Teacher Tools

Lesson 2
Make It All Better!

OVERVIEW

Innovations can make a real difference in people's lives, especially in times of need. In this 3-part lesson, students will identify innovations at their school that have been created to help people or solve specific problems. They then will identify problems facing their community and create a prototype of an innovation that could be designed to "make it better."

This lesson is intended for classroom activity, and students who wish to create videos for the 2011 Discovery Education 3M Young Scientist Challenge may consider any subject within the broader categories of How We Move, How We Keep Ourselves Healthy and How We Make a Difference, as presented in the official rules.

Length of Lesson: 2-3 class periods, time outside of class

Subject Area(s): Science, Technology, Language Arts

OBJECTIVES

Students will:

- Draw conclusions about how innovations can often be designed to solve practical problems.
- Explain how innovations/technology at their school has been designed to solve problems.
- Identify problems in their own community.
- Design an innovation to solve a problem that impacts those in their community.

MATERIALS

- Pencils, one per student
- Art/building materials, e.g., masking tape, paper clips, clay, rubber bands, glue, Styrofoam, etc.
- "Innovation Hunt" student activity sheet, one per student group
- "Making a Difference in My Community" student activity sheet, one per student
- 10 pieces of flip chart paper, each one with one of the following words written on it: Social, Environmental, Educational, Medical, Children, Safety, Financial, Technological, Animal & Other
- Markers
- Access to the Internet
- Local newspapers, news magazines

PROCEDURE

Part 1

1. Divide students into small groups and hand each group enough pencils for each member. Ask them to discuss and present answers to the following questions:
    a. What is the object you have been given?
    b. What is it used for?
    c. Would you call this object an "innovation?" Note: An innovation is "something that is newly introduced."
    d. What did people likely do/use before it was invented?
    e. What might you use instead if this had never been invented?
    f. Does it have any limitations? What if you could not hold it in your hands?

2. Tell student groups to imagine that someone in the class has broken both hands. Their hands are in casts and they do not have use of them. But they must still be able to use a pencil for their schoolwork! Challenge groups to come up with an innovation that could help their classmate write. Their idea could be something added to a current pencil or a brand new innovation. It must be practical, safe, affordable, and portable. Most of all, it must solve their classmate's problem. Encourage students to use the building materials (see materials list) to help them come up with/test their ideas.

3. Have each group present their idea and how it works. Then have students vote on the innovation that best meets the requirements, justifying their choice. Leave ample class time for discussion.

4. Remind students that innovations often come about in order to help solve a problem or make life better for someone. In the case of the introductory activity, they were helping to solve a problem for someone with a temporary need. What other innovations help those with temporary special needs? What about those with permanent special needs such as physical challenges or lack of resources? What about innovations to protect people in the event of an emergency?

5. Distribute the "Innovation Hunt" student activity sheet. Read the directions to students. The activity challenges student groups to go on an "Innovation Hunt" around their school in search of innovations that help people in some way.

6. Give groups a set amount of time for their "Innovation Hunt." Then have them come back together and present their lists.

7. What conclusions can they draw about the innovations at their school designed to help people?

Part 2

8. Share with students that the innovations students found on their "Innovation Hunt" help those in their schools but what innovations help people in the community? What problems in the community could be solved or fixed by a new innovation? Could they come up with an idea that could do just that?

9. Write the word, "community" on the board. Ask students to define what their community means to them. Is it their neighborhood? Their town? Their city? Work together as a group to come up with a common definition.

10. Challenge students to write a sentence or a group or words that describes their community. Ask them to share their sentences with a partner, identifying similarities and differences in the way that each one views the same place. Challenge pairs to come up with both strengths and problems in the community.

11. Hang the 10 signs around the room (see materials list). Tell students that each sign represents a different category of possible problems or challenges in their community.

12. Direct student pairs to list the problems they identified on the sign with their appropriate category. Review the list. Do students agree with these problems? If not, challenge students who wrote the problem to justify it.

13. Distribute the "Making a Difference in My Community" student activity sheet. Read the directions for Part 1 with students. Part 1 asks students, individually or in pairs, to identify two problems or issues in the community, based on credible sources. You may want to review examples of credible sources, including interviews with parents, community leaders and members; local news sources; community meetings; and community websites.

14. Give students ample time to complete Part 1. Then have them come back together and share what they've learned. Direct them to list each problem they've identified on the appropriate sign from earlier in the lesson. Review all of the problems with students and challenge them to circle those that they heard most frequently. Review all of the circled problems/issues. Highlight those that students believe could be positively impacted by a new innovation.

