

PBS TeacherLine Course Syllabus

Title

A Curiosity-Driven Approach to Teaching K-2 Science

Target Audience

Grades K - 2

Prerequisites

To successfully complete this course, participants should have:

- At least one year of experience teaching students in Preschool to Grade 2.
- Completed either a previous online course or the PBS course, *Practice Learning Online with TeacherLine*.

Course Description

In this facilitated course, participants will develop a firm understanding of inquiry-based and connected learning approaches to support young children's understanding of essential science concepts connected to standards in the Next Generation Science Standards for children in early childhood and early elementary grades.

Course Authors

This course was developed by PBS in consultation with Boston University School of Education.

Why Is This Course Important to Early Childhood Teachers?

From the Authors' introduction

"As teachers, perhaps our most common daily goal is to teach in ways that engage our students fully and joyfully in important and meaningful content. We know this has happened when we observe our kids reading or listening carefully as they gather information; when we see them smiling and engaging as they play an educational game; when we hear them collaborating with others to conduct a hands-on investigation; or when we listen to them share what they have learned. We can tangibly see that our teaching is making a difference. How good it feels!

In this course, our intent is to help you increase those impactful, feel-good teaching moments. With inquiry-based and connected learning approaches as a foundation, you will explore ways to maximize young children's science knowledge and understanding – helping them to think, act, and talk like the scientists we know they are!

Through the course, you will develop understanding of foundational knowledge and implications for teaching and learning as you read brief, evidence-based descriptions of recommended teaching practices; examine PBS Kids Teaching Tips, PBS Kids digital resources, and other high-quality educational resources--to help teachers put the ideas into practice; visit classrooms via video where you will observe the PBS Kids Teaching Tips in action; and listen to a teacher as she discusses a focal practice and describes her approach to instruction.

After reading, viewing, or listening, you will be prompted to reflect on the ideas and consider how you might implement them within your own classroom or learning context. Ultimately, this course was designed to support a rich, two-way exchange. We hope you will learn from the

knowledge and experiences we share, and that you will share your valuable knowledge and experiences with the other participants in this course. “

Goals

The goal of this course is to help early childhood educators engage children fully and joyfully in important and meaningful science and literacy content. Using inquiry-based and connected learning approaches as a foundation, teachers will learn to support young children’s understanding of physical and life science concepts.

Course Summary

- This course is grounded in inquiry as an approach to learning about science and in connected learning as a way to bring together the various resources that are available to classroom teachers as they deepen children’s conceptual understandings and connect their students to each other, to family and community members, and to the world-at-large.
- In our approach to learning we emphasize:
 - providing opportunities for young children to observe, gather, examine, question, analyze, and apply information in a variety of contexts
 - using digital devices (e.g., tablets, computers, interactive whiteboards) and digital resources that connect learners to each other (e.g., blogs, podcasts) and connect learners to a knowledge base (e.g., google) and digital apps (e.g., *PBS Kids ScratchJr.*)
 - learning across the disciplines (i.e., science, literacy, math) that are taught in early childhood and elementary school classrooms
 - connecting information through evidence-based teaching practices
- Multimodal “text sets” serve as learning resources. These include:
 - Informational texts
 - PBS Kids digital games, videos, and apps
 - Digital and traditional images
 - Educational and common realia (e.g., cardboard ramps, toy cars) (especially as a foundation for scientific investigations)
 - Student writing, traditional and digital (e.g., *PBS Kids ScratchJr*, blogs, podcasts, drawings)
- PBS Kids *Teaching Tips*, and classroom videos that capture the *Teaching Tips* “in action,” are used to exemplify the recommended teaching practices and make the ideas “come alive” for course participants.
- Each of the six sessions is expected to require approximately 7.5 hours to complete (45 hours total). Participants are expected to complete one session per week over a six-week period.

Expected Learning Outcomes

By the end of the course, participants will understand and be able to apply the following in their professional practice:

1. Critically evaluate and select multimodal resources that will provide young children multiple pathways toward the development of deeper understanding.
2. Understand how inquiry-based learning supports scientific understanding and knowledge development.
3. Understand the role vocabulary development in deepening children's scientific content knowledge.
4. Identify and use culturally relevant teaching practices to support children's social, emotional, and cognitive development as learners and scientists.
5. Understand how connected learning supports scientific understanding and knowledge development.
6. Apply what they have learned to develop a comprehensive and detailed lesson plan to teach a science standard in their respective grade.

Participants demonstrate learning outcomes in four ways:

1. End of Session Quizzes
2. Online Journal Responses
3. Discussion Forum Responses
4. A Two-Part final Project

Course Outline & Assignments

Session 1: Welcome, Overview and Goal Setting

In this session, participants will:

- a. Read an overview of the course and its objectives.
- b. Examine NGSS science standards related to their respective grade level.
- c. Understand the role and importance of assembling multimodal resource sets to deepen children's understanding and knowledge.
- d. Learn about criteria to guide selection of appropriate children's books, videos, images and digital games.
- e. On the Discussion Forum, introduce themselves and meet other course participants.
- f. In an Online Journal, reflect on their own science teaching practices and set goals for their learning throughout the course.
- g. Explore additional resources for further learning.

