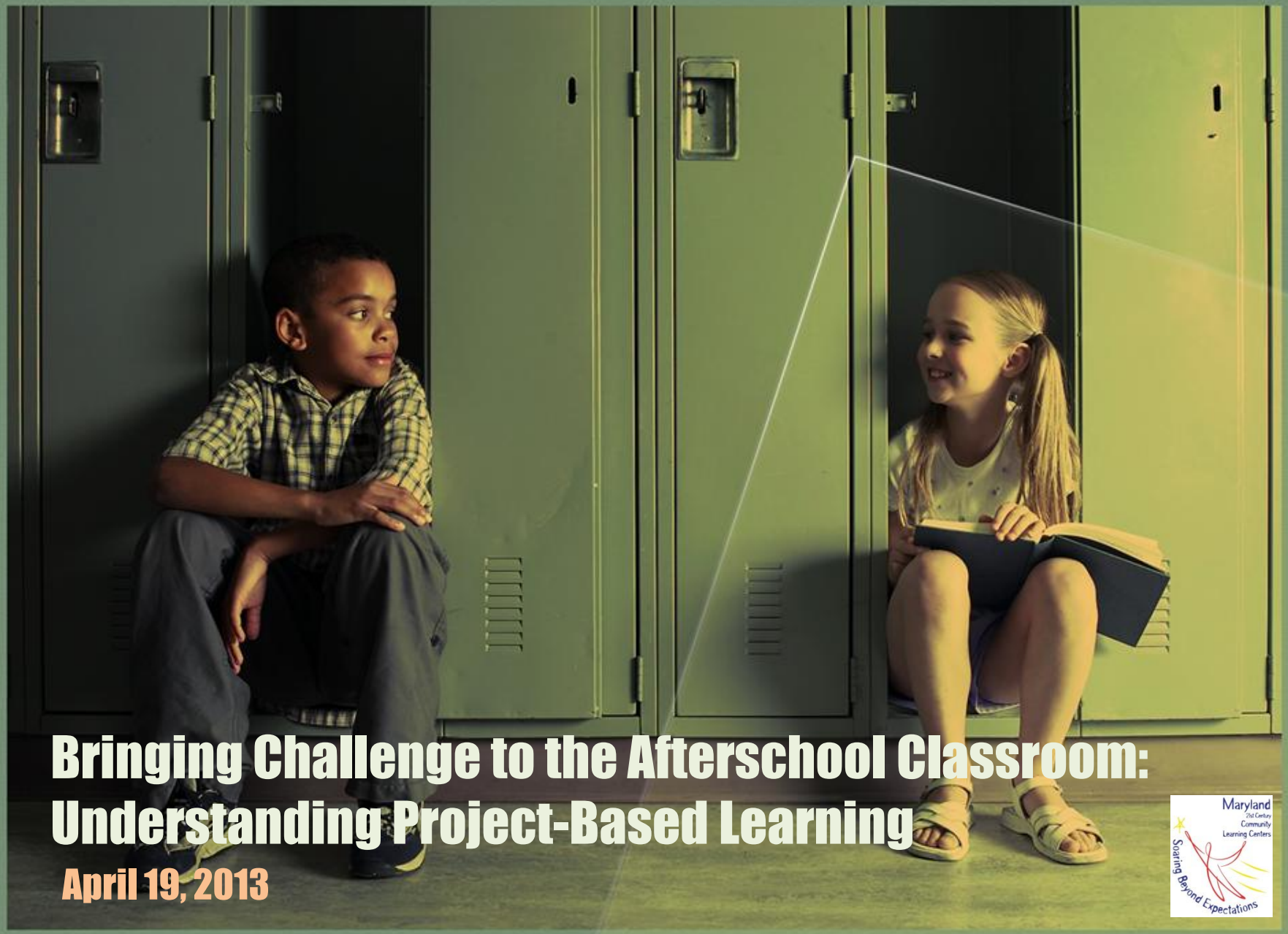


Bringing Challenge to the Afterschool Classroom: Understanding Project-Based Learning

