INTRODUCTION

You've heard about Project Based Learning, and you may even have tried it, but perhaps you're wondering… Sure, it sounds good, but is it right for me and my students? Can I do it in today's educational landscape? Can I make sure it's well-designed, so we meet learning goals and don't waste precious time? Our answer to all these questions is "yes"— with some "buts and ifs" we'll explore in this book. By the end, we hope you'll be planning a project and be ready to provide children with a great learning experience!

This chapter contains information about:

- The Purpose of This Book and How to Use It

- Snapshots of K-5 Projects

- What is Project Based Learning?

- Why Use Project Based Learning as a Teaching Method?

- Misconceptions of PBL

- PBL's Effectiveness: What Experience and Research Tells Us

- How PBL Can Fit in an Elementary School Program

- The Role of the Teacher in PBL

The Purpose of This Book and How to Use It

This book is written for K-5 teachers who may be new to Project Based Learning, or who may have tried PBL before but would like to improve their practice. *PBL in the Elementary Grades* is designed to provide easy to read, practical, step-by-step advice about planning and managing a standards-focused project, and some tools to help you do it well. The basic PBL design we describe can work for any academic content area and grade level.

How to Use This Book

This book is meant to be used to actually plan a project while you read it. You can make copies of the following three planning forms we provide in the *Useful Stuff* section, or you can use the electronic versions available at **bie.org/tools/useful**. A third option is to use the "Do It Yourself" feature of BIE's website, an online tutorial where you can plan and record your projects, at **bie.org/diy**. The three planning forms are:

- **Project Overview:** A two-page form for recording a summary of your project

- **Project Teaching and Learning Guide:** A form for analyzing and planning specific instructional supports for the knowledge and skills students will need to be successful in the project

- **Project Calendar:** A form for planning the daily use of time in your project

We encourage you to complete these forms as you go through each chapter — we'll remind you. You'll also see examples of completed forms from our Spotlight Projects.

Some readers might prefer starting with the *Spotlight Projects* chapter, to see a range of real projects in a variety of grade levels and settings. We refer to these projects throughout the book. We've included another sample project to help you get a picture of PBL in action: a fictitious project described in detail as it unfolds in a second grade classroom, *Managing PBL: A Portrait* on page 75.

In each chapter, you'll see the following special features:

TIPS FROM THE CLASSROOM

Advice on various topics from experienced PBL teachers.

K-2 How-to

Special notes to primary grades teachers for using PBL with younger students.

Bulletin Board

Additional examples, resources, or notes on specific topics.

✳ USE THIS

Reminder that a form, handout, or example can be found in Useful Stuff, near the back of the book.

Snapshots of Projects in K-5

Projects come in many shapes and sizes. Here are some quick glimpses of project work in K-5 classrooms that show how varied PBL can be:

Kindergarteners *learn about food groups and assemble pictures for menus they create to explain a healthy Thanksgiving meal, which they present to parents and other students.*

Fourth graders *study maps and primary source documents as they take the role of Spanish missionaries deciding where to build the 22nd California mission (if there was to be one) and what it might look like.*

A first grader *revises a butterfly drawing for his team until it looks good enough to include in a boxed set of illustrated cards of state wildlife that the class is creating.*

Fifth graders *analyze the pH of soil and water samples while searching for clues to determine sources of pollution in their town.*

Second graders *reflect on why we remember certain events as they prepare to record podcasts of themselves telling a story about an experience, with descriptive details, a logical sequence, and a conclusion.*

Third graders *learn heating, cooling, and basic engineering principles while designing nest houses that will keep squirrels warm in the winter and cool in the summer.*

First graders *learn about the power of wind while designing, building, and testing model sailboats using recycled materials.*

Fifth graders *learn about urban planning while assessing the aesthetics of the neighborhood around their school, constructing maps that identify positive and negative characteristics, and recommending improvements.*

First graders *investigate the contents of suitcases filled with diaries, family photographs, artifacts, maps, and architectural drawings. They generate questions to investigate about family life in their local community long ago so they can create a video on the topic.*

