Module Summary

In this module, teachers will:
• Explain the benefits of problem-based learning for students and teachers.
• Identify the mindsets and beliefs of an effective problem-based learning facilitator.
• Describe three steps of problem-based learning.

Module activities:
Teachers will learn what problem-based learning (PBL) is and how to design a PBL experience. Teachers will review an exemplar plan, take a self-assessment and either begin brainstorming their own PBL lesson or evaluate a hypothetical plan.

Key Takeaways

Essential knowledge:
• It’s important to note that before designing and implementing a PBL experience, students should be able to work effectively in groups. If this is not the case, visit the modules entitled Developing Behaviors for Cooperative Learning and Structuring Cooperative Learning.
• Problem-based learning is “an instructional approach where learners grapple with meaningful problems and collaboratively work towards their resolution” (Rillero, 2015, p. 2). Problem-based learning can be used for a single lesson or as part of a long-term experience (Metz, 2015).
• PBL benefits students in a couple of ways. First, when students work through meaningful problems they cultivate critical thinking and problem-solving skills (Behizadeh, 2014; Dochy et al., 2003; Hmelo-Silver & Barrows, 2006; Lee, Huh, & Reigeluth, 2015). In addition, research shows that students who participate in PBL experiences achieve higher grades compared to students who receive conventional instruction (Dochy, Segers, Van den Bosschi, & Gijbels, 2003; Marle et al., 2014).

Essential skill:
• Three steps to design an effective PBL experience are:
  1. Establish the problem: Identify a problem that has real-life application and is meaningful to students.
  2. Create the experience: During this step, teachers plan for how students will collaborate and share their solutions.
  3. Evaluate: During this step, the teacher identifies academic and social outcomes for the experience. They teacher also plan formative and summative assessment opportunities.

Essential mindsets:
In order to effectively operationalize problem-based learning in the classroom, the teacher needs to believe that:
• Learning is a form of sense-making for students (Hmelo-Silver & Barrows, 2006). This means that a teacher should value working with students to understand content rather than just delivering the information to them. The teacher should view him or herself as someone who facilitates learning and not a dispenser of knowledge (Hmelo-Silver & Barrows, 2006; Licht, 2014).
• Designing and implementing problem-based learning experiences is a process that evolves over time for both the teacher and students (Hmelo-Silver & Barrows, 2006). That is to say that the first few experiences will probably not go perfectly. The important thing is that students and teachers work through the experience.
**The Skill in Action**

**Establishing the problem:** The problem should...
- Be engaging and meaningful to students.
- Require collaboration and teamwork to solve.
- Help students master academic standards.

**Creating the experience:** The teacher should plan for how students will collaborate to develop and share solutions. The teacher identifies social outcomes (e.g. praising and encouraging others, providing constructive criticism, or contributing ideas) to observe for and how he or she will support groups when they struggle.

**Evaluate:** The teacher uses pre-identified academic standards and social outcomes to:
- Determine a reasonable number of outcomes to assess.
- Plan formative and summative assessment opportunities.
- The teacher then uses data from these assessments to reflect and inform future experiences. If the teacher sees that an outcome was not met, he or she should re-teach as needed.

### Questions for Discussion

The following is a list of suggested questions for engaging in a reflective dialogue with the teacher, either before or after he or she attempts to implement the skill.

- How do you think PBL will benefit your students?
- Are your students able to work effectively in cooperative groups? Why or why not?
- What role should you see yourself playing in a PBL experience?
- How is that similar or dissimilar to the role you normally play in the classroom?
- What are your expectations for both yourself and your students during a PBL experience?
- How do you believe the knowledge and skills highlighted in this module will benefit your growth as a teacher?
- How can I provide support as you design your first PBL experience?

### Coaching Moves

**Situation:** The teacher attempts a PBL experience, but students struggle and don’t develop potential solutions.

**Ask:**
- Have you taught and practiced cooperative learning behaviors with your students?
- How familiar are students with working cooperatively?
- How did you identify the problem?
- How did you plan for the experience?
- What assessment opportunities did you include?
- How did you keep track of students’ progress during the experience?

**Suggest:**
- Explore the modules entitled Developing Behaviors for Cooperative Learning and Structuring Effective Cooperative Learning.
- Learn about your students’ interests and use these to establish a problem.
- Create and implement a PBL together.
- Plan formative and summative assessment opportunities before beginning the experience.

### Standards

**InTASC:** Standard 4: Content Knowledge-The teacher understands the central concepts, tools of inquiry, and the structures of the discipline(s) he or she teaches and creates learning experiences that make these aspects of the discipline accessible and meaningful for learners to assure mastery of the content.

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1 For more information on these skills, refer to the module entitled Developing Behaviors for Cooperative Learning.