

HARMONY PUBLIC SCHOOLS

RTT-D Grant PBL Initiative

Program Overview

The Project Based Learning initiative, launched during the 2013-2014 school year, addresses the increased need for students to acquire critical-thinking, problem-solving, collaboration and communication skills, otherwise known as 21st century skills. Through Project Based Learning (PBL), students are exposed to deep learning experiences that are inquiry based, student-centered, and integrated to the curriculum. The Harmony approach is to maintain the focus on standards-based and student-centered teaching while enriching and extending the learning of students through PBL work. The goal is to promote not only collaborative skills and student ownership of learning but also to promote student success in state and national standards.

What is Project-Based Learning?

Project Based Learning is an instructional approach that emphasizes critical-thinking, collaboration and personalized learning. In project-based learning, student groups engage in meaningful inquiry that is of personal interest to them. These projects are based on problems which are real-life oriented, curriculum-based, and often interdisciplinary. Learners decide how to approach a problem and what activities or processes they will perform. They collect information from a variety of sources, analyze, synthesize and derive understanding from it. The real-world focus of PBL activities is central to the process because it motivates students and adds value to their work. Their learning is connected to something real and involves life skills such as collaboration and reflection. Technology enables students and teachers in various phases of the PBL process. At the end of the PBL, students demonstrate their newly acquired knowledge and are evaluated by how much they have learned and how well they communicate it. Students also conduct self-evaluation to assess their own growth and learning. Throughout this process, the teacher's role is to guide and advise students, rather than to direct and manage student work.

What are the components of Project-Based Learning?

According to the Buck Institute for Education there are eight essential components of meaningful PBL experiences. These essentials are summarized below.

1. Significant content: The project focuses on important knowledge and concepts derived from the standards and targets essential understanding in the course. Students should find the content to be significant in terms of their own lives and interests. A well designed PBL is an effective vehicle for understanding content more deeply than by traditional methods such as lectures and textbooks.

2. A Need to Know: Teachers powerfully activate students' need to know content by launching a project with an "entry event" that engages student interest and initiates questioning. The entry event can be anything that sparks student inquiry such as a video, a

discussion, a guest speaker, a field trip, a laboratory experience, etc. In contrast, announcing a project with a packet of papers will likely not create excitement and an atmosphere of active learning. Simply telling students that they should learn something because they will need it later does not motivate them. With a compelling student project, the reason for learning relevant material becomes personal and purposeful to the student.

3. A Driving Question: After the discussion and brainstorming, students create a Driving Question to focus their efforts. A good Driving Question captures the heart of the project in clear, compelling language. The Question should be provocative, open-ended, complex, and linked to the core of what we want students to learn. It could be abstract, concrete, or focused on solving a problem. The Driving Question allows students to understand why they are undertaking a project as well as the sequence of activities that ensues from their personal challenge.

4. Student Choice and Voice: Students' interest is captured by a challenging question that is selected and crafted by the students. This provides the student Choice to the project. The requirements of the projects such as project report, digital and oral presentations, visual demonstrations etc. provide Student Voice to the project. The Student Choice and Voice makes the project meaningful to the students. The more Voice and Choice for the student, the greater the ownership of the learning will be. However, projects should be designed with the extent of student choice that best fits each student. On the limited-choice end of the scale, learners can select what topic to study or choose how to design, create, and present products. As a middle ground, teachers might provide a limited menu of options to prevent students from becoming overwhelmed by choices. On the "the more the better" end of the scale, students can decide what product they will create, what resources they will use, how they will structure their time or even their topic and Driving Question.

5. 21st Century Skills: Collaboration is central to the PBL learning experience. A project should give students opportunities to build valuable 21st century skills such as collaboration, communication, critical thinking, and the use of technology, which will serve them well in the workplace and in life. Once students have decided on the Driving Question, they form teams of three or four and begin planning how they would work together. Each team regularly pauses to review their progress. Teachers can help grow these collaboration skills by using team building techniques and time/task organizers. Teachers in a Project Based Learning environment also assess these skills and provide frequent opportunities for students to assess themselves.