April 19, 2013

Maryland 21st Century Community Learning Centers
Soaring Beyond Expectations

The Whole Child Initiative

www.ascd.org

10 Challenged Indicators

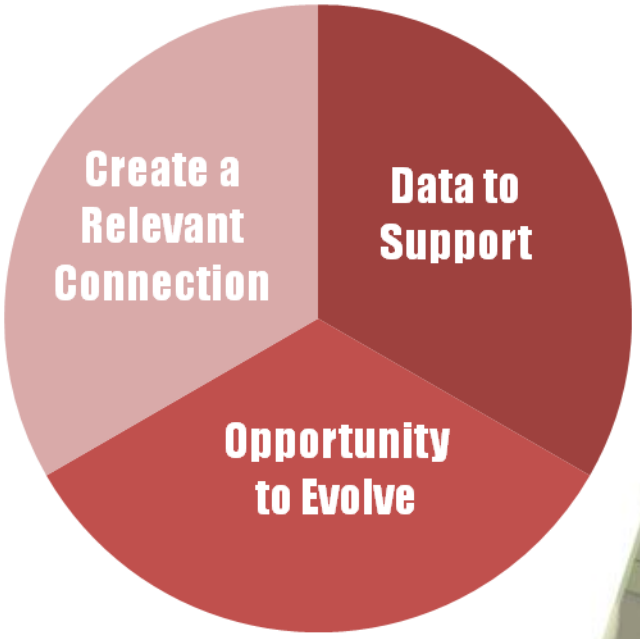
www.ascd.org

Connection to Afterschool

Indicator 2: Provide opportunities for students to develop critical thinking and reasoning skills

Indicator 3: Use qualitative and quantitative data to support students' academic and personal growth

Indicator 7: Community-based programs provide students with experiences relevant to higher education, career and citizenship



Project-Based Learning is Not . . .

Project-Based Learning is Not . . .

Project-Based Learning is Not . . .

Project-Based Learning is Not . . .

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Project-Oriented Learning

Key Elements of Project-Based Learning

- ❑ Teaches significant content
- ❑ Requires critical thinking, problem solving, collaboration and various forms of communication
- ❑ Is organized around an open-ended driving question
- ❑ Incorporates essential educational content
- ❑ Allows for student voice and choice
- ❑ Provides a process for purposeful reflection

Project Planning Guides

www.foundationsinc.org

Project Planning Guides

www.bie.org

Spotlight Project: *Projectile Motion*

PROJECT OVERVIEW

page 1

Name of Project:	Projectile motion	**Duration:**	2 weeks
Subject/Course:	math (Algebra II/Trigonometry)	**Grade Level:**	11
Other Subject Areas to Be Included:	Physics		

Project Idea Summary of the challenge, investigation, scenario, problem, or issue:	Students work in teams to design and construct a ballistic device that launches an object in a flight path that follows a parabola. They use low cost materials (PVC pipe, plywood, rubber bands, etc.) to build the device, which must be capable of repeated firings. Students use knowledge of quadratic functions in order to hit a target. Each team conducts multiple tests and use the data they record to redesign their device if needed. Students make an oral presentation using PowerPoint slides to summarize their findings.
Driving Question	How can we build a device to launch a projectile, and calculate its motion in order to hit a target?
Content and Skills Standards to be addressed:	**Students will be able to:** • use two-dimensional equations of motion for projectile motion to calculate initial velocity, time in the air, horizontal distance and maximum height. • use trigonometry to resolve two-dimensional vectors into its vertical and horizontal components • Graph quadratic equation and find x-intercepts, y-intercepts and vertex • Apply factoring, quadratic formula and graphing calculator to find x-intercepts of a quadratic graph **CA Content Standards** – Algebra II: 8.0, 10.0; Trigonometry: 12.0, 19.0; Physics: 1i, 1j

		T+A	E		T+A	E
21st Century Skills explicitly *taught and assessed* (T+A) or *encouraged* by project work, but not taught or assessed (E):	Collaboration	☒	☐	Other: Critical and Creative Thinking; Problem Solving	☐	☒
	Presentation	☒	☐		☐	☐
	Critical Thinking:	☐	☐		☐	☐

Culminating Products & Performances	**Group:**	Design Proposal Complete Ballistic Device Main Test Report Angles of Elevation Report Oral Presentation	**Presentation Audience:** ☐ Class ☐ School ☐ Community ☐ Experts ☐ Web ☐ Other:_____
	Individual:		

Convergent vs. Divergent Questions

Convergent questions are "close-ended" and based on factual information

- Have one "right" answer, often "yes" or "no"
- The questioner usually has the answer in mind
- Common in tests

