: How do we design the most effective plant for humans?	Problem / Issue: The apocalypse has happened, and you need to genetically modify a plant that will both grow well in apocalyptic conditions, and feed the human population.
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: - What makes a plant, a plant? Brainstorm/research plant parts - Dissection of plant parts with microscope (labs) - Geometry construction labs (connection to product presentation) - Super Plant design and visual report (with Geometry construction application for diagrams) - Peer/teacher evaluation and student modification - Gallery walk to share Super Plants	
PRODUCTS Evidence of Learning: - Lab notebooks - Super plant presentation and report	- Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc. - Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line. - Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.



FORMATIVE ASSESSMENT TOOLS

CHOOSE SHORT CYCLE ASSESSMENT

SHORT CYCLE ASSESSMENT

- ☒ Exit tickets
- ☐ Think, Pair, and Share
- ☐ Concept or Web Maps
- ☒ One Sentence Summary
- ☒ Observation
- ☒ Turn to Your Partner
- ☒ Journal Entry
- ☐ Hand Signals
- ☐ Defend / Justify Answer
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____



VOCABULARY

Tests basic understanding of a concept.



COMPARE & CONTRAST

Assesses real-world application of knowledge.



EXTENDED ANSWER

Requires synthesis of knowledge in multiple applications.

Explain a way to construct a square inside a circle using only a compass and straightedge.

Fold Here

Mini Challenge Sheet

Design

Materials:

Name: _____

Date: _____

Period: _____

Problem Scenario:

Question/Issue:

How does a cell work?

2. Design:



Design a model to create an analogy of a plant cell (Models or representations may take any appropriate form in any medium, from a colored pencil sketch to a music video. Creativity in construction is encouraged. The model, in whatever form it takes, must include a part for each of the cell parts.)

Complete the Cell City Analogy Chart _2
due end of class on 27 October 2015

1. Brainstorm:

1. Identify the major organelles found in a eukaryotic cell and describe their functions.
2. Draw a map of Grant City. Label your map using both the name for the part of the city and the cell organelle name. Be sure that you pay attention to appropriate locations
3. Complete the Cell City Analogy Chart
4. Define prokaryotic and eukaryotic
5. Computers are not allowed in the brainstorm section

3. Build:

Create a non-perishable model of your cell city analogy using appropriate/ realistic proportions built to scale. Identify the scale.

Models:

Models or representations may take any appropriate form in any medium, from a colored pencil sketch to a music video. Creativity in construction is encouraged. The model, in whatever form it takes, must include a part for each of the cell parts.

build must be completed by 12pm on 29 October 2015

⁴
~~3. Build:~~

⁷
5. Modify:

Students will create an outline of changes that should be made to improve the model. Uploaded into Edmodo in the appropriate location. (due beginning of class on Monday, 2 November 2015)

⁴
4. Evaluate:

Students will evaluate three cell models using the given rubric during a gallery walk at 12pm Thursday (29 October 2015).

⁷
6. Share:

Students will submit the final model (due beginning of class on Monday, 2 November 2015). Directions will be announced in class.

TPBL PROJECT SNAPSHOT

THE PAST  FOUNDATION

INSTRUCTOR:

GRADE LEVEL: 10

OTHER TEACHERS/SUBJECTS:

START DATE:

SUBJECT: Bio, Humanities, Geometry

PRESENTATION:

Theme: Human and Animal Cells

Problem / Issue: We've learned about plants and plant cells...so what do human and animal cells look like, and how are they different?

Overarching Question: What does a cell look like in my own body?

PROJECT OVERVIEW

ALIGNED STANDARDS

PROJECT Activities:

- Analogous model of cell (with geometric constructions)
- Geometry construction labs (Geometer's Sketchpad)
- Cheek cell lab
- Gallery walk of Cell City (analogous) Models

PRODUCTS Evidence of Learning:

- Analogous cell models with geometric constructions

- Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

- Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle.



FORMATIVE ASSESSMENT TOOLS

CHOOSE SHORT CYCLE ASSESSMENT

SHORT CYCLE ASSESSMENT

- ☐ Exit tickets
- ☒ Think, Pair, and Share
- ☐ Concept or Web Maps
- ☐ One Sentence Summary
- ☒ Observation
- ☒ Turn to Your Partner
- ☒ Journal Entry
- ☐ Hand Signals
- ☐ Defend / Justify Answer
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____


VOCABULARY

Tests basic understanding of a concept.


