



Leonardo da Vinci' Robot

Age group/class: 15 – 16 years old

Lesson title: Leonardo da Vinci' Robot

School Discipline: Robotics

Key concepts: application of robotics in real life

Aims:

- Recognize the practical applications of robotics in real life
- Introduce Leonardo da Vinci' discoveries
- Discuss about discoveries created by mistake

Skills developed: observation, analysis and research

Materials/Equipment needed:

- <https://www.youtube.com/watch?v=9xtuXJo364> (to be used in the introduction activity to provide some basic information about Leonardo da Vinci)
- <https://eloquent-ramanujan-887aa5.netlify.app/da-vinci.html> (to be used for the practical VR experience)
- VR headset
- VR video / link
- <https://www.youtube.com/watch?v=MZZByvetA0A> (to be used for the follow-up activity)
- <https://www.businessinsider.com/these-10-inventions-were-made-by-mistake-2010-11?IR=T> (to be used for the follow-up activity)

Lesson plan:

| Stages | Description of activity | Time |
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| Preparation before the lesson | <p>If this is a first VR experience for students – go through the safety rules:</p> <ul style="list-style-type: none"> – Learners are to sit down whilst using the VR glasses and not hold anything in their hands, unless the experience is of such a nature that it requires you standing, in which case, ensure enough space is allowed around all students. – Learners will be told to expect a feeling of vertigo. If it gets worse, students must remove VR glasses. – Learners need to know how to adjust the viewing focus before using the headsets. – Learners must not use the headset when they are: tired, need sleep, under emotional stress or anxiety, when suffering from cold, flu, headaches, migraines as this can worsen their susceptibility to adverse reactions. – Learners should be given the choice to opt out of using VR. | |





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| Introduction | <p>Share Learning Intentions with students</p> <p>The aims of the current lesson plan are the following:</p> <ul style="list-style-type: none"> – Recognize the practical applications of robotics in real life – Introduce Leonardo da Vinci’ discoveries – Discuss about discoveries created by mistake <p>School subjects are usually felt as far from real-life, especially in students’ perception. The reality is completely different, as what is written in school books has a direct application in real life. And some of the objects students are more familiar with are the natural descendants of inventors’ discoveries. The same inventors who populate their school books. The current lesson plan aims at making this link even more evident.</p> <p>On the other hand, it turns out that many of society's most well-known inventions were simply mistakes made by scientists on alternative quests. The current lesson plan represents the best opportunity to discuss about this topic.</p> | <p>5 min.</p> |
| Initial Immersive Experience | <p>“Let’s move to Florence and lets’ enter the Leonardo da Vinci museum”: https://eloquent-ramanujan-887aa5.netlify.app/da-vinci.html</p> <p>Learners put on the VR headsets and explore the video at their own pace for about 10 minutes.</p> | <p>10 min.</p> |
| Guided Immersive Experience | <p>After a free exploration of the VR resource, teacher asks students to focus on the last Leonardo’ discovery analysed within the video: the mechanical knight.</p> <p>Leonardo's robot, or Leonardo's mechanical knight (Italian: Automa cavaliere / lit. "Automaton knight"), was a humanoid automaton designed and possibly constructed by Leonardo da Vinci around the year 1495.</p> <p>A detailed description of this invention is provided by the teacher.</p> | <p>20 min.</p> |
| Follow up | <p>1) Ante-litteram discoveries</p> <p>Students are asked to watch a video focusing on Leonardo da Vinci’ mechanical knight: https://www.youtube.com/watch?v=MZZByvetA0A</p> <p>2) Work group</p> <p>Students are divided into 2 groups and are asked to list the possible real-life applications of robotics. An assessment of this activity is provided in the following article: https://engineering.ckovation.com/10-impacts-robots-everyday-life/</p> <p>3) Discoveries created by mistake</p> <p>“Leonardo da Vinci was not aiming at creating a robot as we intend it. But the reality shows that his mechanical knight is really close to our</p> | <p>10 min.</p> <p>10 min.</p> <p>10 min.</p> |





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| | idea of robot. Do you know about discoveries resulting from mistakes done by inventors?" An assessment of this activity is provided in the following article: https://www.businessinsider.com/these-10-inventions-were-made-by-mistake-2010-11?IR=T | |
| Formative Assessment | <ul style="list-style-type: none"> – “Which are the robotics principles behind the mechanical knight?” – “List 3 discoveries done by Leonardo da Vinci” – “List 3 practical applications of robotics in real life” | 5 min. |