Divergent questions are "open-ended" and do not have a single right answer

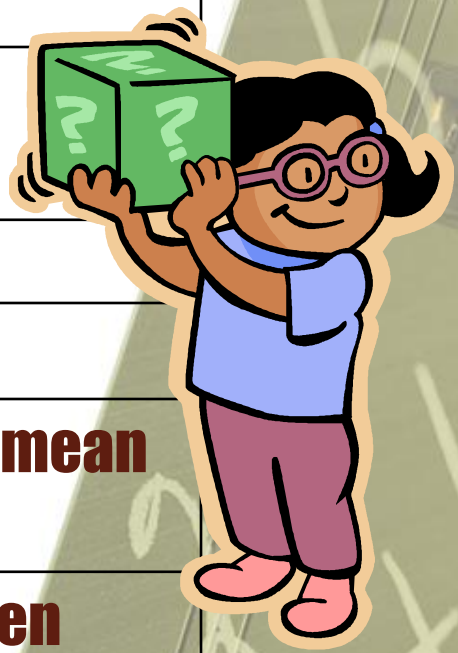
- Have a range of possible responses
- The questioner does not necessarily have a correct answer in mind
- Stimulate conversation

What is a Driving Question?

Drafting a Driving Question

Weak:	**What is an ecosystem?**
Better:	**How do scientists analyze the ecosystem?**
Best:	**How do human beings "compete" in an ecosystem?**

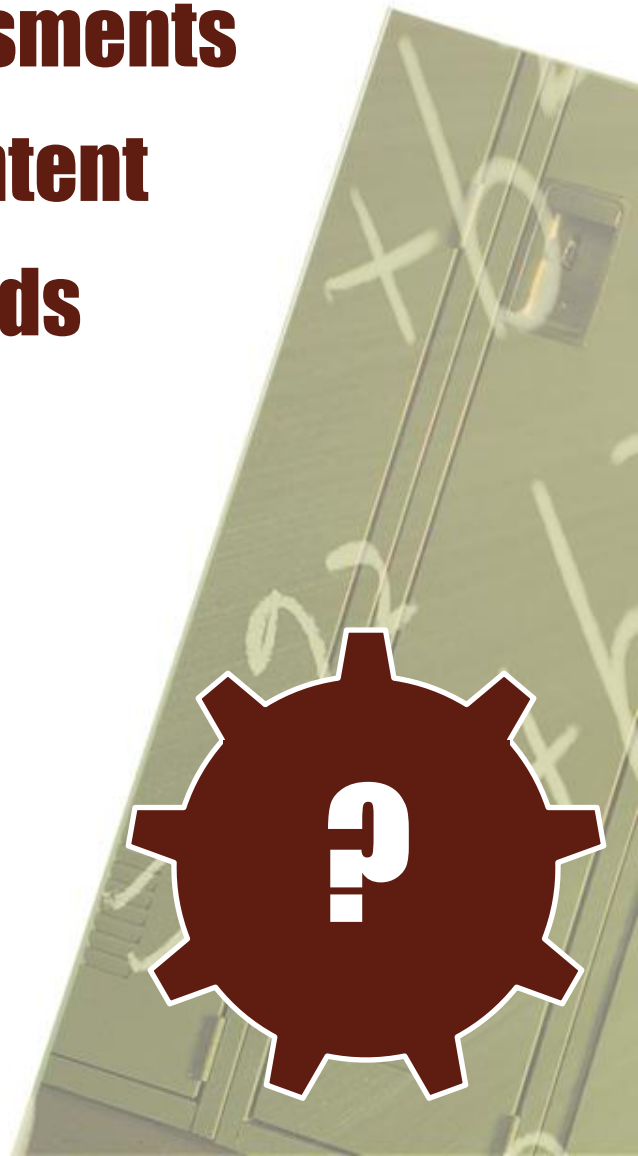
Weak:	**What is the history of our neighborhood?**
Better:	**What does the history of our neighborhood mean to its current residents?**
Best:	**How have our attitudes and experiences been shaped by our neighborhood?**



Projects to Products

Incorporating Academic Strategies

- Include findings of student assessments
- Reinforce essential academic content
- Combine cross curricular standards
- Integrate various learning styles



Understanding and Practice

Goal	Increase reading scores
Academic Content	Understanding literary language used in texts (ex. simile, metaphor, rhyme, rhythm, alliteration)
Driving Question	How does literature reflect the times in which it was written?
Lesson Planning Topic	Four Purposes of Writing
Group Discussion	Was Shakespeare a rapper?
Content Areas	Reading, History, Math, Social Studies, Art
Career Connection	How do I write persuasively to influence my audience?