COMPARE & CONTRAST

Assesses real-world application of knowledge.


EXTENDED ANSWER

Requires synthesis of knowledge in multiple applications.

Explain a ways to construct a regular hexagon inside a circle using only a compass and straightedge.

Mini Challenge Sheet

Design

Materials:

Name: _____

Date: _____

Period: _____

Problem Scenario:

The sophomore class has a problem:
Students must decide the best way to
organize their snacking needs.

Question/Issue:

2. Design:



Students are given a choice between 9 different types of snack chips. They must decide a dichotomous key in order to create an identification system for people who can not or do not have the capabilities of identifying the different snack.

1. Brainstorm:

Students will brainstorm the best way to
identify the similar and contrasts between the
different types of chips available for
snacking.

4

3. Build:

Students will take samples of each of the chips and build a dichotomous key

7

5. Modify:

any necessary changes will be made.

4

4. Evaluate:

Each student will be assessed by at least 2 other students working through the dichotomous key.

7

6. Share:

student will have their dichotomous key followed through by at least 2 students-- other than those who assessed.

TPBL PROJECT SNAPSHOT

THE PAST FOUNDATION

INSTRUCTOR: Jeff Schneider

GRADE LEVEL: 10th

OTHER TEACHERS/SUBJECTS: Mrs. Schneider

START DATE:

SUBJECT: Biology / English II

PRESENTATION:

Theme: HOW do I organize my snacks?	Problem / Issue: Chip Challenge
Overarching Question:	
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: Brainstorm Research Questioning organize and create a means of identification identify similarities and contrasts between chips	Standard & Objective Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. Research to Build and Present Knowledge Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. Draw evidence from literary or informational texts to support analysis, reflection, and research.
PRODUCTS Evidence of Learning: dichotomous key	

FORMATIVE ASSESSMENT TOOLS	→ CHOOSE SHORT CYCLE ASSESSMENT →	SHORT CYCLE ASSESSMENT																																	
☐ Exit tickets ☐ Think, Pair, and Share ☐ Concept or Web Maps ☐ One Sentence Summary ☒ Observation ☐ Turn to Your Partner ☒ Journal Entry ☐ Hand Signals	Fold Here <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%; text-align: left; padding: 5px;">Types & How Many</th> <th style="width: 30%; text-align: center; padding: 5px;">Pre-Scores</th> <th style="width: 30%; text-align: center; padding: 5px;">Post Scores</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">☐ Vocabulary</td> <td style="text-align: center; padding: 5px;"> </td> <td style="text-align: center; padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;">☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Vocabulary</td> <td style="text-align: center; padding: 5px;"> </td> <td style="text-align: center; padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;">☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Vocabulary</td> <td style="text-align: center; padding: 5px;"> </td> <td style="text-align: center; padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;">☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="text-align: center; padding: 10px;"> Growth Vocabulary • Compare & Contrast • Extended Answers </td> </tr> </tbody> </table>	Types & How Many	Pre-Scores	Post Scores	☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			Growth Vocabulary • Compare & Contrast • Extended Answers			Questions How would you classify the type of snacks? How would you prioritize the traits to create a dichotomous key? What would be your own original way to classify organisms?
Types & How Many	Pre-Scores	Post Scores																																	
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TPBL PROJECT SNAPSHOT

THE PAST FOUNDATION

INSTRUCTOR: Jeff Schneider

GRADE LEVEL: 10th

OTHER TEACHERS/SUBJECTS: Mrs. Schneider

START DATE:

SUBJECT: Biology / English II

PRESENTATION:

Theme: What makes us who we are?	Problem / Issue: Genetics
Overarching Question:	
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: Brainstorm Research Questioning create a survey distribute a survey analyze a survey and its results interview those surveyed identify possible alleles analyze a graph write survey questions	Standard & Objective Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. Research to Build and Present Knowledge Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. Draw evidence from literary or informational texts to support analysis, reflection, and research.
PRODUCTS Evidence of Learning: survey--in excel	





FORMATIVE ASSESSMENT TOOLS → **CHOOSE SHORT CYCLE ASSESSMENT** → **SHORT CYCLE ASSESSMENT**

☐ Exit tickets

☐ Think, Pair, and Share

☐ Concept or Web Maps

☐ One Sentence Summary

☒ Observation

☐ Turn to Your Partner

☒ Journal Entry

☐ Hand Signals

BASIC VOCABULARY
 Tests basic understanding of a concept.