Session 2: An Inquiry-Based Approach: Helping Children Think and Act Like Scientists

In this session, participants will:

- a. Read a description of inquiry-based learning and examine its importance as an approach to teaching young children.
- c. Examine important actions teachers take to ensure equitable opportunities for children to learn about science through inquiry-based learning.
- d. Visit a first-grade classroom via two videos of a first-grade teacher implementing PBS Kids *Teaching Tips* to observe inquiry-based learning.
- e. On the Discussion Forum, share their observations of the first-grade teacher's approach.
- f. In an Online Journal, reflect on their own inquiry-based teaching practices and strategize ways to incorporate inquiry-based learning experiences in future lessons.
- h. Explore additional resources for further learning.

Session 3: Building Vocabulary: Helping Children Talk Like Scientists

In this session, participants will:

- a. Read an article about modeling the use of sophisticated words to promote learners' vocabulary growth and word consciousness. The article will outline the research support for this approach, suggestions for how teachers can accomplish this goal, and examples from teachers who have done it successfully.
- b. Examine how Alicia, the first-grade teacher, incorporates vocabulary relating to energy and motion to expand her learners' science vocabulary and concept knowledge.
- c. On the Discussion Forum, share ideas for their favorite resources to build children's scientific vocabulary and a strategy for how they use these resources.
- d. In an Online Journal, reflect on a short case study that documents a teacher's practice of introducing physical science vocabulary to her students.
- e. Explore additional resources for further learning.

Session 4: Culturally Relevant Teaching: Tapping Into Your Classroom's Unique Interests, Talents, and Experiences

In this session, participants will:

- a. Read a description of culturally-relevant teaching of science and examine its importance as an approach to teaching young children.
- b. Examine important actions teachers take to practice culturally relevant teaching of science.
- c. Listen to an interview with Alicia, the first-grade teacher, who describes how she incorporated culturally relevant teaching into a PBS Kids *Teaching Tips* lesson.
- d. On the Discussion Forum, connect Alicia Poulin's teaching suggestions to what they have learned about culturally relevant teaching of science and consider implications for children's learning.
- e. On the Discussion Forum, share their observations of culturally relevant teaching of science and suggest implications for their own teaching; read and comment on the ideas of others.
- f. In an Online Journal, with the principles of culturally relevant teaching (CRT) in mind, begin framing a lesson that integrates CRT with an inquiry-based, vocabulary rich experience for learners. This will serve as participants' first project, which will prepare them for the final creation of a full instructional plan.
- g. Complete a brief multiple-choice quiz to check understanding.
- h. Explore additional resources for further learning.

Session 5: The Connected Learning Model: Planning an Integrated, Multimodal Experience

In this session, participants will:

- a. Read a description of connected learning and examine its importance as an approach to teaching young children.
- b. Review evidence on the effects of high-quality educational media on young children's cognitive, social, and literacy development.
- c. View a PBS Kids digital game (*Wild Kratts Powersuit Maker*) about animal adaptations and use the evaluative criteria to judge its appropriateness as a classroom curriculum resource.
- d. In Discussion Forum, share recommendations for how to connect school and home science learning through multimodal resources.
- f. In Online Journal, review and recommend multimodal resources that support your science teaching practice and build upon the
- g. Complete a brief multiple-choice quiz to check understanding.

- h. Explore additional resources for further learning.

Session 6: Putting it Into Practice: Nurturing the Scientists in Your Classroom

In this session, participants will:

- a. Review relevant science standards to identify a knowledge goal for the target lesson.
- b. Prepare an instructional unit that includes:
 - appropriate multimodal resources to teach the identified knowledge goal(s).
 - appropriate inquiry-based, connected, and culturally-relevant learning activities to teach the identified knowledge goal(s).
- c. After submitting their instructional plan, review a lesson from a PBS Kids *Teaching Tips*.
- d. Via video, observe Alicia Poulin as she teaches the complete lesson.
- e. Through images on the course website, review lesson artifacts (e.g., concept map) and children's work samples (e.g., PBS Kids *ScratchJr.* science reports).
- f. In an Online Journal, comment on Alicia's teaching actions and also on the ways Alicia's lesson is similar or different from theirs. If appropriate, suggest ways they might modify or revise their own lesson.
- g. Complete a brief self-assessment.
- h. Explore additional resources for further learning.

Schedule

This course is scheduled to take approximately 45 hours to complete. Each of the six sessions is expected to require approximately 7.5 hours to complete (45 hours total). Participants are expected to complete one session per week over a six-week period.

All learners are different, and some participants may need additional hours to complete all coursework depending on learning styles and work habits.

Credits

To be determined by college or university

Requirements

Learners are expected to:

- Complete all assignments.
- Participate and actively engage in discussions with fellow learners while contributing to the social construction of knowledge.
- Be self-directed and self-motivated.
- Ask for assistance when they need it.

Materials (hardware, software, plug-ins)

Technical Requirements

- Word processor
- Internet service provider
- E-mail

Academic Dishonesty Policy

To be inserted by university institution only.

Evaluation

This course is evaluated on a letter grade basis, and may be available for graduate credit. See graduate credit details pertaining to specific graduate credit institutions.