15. Based on the lists, ask each group to choose one problem to focus on.

Part 3

16. Review Part 2 of the activity sheet which asks student pairs to learn as much as they can about the problem they've selected. Again, provide ample time for research.

17. Once students have completed their research, direct them to complete Part 3 which challenges them to develop an idea for an innovation that could positively impact the problem they've chosen. For this part, students will need time for research as well as time to brainstorm and develop their idea.

18. Once students have completed Part 3 of the activity sheet, have them present their ideas to the class. Have the class evaluate:
    a. Which innovations are most practical?
    b. Which innovations could make the greatest difference?
    c. Which innovations would they be most interested in actually designing?
    d. How can continued innovation make a real difference in their community?

EXTENSIONS

- Have students design prototypes of their innovations and present them to community leaders.
- Brainstorm other possible innovations related to "How We Make a Difference."
- Have students create individual videos showcasing innovations related to "How We Make a Difference" in the 2011 Discovery Education 3M Young Scientist Challenge! To learn more about the 2011 Challenge, go to YoungScientistChallenge.com.

EVALUATION

You can evaluate your students using the following three-point rubric:

- **Three points:** Identified at least 2 authentic community problems using credible sources; thoroughly researched factual information using credible sources; developed an original idea that could positively impact the problem they identified; able to explain how the idea could positively impact the problem they identified.
- **Two points:** Identified at least 1 authentic community problem using credible sources; adequately researched factual information using credible sources; developed an original idea that could positively impact the problem they identified; difficulty explaining how the idea could positively impact the problem they identified.
- **One point:** Not able to identify authentic community problems using credible sources; difficulty researching factual information using credible sources; unable to develop an original idea that could positively impact the problem they identified; unable to explain how the idea could positively impact the problem they identified.

STANDARDS CORRELATION

The National Academy of Sciences provides guidelines for teaching science in grades K-12 to promote scientific literacy. To view the standards, visit this website: books.nap.edu/html/nses/html/overview.html#content.

This lesson plan addresses the following national standards (Grades 5-8)

- Science as Inquiry: Abilities necessary to do scientific inquiry
- Science as Inquiry: Understanding about scientific inquiry
- Life Science: Regulation and behavior
- Science and Technology: Abilities of technological design
- Science in Personal and Social Perspectives: Risks and benefits
- Science in Personal and Social Perspectives: Science and technology in society

Student Activity Sheet: Innovation Hunt

Innovation is the "process of making improvements by introducing something new." Innovations are often designed to solve a problem, help someone in need, or make a positive difference to a person or place. How many innovations can you find in your school that solve a problem or help someone in need?

Here's your challenge! Take a walk around your school and try to find innovations that solve a problem or help people. In the chart below, write each innovation, as well as the problem it solves or the person/group it helps. Two examples are done for you. See which team can find the most "helpful innovations!"

Name of Innovation	**Problem It Solves or Person/Group It Helps**
Ex: Fire Extinguisher	Helps the entire school in case of a fire. Releases chemicals that help to put fires out.
Ex: Ramp to get on stage	Helps those who cannot walk up stairs to access the stage.

Student Activity Sheet: Making a Difference in My Community

Innovation can touch our lives in many ways, especially in times of need. How much do you know about the problems in your community that relate to those in need? They could be related to children, safety, education, health, or shelter, in addition to many others. In this activity, you will learn about problems that impact those in your community and design an innovation that could help to make a difference.

Part 1- Identify the Problem

1. Define your community. Is it a neighborhood, town, city, borough?

2. What are the positive qualities that describe your community?

3. What problems or issues exist in your community that relate to those in need? To help you answer this question, you must use a source other than yourself! Your source can be a parent, community leader, newspaper, news magazine, website, or other fact-based resource. In the chart below, list at least two problems or issues your community faces, along with your source.

Problem or Issue in My Community	Source (person interviewed or name of news source)

Part 2- Learn About the Problem

In order to figure out what innovation could make a difference, you should learn as much as you can about the problem. This could include research online, at the library or with interviews. In the space below, write what you learned about the issue or problem you have identified. Think about how many people are impacted, where the problem is greatest, what has already been done, and what the greatest need is.

Part 3- Design an Innovation That Could Make a Difference

Now that you are an expert, it's time to make a difference. In the space below or a separate sheet of paper, describe or draw a picture of an innovation that you could design to help make a difference with the problem you've identified. Explain how it will work, and justify how it will make a difference based on your research.