LESSON: DEAN KAMEN AND DEKA

(To follow Amplify CKLA 4, Unit 4, Lesson 8)

At a Glance

This lesson introduces students to renowned New Hampshire-based inventor, Dean Kamen, and some of his company's innovations.

Primary Focus Objectives

- Students will read a non-fiction text about a New Hampshire inventor.
- Students identify which category of need the innovations address.

Formative Assessment

- Completion of graphic organizer

Standards

CCSS.ELA-LITERACY.W.4.2
Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

Materials

- Focus Text: Moose on the Loose Unit 17: Learn It! "The Economy," pages 4-5
- Vocabulary Card
- "Innovation in an Old Mill Building" graphic organizer
- Optional: Steam Power infographic
- Optional: Slingshot product description

Learning Activity

1. **Explore Vocabulary Card.** Discuss the word innovation. Ask students if they have heard it used before and if they can think of any examples of something that is an innovation. Why do they think people innovate? *(5 minutes)*

2. **Preview the Focus Text.** Project or direct students to Moose on the Loose Unit 17: Learn It! "The Economy," pages 4-5. Navigate and identify the non-fiction features of this text: heading, images, captions, and key words. Show students how to click on Dean Kamen's name to access a bio and how to click on the image to get a longer caption. *(5 minutes)*

3. **Read the Focus Text and complete the graphic organizer.** Distribute copies of "Innovation in an Old Mill Building" and support students as they use the non-fiction text features to complete the graphic organizer. After they finish, students should write a statement explaining which category they think is most important for innovation and why. *(20 minutes)*

4. **Share and graph the results.** Ask students to share their statements about which area of innovation is the most important. Tally the results and challenge students to create a bar graph or picture graph to illustrate the data. As a group, discuss why DEKA focuses on these areas for their innovations. *(10 minutes)*

5. **Optional: Compare Steam Systems.** Compare information about DEKA's Slingshot to the Moose on the Loose infographic about steam power. Discuss how steam power is created and used in both systems. *(15 minutes)*

EDUCATOR RATIONALE AND ANSWER GUIDE

Connection to Amplify

This lesson builds on skills developed in Amplify Unit 4: Eureka! Student Inventor, including reading non-fiction text and writing brief explanatory texts. This lesson reinforces the concept that people invent to solve problems by introducing students to a New Hampshire inventor, Dean Kamen, and his Manchester-based company, DEKA. Students read brief descriptions of some of DEKA's innovations, and they sort them on a graphic organizer with supporting details. An optional activity guides students to compare how steam power was originally used in the mill buildings where DEKA is currently located and how DEKA uses the concept of steam power as an innovative way to provide access to clean water in countries where that is a problem.

Preview the Focus Text

Dean Kamen's biography is accessed by clicking on his name on page 5. The longer caption for the Segway image is accessed by clicking on the image on page 5. Moose on the Loose provides many details about the Segway. More details about the other innovations, should you wish to share them with students, are available at https://dekaresearch.com/innovations/.

Read the Focus Text and complete the graphic organizer

Explain to students that by reading the main text, the bio of Dean Kamen, and the image caption, they will learn about six different innovations developed by Dean Kamen and DEKA, a New Hampshire technology company that he started in a former mill building in Manchester. Explain that as they read, they should identify which innovation matches the category on each windowsill of the building. Students should write the name of the innovation and list a few details about the problem it solves in the window. The innovations should be sorted in the following way: Healthcare: machine for kidney problems, prosthetic arm; Transportation: iBot and Segway; Education: FIRST Robotics; Clean Water: portable water purification.

Optional: Compare Steam Systems

Students should observe that both systems require a source of water. A running, dammed river for the older system and a well or piped water for the Slingshot. Both systems need to heat the source water. The older system used coal or wood to heat the water. The Slingshot uses low levels of electricity to heat copper tubes. Water heats as it flows through the tubes. The big difference starts at this stage. In the old system, the heated water turns to a gas (steam) and that steam is forced through pipes. That pressure moves gears and makes machines move. As the steam cools and turns back into a liquid (water), it is flushed back out into the river. The Slingshot uses the pressure created by its steam to help with the evaporation process, so it doesn't have to use as much electricity. As its steam cools (condensation), that clean water is collected and pumped out for people to drink.

