3. Problem Statement. The next step is to articulate a problem statement that is:

a. Developmentally appropriate (not too difficult), yet complex enough to benefit from group work.
b. Grounded in a student reality (authentic, real-world, personal).
c. Reflective of learning outcomes, often targeted at a common misconception or difficulty.
d. Ill-structured—meaning that the problem might have multiple possible or seemingly-possible solutions, that it is couched in the complexities of real life, and that it doesn’t contain all the information for its own resolution (not a story problem).

The problem statement may be as short as a question or as detailed as a multi-page case study. A good problem statement will provide enough information to define the boundaries of the issue without leading the student toward an answer. It will challenge students to research, discuss, analyze, and interpret. Students should be able to break it down in ways that indicate starting points or directions. The final problem statement is often framed in terms of a specific situation in a specific context along with a role the student is to assume (Imagine that you’ve been asked to...)

1. Motivation. Although problems are often intrinsically motivating, sometimes you need to spark initial interest. Allowing students to experience the authenticity, the reality or the personal impact of the problem can help.

2. Support. Once students are interested, you can often help them launch their investigation with focus questions, a tutorial guide, or suggestions.

3. Work collaboratively. Students should work collaboratively in small groups or teams towards a solution. Physics instructors use iClickers and Concept Tests to give group quizzes. Business uses Case Methods. Different pedagogies work in different settings, but all require the students to draw from and contribute to group learning.

4. Assessment: Lastly, you need to consider ways to evaluate the student work.
EXAMPLE
Project
An education instructor finds it difficult to get her students to see past their own biases and to understand the complexities involved when thinking about educational reform. She chooses to put them in charge of the management of failing Chicago schools. In the problem description, she gives some background, establishes a time frame and resource list. The students are excited and begin collaborative research immediately after determining the relevant issues. She supports them in their work with lists of helpful websites and a handbook on educational design. Finally, she develops a rubric for assessing each team’s final proposal based on their abilities to articulate and defend the positions that they took.

Concept Test
An instructor chooses several problems with multiple or counter-intuitive solutions as the framework for a curricular unit. She then uses concept tests as a way to assess the individual and group work used to approach the problems.

Case Study
An instructor uses a mixture of pre-written and self-generated case studies to emphasize key understandings. He has students work together in teams to discuss and resolve the issues and then present their solutions to the rest of the class.

TIPS
• Sequence carefully. Careful sequencing of the problems is crucial if the course is to use a number of problem-based activities. The most important problem is often not appropriate as the first problem. Rather, early problems should model the process and be supported by the instructor.
• Pair with collaborative strategies (Teach One Another) for the most effective problem solving. Consider paired discussion, Socratic Method, projects, learning teams and other approaches.
• Use appropriately. Use this strategy only when recall is not the primary task of the learning.
• Find context. Threshold concepts, concepts that underlie new ways of thinking, are often effective settings for good problem-based activities.
• Find appropriate level. Many effective problems are messy at a first glance. They are complex and ill-structured, offering no easy answer and many potential solutions, which allows for students to find solutions to problems that are not a single-solution scenario.

PITFALLS
• Not a hands-off instructional strategy. The instructor needs to be deeply involved in structuring, training, guiding, and evaluating student performance.
• Time. Problem-based instruction takes time and is less-directly controlled than other approaches.
• Newness. Problem-based instruction often requires new skills for both instructor and students. Introducing it for the first time should be done with due preparation and deliberation.
• Difficult. Instructors often tend to under-estimate the difficulties students face when confronted with problems and diminished guidance.
• Not content coverage. Although it’s tempting to do so, a problem shouldn’t be designed around a given block of content, but rather around learning outcomes for the content.

KEY ARTICLES

OTHER RESOURCES
• Short YouTube intro to PBL
• A few problem examples
• PBL Clearinghouse
• PBL development
• Using professional literature to create problems
• A thorough but accessible portal on PBL
• Book Chapter

http://www.byui.edu/learning-and-teaching/instructional-tools