Third graders *email opinion pieces on what they think should be done with vacant land in their community to an economic development agency for feedback before submitting them to a local newspaper.*

Kindergarteners *make four different kinds of puppets with help from a local theatre company as they plan how to re-tell classic children's stories in a puppet show.*

Second graders *try to guess how much food, school supplies, or other kinds of items they could buy with 1000 pennies, then create shopping lists and visit local stores and websites to compare prices to prepare for a presentation about where to buy things.*

Fourth graders *create a blog to publish their writing on the theme of "What It's Like to Be 10" after reading memoirs of childhood by various authors.*

A kindergarten class studies local wildlife and observes the life cycle of animals kept in the classroom, as they make a field guide about their county's woodland creatures.

A kindergarten class *studies local wildlife and observes the life cycle of animals kept in the classroom, as they make a field guide about their county's woodland creatures.**

Fifth graders *take the role of medical school students and try to determine what might be causing a patient's symptoms: a problem in the respiratory or circulatory system.**

Third graders *dig deep into the history of their urban neighborhood though interviews, research, and field visits, then create museum exhibits in the school library.**

First graders *learn about communities, rules and laws as they help their school develop behavior rules for different parts of the playground and campus, making posters and a video to share with other students.**

Fourth graders *decide to save a local endangered species by starting a conservation effort and restoring creek habitats.**

Second graders *run a lunchtime pizza business for two days, culminating a study of what work is like, in which they interviewed people at local businesses.**

Fifth graders *learn to collect and display data and plot points on a graph as they figure out which cell phone plan is best for their family and prepare a presentation to their parents and classmates.**

Third graders dig deep into the history of their urban neighborhood though interviews, research, and field visits, then create museum exhibits in the school library.

* These last seven projects are described in detail in this book's ***Spotlight Projects*** chapter.

What is Project Based Learning?

In Project Based Learning, students are pulled through the curriculum by a meaningful question to explore, an engaging real-world problem to solve, or a challenge to design or create something. Before they can accomplish this, students need to inquire into the topic by asking questions and developing their own answers. To demonstrate what they learn, students create high-quality products and present their work to other people. Students often do project work collaboratively in small teams, guided by the teacher.

Although it is easier to define what PBL is *not* (e.g., worksheets disconnected from larger intellectual inquiry), it is more difficult to define what it is… and in one sentence. Here is our best attempt:

> *Project Based Learning is a systematic teaching method that engages students in learning important knowledge and 21st century skills through an extended, student-influenced inquiry process structured around complex, authentic questions and carefully designed products and learning tasks.*

A project should be a rigorous learning experience. It is not the dessert you serve students so they can "have fun" or "get a hands-on experience" after a traditional unit of instruction. Instead, a project is the *main course* that organizes the unit. In most cases, it's helpful to actually think of the project *as* the unit. For more on what a project is and is not, see ***Misconceptions of PBL*** on page 10.

> If you try to rush a project, there isn't enough time to fully include all the essential elements — and students won't learn as much or as well.

The length of a project can vary. Most projects take from 2-4 weeks to complete, assuming students work on them for only part of a day. Some may be longer, as you'll see when you read about our Spotlight Projects. If you try to rush a project, there isn't enough time to fully include all the essential elements listed below — and students won't learn as much or as well.

A project has typical phases, although no two projects are alike. There is a beginning, middle, and end. For a visual representation of these phases in the BIE model of PBL, see the diagram on page 46, "The Flow of a Project."