PROFICIENT COMPARE & CONTRAST
 Assesses real-world application of knowledge.

MASTERY EXTENDED ANSWER
 Requires synthesis of knowledge in multiple applications.

Types & How Many

Pre-Scores

Post Scores

☐ Vocabulary
☐ Compare & Contrast
☐ Extended Answer

☐ Vocabulary
☐ Compare & Contrast
☐ Extended Answer

☐ Vocabulary
☐ Compare & Contrast
☐ Extended Answer

Growth

Vocabulary •

Compare & Contrast

• Extended Answers

Questions

What is the best manner to collect data to draw a conclusion about genetic similarities in a small database?

What conclusions can be drawn from a survey on genetic traits?

What traits are genetic markers?

Fold Here

Mini Challenge Sheet

Design

Materials:

Name: _____

Date: _____

Period: _____

Problem Scenario:
Big Numbers

2. Design:



Question/Issue:

What do big numbers look like in a useable fashion.

Create a table in Excel that shows all of the numbers between 10^{15} & 10^{23} . exponent value, a # in scientific notation, same # in standard notation, a real-life example of something that is that size

1. Brainstorm:

what are exponents and what do numbers look like in large quantities?

4

3. Build:

a chart that demonstrates large numbers that correspond to a recognizable item?

7

5. Modify:

any necessary changes will be made.

4

4. Evaluate:

peer review

7

6. Share:

class share on the overhead

TPBL PROJECT SNAPSHOT

 THE PAST  FOUNDATION

INSTRUCTOR: Jeff Schneider

GRADE LEVEL: 10th

OTHER TEACHERS/SUBJECTS: Mrs. Schneider

START DATE:

SUBJECT: Biology / English II

PRESENTATION:

Theme: what are exponents and what do numbers look like in large		Problem / Issue: Big Numbers	
Overarching Question:			
PROJECT OVERVIEW		ALIGNED STANDARDS	
PROJECT Activities: Brainstorm Research Questioning Create a table in Excel that shows all of the numbers between 10^{15} & 10^{23} . exponent value, a # in scientific notation, same # in standard notation, a real-life example of something that is that size Use table to help calculate dimensions of images by pixel size in computer animation (trig + sci notation applications)		Standard & Objective -Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. -Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. -Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. -Research to Build and Present Knowledge -Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. -Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. -Draw evidence from literary or informational texts to support analysis, reflection, and research. -Understand that by similarity, side ratios in right triangles are properties of the	
PRODUCTS Evidence of Learning: excel table Computer animation parameter visual report			

FORMATIVE ASSESSMENT TOOLS		CHOOSE SHORT CYCLE ASSESSMENT	SHORT CYCLE ASSESSMENT																																							
☐ Exit tickets ☐ Think, Pair, and Share ☐ Concept or Web Maps ☐ One Sentence Summary ☒ Observation ☐ Turn to Your Partner ☒ Journal Entry ☐ Hand Signals	Fold Here	<table border="1"> <thead> <tr> <th>Types & How Many</th> <th>Pre-Scores</th> <th>Post Scores</th> </tr> </thead> <tbody> <tr> <td>☐ Vocabulary</td> <td> </td> <td> </td> </tr> <tr> <td>☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td>☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td>☐ Vocabulary</td> <td> </td> <td> </td> </tr> <tr> <td>☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td>☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td>☐ Vocabulary</td> <td> </td> <td> </td> </tr> <tr> <td>☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td>☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="text-align: center;">Growth</td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td>Vocabulary •</td> <td>Compare & Contrast</td> <td>• Extended Answers</td> </tr> </tbody> </table>	Types & How Many	Pre-Scores	Post Scores	☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			Growth						Vocabulary •	Compare & Contrast	• Extended Answers	Questions What would happen if you had too many numbers to maintain accuracy? How would you display an extremely large number? What could be done to minimize inaccuracies in large numbers? _____ _____ _____ _____ _____ _____ _____
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BASIC  **VOCABULARY**
Tests basic understanding of a concept.