Assessment Strategies

- Observation of the project's work or progress
- Group evaluation
- Self-evaluation
- Pre/post testing
- Personal portfolios
- Checklists and logs

1. Taking Responsibility for One's Own Learning and Performance

NOT PROFICIENT		PROFICIENT
− Student does not take responsibility for or does not complete his/her tasks within the group (e.g., does not make an effort to do high-quality, on-time work)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student takes responsibility for and completes his/her tasks within the group (e.g., making an effort to do high-quality, on-time work)
− Student is often off-task or disengaged (e.g., doesn't say much; isn't listening attentively; isn't doing related work)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student is on-task and engaged in whatever the group is doing/ discussing (e.g., is contributing relevant knowledge, opinions, and skills; is listening attentively to others)
− Student does not use feedback in a constructive way (e.g., becomes defensive, does not use feedback from others to improve his/her work or understandings)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student uses feedback in a constructive way (e.g., does not become defensive, uses feedback from others to improve his/her work or understandings)

***NP** = Not proficient* ***P** = Proficient*

Notes:

_____Points earned / _____ Points possible

2. Maximizing Group Task Performance

NOT PROFICIENT		PROFICIENT
− Student does not pay attention to the quality of the work and understanding of other members and of the group as a whole	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student pays attention to the quality of the work and understanding of other members and of the group as a whole, taking action to improve it when appropriate (e.g., offering feedback/assistance to others)
− Student does not use discussion facilitation strategies for improving the effectiveness the group's task-related conversations (e.g., does not summarize comments, ask for clarification, build consensus)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student uses discussion facilitation strategies for improving the effectiveness the group's task-related conversations (e.g., summarizes comments, asks for clarification, builds consensus)
− Student does not use project management strategies — when applicable — for improving the effectiveness of the group's work on the task (e.g., does not create timelines; identify or set goals; prioritize and allocate tasks; organize resource-gathering; monitor progress; keep group on task)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student uses project management strategies — when applicable — for improving the effectiveness of the group's work on the task (e.g., creates timelines; identifies or sets goals; prioritizes and allocates tasks; organizes resource-gathering; monitors progress; keeps group on task)

***NP** = Not proficient* ***P** = Proficient*

Notes:

_____Points earned / _____ Points possible

3. Managing Social Relations

NOT PROFICIENT		PROFICIENT
− Student generally does not show respect for the ideas, opinions, values and feelings of other group members (e.g., is rude, does not acknowledge what others have to say, uses putdowns)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student consistently shows respect for the ideas, opinions, values, and feelings of other group members (e.g., is polite, acknowledges what others have to say, offers only constructive criticism — no put-downs)
− Student is generally not able to work well with diverse group members (e.g., withdraws, is uncooperative, causes conflict)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student works well with diverse group members; cooperates and does not cause conflict
− Student does not actively encourage group cohesion (e.g., does not help manage/resolve conflict within the group; does not set a positive tone in words and actions)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student actively encourages group cohesion (e.g., by helping to manage/resolve conflict within the group or by setting a positive tone in words and actions)

***NP** = Not proficient* ***P** = Proficient*

Notes:

_____Points earned / _____ Points possible

21ST CENTURY SKILLS ASSESSMENT RUBRIC: **PRESENTATION**

Part I — Individual Components*

1. Style of Presentation

NOT PROFICIENT		PROFICIENT
− Student does not choose the style of presentation most appropriate for its goals (e.g., is too informal or does not take it seriously)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student chooses the style of presentation most appropriate for its goals (e.g., to persuade, inform, explain, entertain)
− Student does not adjust wording, style of delivery, and the amount and kind of information communicated to fit the needs of the specific audience (e.g., says too little or too much, or uses unfamiliar terms and concepts without explaining them)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student adjusts wording, style of delivery, and the amount and kind of information communicated to fit the needs of the specific audience (e.g., does not say too little or too much, or use unfamiliar terms and concepts without explaining them)

***NP** = Not proficient **P** = Proficient*

Notes:

_____Points earned / _____ Points possible

2. Delivery (appearance, voice, eye contact)

NOT PROFICIENT		PROFICIENT
− Student does not have appropriate body posture, movement, use of gestures, or attire	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student has appropriate body posture, movement, use of gestures, and attire
− Student's voice is too quiet or unclear; delivery may be too rushed and/or have interruptions, hesitations, or excessive use of filler words (e.g., "um," "you know," "so...")	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student's voice is consistently audible and clear; delivery is not too rushed and is without interruptions or hesitations, with minimal use of filler words (e.g., "um," "you know," "so...")
− Student does not make frequent eye contact (e.g., screen or notes are read or referred to excessively, without looking at audience)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student makes frequent eye contact (e.g., if notes are used they are only glanced at)

***NP** = Not proficient **P** = Proficient*

Notes:

_____Points earned / _____ Points possible

3. Response to Questions (from audience or teacher)

NOT PROFICIENT		PROFICIENT
− Student does not have a response or the response is not precise or to the point of the question (e.g., too brief or long, or off topic)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student's response is precise and to the point of the question (e.g., not too brief or long, or off topic)
− Student does not respond appropriately to questions that are unclear or problematic (e.g., is impolite in his/her response, gives an answer that shows the question was misunderstood, or tries to give an answer even though he or she does not know enough)	⬅NP- - - - - - - - - Approaching - - - - - - - - -P➡	+ Student responds appropriately to questions that are unclear or problematic (e.g., politely asks clarifying questions, repeats or rephrases questions to be sure of understanding, explains that the question is beyond the scope of the project and would require more research)

***NP** = Not proficient **P** = Proficient*

Notes:

_____Points earned / _____ Points possible

* If group presentations are given, each group member (presenter) is typically scored individually on each of these dimensions.

Managing Your Project Roles

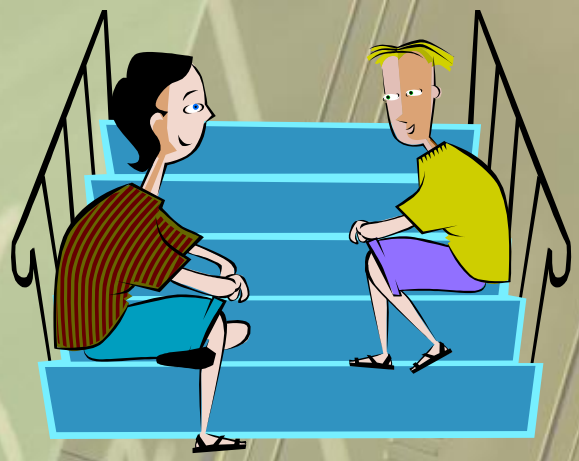
- ✓ Director – develop specific learning experiences to meet goals including providing limits and guidelines
- ✓ Guide – assist in planning the process, monitor progress
- ✓ Coach – give suggestions when needed and help when asked
- ✓ Co-learner – explore areas that are new to you
- ✓ Cheerleader – offer encouragement and support

Managing the Group's Project Roles

- ✓ Group Leader – keeps the group on task and helps to organize the process
- ✓ Timekeeper – keeps the group on schedule
- ✓ Recorder – takes minutes and drafts reports
- ✓ Observer – uses a tool to monitor daily activities
- ✓ Researcher – collects data and information
- ✓ Spokesperson – communicates on behalf of the group
- ✓ Controller – organizes and coordinates resources

Make Time for Reflection

- Daily project logs using technological tools
- Weekly status reports that detail progress
- Rubrics that address growth and development
  - Academics
  - Team collaboration
  - Critical thinking and reasoning skills
- Oral presentations
- Roundtable discussions



Reflection Log

www.bie.org

PROJECT WORK REPORT: **INDIVIDUAL**			
Project Name:			
Student Name:		**Date:**	
For the Time Period:	Day(s): _____ Week: _____		

During this time period I had the following goals for project work:	1	
	2	
	3	
	4	
	5	

During this time period I accomplished...	1	
	2	
	3	
	4	
	5	

My next steps are...	1	
	2	
	3	
	4	
	5	

My most important concerns, problems or questions are...	1	
	2	
	3	
	4	
	5	

Sharing the Project

- Make it public!
- Answers the driving question
- Showcases a product or event
- Demonstrates understanding of content
- Connects to higher learning
- Participation from every student

RESOURCES:

- www.pbl-online.org
- www.bie.org
- www.y4y.ed.gov
- www.edutopia.org
- www.foundationsinc.org