Projects can take many forms. We use the term "PBL" broadly, including under its umbrella such similar instructional methods as problem-based learning, design challenges, place-based learning, the use of complex case studies and simulations, and guided inquiry. Other writers distinguish these types of learning from Project Based Learning. We believe they share common characteristics and are more alike than different.
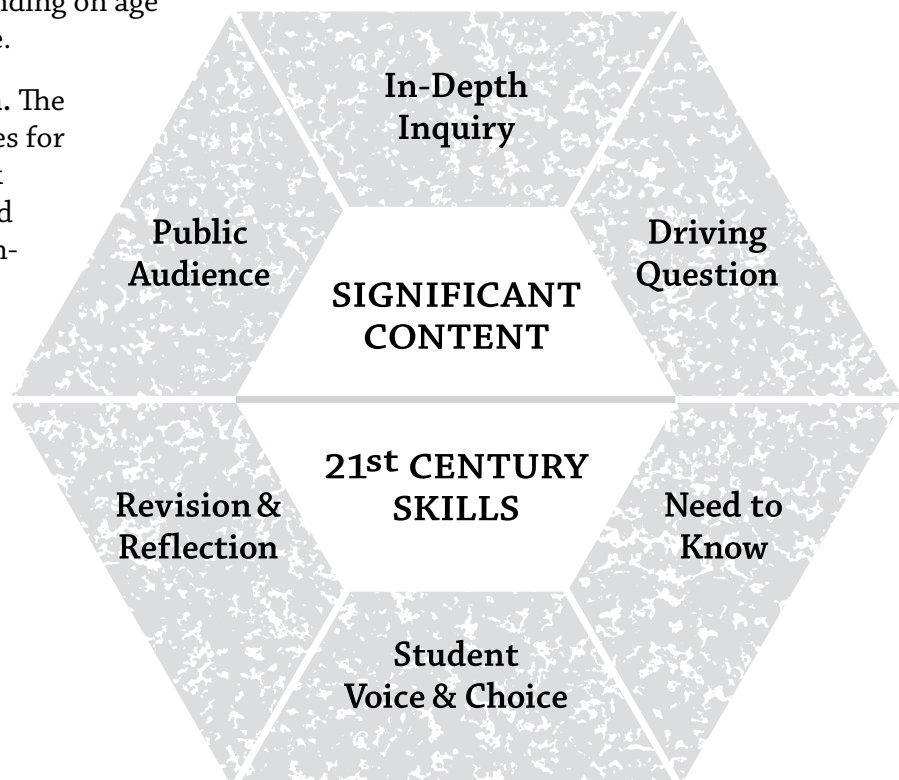
A project could be:

- An exploration of a philosophical question, such as "What is a healthy community?"

- An investigation of a historical event or a natural phenomenon

- A problem-solving situation, either real or in a fictitious scenario

- An in-depth examination of a controversial issue

- A challenge to design a physical or computer-based artifact, develop a plan, or produce an event

- A challenge to create a piece of writing, multimedia, or work of art for a particular audience or purpose

Essential Elements of PBL

Whatever form a project takes, it must have these essential elements to meet our definition of PBL:

- **Significant Content.** At its core, the project is focused on teaching students important knowledge and skills, derived from standards and key concepts at the heart of academic subject areas.

- **21st Century Skills.** Students build skills valuable for today's world, such as critical thinking/problem solving, collaboration, and communication, which are taught and assessed.

- **In-Depth Inquiry.** Students are engaged in a rigorous, extended process of asking questions, using resources, and developing answers.

- **Driving Question.** Project work is focused by an open-ended question that students explore or that captures the task they are completing.

- **Need to Know.** Students see the need to gain knowledge, understand concepts, and apply skills in order to answer the Driving Question and create project products, beginning with an Entry Event that generates interest and curiosity.

- **Voice and Choice.** Students are allowed to make some choices about the products to be created, how they work, and how they use their time, guided by the teacher and depending on age level and PBL experience.

- **Revision and Reflection.** The project includes processes for students to use feedback to consider additions and changes that lead to high-quality products, and think about what and how they are learning.

- **Public Audience.** Students present their work to other people, beyond their classmates and teacher.

In-Depth Inquiry

Public Audience

Driving Question

SIGNIFICANT CONTENT

21st CENTURY SKILLS

Revision & Reflection

Need to Know

Student Voice & Choice

Why Use Project Based Learning as a Teaching Method?

PBL is valuable because it effectively teaches content knowledge and skills, builds deeper understanding of concepts, and makes a school curriculum more engaging and meaningful for students. PBL is one of the best ways to prepare students for the demands of life, citizenship, and work in today's world. To see the research behind these claims, see **bie.org/research**.

