**O3.2\_Lesson plan\_Physics\_Inclined Plane**

**Age group/class:** 12 years old

**Lesson title:** Movement on an inclined plane

**School Discipline:** Physics

**Key concepts:** Inclined plane, movement, skier

**Aims:** - Description of the inclined plane,

- Identification of the characteristics of the inclined plane (angle, height, etc.)

- Mathematical modelling - strong decomposition, determination of acceleration when ascending / lowering a body on the inclined plane with and without friction

- Application - movement of a skier on the inclined plane - VR experience

**Skills developed**: Analysis, collaboration, communication

**Materials/Equipment needed**: Video projector and computer, VR glasses

**Lesson plan:**

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| **Stages** | **Description of activity** | **Time** |
| **Preparation before the lesson** | Familiarise students with VR if you use it for the first time.  Go through safety rules with students before using VR.  Each time before going to VR, remind students about the possible negative effects some of them can get and set the expectations.  Give students the option to opt out of VR. |  |
| **Introduction** | The teacher asks students questions to highlight some observations made by students in their daily lives:  Why does a sled left on a slope go down?  Why do we get tired faster when climbing up a hill than going on a horizontal road?  If we climb different hills, we will have different experiences. Why? |  |
| **Initial Immersive Experience** | Initially we follow a skier on the slope in VR (the raw film without parameters) and starting from the observations we identify the characteristics of the inclined plane. We model the reality of VR by replacing it with a model that presents a body on the plane. The characteristics of the movement will be determined on this model. |  |
| **Guided Immersive Experience** | The skier in VR (with the physical parameters) is tracked again and the movement parameters are followed. The mathematical equations deduced on the model will provide the justification. |  |
| **Follow up** | Then the teacher divides the class into pairs and indicates certain times for which the students using the VR identify the speed of the skier and determine the acceleration. |  |
| **Formative Assessment** | Using the VR data the students will determine the strength of resistance encountered by the skier. |  |