6. Inquiry and Innovation: Brainstorming sessions as a class helps students generate new ideas and questions. Student team discussion allows opportunities to fine-tune their own Driving Questions and to discuss resources and procedures. Students find project work to be more meaningful if they conduct real inquiry that begins with their own questions, leads to a search for resources and the discovery of answers, and which ultimately leads to generating new questions, testing ideas, and drawing their own conclusions. With real inquiry comes innovation – a new answer to a Driving Question, a new product, a new solution to a problem. Students are not expected to simply reproduce provided information in a pretty format. The teacher's task is to create the context for real inquiry in the classroom and to guide students through the process.

7. Feedback and Revision: As students develop their ideas and products, student teams use rubrics and exemplars to review and critique one another's work. The teacher checks research notes, reviews rough drafts and plans, and meets with teams to monitor their progress. The mentoring process of monitoring and feedback is formalized and structured so all student teams have guidance from their teacher throughout the duration of the project. Students learn through this mentoring that first attempts do not always result in high quality and that revisions are a frequent feature of real-world work. In addition to providing direct feedback, a teacher coaches students in using rubrics or other sets of criteria to critique one another's work. Teachers can arrange for experts or adult mentors to provide feedback, which is especially meaningful to students because of the source.

8. Publicly Presented Product: Student teams present their findings, conclusions, and solutions to audiences such as peers, parents, representatives of community, business, government organizations and professionals from various industries. Students answer questions and reflect on how they completed the project, next steps they might take, and what they gained in terms of knowledge and skills and pride. When they present their work to a real audience, they connect to real life through their PBL projects. These projects become authentic when the process replicates real-life tasks and students are no longer observers but participants in real life experiences.

What is Standards-Focused PBL?

There is no one accepted definition of PBL. However, BIE defines standards-focused PBL as ***a systematic teaching method that engages students in learning knowledge and skills through an extended inquiry process structured around complex, authentic questions and carefully designed products and tasks.*** This definition encompasses a spectrum ranging from brief projects of one to two weeks based on a single subject in one classroom to year long, interdisciplinary projects that involve community participation and adults outside the school.

More important than the definition itself are the attributes of effective projects. You will find that the BIE planning model is based on a number of criteria that distinguish carefully planned projects from other extended activities in the classroom.

Outstanding projects...

- Recognize students' inherent *drive to learn*, their capability to do important work, and their need to be taken seriously by putting them at the center of the learning process.
- Engage students in the central concepts and principles of a discipline. The project work is *central* rather than peripheral to the curriculum.
- Highlight provocative issues or questions that lead students to *in-depth exploration of authentic and important topics.*
- Require the use of essential *tools and skills*, including technology, for learning, self-management, and project management.
- Specify *products* that solve problems, explain dilemmas, or present information generated through investigation, research, or reasoning.
- Include *multiple products* that permit frequent feedback and consistent opportunities for student to learn from experience.

- Use *performance-based assessments* that communicate high expectations, present rigorous challenges, and require a range of skills and knowledge.
- Encourage *collaboration* in some form, either through small groups, student-led presentation, or whole-class evaluations of project results.

The BIE model for PBL also addresses a singular need in the field of PBL: to create *standards-focused* projects that fit well with the era of accountability and performance. Often projects have been used as fun or change-of-pace events completed after students have been pushed through homework assignments, lectures, and tests.

In standards-based PBL, students are pulled through the curriculum by a Driving Question or authentic problem that creates a need to know the material. The Driving Question is tied to content standards in the curriculum, and assessment is explicitly designed to evaluate the students' knowledge of the content.

Similarly, Project Based Learning is sometimes equated with inquiry-based or experiential learning. Though PBL shares some overlapping characteristics with these two terms, standards-focused PBL is designed to acknowledge the importance of standards and evaluation of student learning. In an era of accountability, with testing and performance uppermost in the minds of parents and educators, it is imperative that all instructional methods incorporate high standards, rigorous challenges, and valid assessment methods.