An effective way to learn content knowledge and skills

Many critics of the education system in the U.S. and other countries argue that the typical curriculum is "a mile wide and an inch deep." Teachers experience this too, when they have to rush through topics instead of teaching them thoroughly, in order to "cover the standards." And students are aware that they have not learned things well or in depth when they move from unit to unit with no time to be thoughtful or apply what they learn. Students in the upper grades memorize material for test after test — without remembering, the next week, month, or year, very much of what they supposedly "learned."

PBL can help fix this situation. Projects can and should be designed to focus on important content standards — that's one of the main messages of this book. But students taught with PBL are also meant to delve deeply into a topic. They spend time thinking about how to create a complex product or answer a profound question, solve a problem or resolve an issue. In order to successfully complete a project, students still need to gain content knowledge and use academic skills, but they understand concepts more thoroughly and retain what they learn longer.

> If you ask students what they don't like about school, many of them will tell you "it's boring!"

Making a school curriculum more engaging and meaningful

If you ask students what they don't like about school, many of them will tell you "it's boring!"

This is generally less true in the early elementary grades, but even young students may find school work to be less exciting than it could be. Even if a teacher's activities and lessons are not boring and actually fun, students may not see how it connects to anything except the world of school. But in a good project, students readily sense that what they are doing is meaningful. They're working on authentic tasks and products, exploring issues relevant to their lives, and connecting with adults and organizations in the community and beyond. They see how the knowledge and skills they're learning apply to the real world. And some projects — often the most memorable ones — can actually change a young

person's life by igniting a lifelong passion for a topic, or by showing them they have the power to do something about what they see in the world.

Building readiness for 21st century work, life, and citizenship

The turn of the 21st century sparked reflection across the nation about the state of our current education system. Three key questions emerged: "How is the world changing?", "What skills and knowledge do our students need to be successful in this new world?" and "How can schools help students develop these skills and knowledge?" *Time* magazine's December 2006 cover story, "How to Bring Our Schools Out of the 20th Century," contained a compelling introduction:

> *There's a dark little joke exchanged by educators with a dissident streak: Rip Van Winkle awakens in the 21st century after a hundred-year snooze and is, of course, utterly bewildered by what he sees. Men and women dash about, talking to small metal devices pinned to their ears. Young people sit at home on sofas, moving miniature athletes around on electronic screens. Older folk defy death and disability with metronomes in their chests and with hips made of metal and plastic. Airports, hospitals, shopping malls — every place Rip goes just baffles him. But when he finally walks into a schoolroom, the old man knows exactly where he is. "This is a school," he declares. "We used to have these back in 1906. Only now the blackboards are green.*

The article exposed the challenge facing America's schools: How can we change the systems originally designed to educate workers for agrarian life and industrial-age factories to systems that prepare students for today's globalized, knowledge-based economy?

The business world tells us that successful employees, managers, entrepreneurs, and leaders in the 21st century economy do not only need knowledge and basic skills like the kind taught in school. They also need to know how to learn new knowledge and skills; to acquire, evaluate and use information from a variety of sources; to work in teams; to solve problems and think critically; to manage complex tasks; and to communicate with a variety of others using a variety of media. These are often called "21st century skills" and they are being adopted by school systems and states across the U.S. and around the world. But the reality is that many schools have not adopted curriculum design models and instructional methodologies that cultivate these skills. PBL is one of the best ways to be sure these skills are explicitly taught, because well-designed projects require them. (For more on targeting 21st century skills in projects, see page 30.)

> PBL is one of the best ways to be sure 21st century skills are explicitly taught, because well-designed projects require them.

Apart from the demands of the modern workplace, the skills PBL cultivates are useful for life in general. People think critically when they decide what credit card to get, and when they try to find a job. They solve problems big and small, from finding good health care to deciding on the best plants for a garden. They collaborate when coaching a soccer team, or serving on committees of organizations they belong to. They have to handle complicated planning efforts, like parties, weddings, or vacation trips. They communicate to an audience when they write letters, speak in front of a group, and make photo albums as presents. As citizens in a democracy, people need to analyze issues, evaluate sources of information, make decisions and take action, from voting to fundraising to joining (or leading) an effort to make change. All of these competencies — and the desire to use them afterward — can be gained through projects.

