



MedTech: Orthopaedic Implants and Regenerative Medicine

Scheme of Work

	Lesson 1	Lesson 2	Lesson 3
Length	Approx. 1 hour	Approx. 1 hour	Approx. 1 hour
Objectives	<p>To define relevant terms related to orthopaedic injury and treatment.</p> <p>To describe different types of joint replacement in the human body.</p> <p>To investigate biocompatibility and produce an informative leaflet.</p>	<p>To distinguish between different categories of stem cells.</p> <p>To explore the stem cell therapy process.</p> <p>To consider the benefits of regenerative medicine.</p>	<p>To compare orthopaedic implants with regenerative medicine.</p> <p>To evaluate the benefits and drawbacks of each.</p>

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

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Lesson 1 plan

Starter activity	Learning objectives
<p>Lead a class discussion, asking students first to share any stories they have where they have damaged their joints, and what the treatment involved. Then, ask students if they can define the following terms (in relation to medicine):</p> <ul style="list-style-type: none"> • Joints • Arthritis • Trauma <p>Definitions given in Step 1.2 will be useful for eliciting correct answers (ensure that the different types of joint are covered).</p>	<ul style="list-style-type: none"> • To define relevant terms related to orthopaedic injury and treatment. • To describe different types of joint replacement in the human body. • To investigate biocompatibility and produce an informative leaflet.
Main activities	Resources required
<p>Watch the video in Step 1.3 (What joints can be replaced?). In small groups, students then work through the exercise in Step 1.3. Collect the exercise PDF (or close devices) and do a quick verbal quiz, asking students to give information on the various joint replacements.</p> <p>In their groups, students now research 'biocompatibility' in order to create an information leaflet for a hypothetical joint replacement patient. Leaflets should include a definition of biocompatibility, considerations in designing implants, and information on at least four different types of materials used in replacements.</p> <p>Information in Step 1.4 may be useful, but students should research more widely first.</p>	<ol style="list-style-type: none"> 1. Devices to watch video and perform research. 2. Device for exercise in Step 1.3 or PDF print out of exercise. 3. Materials for creating information leaflets. <p>Assessment for Learning Verbal quiz, information leaflets.</p> <p>Differentiation SEND: Videos have subtitles. Low ability: Peer-learning. Gifted and Talented: Peer-teaching.</p> <p>Plenary Groups present their leaflets to each other. In doing this, other groups should consider the leaflet from a patient's point of view, and ask any relevant questions they think a patient might ask.</p>

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Lesson 2 plan

<p>Starter activity</p> <p>In pairs, ask students to recap the last lesson and list the benefits of orthopaedic implants.</p> <p>Share ideas briefly as a class and collect a shared list of the benefits.</p>	<p>Learning objectives</p> <ul style="list-style-type: none"> • To distinguish between different categories of stem cells. • To explore the stem cell therapy process. • To consider the benefits of regenerative medicine.
<p>Main activities</p> <p>As an introduction to the task, lead a brief class discussion, asking students what they think the term 'regenerative medicine' means, and what they know about stem cells and stem cell treatment.</p> <p>In groups, students will spend the lesson researching regenerative medicine and stem cell treatment. Each group will create an engaging poster, using creative materials to create diagrams and present information.</p> <p>Posters should include:</p> <ul style="list-style-type: none"> • Information on the different types of stem cell and their functions. • Applications of stem cells • Information on the stem cell therapy process • Benefits of stem cell therapy <p>Place each poster in a different area of the room, and ask students to move around and look at each in turn.</p>	<p>Resources required</p> <ol style="list-style-type: none"> 1. Devices/materials for research. 2. Creative materials for creating posters. <p>Assessment for Learning</p> <p>Posters, discussion contributions and explicit comparison between knowledge start and end of class.</p> <p>Differentiation</p> <p>SEND: Teacher-led support. Low ability: Peer-learning. Gifted and Talented: Peer-teaching.</p> <p>Plenary</p> <p>Students should give constructive feedback on each other's posters.</p> <p>As a class, summarise key learning and compare what they know now about regenerative medicine with what they knew at the beginning of the lesson.</p>

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Lesson 3 plan

<p>Starter activity</p> <p>Write 'orthopaedic implants' and 'regenerative medicine' on pieces of flipchart paper. Ask students to list what they can remember about each from the last two lessons. Ask each student who lists something to write it up on a post-it note and stick it to the relevant piece of paper. Keep these on display for the lesson.</p>	<p>Learning objectives</p> <ul style="list-style-type: none"> • To compare orthopaedic implants with regenerative medicine. • To evaluate the benefits and drawbacks of each.
<p>Main activities</p> <p>Individually, students will produce a discursive piece of writing which examines the benefits and drawbacks of orthopaedic implants and regenerative medicine.</p> <p>In the assignment students should attempt to give a balanced and detailed view of each. At the end of the assignment, they should summarise and give their personal opinion, answering this question:</p> <ul style="list-style-type: none"> • Is regenerative medicine a better treatment option than orthopaedic implants? <p>To aid their work, students can review the lists from the starter activity, discuss their assignments with each other for peer support and also should be able to further research if necessary.</p>	<p>Resources required</p> <ol style="list-style-type: none"> 1. Flipchart paper and post-it notes. 2. Devices for research. 3. Materials/devices for discursive writing. <p>Assessment for Learning</p> <p>Recall of information, individual assignments.</p> <p>Differentiation</p> <p>SEND: Teacher-led support. Low ability: Peer-learning. Gifted and Talented: Peer-teaching.</p> <p>Plenary</p> <p>Ask students to vote 'yes' or 'no' to the question:</p> <ul style="list-style-type: none"> • Is regenerative medicine a better treatment option than orthopaedic implants? <p>If there is time, discuss ideas and opinions.</p>