References

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Larmer, J., Mergendoller, J. (2010). 8 Essentials for Project-Based Learning. Retrieved from [http://www.bie.org/tools/freebies/Project Based Learning for the 21st Century](http://www.bie.org/tools/freebies/Project%20Based%20Learning%20for%20the%2021st%20Century)

Markham, Thom, John Larmer, and Jason Louis. Ravitz. *Project Based Learning Handbook: A Guide to Standards-focused Project Based Learning for Middle and High School Teachers*. Novato, CA: Buck Institute for Education, 2003. Print.

How does Project Based Learning look like at Harmony Schools?

Harmony PBL program customizes and individualizes the PBL experience for its students while incorporating the research from successful PBL programs into the design and structure.

Technology is integrated into every phase to enable students to progress and complete PBL projects successfully while learning life skills. The STEM focus of the Harmony PBL program allows the growth and acquisition of 21st Century skills. A framework of the Harmony Public Schools PBL program for middle and high school is shown.

PBL Framework

Middle School

Levels	Content/ Courses	# of Projects	Allotted Time	Structure	Technology Integration
Level I	English	1 Project each Semester	1 week	Group work (3-4 students per group)	Digital Photo Gallery Presentation (optional)
	Math	1 Project each Semester	1 week	Group work (3-4 students per group)	1 Digital Photo Gallery Presentation per year
	Social Studies	1 Project each Semester	1 week	Group work (3-4 students per group)	Digital Photo Gallery Presentation (optional)
	Science	1 Project per grading period	1 week (may be done in small increments throughout a period of two weeks)	Group work, in class (3-4 students per group)	1 Digital Photo Gallery Presentation per <i>semester</i>
Level II	Math /Science /Engineering	1 Holistic Project per Year	1st Semester	Individual or group of no more than three members, at home	1 Video Presentation <i>with optional DISTCO Contest participation</i>

High School

Levels	Content/ Courses	# of Projects	Allotted Time	Structure	Tech. Integration
Level I	English	1 Project Each Semester	1 week	Group work (3-4 students per group)	Digital Photo Gallery Presentation (optional)
	Math	1 Project Each Semester	1 week	Group work (3-4 students per group)	1 Digital Photo Gallery Presentation per semester
	Social Studies	1 Project Each Semester	1 week	Group work (3-4 students per group)	Digital Photo Gallery Presentation (optional)
	Science	2 Projects Each Semester	1 week	Group work (3-4 students per group)	1 Digital Photo Gallery Presentation per semester
Level II	Math/ Science with integrated ELA, Social Studies, & Technology	1 Inter-disciplinary Project each Year	1st Semester	Individual or group of no more than three members	Presentation through video, website and brochure + (DISTCO Contest)
OR Level III	Math/ Science with integrated ELA, Social Studies, & Technology	1 Inter-disciplinary Project each Year	1st Semester	Individual or group of no more than three members	Presentation through video, website and brochure + (DISTCO Contest)

MIDDLE SCHOOL

Language Arts

Level I

Level I is a short term project that targets 21st century skills within the context of the curriculum.

Middle school ELA students will complete at least one PBL project in class each semester. Some of the major features of the Level I PBL projects are outlined below:

- The projects are based on the standards covered within the context of the curriculum as described by the scope and sequence of the course.
- The projects are conducted as in-class group projects. Student groups of 3-4 students are recommended.
- The time required for completion of projects should be no more than one week.
- PBL teacher guides and training for effective planning and integration of the PBL projects into the curriculum will be provided at the start of the school year.
- The teachers will provide relevant information, timelines, documents, assessment rubrics and guidance for the successful completion of projects to their students in a timely manner.
- Upon completion of project, students are expected to produce a three dimensional display as well as a digital presentation of their work.
- The respective teachers using provided rubrics will complete project assessment in each of the core content areas.

Mathematics

Level I

Level I Mathematics PBLs are embedded into the math curriculum as an introduction or enrichment activity. The activities require group work and teachers' special attention when monitoring students. Once students finish working in groups, teachers should pick different solution and organizing methods of students and let them to present in the class. The utmost goal of the teacher is to relate different solution methods and tie all the work done to the objectives of that curriculum unit. All of the projects are aligned with Texas Essential Knowledge and Skills (TEKS) and they are implemented in the class. With this activities, students improve their group work skills and their ability to explain and justify their solutions.