Misconceptions of PBL

Many teachers, administrators, parents and the general public have the wrong impression of PBL. They might have gotten that impression from seeing poor examples of it, or from listening to supporters of other instructional methodologies presumed to be in competition with PBL. Some misconceptions about what PBL is, and what it is appropriate for, lead teachers to reject its use in their classroom. However, we think there is a place for PBL in every school, in every grade, and it should be part of the mix of opportunities to learn given to every student.

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Misconception #1

PBL isn't standards-based. It focuses on "soft skills" such as critical thinking and collaboration, but ignores content.

Fact Check: Among PBL practitioners, different models exist and the focus on standards varies. The BIE model for PBL is standards based. Driving Questions are aligned with or even derived from content standards. The major products students create require a demonstration of knowledge and understanding of important concepts, and should be assessed in terms of standards. PBL marries the teaching of critical thinking skills with rich content, because students need something to think critically *about* — it cannot be taught independent of content.

Misconception #2

Young children are not ready for rich content. There isn't enough instructional time for science and social studies-focused projects. We need to teach basic literacy and math skills first.

Fact Check: Knowledge plays an important role in early literacy. To build reading comprehension skills children need to develop broad content knowledge across domains, including science and social studies. In elementary school, content-rich projects build background knowledge that influences comprehension. Additionally, projects can increase student motivation to read, write, and learn mathematics because they are engaged by the topic and have an immediate, meaningful reason to apply these skills. Literacy skills can be taught in the context of a project, especially reading and interpreting non-fiction —an area in which many students typically underperform on standardized tests.

> Projects can increase student motivation to read, write, and learn mathematics because they are engaged by the topic.

Misconception #3

PBL is the same as "making something", "hands-on learning" or "doing an activity."

Fact Check: PBL is often focused on creating physical artifacts, but the artifacts are not as important as the intellectually challenging tasks that led to them. For example, it's not truly PBL if students are *simply* making a collage about a story, constructing a model of the Egyptian pyramids, or analyzing water samples from a lake. These artifacts and activities *could* be part of a rigorous project if they help students meet a complex challenge and address a Driving Question. Some people may also think PBL is like the Montessori method, which is based on self-directed learning, but a project is an extended experience with activities connected by a Driving Question and coached by teachers.

Misconception #4

A project takes too much time.

Fact Check: It is true that projects take time, but it is time well spent. A project is not meant to "cover" a long list of standards, but to teach selected important standards in greater depth. The key is to design a project well, so it aligns with standards, and manage it well, so time is used efficiently.

Note: Some teachers are concerned that *planning* a project takes too much time. PBL does require advance preparation, but it gets easier the more you do it, especially if you can run the same project year after year.

Misconception #5

PBL is only for older students…or fluent English speakers…or those who don't have learning disabilities.

Fact Check: Teachers of all students, from preschool through graduate school, have used PBL effectively. You just have to make adaptations based on your

students' needs. For example, first graders will need more direction from the teacher than fourth graders. Doing a project is a natural way to learn, so why deny this to young children? Their inborn sense of curiosity makes inquiry a powerful and engaging learning process. Projects are effective for English Learners because reading and writing is purposeful and connected to personally meaningful experiences. For students with disabilities, use the same support strategies during a project as you would use in other situations, such as differentiation, modeling, and providing more time and scaffolding. Since projects involve more work in small groups, it provides you with better opportunities to meet individual student needs. Finally, projects can provide English Learners and students with disabilities with chances to show their strengths and feel included in the classroom.

Misconception #6

PBL is too hard to manage, and/or it doesn't fit with my teaching style.

Fact Check: Some teachers find project work to be "messy"—they aren't in total control of their students' every step during project work. You do need to be comfortable with a certain amount of lively interaction and out-of-their-seats activity in the classroom (or outside of it!). A project is never fully predictable, and can evolve while you're in the middle of it, so you have to be flexible and ready to make adjustments. For teachers only used to direct instruction, it may be challenging at first to manage students working in teams and handle the open-endedness of PBL, but with more experience it gets easier. If you need to conduct a project with more structure or prefer a looser approach, either way is OK. What is important is that students are learning as a result of participating in the project. (For more on this topic, see the *Managing Your Project* chapter of this book.)