PROFICIENT  **COMPARE & CONTRAST**
Assesses real-world application of knowledge.

MASTERY  **EXTENDED ANSWER**
Requires synthesis of knowledge in multiple applications.

Mini Challenge Sheet

Design

Materials:

Name: _____

Date: _____

Period: _____

Problem Scenario:

Big Numbers and mystery fossil

Question/Issue:

What do big numbers look like in a useable fashion?

1. Brainstorm:

Choose an animal that exists today. Using what you know about natural selection, taxonomy, and evolution, hypothesize as to what these animals may evolve into after 10,000,000 years.

2. Design:



Create an info-graph that identifies the animal today and the future animal. You must include for each animal:

1. The name of the new animal (give a scientific name and a common name, include reasoning for the new name)
2. The changes in this animal that have occurred over time--with scientific data to support your conclusions.
3. The factors that led to each change in the animal--and the time frame for those factors to affect the animal
4. The habitat of the new animal with scientific reasoning as to how the habitat became that habitat.
5. The taxonomic levels of the animal
6. All numerical data should be represented in scientific notation with appropriate significant digits.
7. TBD - What is missing from this assignment?

4

3. Build:
infographic

7

5. Modify:
any necessary changes will be made.

4

4. Evaluate:
peer review

7

6. Share:
class share--gallery walk

TPBL PROJECT SNAPSHOT

THE PAST  FOUNDATION

INSTRUCTOR: Jeff Schneider

GRADE LEVEL: 10th

OTHER TEACHERS/SUBJECTS: Mrs. Schneider

START DATE:

SUBJECT: Biology / English II

PRESENTATION:

Theme: Body Systems	Problem / Issue: Mystery Fossil
Overarching Question:	
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: Brainstorm Research Questioning name a new animal (give a scientific name and a common name, include reasoning for the new name) identify the changes in this animal that have occurred over time--with scientific data to support your conclusions. identify factors that led to each change in the animal--and the time frame for those factors to affect the animal identify and synthesize the habitat of the new animal with scientific reasoning as to how the habitat became that habitat. identify the taxonomic levels of the animal represent scientific notation with appropriate significant digits.	Standard & Objective Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. Research to Build and Present Knowledge Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. Draw evidence from literary or informational texts to support analysis, reflection, and research.
PRODUCTS Evidence of Learning: Create an info-graph that identifies the animal today and the future animal. You must include for each animal:	

FORMATIVE ASSESSMENT TOOLS	→ CHOOSE SHORT CYCLE ASSESSMENT →	SHORT CYCLE ASSESSMENT																																							
☐ Exit tickets ☐ Think, Pair, and Share ☐ Concept or Web Maps ☐ One Sentence Summary ☒ Observation ☐ Turn to Your Partner ☒ Journal Entry ☐ Hand Signals	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 33%; text-align: left; padding: 5px;">Types & How Many</th> <th style="width: 33%; text-align: center; padding: 5px;">Pre-Scores</th> <th style="width: 33%; text-align: center; padding: 5px;">Post Scores</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">☐ Vocabulary</td> <td style="text-align: center; padding: 5px;"> </td> <td style="text-align: center; padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;">☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Vocabulary</td> <td style="text-align: center; padding: 5px;"> </td> <td style="text-align: center; padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;">☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Vocabulary</td> <td style="text-align: center; padding: 5px;"> </td> <td style="text-align: center; padding: 5px;"> </td> </tr> <tr> <td style="padding: 5px;">☐ Compare & Contrast</td> <td></td> <td></td> </tr> <tr> <td style="padding: 5px;">☐ Extended Answer</td> <td></td> <td></td> </tr> <tr> <td colspan="3" style="text-align: center; padding: 10px;">Growth</td> </tr> <tr> <td style="text-align: center; padding: 5px;"> </td> <td style="text-align: center; padding: 5px;"> </td> <td style="text-align: center; padding: 5px;"> </td> </tr> <tr> <td style="text-align: center; padding: 5px;">Vocabulary •</td> <td style="text-align: center; padding: 5px;">Compare & Contrast</td> <td style="text-align: center; padding: 5px;">• Extended Answers</td> </tr> </tbody> </table>	Types & How Many	Pre-Scores	Post Scores	☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			☐ Vocabulary			☐ Compare & Contrast			☐ Extended Answer			Growth						Vocabulary •	Compare & Contrast	• Extended Answers	Questions What would happen if you found a fossil that had previously never been identified? How would you classify a previously unidentified fossil? What characteristics are most important when identifying a newly found fossil?
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TPBL PROJECT SNAPSHOT

