UNIVERSITY OF LEEDS

MedTech:
Trends and Product Design

Scheme of Work

	Lesson 1	Lesson 2	Lesson 3
Length	Approx. 1 hour	Approx. 1 hour	Approx. 1 hour
Objectives	To define the concept of medical technologies and give some examples. To identify relevant factors which impact the development of medical technologies. To consider the history of medical technology innovation, focusing on three specific devices.	To consider the future of MedTech's role in healthcare. To explain the challenges encountered during development processes in MedTech.	To explore how medical technology meets specific medical needs. To research the testing procedures involved in ensuring a device is safe. To compare different medical technology devices.

Lesson plans for each session can be found on the following pages.

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Lesson 1 plan

<table>
<tr><th>Starter activity</th><th>Learning objectives</th></tr>
<tr><td>Ask the class the following question and collect responses.

• When you think of medical technologies, what comes to mind?
• Can you think of any other factors which you think are responsible for innovation in healthcare, either in the past or today?</td><td>• To define the concept of medical technologies and give some examples.
• To identify relevant factors which impact the development of medical technologies.
• To consider the history of medical technology innovation, focusing on three specific devices.</td></tr>
<tr><th>Main activities</th><th>Resources required</th></tr>
<tr><td rowspan="5">Look at the timeline of innovation in MedTech from Step 1.3. Highlight and lead discussion on any important or interesting points.

Divide class into three groups. Each group will research and produce a timeline of development and design for the following medical devices:

• The stethoscope
• Wound dressings
• Hip implants

Each group then presents their timeline to the class.

(Optional: after performing their own research, the class can watch the video ‘A history of innovation’ in Step 1.4 which describes the development of these devices).</td><td>1. A history of innovation in MedTech (Step 1.3) PDF version or device for class to view.
2. Materials for creating timelines.
3. Devices for performing research (and optionally watching the video)</td></tr>
<tr><th>Assessment for Learning</th></tr>
<tr><td>Group timelines, contributions to discussion.</td></tr>
<tr><th>Differentiation</th></tr>
<tr><td>SEND: Teacher-led support.
Low ability: Peer-learning.
Gifted and Talented: Peer-teaching.</td></tr>
<tr><th>Plenary</th></tr>
<tr><td>Discuss and answer the following questions:

• What are the similarities and differences in the developmental processes of these technologies?
• Revisit the factors identified in the starter activity. Can you identify more, or refine the list?</td></tr>
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Lesson 2 plan

<table>
<tr><th>Starter activity</th><th>Learning objectives</th></tr>
<tr><td>As a class, watch the video in Step 1.7 ‘What could the future hold for healthcare?’.

Lead a class discussion on the challenges facing the MedTech industry and identify the four listed below.</td><td>• To consider the future of MedTech’s role in healthcare.
• To explain the challenges encountered during development processes in MedTech.</td></tr>
<tr><th>Main activities</th><th>Resources required</th></tr>
<tr><td rowspan="6">Four challenges faced by the MedTech industry:

1. The impact of public perception.
2. The automation of the healthcare profession.
3. Negative perceptions of ‘big data’.
4. Getting technologies to ‘talk’ to each other.

Put each challenge (prepared flipchart paper) on one of four tables around the classroom. Ask students to divide amongst the tables and brainstorm examples and solutions for each challenge on the flipchart paper. After 5 minutes on each table, students should move to another.

After four rounds, reconvene and summarise each of the flipchart paper’s contents.</td><td>1. Device for watching video.
2. Flipchart paper and pens.
3. Four tables and space for activity.
4. Materials/devices for individual reports.</td></tr>
<tr><th>Assessment for Learning</th></tr>
<tr><td>Populated flipchart papers, individual assignments.</td></tr>
<tr><th>Differentiation</th></tr>
<tr><td>SEND: Videos have subtitles.
Low ability: Peer-learning.
Gifted and Talented: Peer-teaching.</td></tr>
<tr><th>Plenary</th></tr>
<tr><td>Using the class activity, and information and ideas from Steps 1.8 – 1.11, students should write a short assignment summarising each of the challenges faced by the MedTech industry (this could be finished as homework).</td></tr>
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Lesson 3 plan

<table>
<tr><th>Starter activity</th><th>Learning objectives</th></tr>
<tr><td>Explain that students are going to research a MedTech device in this lesson and then write a short video script for the product.

Watch the Youtube video on dCell Technology: Tissue Regenix and hand out the script (in Step 2.14) to give learners an example and ideas for their own videos.</td><td>• To consider how medical technology meets specific needs.
• To research the testing procedures involved in ensuring a device is safe.
• To compare different medical technology devices.</td></tr>
<tr><th>Main activities</th><th>Resources required</th></tr>
<tr><td rowspan="4">In pairs, students will now choose a MedTech device to research. Devices could be from companies such as Creavo, Neotherix, Medtronic, Oxford Nanopore, or any other (it may be helpful to prepare a list for students to choose from).

Ask each pair to think about who could use the device and how they would benefit from it. They should conduct their research and answer the following questions:

• What is the technology behind the device?
• What needs does the device meet?
• Who will benefit from the device and how?
• What testing procedures have taken place to ensure that the device is safe to use?
• How does the device compare to what is already on the market?

After researching, each pair should write a short (no more than 500 words) video script for their device which answers the questions above.</td><td>1. Devices to watch video and perform research.
2. Materials for research and video scripts.</td></tr>
<tr><th>Assessment for Learning</th></tr>
<tr><td>Video scripts, individual reflections.</td></tr>
<tr><th>Differentiation</th></tr>
<tr><td>SEND: Videos have subtitles.
Low ability: Peer-learning.
Gifted and Talented: Peer-teaching.</td></tr>
<tr><th>Plenary</th></tr>
<tr><td>Ask students to write a short individual reflection, identifying three things they have learned about medical technology in the last three lessons.</td></tr>
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