> A well-designed and well-implemented project helps students see how school connects to the outside world.

PBL's Effectiveness: What Experience and Research Tells Us

Project Based Learning has had its advocates for many years, and more and more teachers and schools in the 21st century are recognizing its value.

Classroom teachers, based on their experience, say that a well-designed and well-implemented project:

- Can work for all kinds of students, with the right support
- Improves students' motivation to learn
- Can be used to teach academic content standards

- Is one of the best ways to build skills such as critical thinking, collaboration, and communication

- Can include multiple opportunities to integrate technology

- Helps students see how school connects to the outside world by making learning relevant and meaningful

- Promotes greater civic participation and global awareness

Well-designed and well-implemented PBL can improve students' retention of knowledge over time.

Researchers have found that well-designed and well-implemented PBL can:

- Be more effective than traditional instruction in increasing academic achievement

- Increase student engagement in learning

- Improve students' retention of knowledge over time

- Improve students' mastery of 21st century skills

- Be effective in improving the performance of lower-achieving students

- Increase students' achievement on state-administered, standardized tests

Research studies documenting the above claims can be found on the BIE website at **bie.org/research**.

Researchers also would say, naturally, that PBL needs more research, because it has been hard to pin down — so much depends on how it is defined, the particular circumstances in a school, and the quality of classroom implementation.

Schools have used PBL effectively in all grade levels and subjects, and for these special purposes:

- Integrating two or more school subjects and encouraging team teaching

- Providing children with opportunities to interact with adults and the world outside of school and their local community

- Connecting the school to other schools, the community, businesses, and other organizations

How PBL Can Fit in an Elementary School's Literacy Program

To teach reading, writing, oral language skills, and literature, most elementary schools today use a literacy model, some of which must be followed strictly—"with fidelity," as they say—in order to achieve the results promised. One of the requirements is that a certain number of minutes per day must be dedicated to the model. Other literacy programs are more flexible, allowing room for teachers to add their own pieces or combine it with other instructional strategies. The same is true for teaching mathematics; there are strict programs and more flexible ones. Where does PBL fit in all this?

PBL is a flexible teaching methodology that can be part of a school program with any literacy model, but to varying extent:

1. **Fully integrated PBL: Projects are used throughout the school day and program, and may incorporate all content areas, including literacy and math.**

   On one end of the spectrum are schools that use PBL as a vehicle to teach all academic content areas, including literacy and math. Students may do project work throughout the entire day. Schools utilizing this approach would likely have a balanced literacy framework—one that emphasizes the teacher's role in choosing strategies and materials—instead of a scripted commercial reading program. Projects often focus on social studies or science, but may also focus on literature and math, and integrate the arts. Math is usually taught during a protected block of time, although the math skills needed for the project may be included. Literacy is taught within the context of the project, for example:

   ▶ Readers' and Writers' workshops connect to project work

   ▶ Students read to gain knowledge needed for the project

   ▶ Students write to describe learning experiences, create products, and reflect on project work

2. **Partially integrated PBL: Projects occur mainly during the time of day used for science and/or social studies and the arts, but include some literacy and math when appropriate.**

   In the middle, which is where most of the Spotlight Projects in this book fall, are schools where teachers anchor their projects mainly in science or social studies but integrate the arts, literacy and math when appropriate. Teachers in these schools may also design occasional projects that focus on literature or applied math, as long as they are still following the guidelines of their literacy model. Schools utilizing this approach to PBL often use a state or

district-adopted literacy program. Math is usually taught as a stand-alone subject, although some applications of math may be included in projects. Students primarily do project work in the afternoon, but some project work is incorporated into the morning literacy block, for example:

▶ Fiction and non-fiction texts that connect to the topic for the project are incorporated into guided reading