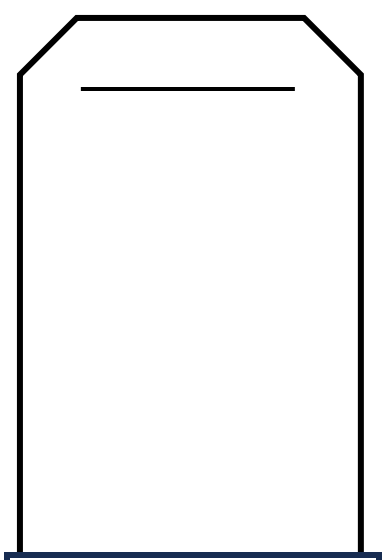
INNOVATION

Part of speech: noun

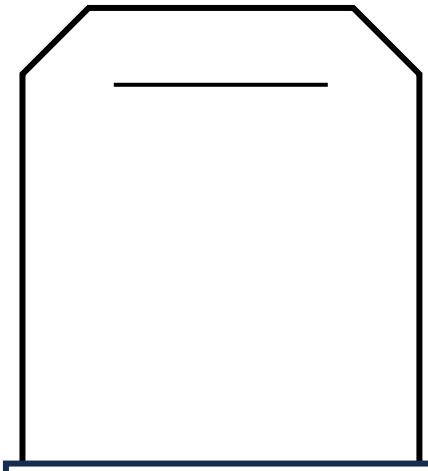
Definition: a new method, product, or idea

How to use it: Steam power was an **innovation** that made New Hampshire factories work faster than ever

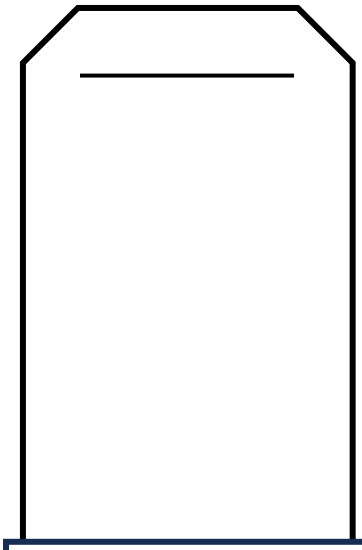
INNOVATION IN AN OLD MILL BUILDING



Healthcare

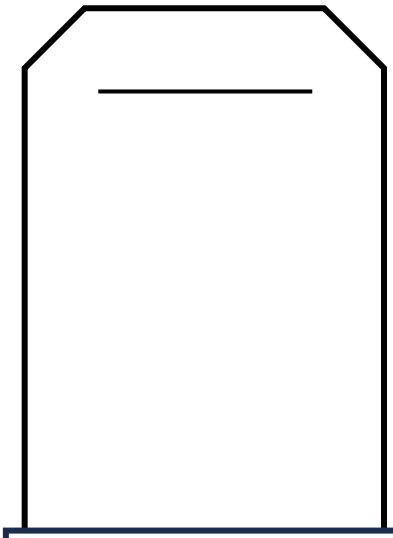


Transportation

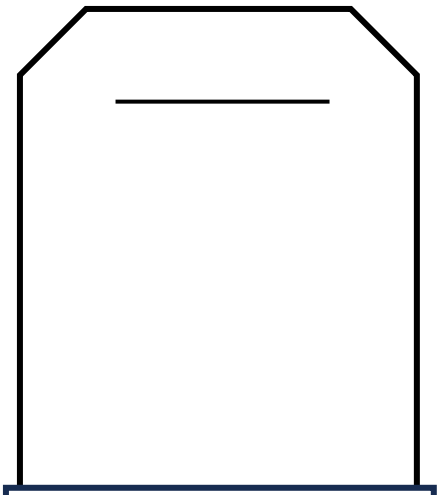


Healthcare

DEKA



Education



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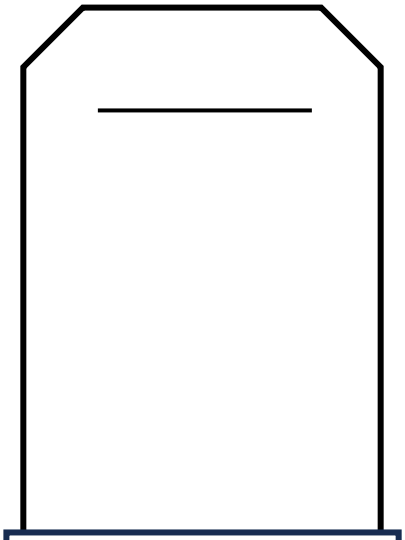

Clean Water