**03.2 Lesson plan**

**Age group/grade:** 16 y. o. / 10 grade

**Lesson title**: Arc length of a circle, sector area of a circle

**School Discipline:** Mathematic

**Key concepts:** central angle; sector of a circle.

**Objectives:**

* To discover what is meant by a central angle and a sector of a circle;
* Be able to identify in the drawing the radius, arc and angle of the circle sector;
* To learn to calculate the length of the arc of a circle and the area of sector.

**Skills developed:** application of theoretical knowledge; correct use of mathematical concepts; cooperation.

**Materials/Equipment needed:**

* Computer with video projector;
* VR glasses;
* VR video/link: <https://eloquent-ramanujan-887aa5.netlify.app/math.html>

**Lesson plan:**

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| **Stages** | **Description of activity** | **Time** |
| **Preparation before the lesson** | Students already know and have learned what a circle looks like and what are the types of angle. During the lesson, students will learn new formulas and how to apply them in practice.  Introducing students to VR glasses if this is their first VR experience.  Proper and safe use of VR glasses;  Potential adverse effects of VR glasses;  Students should be given the choice to opt out of using VR. |  |
| **Introduction** | Angles: Using Circles  Teacher shows a circle on the projector:    Teacher asks students the following guiding questions:   * Where is the central angle? * Where is the radius? * Where is the arc?   Discusses with students and reminds them key concepts. | 5 min |
| **Initial Immersive Experience** | Teacher suggests students using VR glasses and in the provided video to find the formulas they need for this lesson: <https://eloquent-ramanujan-887aa5.netlify.app/math.html> | 5 min |
| **Guided Immersive Experience** | Teacher together with students discuss the identified formulas. Students write down the formulas in their notebooks:    Teacher gives students a task: using the information provided in the VR video, find multiple circles and apply the formulas to make the calculations. | 15 min |
| **Follow up** | After completing the given task, the teacher reviews how the students performed and divides the students into groups. Students share in their groups the calculations they made using VR video.  The teacher provides revised formulas to calculate the arc length and the sector area of a circle.  arc length formula ! | Math, Knowledge, Chart        Then students in groups have a  new task: following the material  provided in VR video, to measure  and calculate the data of the open  tower vault according to the revised  formulas.  After completing the given task, teacher reviews the group work and answers the students' questions on the application of the circle formulas for arc length and sector area. | 15 min |
| **Formative Assessment** | Teacher shows on the projector circles and sectors of different size and asks students the following questions:  What is the size of a central angle? How arc is labeled? How radius is labeled? How to calculate the exact length of the arcs and sectors provided in the drawing?   |  |  |  | | --- | --- | --- | | How to Determine the Length of an Arc - dummies | Arc Length | CK-12 Foundation | Arc Length | andymath.com |   Teacher collects the students’ responses and makes corrections if needed. | 5 min |