

Discover Dark Matter

Pedagogical Scenario

Pre-briefing

Familiarization with VR technology and needs (out of class)

Teacher

1. Use a headset.
2. Plan sufficient physical space for the VR group activity.
3. Test casting on a device.

For more information, consult the Teacher's guide.



Preparation of material (out of class)

Teacher

Prepare pedagogical material and go over the documentation to be distributed:

1. Teacher's guide.
2. VR headset Introduction document
3. Mission planning document.
4. Pre-simulation questionnaire
5. Mission's chief instruction document
6. Engineer's calculation document
7. Post-simulation questionnaire



It might be useful to understand the basics of dark matter and dark energy.

Mapping of detailed activity plan and distribution of documentation (in class)

Teacher

1. Map the activity plan
2. Brief overview of the concept of dark matter.
3. Review of the concepts of conservation of energy, of gravitational potential energy and of circular dynamics, if needed.
4. Distribute the Mission planning document
5. Distribute the VR headset introduction document



Preparation for the activity (out of class)

Students

- Read accompanying document
- Complete the Mission planning document.



Briefing (in class)

Introduction to VR activity, documentation and objectives

Teacher

- Introduce activity plan and objectives.
- Form groups of three for the activity
- Distribute hard copies of the pre-simulation questionnaire.



5 min



Group

Review of Mission's plan document

Students

- Students complete the pre-simulation questionnaire.
- Note: The questionnaire is used as guide for students to compare answers from the Mission planning document.



10 min



Group

Consolidation of Mission planning document

Teacher

- Answer student questions about the Mission planning document (if any).
- Consolidate the graph showing the orbital speed of a star as a function of its distance from the galactic center.



5 min



Group

Introduction to VR equipment

Teacher

- Introduce critical manipulations related to VR material
- Review security warnings linked to VR.
- Distribute the equipment.
- Distribute the Mission's chief and Engineer's document, if needed.



5 min



Group

Activity (in class)

Role distribution

Students

Each group must assign a role to each member.

- Pilot: Uses the headset.
- Mission's chief: Guides the pilot based on the instruction document.
- Engineer: Completes the calculations.

Note that it is possible to modify the roles during the activity.



2 min



Group