THE PAST FOUNDATION

INSTRUCTOR: Jeff Schneider

GRADE LEVEL: 10th

OTHER TEACHERS/SUBJECTS: Mrs. Schneider

START DATE:

SUBJECT: Biology / English II

PRESENTATION:

Theme: Body Systems	Problem / Issue: Body Systems
Overarching Question:	
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: Brainstorm Research Questioning identify elements for a cladogram for unspecified futuristic animal	Standard & Objective Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others. Research to Build and Present Knowledge Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation. Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism. Draw evidence from literary or informational texts to support analysis, reflection, and research.
PRODUCTS Evidence of Learning: cladogram	





FORMATIVE ASSESSMENT TOOLS → **CHOOSE SHORT CYCLE ASSESSMENT** → **SHORT CYCLE ASSESSMENT**

☐ Exit tickets
☐ Think, Pair, and Share
☐ Concept or Web Maps
☐ One Sentence Summary
☒ Observation
☐ Turn to Your Partner
☒ Journal Entry
☐ Hand Signals

BASIC

VOCABULARY
 Tests basic understanding of a concept.

PROFICIENT

➔

COMPARE & CONTRAST
 Assesses real-world application of knowledge.

MASTERY

📖

EXTENDED ANSWER
 Requires synthesis of knowledge in multiple applications.

Types & How Many

Pre-Scores

Post Scores

☐ Vocabulary ☐ Compare & Contrast ☐ Extended Answer		
☐ Vocabulary ☐ Compare & Contrast ☐ Extended Answer		
☐ Vocabulary ☐ Compare & Contrast ☐ Extended Answer		

Growth

Vocabulary •

Compare & Contrast

• Extended Answers

Questions

How would you determine what goes into a cladogram?

What is the relationship between animals and time?

How would you construct a model demonstrating the different evolutionary steps in a biological species?

Fold Here

TPBL PROJECT SNAPSHOT

THE PAST FOUNDATION

INSTRUCTOR: Jeff Schneider

GRADE LEVEL: 10th

OTHER TEACHERS/SUBJECTS: Mrs. Schneider

START DATE:

SUBJECT: Biology / English II

PRESENTATION:

Theme: Body Systems	Problem / Issue: Body Systems
Overarching Question:	
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: Brainstorm Research Questioning create a mural and presentation Define ANATOMY & PHYSIOLOGY List and describe the characteristics of life Know the levels of organization, from simplest to most complex Describe the body cavities, what organs are found in each and be able to identify them on a diagram. Describe the membranes and their locations Describe the organ systems, their functions, and organs found in each Describe the ANATOMICAL POSITION Know the relative positions Understand the body sections (slices/planes) used to observe internal	Standard & Objective Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.* Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
PRODUCTS Evidence of Learning: mural/ presentation	

FORMATIVE ASSESSMENT TOOLS	→	CHOOSE SHORT CYCLE ASSESSMENT	→	SHORT CYCLE ASSESSMENT																																						
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Types & How Many	Pre-Scores	Post Scores																																								
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Vocabulary •	Compare & Contrast	• Extended Answers																																								

Mini Challenge Sheet

Design

Materials:

Name: _____

Date: _____

Period: _____

Problem Scenario:

Golden Ratio--examining patterns in the Human Body

Question/Issue:

Are you Golden?

1. Brainstorm:

Identify measurements of determined location to use for designing an answer to Are You Golden?

2. Design:



1. Grab a tape measure and do the following:

a. Measure your height without your shoes. Record your measurement below as A.

A =

b. Measure the height from the top of your head to the tips of your fingers with your arms straight down at your side. Record your measurement below as B.

B =

c. Measure the height from the top of your head to your navel. Record your measurement below as C.

C =

d. Measure the height from the top of your head to your elbows. Record your measurement below as D.

