

Futurecade

Teacher briefing notes

What is Futurecade?

Futurecade is an innovative online suite of games from the Science Museum that allows students to explore how science and technology impacts on their everyday lives.

Futurecade's four games are inspired by current and future technology in the fields of robotics, satellites and space junk, geo-engineering and synthetic biology.

We developed the games with the aim that they would be fun and enjoyable for teenagers to play. They are based on science that is being researched today and may affect our lives in the future. We have also integrated thought-provoking questions around the science and consequences of the gameplay so that you can use them in the classroom to generate discussion.

Overall learning outcomes (see also 'Summary of games')

We believe *Futurecade* can:

- Foster critical thinking, informed decision-making and interest in science.
- Help impart knowledge, so that participants can discuss the outcomes with others afterwards, but most importantly it can **provoke thought about how science shapes our lives.**

Why play games?

Finding the right tools to engage teenagers is key; we live in an increasingly digital society, so games are a great way to get your students talking science. As well as being motivating and rewarding, games can also help engage students with different learning styles and reach those who don't respond to conventional teaching methods.

We aren't the only ones who think so. Michael Gove, Secretary of State for Education, recently said: *'Games and interactive software can help pupils acquire complicated skills and rigorous knowledge in an engaging and enjoyable way.'*

What about the science?

The games are based on real science that is being researched today and could affect our lives in the future.

We worked with scientists to put together background science notes to support the use of the games in the classroom.

The gameplay

The games deal with scientific issues where there isn't a simple right-or-wrong answer. In the games, players' actions have consequences for humanity. This is demonstrated by gaining or losing 'human points'.

Thought-provoking questions encourage players to consider the applications and implications of science in our lives, and make them want to find out more. The in-game questions can be used in the classroom to support discussion. Use the background science notes to help your students explore the topics further.

Using Futurecade

Futurecade can be used in many ways. The four games are stand-alone. You could focus on one game, *Cloud Control* for example, and use it to explore a wide range of topics related to climate change, from geo-engineering to the greenhouse effect.

We would recommend using the games:

- To introduce any of the themes explored in them, e.g. genetic engineering or space junk.
- As a stimulus for a discussion lesson exploring the applications and implications of science.
- As a homework assignment.
- In a STEM club.

Lesson ideas

Get 'em talking

At the end of each game (on the results screen) your students are shown a thought-provoking question that reflects their gameplay. Encourage them to discuss their question in small groups. Students can then share their question with the rest of the class. Develop the discussion further using the questions in the background science notes. This will ensure that all the students have had an opportunity to share their opinions and consider the implications of the science.

Billion-pound offer

After playing all four games, set groups of students the challenge of comparing and contrasting the importance and impact that each technology will have in the future. Your students must vote for which one they would like to invest a billion pounds in!

Dragons' Den debate

Groups of students could research one of the four technologies and in a *Dragons' Den* format present arguments for why their technology should be funded for further research. Teachers or technicians could sit on the 'funders panel' and decide which groups would be awarded funding.

News + Views

If you make use of the Science Museum's News + Views activity, your students can first play the *Futurecade* games to familiarise themselves with the issues. Then they create a display poster exploring the different opinions around a topic, using the background science notes. News + Views content packs for each game, including images and quotes from scientists, will be available on the sciencemuseum.org.uk/educators website from March 2012.

Top tips

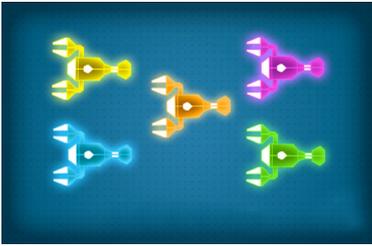
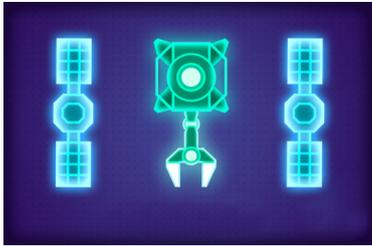
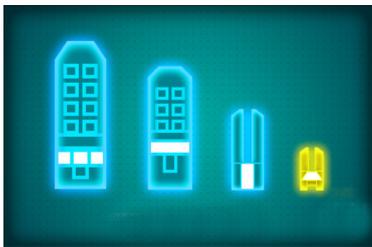
- Have a go at playing the games yourself.
- Instructions on how to play are given at the start of each game, but you can also pause the game and access instructions using the  icon at any point.
- To encourage discussion, group two or three students around one computer.
- Thought-provoking questions that reflect gameplay are given at the end of each game on the results screen. You can access further information to encourage discussion by clicking the  button.
- The background science for all of the games can be found on the Science Museum Educators website: sciencemuseum.org.uk/educators
- If you don't have access to an IT suite, ask volunteers to play the game on a classroom whiteboard and use the thought-provoking questions to begin a group discussion.

Game short cuts

Here are some short cuts that have been built into the games to make them easier for you to use:

- Type **endgame** during gameplay to end the game and bring up the results screen and the links to the thought-provoking questions.
- To clear scores from previous plays on a computer, type **clear** and refresh the browser. You can do this at any stage of gameplay, and it's especially useful if students will be taking turns on the same computer.

Summary of games

	Game summary	Learning outcomes	Discussion areas
<p><i>Robo-Lobster</i></p> 	<p>Robotic lobsters have been designed to destroy mines in the sea. Take control of your Robo-Lobsters and keep the harbour safe from attack!</p>	<p>Robots are doing dangerous jobs so humans don't have to.</p> <p>A robot is only as good as the instructions programmed into it.</p>	<p>What jobs would you be happy for robots to do?</p> <p>Who is responsible for a robot's actions?</p> <p>Can we trust robots to keep us safe?</p>
<p><i>Space Junker</i></p> 	<p>The Earth is surrounded by orbiting space junk. Keep our satellites safe by clearing the skies with your Space Junker craft.</p>	<p>Our lifestyles depend on satellites orbiting the Earth.</p> <p>Space junk poses a danger to working satellites.</p>	<p>Do we really need to worry about space junk?</p> <p>Who is responsible for littering space?</p> <p>Who should pay for cleaning up space junk?</p>
<p><i>Bacto-Lab</i></p> 	<p><i>E. coli</i> bacteria can be engineered so they make useful products. Engineer your <i>E. coli</i> in the right order. Don't make a mistake – you might create harmful mutant bacteria!</p>	<p>Bacteria (<i>E. coli</i>) are being manipulated to manufacture useful products.</p> <p>Should we do it?</p> <p>How safe is it?</p>	<p>Would you take engineered <i>E. coli</i> as medicine?</p> <p>Could bacteria save the world?</p> <p>Is it OK to engineer any organism?</p>
<p><i>Cloud Control</i></p> 	<p>The Earth's climate is changing. Use Flettner ships to brighten clouds so they reflect sunlight and lower the Earth's temperature.</p>	<p>Geo-engineering (cloud brightening) could be used to control the climate.</p> <p>If we don't do something to control the climate there could be global consequences.</p>	<p>Is trying to change the climate OK?</p> <p>Can we really stop climate change?</p> <p>Who is responsible for combating climate change?</p>