Science

Level I

Level I investigations are curriculum based learning experiences that are essential activities in the course. These activities are part of the lesson; usually the “Elaborate” phase of a lesson designed according to the 5E Instructional model. Within the context of Level I, the students learn how to plan an investigation, implement it, analyze data and report/present their findings and conclusions. Additionally, students learn how to collaborate, engage in self-evaluation and work as responsible citizens in the classroom.

No additional work is required of the teacher other than to monitor and guide students towards successful learning outcomes. These activities will be completed in class during the school year according to the scope and sequence of the course. Since these activities are meant to serve as a spark to student inquiry, student presentations and discussion of conclusions on real life applications must be an integral part of classroom instruction.

Level II

These are semester-long projects that students begin during the first quarter of the course and complete by the end of the first semester. The projects conform to all attributes of Project Based Learning described in the information section earlier. Students will complete the Level II project *in addition* to the curriculum based Level I investigations. Level II projects should provide opportunities for the students to engage in meaningful inquiry of personal interest at greater depth.

Students who have a difficult time coming up with project ideas and driving questions on their own, may receive help from the teacher with such ideas. The classroom “explore” and “engineering connections” activities, as well as the Level I projects, scaffold students into the first phase of a project. They provide a choice of thought provoking activities that will allow the students to generate driving questions which they can investigate on their own. However, with Level II, students will be asked to create and develop their project from start to finish on their own, or with a partner, and with some support from the teacher.

In Level I, the teacher provides the time, space, and supervision for the student to complete the laboratory activities. In level II, the teacher will provide structure via checkpoint deadlines for work increments. In both Levels I and II, the teacher guides and mentors the students in a timely manner through various phases of the project. The timeline will aid the student as well as the teacher in keeping track of time and will allow for efficient completion without unnecessary stress at the end of the year.

Social Studies

Level 1

Level I projects will be drawn from the Texas Essential Knowledge and Skills (TEKS) for a course of study. Driving Questions are used to capture the theme of the project in the form of a problem or a question that cannot be easily solved or answered. The Driving Question has three main characteristics. It must be (1) provocative or challenging, (2) open-ended and/or complex and (3) linked to the core of what students are to learn.

Examples of Driving Questions derived from TEKS of six social studies courses:

World Cultures TEKS Geography 4B: "patterns of populations in places and regions" **Driving Question:** What effect will the new Exxon-Mobil corporate offices have on The Woodlands?

Texas History TEKS History 3A: "trace the development of events that led to the Texas Revolution" **Driving Question:** Could Mexico have avoided the revolution in Texas?

U.S. History/8th Grade TEKS History 5C: "explain the origin and development of American political parties" **Driving Question:** How did political parties evolve into to dominant ideologies?

World Geography TEKS Culture 18D: "compare life in a variety of urban and rural areas in the world to evaluate political, economic, social and environmental changes" **Driving Question:** What distinctions can be drawn between Brazil and Houston on changes to the urban environment?

World History TEKS History 1E: "identify major causes and describe the major effects of important turning points in world history from 1750-1914...the Scientific Revolution... **Driving Question:** What were some effects of the Scientific Revolution in the 16th century on Western Culture?

U.S. History/11 TEKS History 3C: "analyze social issues affecting women, minorities, children, immigrants, urbanization, the Social Gospel, and philanthropy of industrialists" (1877-1898) **Driving Question:** Were industrial philanthropists of the late 1800s robber barons or generous benefactors?

Technology Integration

Email System and Chromebooks:

- All middle school students will be provided an email account through Harmony's Gmail domain.
- The choice of Gmail account will allow students to use their Chromebooks for PBL reports and digital presentations without any problems.

Level I

- Upon completion of PBL projects in Math and Science, students will be required to produce a digital story involving photos and captions only (digital photo gallery presentation).
- Producing digital photo gallery presentations in Social Studies and English subjects will be optional.
- Digital presentations will be evaluated via rubrics for technology and content
- Students may use software such as Windows Movie Maker, animoto, iVideo or WeVideo. WeVideo is recommended as the software tool for creating PBL digital photo gallery presentations based on following factors: ease of use; seamless integration of WeVideo with Gmail, Google Drive, and thus Chromebooks; and internet-based software without the need of installation or physical storage space needs.
- Training materials including video tutorials are prepared for students and teachers at this level. The training materials are on how to use WeVideo for creating digital photo gallery presentations. The video tutorials are also hosted through pbl.harmonytexas.org website. Produced digital photo gallery presentations may be kept in students' Google Drive folders for future reference.