D =

e. Measure the length of your hand, and record it as E.

E =

f. Measure the distance from your wrist to your elbow; record your measurement below as F.

F =

4

3. Build:
Document measurements and do the math

7

5. Modify:
any necessary changes will be made.

4

4. Evaluate:
gallery walk

7

6. Share:
class share--gallery walk

TPBL PROJECT SNAPSHOT

THE PAST FOUNDATION

INSTRUCTOR: Jeff Schneider

GRADE LEVEL: 10th

OTHER TEACHERS/SUBJECTS: Mrs. Schneider

START DATE:

SUBJECT: Biology / English II

PRESENTATION:

Theme: Golden Ratios	Problem / Issue: Are you Golden?
Overarching Question:	
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: Brainstorm Research Questioning measure identify ratios document measurements	Standard & Objective -Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. -Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.* -Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. -Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. -Prove theorems about triangles. Theorems include: a line parallel to one side of a triangle divides the other two proportionally, and conversely; the Pythagorean Theorem proved using triangle similarity. -Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
PRODUCTS Evidence of Learning: analysis of whether the measurements taken create a golden ratio.	

FORMATIVE ASSESSMENT TOOLS		→ CHOOSE SHORT CYCLE ASSESSMENT →	SHORT CYCLE ASSESSMENT																																						
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TPBL PROJECT SNAPSHOT



INSTRUCTOR: Jeff Schneider

GRADE LEVEL: 10th

OTHER TEACHERS/SUBJECTS: Mrs. Schneider

START DATE:

SUBJECT: Biology / English II

PRESENTATION:

Theme: Germs	Problem / Issue: What is the Germiest place in the school?
Overarching Question:	
PROJECT OVERVIEW	ALIGNED STANDARDS
PROJECT Activities: Brainstorm Research Questioning create a petri dish with biologic sample swab appropriately for bacteria/ fungus observe for growth	Standard & Objective Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.* Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).*
PRODUCTS Evidence of Learning: petri dish biologic sample prepared slides	





FORMATIVE ASSESSMENT TOOLS	→ CHOOSE SHORT CYCLE ASSESSMENT	→ SHORT CYCLE ASSESSMENT
☐ Exit tickets ☐ Think, Pair, and Share ☐ Concept or Web Maps ☐ One Sentence Summary ☐ Observation ☐ Turn to Your Partner ☐ Journal Entry ☐ Hand Signals	Types & How Many ☐ Vocabulary ☐ Compare & Contrast ☐ Extended Answer ☐ Vocabulary ☐ Compare & Contrast ☐ Extended Answer ☐ Vocabulary ☐ Compare & Contrast ☐ Extended Answer Growth ☐ Vocabulary • ☐ Compare & Contrast ☐ • Extended Answers	Questions What is a germ? What approach would you use to determine the germiest place in school? How would you test for the germiest place in school? Describe the geometric modeling you would use in your test design.

Fold Here

BASIC

VOCABULARY

Tests basic understanding of a concept.

➔

PROFICIENT

COMPARE & CONTRAST

Assesses real-world application of knowledge.

📖

MASTERY

EXTENDED ANSWER

Requires synthesis of knowledge in multiple applications.

Appendix B: Survey Results from Hybrid Pilot 2015/2016

	What 3 things did you like about having multiple teachers in your classroom	What 3 things were hard to get used to about having multiple teachers in your classroom	How easy or difficult was it for you to shift from a textbook-based class to problem-based class and why	Nationally, there's a known "wobble" when teachers and students change from textbook-based to problem-based learning. Do you think you've passed the "wobble" yet? For example is there a unit your particularly felt good about?
33	Could get help whenever needed. Had help all the time. More than one student can get help at once	17 The assignments were more complex with multiple teachers. the variation of assignments. Each teacher had a different idea of the assignment. Making sure I paid attention during class because all the teachers gave input about what we learned during each class. chances to make assignments more complicated. Class was harder with more than one teacher. They [teachers] taught at a higher level. It was hard learning everything all them were teaching. assignments were graded more closely. making sure I emailed my assignments to all the teachers	Difficult 62.5% (20)	Yes 62% (18)
22	Teachers knew different stuff. I could get multiple ideas by asking each teacher for help. Each had a different skill that could be greatly used for help. [3 Teachers] know a lot more than just one does. It was different having 3 teachers in one, because you are teaching different subjects all in one, but it turned out okay	13 paying attention to multiple opinions. There were three different answers to questions. different opinions on topics. They [teachers] all taught differently. talking to multiple teachers. asking multiple teachers questions for a single class	Easy 37.5% (12)	No 38% (11)
17	Multiple points of view. We got different opinions about everything. There were three answers to everything	11 talking loud enough to be heard. Hearing. all the voices talking over each other. its a little confusing at times it can be a little overwhelming. Background Noise	In these responses several participants noted it was difficult at first and then got easier. In these instances a point was given to each choice creating an "n" of greater than 29	
3	No substitutes who didn't know what was going on in class	7 having teachers from another town		
2	Class was easier having 3 teachers. It makes things easy to co op without getting frustrated about only one teacher	6 the different way of teaching was hard. It wasn't the teachers it was hard getting used to, it was the way of teaching that was the hard part. all the different ways to do things made some things confusing		

