Do the Science

Instructional materials (text; kit): Pictures of problems solved by technology throughout history; Articles about problems that have been solved through technological design; Students' science notebooks, or worksheet: "What was the problem? How was it solved?" **Grade Level: 6-8**

Lesson: Students will inferentially arrive at the concept of technological design.

Big Idea: Some problems can be solved by *technological design. Technological designers* (including *engineers*) identify *criteria* for a successful design, research how others solved similar problems, and brainstorm *solutions*. 6-8APPD

Lesson Learning Target: Define a problem that can be solved by *technological design*.	**Common Misconceptions**: Student perspectives focus on failure of technological solutions. • If risk of failure is to oneself and voluntary it is not worthy of concern by others. • If risk of failure involves harm to oneself and benefits to oneself, it has high interest, and any risk of harm to others is ignored.
Success Criteria: I can…describe a problem that requires a *technological solution*. • I can name the problem • I can describe the difficulties that make up the problem. • I can explain why this problem requires a *technological solution*. • I can identify a *technological solution* used to solve the problem.	**Vocabulary:** technology technological design technological solution engineers technological designers

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Elicitation Activity*: **Students inferentially arrive at the concept of *technological solution*.** Given pictures of examples/non-examples of problems that can/cannot be solved by technology, the students sort the pictures, come to agreement on which problems can/cannot be solved by technology, and come up with traits of technologically solvable problems and traits of problems that cannot be solved by technology. Then come up with whole-class consensus on problem/solution for each picture. Post on wall.	**Talk structures/Discourse techniques:** Small group discussion. Whole class discussion
Topic introduction/lesson Activities: • Teacher verbally models metacognitive processes while reading a sample article. ~Use text features -- recognize parts of the text that aid comprehension ~Model highlighting text ~Model identifying the problem/solution • Students choose articles to read: "As you read the article, highlight problem talk and solution talk. • Students read, highlight, fill out the problem/solution chart. • Students meet with others that read the same article and come to consensus about the problem and solution presented in the article.	Teacher to class Individual Small group

Embedded Formative Assessment/s:

Highlighted problem and solution talk in article.
Completed "What was the problem? How was it solved?" worksheet.
Exit slip

Adjustment Trigger *What level of student performance will necessitate an instructional adjustment?* Student does not meet <u>all</u> success criteria.	**Meet <u>all</u> success criteria:** • name the problem • describe the difficulties that make up the problem. • explain why this problem requires a *technological solution*. • identify a *technological* solution used to solve the problem.

Instructional Adjustment (if needed):

Whole class:
Review pictures: problems/solutions
Read an article together and come to consensus on problem/solution.

Then individually read alternate articles and complete another What was the problem? How was it solved? Worksheet.

Lesson Closure*:

Exit slip: display a new problem/solution picture to the class. Students identify the problem and how technology is being used to solve the problem.

* Opportunity for formative assessment