Level II

- Students will complete one interdisciplinary PBL project during the first semester of an academic year, and which they will use as their Science Fair submission. Upon completion of the PBL project, students will be required to produce a digital story with pictures, and sound (narration).
- Digital presentations will be evaluated via rubrics for technology and content
- Students may use software such as Windows Movie Maker, animoto, iVideo or WeVideo. WeVideo is recommended as the software tool for creating PBL digital photo gallery presentations based on following factors: ease of use; seamless integration of WeVideo with Gmail, Google Drive, and thus Chromebooks; and internet-based software without the need of installation or physical storage space needs.
- Training materials including video tutorials are for students and teachers at this level. The training materials will be on how to use WeVideo for creating digital stories.
- The video tutorials will be hosted through the pbl.harmonytexas.org website.
- Harmony Students' digital stories, based on their Level II PBL projects, may also be submitted to the annual Digital Storytelling Contest (DISTCO), and will be accepted automatically.
- The DISTCO system will host students' PBL digital stories for future review and access.

HIGH SCHOOL

Chemistry

Level I

Chemistry Level I investigations are curriculum based learning experiences that are essential activities in the course. These activities may be part of the lesson; usually the “Elaborate” phase of a lesson designed according to the 5E Instructional model. Within the context of Level I, the students learn how to plan an investigation, implement it, analyze data and report/present their findings and conclusions. Additionally, the students learn how to collaborate, engage in self-evaluation and to work as responsible citizens in the classroom. These investigations may serve as an “entry event” for a student to design a long-term Level III project.

No additional work is required of the teacher other than to monitor and guide students towards successful learning outcomes. These activities will be completed in class during the school year according to the scope and sequence of the course. The essential activities identified for the chemistry course are –

- Thickness of an oil film
- Percent of salt in sea sand
- 1. Empirical formula
- 2. Percent yield of a chemical reaction
- 3. Heat of reaction
- 4. Acid rain

Since these activities may serve as a spark to student inquiry, student presentations and discussion of real life applications must be an integral part of classroom instruction.

Level II & Level III

These are semester-long projects that students begin during the first quarter of the course and complete by the end of the first semester. The projects conform to all attributes of Project Based Learning described in the information section earlier. Students will complete either a Level II or Level III project in addition to the curriculum based Level I investigations. Level II and Level III projects provide opportunities for the students to engage in meaningful inquiry of personal interest at greater depth.

Level II is intended for students who have a difficult time coming up with project ideas and driving questions on their own. Level II scaffolds students into the first phase of the project by providing a choice of thought provoking activities that will allow the students to generate driving questions that they can investigate on their own. Level III applies to students who create and develop their project from start to finish on their own with little support from the teacher.

In Level II, the teacher provides the list of “Study” activities for student selection and also provides the time, space, and supervision for the student to complete the laboratory activities. In both Levels II and III, the teacher guides and mentors the students in a timely manner through various phases of the project. The timeline will aid the student as well as the teacher in keeping track of time and allows for efficient completion without unnecessary stress at the end of the year.

Biology

Level I

Biology Level I projects are aligned with the TEKS and follows the Scope and Sequence. Students will complete four level I PBL projects in class through each 9 weeks period. Following PBL investigations will be done in class:

- Lactase Enzyme
- Diffusion and Osmosis
- Blood Typing and Genetics
- Antibiotic Sensitivity Test

Level II & III

Biology Level II and Level III are semester-long individual projects that students begin during the first quarter of the course and complete by the end of the first semester. The projects conform to all attributes of Project Based Learning described in the information section earlier. Students will complete either a Level II or Level III project in addition to the curriculum based Level I investigations. Level II and Level III projects provide opportunities for the students to engage in meaningful inquiry of personal interest at greater depth.

