Teacher Checklist
These steps will help get PBL started on the right foot.

Keep it Simple:
- Focus on a few power standards and one subject rather than several.
- Don’t get “tech happy” at first. Master the design and implementation process, technology can be added later.
- Start small, make it a manageable experience.

Do Your Homework:
- Be arméd with knowledge about existing models, lessons and successes to start in a positive direction.
- http://globe.gov has a wealth of information about protocols.
- Watch this excellent introductory video on starting PBL. http://www.youtube.com/watch?v=-OWx6KZQDoE

Communication is key!
There are many stakeholders in education quality. Communication with staff, teachers, school administrators, students, parents and community members is critical.

Don’t be afraid to ask for help. Remember there are people across the GLOBE community who are invested in connecting young people using Project Based Lessons. help@globe.gov

Evaluation and Assessment Plan
Incorporate checkpoints and deadlines along the way to monitor student learning as the project progresses. Rubrics provide a fair way to assess performance.

When Disaster Strikes
Unforseen circumstances happen. When students encounter problems, embrace the teachable moments to help them learn important life lessons about solving problems and overcoming obstacles. Be adaptable and flexible to change goals when necessary.
Why do Project or Inquiry-Based Learning?

Students work in teams to experience and explore relevant, real-world problems, questions, issues and challenges; then create presentations and products to share what they have learned.

Benefits of PBL

- Authentic Achievement
- Assessment FOR learning as well as assessment OF learning
- Formative (along the way) FOR learning
- Summative (at the end) OF learning
- Adds rigor and relevance
- Causes genuine and relevant inquiry
- Open-ended which generates more questions
- Deal with the levels of depth and knowledge
- Challenge and stimulate new ways of thinking
- Require students to develop a plan and make decisions
- Consistent with standards and frameworks

Success stories using GLOBE and PBL

In 1995 I was introduced and trained in GLOBE. It was overwhelming as to how I would integrate all or any of the protocols and information presented. For several years we did separate pieces throughout the year. Shortly afterwards I became involved with Earth Systems Science and PBL. Many of the modules that were being used were about topics that were global and not local. So I decided to follow the PBL precepts of having students take ownership by designing a curriculum combining Earth Systems Science, PBL and GLOBE. My goal was to have students make connections between the different spheres and collect data to see what story they could tell about our local environment. “How Healthy Is Our Watershed?” was born and continues to develop today.

-Gary Popiolkowski, Charters-Houston Jr./Sr. High School, Houston, PA

Next Generation Science Standards (NGSS)

Searchable Standards By Performance Expectations

Overview of GLOBE Protocols

The GLOBE Program enables you and your class to engage in a collaborative, scientific exploration of the world around you. With schools in over 110 countries, GLOBE facilitates scientist-student-teacher collaboration.

http://www.globe.gov/teaching-and-learning/overview/overview

PBL with GLOBE protocols and activities incorporates the eight NGSS Science and Engineering Practices.

http://www.nextgenscience.org/search-standards-dci

Learning Activities

Learning activities used with protocols to enhance student understanding of content.

Hydrology:
http://www.globe.gov/web/hydrology/learning-activities

Atmosphere:
http://www.globe.gov/web/atmosphere-climate/learning-activities

Earth as a System:
http://www.globe.gov/web/earth-systems/learning-activities

Land Cover and Biology:
http://www.globe.gov/web/landcover/learning-activities

Soil:
http://www.globe.gov/web/soil/learning-activities

Collaboration and Partners

Click the “View Community Map” at the bottom of the page. Get connected to GLOBE teachers and scientists.

http://www.globe.gov/community/schools/overview

Storytelling

Helpful guide to using storytelling in the classroom; a great way to introduce the topic. https://www.storyarts.org/classroom/index.html

Project-Based Inquiry Learning: Science Teaching and Learning for the 21st Century

Develop skills in designing and using project-based inquiry learning (PBIL) to enhance conceptual understanding, critical thinking, scientific reasoning, and problem solving in standards-based classrooms.

NATIONAL RESOURCES

National Science Foundation (NSF): Links to current discoveries made in research sponsored by NSF
http://www.nsf.gov/discoveries

National Aeronautics and Space Administration (NASA): Online catalog of NASA Earth and space science resources is for educators of all levels - from elementary to college
http://nasawavelength.org

National Oceanic and Atmospheric Administration (NOAA): Online portal of NOAA education resources
http://www.education.noaa.gov

Storytelling

Helpful guide to using storytelling in the classroom; a great way to introduce the topic. https://www.storyarts.org/classroom/index.html

Project-Based Inquiry Learning: Science Teaching and Learning for the 21st Century

Develop skills in designing and using project-based inquiry learning (PBIL) to enhance conceptual understanding, critical thinking, scientific reasoning, and problem solving in standards-based classrooms.

NATIONAL RESOURCES

National Science Foundation (NSF): Links to current discoveries made in research sponsored by NSF
http://www.nsf.gov/discoveries

National Aeronautics and Space Administration (NASA): Online catalog of NASA Earth and space science resources is for educators of all levels - from elementary to college
http://nasawavelength.org

National Oceanic and Atmospheric Administration (NOAA): Online portal of NOAA education resources
http://www.education.noaa.gov

NGSS

Next Generation Science Standards (NGSS)
Searchable Standards By Performance Expectations

Overview of GLOBE Protocols

The GLOBE Program enables you and your class to engage in a collaborative, scientific exploration of the world around you. With schools in over 110 countries, GLOBE facilitates scientist-student-teacher collaboration.

http://www.globe.gov/teaching-and-learning/overview/overview

PBL with GLOBE protocols and activities incorporates the eight NGSS Science and Engineering Practices.

http://www.nextgenscience.org/search-standards-dci

Learning Activities

Learning activities used with protocols to enhance student understanding of content.

Hydrology:
http://www.globe.gov/web/hydrology/learning-activities

Atmosphere:
http://www.globe.gov/web/atmosphere-climate/learning-activities

Earth as a System:
http://www.globe.gov/web/earth-systems/learning-activities

Land Cover and Biology:
http://www.globe.gov/web/landcover/learning-activities

Soil:
http://www.globe.gov/web/soil/learning-activities

Collaboration and Partners

Click the “View Community Map” at the bottom of the page. Get connected to GLOBE teachers and scientists.

http://www.globe.gov/community/schools/overview

Storytelling

Helpful guide to using storytelling in the classroom; a great way to introduce the topic. https://www.storyarts.org/classroom/index.html

Project-Based Inquiry Learning: Science Teaching and Learning for the 21st Century

Develop skills in designing and using project-based inquiry learning (PBIL) to enhance conceptual understanding, critical thinking, scientific reasoning, and problem solving in standards-based classrooms.

NATIONAL RESOURCES

National Science Foundation (NSF): Links to current discoveries made in research sponsored by NSF
http://www.nsf.gov/discoveries

National Aeronautics and Space Administration (NASA): Online catalog of NASA Earth and space science resources is for educators of all levels - from elementary to college
http://nasawavelength.org

National Oceanic and Atmospheric Administration (NOAA): Online portal of NOAA education resources
http://www.education.noaa.gov