

2007 Darpa Urban Challenge
NewsDepth November 1, 2007
Classroom Activities
Lesson Plans



Team Case's **Dexter**

http://www.darpa.mil/grandchallenge/images/Team_Pics/TeamCase_3.jpg

Overview:

The Students, Faculty, and Alumni that make up **Team Case** are out in the California Desert this week putting Dexter through his paces. Dexter is a robotic vehicle that Case Western Reserve University in Cleveland has entered in the 2007 Darpa Urban Challenge. The challenge is to create a full-sized vehicle that can drive itself through an urban environment. Interacting with live traffic, members of Team Case hope they will qualify for the final event and the first prize of two million dollars this weekend. This lesson will introduce the students to the purpose of the Darpa Urban Challenge and Team Case's entry, Dexter. They will also examine the value of autonomous vehicles in the defense of our country.

Subject matter: Science

Grade levels: 6-8

Classroom activities:

1. Activity #1 Time: 30 minute – 45 minutes

Introduce the students to the Darpa Urban Challenge.

- The **DARPA Grand Challenge** is a prize competition for driverless cars, sponsored by the Defense Advanced Research Projects Agency (DARPA), the central research organization of the United States Department of Defense. Congress has authorized DARPA to award cash prizes to further DARPA's mission to sponsor revolutionary, high-payoff research that bridges the gap between fundamental discoveries and their use for national security. DARPA has technologies needed to create the first fully autonomous ground vehicles capable of completing a substantial off-road course within a limited time. For more details, Wikipedia offers this webpage:
http://en.wikipedia.org/wiki/DARPA_Urban_Challenge
- DARPA has its own page for information about the competition.
<http://www.darpa.mil/grandchallenge/index.asp>
- Visit the Team Case website to get a multimedia experience of their participation in the 2007 Darpa Urban Challenge.
<http://urbanchallenge.case.edu/index.html> Team case website
http://admission.case.edu/admissions/news/news_story.asp?iNewsID=703&&strBack=%2Fadmissions%2FDefault.asp article about Dexter

- Follow with a discussion:
 - “What is an Autonomous Vehicle”?
 - Why do you think the development of one of these is so important to our nation’s defense?
 - Can you think of any other robots that are presently being used for the defense of our nation? Any suggestions for one?
 - Can you think of an idea for a robot that can be used to promote safety in your own school or classroom?

2. Activity #2 Time: 30 minutes up to 2 class periods
 Have students build their own rubber band powered car.
 (NOVA Teacher’s Activity)



The purpose of this activity is for students to experience the process of designing and building a device to meet a set of design and performance criteria just as the teams competing in the DARPA challenge had to.

http://www.pbs.org/wgbh/nova/teachers/activities/3308_darpa.html

Online Lesson Plans:

Standards included in plan

Subject matter: Science and Language Arts

Grade levels 6-8

<http://www.nytimes.com/learning/teachers/lessons/20050915thursday.html>

Automated Intelligence - In this lesson, students redesign everyday robotic devices to increase their autonomy and their usefulness. Students will learn about the latest autonomous vehicles participating in the Defense Advanced Research Projects Agency’s Grand Challenge by reading and discussing the article “Robotic Vehicles Race, but Innovation Wins.”

http://www.nytimes.com/learning/teachers/lessons/20020124thursday.html?searchpv=learning_lessons

Exploring Robots - In this lesson, students learn about the five essential parts of every robot and design their own robots to perform everyday tasks.

<http://www.nytimes.com/learning/teachers/lessons/20060720thursday.html>

Our Robots, Ourselves - In this lesson, students investigate current research in artificial intelligence and imagine the ways in which those technologies can be developed for use in daily life.

Pictures of Dexter



Members of Team CASE are hard at work getting their bot ready for the qualification runs.



Look at all those sensors on the front.



Dexter about to start its qualification run

Source for pictures:

http://www.tgdaily.com/index.php?option=com_content&task=blogsection&id=18&Itemid=41&slideshow=20071027