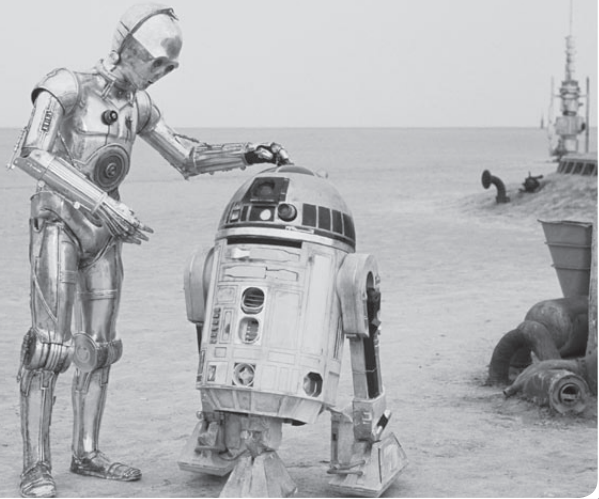


Star Wars

Where science meets imagination

This teachers' supplement should be used in conjunction with Project Pull-out #32: Star Wars: Where Science Meets Imagination, which is in DMAG's issue 85, April 2009. The pull-out will inspire students to learn about magnets, transportation, robots and how people adapt to suit their environment.

A visit to the Powerhouse Museum's Star Wars: Where Science Meets Imagination exhibition will bring these teaching units to life. The exhibition is on in Sydney until 26 April 2009.



© LUCASFILM LTD & TM. ALL RIGHTS RESERVED. USED UNDER AUTHORIZATION.

This supplement encourages students to:

- Understand how magnets work
- Understand that different types of transport use different technologies to move
- Understand that people adapt to their environment yet also modify it
- Learn why robots are used

Science: Magnets

Read pages 50-51 of DMAG's Project Pullout and ask students to complete the "Your Mission" exercise. After completing this, ask students how they think the maglev train system uses magnets to float. The answer: the trains use magnets with the same polarities to repel/push against each other – one on the bottom of the train and the other on the train rails.

IMPORTANT NOTE:

A visit to the Powerhouse Museum's *Star Wars: Where Science Meets Imagination* exhibition is the best way to illustrate this principle. At this exhibition, there is a 'hands-on'

exercise that the whole class can participate in. Students can make a simple maglev vehicle that they can propel along guide rails.

Extension Exercise

Find out about electromagnets, i.e. electrically created magnets that can be turned on and off at will. Look at some examples of where electromagnets are used e.g. in a scrap yard to pick up cars and then to drop them. How would electromagnets help with moving a maglev train?



Transport: Now and Beyond

Ask the class what types of transport they have used and write these on the board. Ask each student to choose one of them and do some research to find out the following:

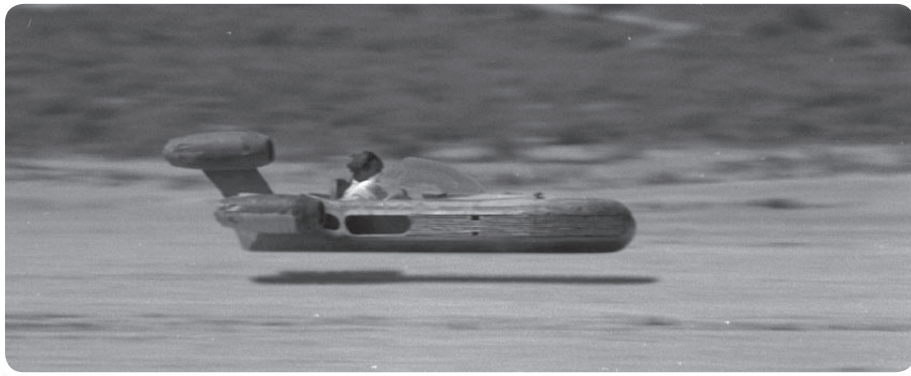
- When was it invented?
- How did it look when it was first invented?
- How does it look now?
- Why do you think these changes (if any) have occurred? How have these changes made the mode of transport better?

Now ask each student to research either the hovercraft, space shuttle, or maglev train. In their research, they should find out the following:

- When was it invented?
- How does it work?
- How is it different from a similar form of transport that is common now? (E.g. How is a maglev train different from an electric train?)
- Why is it not as popular or widely available as the forms of transport discussed in the previous task?

Star Wars

Where science meets imagination



Transport Improvements

Ask students to look at one of the types of transport that is widely available today. What are its good points? What are its bad points? Ask them to write a one page essay on what could be done to improve it. Students should consider:

- Are people able to get to stations/stops easily?
- Does this mode of transport always run on time or are there complications with traffic?
- Are there too many commuters and not enough services?
- How is this transport powered?
- How environmentally friendly is it?

Extension Exercise

Most transport today uses fuel and/or electricity in order to move. Explain to the class that there are more environmentally friendly energy sources that can be used such as solar, hydrogen and wind power. Ask students to illustrate and write a description of a form of transport that uses one of these (or another environmentally friendly energy source).

HSIE: Living in Communities Design a City

As a class, read pages 48-49 of *DMAG* and discuss the "Your Mission" exercise. Explain to the class that people adapt their clothes and lifestyle to suit their environment. Now ask each student to imagine a futuristic city, e.g. a city underwater, in the clouds or on the Moon, and ask them to draw what it would look like. When designing, consider the following: What will their buildings look like? What materials will they be made from? What will people wear? Once completed, students are to share their designs with the class.

English, Art and Drama: Show Time

Ask the class to choose their favourite city from the above exercise as they will be performing a short play set in the city. Divide the class into groups. One group will write and direct the play, another will act and another will do costume and set design.

Extension Exercise

Ask three students to film the play and edit it for dramatic effect.

Science:

Understanding robots

As a class, discuss where students may have seen robots. For instance, robots are used to load pallets, weld cars, spray paint doors, dispose of bombs and even explore space. Discuss the situations in which robots are currently used. Why are robots used instead of humans? Prompts: Dangerous situations, difficult to reach, repetitive, no oxygen, no food, heavy lifting, high-degree of precision required, cheaper than humans etc. As a class, draw a table with two columns and discuss the situations in which robots are well suited, and those in which they're not e.g. when something out of the ordinary occurs. Ask students to complete the robot exercises on the student worksheet.

IMPORTANT NOTE:

If the class visits the Powerhouse Museum's exhibition, they will be able to program their own robot and see how difficult it is to control movement in robots.

About DMAG

These Teachers' Notes were sponsored by the Powerhouse Museum and written by the staff at DMAG. They may be reproduced for use in school classrooms. To subscribe to the magazine they refer to, call 1300 887 795 (Australia) or 612 8296 5413 (international). To visit the *Star Wars: Where Science Meets Imagination* exhibition at the Powerhouse Museum call 136100 or see powerhousemuseum.com