Level II is intended for students who have a difficult time coming up with project ideas and driving questions on their own. Level II scaffolds students into the first phase of the project by providing a choice of thought provoking activities that will allow the students to generate driving questions that they can investigate on their own. Following categories are available for Level II Biology projects.

- | | | |
|-------------------------|---------------|---------------------|
| ● Biomolecules and food | ● Enzymes | ● Osmosis |
| ● Biotechnology | ● Genetics | ● Photosynthesis |
| ● Cell Respiration | ● Heart | ● Pill Bug Behavior |
| ● Cells | ● Homeostasis | ● Proteins |
| ● Classification | ● Lungs | ● Starch Reserve |
| ● Diffusion | ● Mitosis | ● Viruses |
| ● DNA | ● Meiosis | |

In Level II, the teacher provides the list of "Study" activities for student selection and also provides the time, space, and supervision for the student to complete the laboratory activities. In both Levels II and III, the teacher guides and mentors the students in a timely manner through various phases of the project. The timeline will aid the student as well as the teacher in keeping track of time and allows for efficient completion without unnecessary stress at the end of the semester.

Level III applies to students who create and develop their project from start to finish on their own with little support from the teacher. In this level, students are responsible for finding their own project ideas. For example, they might work on a research project by collaborating with a university professor or other outside mentors. Level III will be very similar to Science Fair Project.

Physics

Level I

Physics Level I investigations are curriculum based learning experiences that are essential activities in the course. These activities may be part of the lesson; usually the "Elaborate" phase of a lesson designed according to the 5E Instructional model. Within the context of Level I, the students learn how to plan an investigation, implement it, analyze data and report/present their findings and conclusions. Additionally, the students learn how to collaborate, engage in self- evaluation and to work as responsible citizens in the classroom. These investigations may serve as an "entry event" for a student to design a long-term Level III project.

No additional work is required of the teacher other than to monitor and guide students towards successful learning outcomes. These activities will be completed in class during the school year according to the scope and sequence of the course. The essential activities identified for the physics course in each quarter;

- 1. Distance vs. Displacement with Graph matching extended activity.**
- 2. Impulse Momentum relation in a an elastic collision of PAScars**
- 3. Ohms law in serial and parallel DC circuits**
- 4. Calculating the index of refraction by Snell's Law**

Since these activities may serve as a spark to student inquiry, student presentations and discussion of real life applications must be an integral part of classroom instruction.

Level II & III

Level II and Level III are semester-long individual projects that students begin during the first quarter of the course and complete by the end of the semester. The projects conform to all attributes of Project Based Learning described in the information section earlier. Students will complete either a Level II or Level III project in addition to the curriculum based Level I investigations. Level II and Level III projects provide opportunities for the students to engage in meaningful inquiry of personal interest at greater depth.

Level II is intended for students who have a difficult time coming up with project ideas and driving questions on their own. Level II scaffolds students into the first phase of the project by providing a choice of thought provoking activities that will allow the students to generate driving questions that they can investigate on their own. Level III applies to students who create and develop their project from start to finish on their own with little support from the teacher.

In Level II, the teacher provides the list of "Study" activities for student selection and also provides the time, space, and supervision for the student to complete the laboratory activities. In both Levels II and III, the teacher guides and mentors the students in a timely manner through various phases of the project. The timeline will aid the student as well as the teacher in keeping track of time and allows for efficient completion without unnecessary stress at the end of the semester.

There is no certain list or handouts for level III. The teacher may prepare a set of project ideas for you to choose, or the students may come with their PBL project idea and driven question which covers the subjects you will learn from math or science classes. It can

be :

- in an investigation format
- in a science research project format
- in an engineering or technology project format

Participating in an academic science contest(Robotics , Science Olympiad, ..etc) may be counted as PBL Level- 3 project.

Mathematics

Level I

Level I Mathematics PBLs are embedded into the math curriculum as an introduction or enrichment activity. The activities require group work and teachers' special attention when monitoring students. Once students finish working in groups, teachers should pick different solution and organizing methods of students and let them to present in the class. The utmost goal of the teacher is to relate different solution methods and tie all the work done to the objectives of that curriculum unit. All of the projects are aligned with Texas Essential Knowledge and Skills (TEKS) and they are implemented in the class. With this activities, students improve their group work skills and their ability to explain and justify their solutions.