	What 3 things did you like about having multiple teachers in your classroom	What 3 things were hard to get used to about having multiple teachers in your classroom	How easy or difficult was it for you to shift from a textbook-based class to problem-based class and why	Nationally, there's a known "wobble" when teachers and students change from textbook-based to problem-based learning. Do you think you've passed the "wobble" yet? For example is there a unit your particularly felt good about?
1	If I missed class I could catch up with the videos	5	harder to sleep during class. not being able to do stuff we aren't suppose to do. I like one teacher because it is easier to hide. there were always a lot of eyes watching you. I forgot some were there	
1	They can critique your work right then and there over the computer	5	when the teachers didn't have the plan and gave out differing information. undecided expectations of what is to be done	
1	I did not use them [teachers] as often as I should've but they were useful	3	facing a person on the computer	
1	One thing that was easy is no getting test	3	using the computer to find information was hard. getting use to using the computer more than a book and worksheet. I wasn't fond of doing online work, we had to make sure we turned them in.	
1	that there are people in Ohio	2	too much info at once. they [teachers] went a little too fast	
1	the [the teachers] had fun together	2	which teacher to go to first	
		1	I want the teacher to just tell me the answer	

What 3 things did you like about having multiple teachers in your classroom	Lessons Learned	What 3 things were hard to get used to about having multiple teachers in your classroom	Lessons Learned
Could get help whenever needed. Had help all the time. More than one student can get help at once	Recognized more 1:1 intervention	The assignments were more complex with multiple teachers. the variation of assignments. Each teacher had a different idea of the assignment. Making sure I paid attention during class because all the teachers gave input about what we learned during each class. chances to make assignments more complicated. Class was harder with more than one teacher. They [teachers] taught at a higher level. It was hard learning everything all them were teaching. assignments were graded more closely. making sure I emailed my assignments to all the teachers	Habit to overcome. Learning is segmented and dished out in abstract chunks; reinforce how the chunks work with each other
Teachers knew different stuff. I could get multiple ideas by asking each teacher for help. Each had a different skill that could be greatly used for help. [3 Teachers] know a lot more than just one does. It was different having 3 teachers in one, because you are teaching different subjects all in one, but it turned out okay	Recognized breadth of learning in TPBL	paying attention to multiple opinions. There were three different answers to questions. different opinions on topics. They [teachers] all taught differently. talking to multiple teachers. asking multiple teachers questions for a single class	Recognizing one's own modality of learning is not the only way
Multiple points of view. We got different opinions about everything. There were three answers to everything	Recognized differing modalities of learning among teachers	talking loud enough to be heard. Hearing. all the voices talking over each other. its a little confusing at times it can be a little overwhelming. Background Noise	Learning to deal with surrounding environment; reinforces use of videos
		having teachers from another town	unique variable of rural. equivalent in urban would be teachers from suburbs who do not share same culture
		the different way of teaching was hard. It wasn't the teachers it was hard getting used to, it was the way of teaching that was the hard part. all the different ways to do things made some things confusing	
		harder to sleep during class. not being able to do stuff we aren't suppose to do. I like one teacher because it is easier to hide. there were always a lot of eyes watching you. I forgot some were there	
		when the teachers didn't have the plan and gave out differing information. undecided expectations of what is to be done	