TOOL
State/District Leaders

# Engaging Students in Deeper Learning

**The purpose of this tool is to provide an example of an activity that engages students in deeper learning.**

The 2011 Alliance report, *A Time for Deeper Learning: Preparing Students for a Changing World* (http://all4ed.org/wp-content/uploads/2013/06/DeeperLearning.pdf) describes a mathematical problem-solving application used by Envision Schools. The Really Super Amazing Technical Dive tells the story of a teacher, Ms. Lundin, who will perform a technical dive from a Ferris wheel into a tub of water to help her students learn. The problem involves three things: a Ferris wheel, a stopwatch, and a moving tub of water.

According to the problem, a platform that Ms. Lundin stands on is attached to one of the Ferris wheel seats. There also is a tub of water on a moving cart that runs along a track passing underneath the Ferris wheel and platform. As the Ferris wheel turns, Ms. Lundin needs to jump at exactly the right time so that she will land safely in the tub of water and will not get injured in her attempt.

Unlike math problems that measure just basic skills and not application, students are asked not only to solve the problem and show the final equation, but also to determine exactly when Ms. Lundin should jump (time) and from what height (distance) so she lands safely in the tub. To do this, the students must demonstrate a series of analytical steps:

- Determine what information is needed to decide when and from what height Ms. Lundin should jump.
- Create a model of the situation (physically and graphically).
- Write a problem statement that clearly explains the situation, identifies the questions being asked, and shows the model.
- Give the final equation and explain the sub-equations used to solve it.
- State a recommendation using evidence to convince Ms. Lundin of the findings, and include two problem-solving methods to verify the answer.
- Reflect on the process. What worked? What other factors could have changed the answer?
- Highlight concepts in the problem statement, answer, and reflection.

To complete this task, students must know the subject-matter content—in this case, algebraic functions and physics. They must be able to think critically about all the variables and use their knowledge to formulate and solve a problem, just as they would in college and the workplace. They must be able to communicate effectively and explain their solution using evidence—and because the work is team based, they must collaborate with their peers. Finally, the students must be able to reflect on their work and show that they have learned how to learn.

For both students and teachers to benefit from this kind of deeper, more comprehensive approach to solving a math problem, schools need supportive policies in place that align with this kind of educational approach. For example, in schools that incorporate deeper learning principles, both teachers and students are provided with time for collaboration; student performance is based on the mastery of both rigorous content and skills and measured by more than a simple multiple-choice test; students have access to technology and resources that will guide and inform their project work; and teachers are encouraged to create more complex problems that require students to utilize a variety of skills and content knowledge.

## Activity

Use this example as a starting point. To incorporate deeper learning in a mathematics curriculum, school districts may benefit by considering policies, practices, and procedures that align math content with deeper learning. Examples of policies, procedures, and practices that support deeper learning in the mathematics curriculum follow.

- **Policy example.** School district leaders are interested in measuring deeper learning outcomes in mathematics. Current policy calls for performance tasks, but not in any specific content area. Leaders agree to use current policy to support more deeper learning in mathematics.
- **Procedure example.** Schools work with business partners or other organizations to help each student complete one project during eleventh or twelfth grade that measures deeper learning outcomes as part of the class grade. For example, students in tenth grade traditionally take geometry as a core math class where they learn about geometric measurement and dimension and modeling with geometry. To enhance deeper learning, a district content-area math leader develops a project-based learning activity in conjunction with an engineering firm where students create a prototype-specific product that requires accurate geometric measurement and application of geometric concepts. Such an example would provide students with the opportunity to demonstrate a clear understanding of geometric concepts through real-world application.
- **Practice example.** School districts create collaborative work time with teacher facilitation and experts (as needed) for cohorts of students completing projects.

In the chart, Supporting Deeper Learning in the Curriculum, record recommendations for each category that are necessary to align math content—or any other curriculum area of your choice—with deeper learning. After completing recommendations, identify additional supports (e.g., capacity building, use of technology for instruction, training and coaching, potential site visits to model programs, informational resources, and organizations with expertise, etc.) that align the content with deeper learning successfully.

### Supporting Deeper Learning in the Curriculum

| Policies | Procedures | Practices | Additional Supports |
|---|---|---|---|
| | | | |