Level II & III

Level II Mathematics PBLs are semester-long projects. Students will pick the topic from a given list of the projects along with the instruction, helpful sites and reflection questions. Students will begin the project at the beginning of the academic year and submit it at the end. Teacher will support the student during the year. Teacher will ask each student to submit a timeline to finish the project, therefore students do not have to rush at the end. Teachers will check students' progress and give feedback throughout the year. These projects require construction, data collection and analyses, presentation of the findings and reflection on the project. Each project comes with the reflection questions that students have to answer once they finish their projects. Students have to submit the answers of the reflection questions along with the product they have worked on (poster, research report, construction of an objects etc.). The projects are directly intended to apply mathematics in real life. Therefore, students will recognize the use of mathematics upon the completion of their projects.

There is no certain list or handouts for level III. The teacher may prepare a set of project ideas for you to choose, or the students may come with their PBL project idea and driven question which covers the subjects you will learn from math or science classes.

English/Language Arts

Level I

The instructional model at Harmony is guided through the lens of Project Based Learning (PBL). Instruction has moved from short term knowledge retention to long term retention by

integrating 21st Century learning experiences and embedding Texas Essential Knowledge and Skills (TEKS) such as listening, speaking, reading, and writing as well as citizenship. These real life experiences will prepare Harmony students for future expectations of our society and workforce. The goal is to promote not only collaboration skills and student ownership of learning but also to promote student success in state and national standards.

Level II & II

Level II projects are the year-long individual math or science projects that students begin during the first quarter of the course and complete by the end of the course. Students will complete the Level II project, including its cross-curricular requirements, in addition to the curriculum based Level I investigations.

Level II projects should provide opportunities for the students to engage in meaningful inquiry of personal interest at greater depth by creating and developing their own driving questions and projects, with some support from the teacher.

Students will select one of the following options (journal, argumentative essay, narrative essay, newspaper, or interview) to complete during the process of developing their Level II project, or will obtain ELA teacher-permission to pursue a different option.

This ELA piece will be assessed with a common rubric. Specific deadlines will be determined by the ELA teacher.

Social Studies

At the High School level, students will have two PBL projects to complete each year (One per Semester) at level 1, as well as several Social Studies components to be include in the level II and III PBL projects.

Some examples of the driving questions at this level are:

World Geography TEKS Culture 18D: "compare life in a variety of urban and rural areas in the world to evaluate political, economic, social and environmental changes"

Driving Question: What distinctions can be drawn between Brazil and Houston on changes to the urban environment?

World History TEKS History 1E: "identify major causes and describe the major effects of important turning points in world history from 1750-1914...the Scientific Revolution

Driving Question: What were some effects of the Scientific Revolution in the 16th century on Western Culture?

U.S. History/11 TEKS History 3C: "analyze social issues affecting women, minorities, children, immigrants, urbanization, the Social Gospel, and philanthropy of industrialists" (1877-1898)

Driving Question: Were industrial philanthropists of the late 1800s robber barons or generous benefactors?

Level II & III

Level II & III PBLs in high school are Math/Science projects with integrated English and Social studies components. Students in grades 9 – 12 will be asked to choose a driving question from their Math or Science course. It is then up to the student to investigate the connections the project has to social studies issues. The selection of a driving question and the social studies connections should be determined by the conclusion of the first quarter. Below are 6 ways a student can find the social studies connections to their level II and III PBLs.

1. Historical Connection: Students should be encouraged to examine the historical connections to a math or science problem. They can do this by exploring an event in the past that might be related to the discovery, or an effect of the discovery on an event that had happened as a result. For example, if a student is investigating air pressure, they can include how air pressure is related to the discovery of flight. (From the discovery of hot air balloons in the 18th century, all the way through space travel).

2. Economic Influence: Students can connect a scientific discovery with its economic impact. For example they can explain the discovery of radio waves, and the impact that has had on business and trade. Or explain how a new product has revolutionized an industry (GM Foods) or has caused the destruction of an existing economy.