▶ Teachers use read-alouds that connect to the project topic

▶ Students write about their research and work on written products during writers' workshop

▶ "Working with words" or academic vocabulary words connect to the project topic

▶ Literature circle texts connect to the project topic

3. **Separate PBL: Projects occur only during separate times of the day/ week and do not connect to the literacy or math programs.**

On the other end of the spectrum, teachers in some schools only conduct projects unconnected to the literacy and math program. Project work is only done in the time in the afternoon when science, social studies, and the arts are taught. Fewer projects may be conducted during the year-perhaps only one or two (which is better than none!). Schools using this approach to PBL typically use a state or district-adopted literacy program that must be followed with fidelity. Math is usually taught as a stand-alone subject, although some applications of math may be included in projects.

Bulletin Board

Response to Intervention and PBL: Compatible!

There is no reason not to use PBL if your school also uses RtI. All RtI plans require some form of differentiation for struggling students, and projects are flexible enough to allow for it.

One caveat, though: watch out for "new initiative overload" if too many programs are introduced at the same time. Both PBL and RtI require a serious effort, so it would be wise to get a handle on one before starting the other.

The Role of the Teacher in PBL

Once teachers feel comfortable with PBL, they usually say they'd "never go back." They see how well it works for their students. Also, they enjoy their new role, since PBL allows a teacher to work more closely with students, acting more like a coach instead of the "deliverer of knowledge."

If you're used to — and maybe even enjoy — being the center of attention in your classroom and directing the children's every move, you may think PBL is not for you. But although you do need to give up some control and allow students to make choices and create their own questions and products, conducting a project may not be as big a change as you imagine. You still will be the focus much of the time. You're the "project manager" and are responsible for teaching the content knowledge and skills students need. You'll be providing structured lessons, facilitating the inquiry process, and guiding students through the process of creating products. Doing PBL doesn't mean giving students free reign to do and learn what they want. With some PBL experience, your students should be more able to work somewhat independently, but you play a vital role in framing the experience through careful planning, facilitating the inquiry process, assessing learning, and managing logistics.

> PBL allows a teacher to work more closely with students, acting more like a coach instead of the "deliverer of knowledge."

If you teach younger children, you definitely will need to work more closely with them during projects compared to teachers of students in the upper elementary grades. And remember, in PBL you can still perform your main job of teaching basic reading, writing, and math skills. PBL motivates and provides opportunities for children to learn many things, but it is NOT intended to be a "time out" from teaching the basics.

If teaching with PBL feels challenging at first, be assured that your skills will improve over time, as you learn from each project. We'll say more about your role in the chapters that follow, as it relates to specific steps along the way toward planning and managing a successful project. *Managing PBL: A Portrait* on page 75 will also give you a clear example of the role of the teacher in PBL.

PBL Prepares Students for 21st Century Challenges

"Let's be clear — we are failing too many of our children. We're sending them into a 21st century economy by sending them through the doors of 20th century schools."

— Barack Obama
in a speech at the Center for American Progress

Lots of people are saying the same thing: teaching and learning have to be different in today's world. Education leaders, business leaders, academics and the authors below sound a similar note:

"How has the world of the child changed in the last 150 years? It's hard to imagine any way in which it hasn't changed. They're immersed in all kinds of stuff that was unheard of 150 years ago. And yet, if you look at schools today...they are more similar than dissimilar."

— Peter Senge
Director, Center for Organizational Learning, MIT

"Nations around the world are reforming their school systems...to support the more complex knowledge and skills needed in the 21st century, skills needed for framing problems, seeking and organizing information and resources, and working strategically with others to manage and address dilemmas and create new products."

— Linda Darling-Hammond, *Powerful Learning*

"One key competency that employers across-the-board value in employees is the ability to think creatively and logically in order to solve problems. Such employees are most likely to be promoted in an unforgiving global economy that requires flexibility and an ability to think, speak, and write logically, to solve problems, and to synthesize information."

— The American Diplomacy Project

"Current formal education still prepares students primarily for the world of the past, rather than for possible worlds of the future."

— Howard Gardner, *Five Minds for the Future*