3. Political influence: Students could investigate the role politics plays in their topic of choice. They can trace the influence governments have on funding particular research programs or how much funding is directed towards developing new scientists. Conversely, students could explore how science influences politics, such as the discovery of “greenhouse gases”.

4. Geographical influence: Students can look at how their topic can be observed in the natural world, and investigate if geography is an influence. As volcanoes, geysers and hurricanes all have geographical influences students can make these connections and explain how these forces can affect all of us.

5. Effect of change on Society: Students can show how the topic of their project has influenced the way we live. Students investigating the development of computers, and show how this technology has revolutionized our whole world. Or how discoveries in the medical fields have changed the life expectancy, and what impact this has on culture.

6. Legal impact: Students can also look at how scientific and mathematical discoveries have impacted our legal system. The discovery of Steam power directly led to the Gibbons Vs. Ogden Supreme court case which decided several aspects of federal power in the United States.

Technology Integration

Email System and Chromebooks:

- All HS school students will be provided an email account through Harmony's Gmail domain.
- The choice of Gmail account will allow students to use their Chromebooks for PBL reports and digital presentations without any problems.
- All high school students will sign up for an additional email account through Gmail domain. Students will use the Google Sites and Youtube Channels through their gmail account.
- Students will obtain personal Google account that can be solely used for PBL assignments
- The Gmail system ,Google sites, Google docs ,YouTube Channels, Google Plus and PICASA albums may not be used to create any offensive or disruptive messages. Among those which are considered offensive are any messages that contain sexual implications, racial or gender-specific slurs, or any other comment that offensively addresses an individual's age, sexual orientation, religious or political beliefs, national origin, disability, or anything that could be construed as harassment or disparaging of others.
- Students may not use e-mail or Google sites to send, receive or post materials, proprietary financial information, or other similar materials that violate copyright law. Students will be responsible for any content in their Google personal site that violates copyright law.

Level I

- In each core subject, English, Math, Social Studies, and Science, students will complete two PBL projects in each semester. Upon completion of PBL projects in Math and Science, students will be required to produce a digital story involving photos and captions only (digital photo gallery presentation).
- Producing digital photo gallery presentations in Social Studies and English subjects will be optional.
- There is a Technology Rubric for evaluation of PBL digital photo gallery presentations at this level.
- WeVideo was selected as software tool for creating PBL digital photo gallery presentations at this level. This decision was based on following factors: The ease of use, seamless integration of WeVideo with Gmail and Google Drive, being an internet-based software without the need of installation, and the ability to work with Chromebooks.
- Training materials including video tutorials will be supplied for students and teachers at this level. The training materials will be on how to use WeVideo for creating digital photo gallery presentations. The video tutorials will be hosted through pbl.harmonytexas.org website.
- Produced digital photo gallery presentations will be kept in students' Google Drive folders for future reference.

Level II & III

- Students will complete one interdisciplinary PBL project during the academic year. Upon completion of the PBL project, students will be required to produce;
 - a digital story complete with pictures, video, sound and narration.
 - a google site explaining their projects
 - a brochure for their project including QR codes for movie and website link.
- Students will post their movie presentation to their YouTube Channel.
- Both movie and handout will be inserted in student's Google Site.
- There is a Technology Rubric for the evaluation of PBL digital stories at this level.
- WeVideo will be recommended as the software tool for creating PBL digital stories at this level. However, students will have a choice to select from other digital storytelling software such as Photostory 3, iMovie, Animoto, and Windows Live Movie Maker.
- Training materials including video tutorials are prepared for students and teachers at this level. The training materials will be on how to use WeVideo and other popular software for creating digital stories. The video tutorials will be hosted through pbl.harmonytx.org website.
- Harmony Students' PBL digital stories will be accepted to the Digital Storytelling Contest (DISTCO) 2014 automatically.
- DISTCO system will host students' PBL digital stories for future review and access.

Parent Information and Commitment Form*

I understood all the requirements and information above about RTT-D PBL (Project Based Learning) projects for high school and middle schools

STUDENT NAME (please print)

SIGNATURE

DATE

PARENT NAME (please print)

SIGNATURE

DATE

*This the last page of the form which will be separated from first pages and returned to the subject teacher. First pages will remain with the parents and students.