

# Triseum Pilot: Future Classroom Scenario

*Title of the scenario:*

**No Limits to Learning! Variant: Limits game in the classroom**

*Names of author(s)*

Annamaria Lisotti

## **Relevant Trends/s**

*Write the trend(s) or trends the Scenario is intended to respond to.*

*e.g. <http://www.allourideas.org/trendiez/results>*

- “No fear of Math” & STEM success. Strategies to develop a widespread mathematical literacy and encourage students to take up STEM related careers.
- Game Based Learning & Gamification: learning is achieved through games or game mechanisms.
- Edutainment: playful learning. Learning while having fun.
- Flipped Classroom: students master the basic concepts of the topic at home. Time spent in classroom is used to discuss, share and develop the topic further.
- Individualized learning (learning at your own pace)
- Digital Learning & BYOD
- Active Learning.
- Peer Learning
- Lifelong Learning: learning does not stop when you leave school

## **Learning Objectives and Assessment**

*What are the main objectives? What skills will the learner develop and demonstrate within the scenario? (e.g. 21<sup>st</sup> Century Skills). How will the progress in achievement be assessed, ensuring the learner has access to information on their progress so they can improve?*

### **Main Objectives**

- To ensure that students acquire real mathematical knowledge and do not proceed through the game only by trial and error.
- To make sure that students are able to transfer the acquired knowledge outside the game and to successfully apply it to more ‘*traditional*’ problems.

*What skills will the learner develop and demonstrate within the scenario?*

- Specific skills related to limits and continuity, mainly intuitive and with a graphical approach
- Critical thinking & problem solving
- Digital skills
- Learning by mistakes
- Self reflection
- Communication and collaboration

*How will the progress in achievement be assessed, ensuring the learner has access to information on their progress so they can improve?*

- With quick formative tests at the end of each zone both with the same content as the game and with new quizzes (--> testing the ability to extend and apply knowledge). With the use of Kahoot (<https://kahoot.com/>) feedback will be immediate.
- The teacher will look at students' progress through the Game dedicated tool (statistics, inside in students work) and will discuss with the students the points where they got stuck or lounged for too long.
- Traditional assessment - summative test

## **Learner's Role**

*What sort of activities will the learner be involved in?*

- Theoretical introduction
- Game playing
- Class discussion about typical mistakes and difficulties
- Producing new quizzes
- Peer learning (students tutor each other)
- Assessment

## **Tools and Resources**

*What resources, particularly technologies, will be required?*

### Technologies

- Game Variant Limits software
- Students' personal devices (1:1 at home)
- PC in the school ICT lab (both 1:1 & shared devices )
- Smartboard +projector for classroom interaction and Kahoot sessions
- Smartphone + app for Kahoot
- Desmos

### Basic resources

- Textbook
- Assessment worksheets

### **RESOURCES**

1. Video (warm up activity) <https://youtu.be/QprKiJoMaJ4>
2. <https://teacher.desmos.com/activitybuilder/teacherguide/574de5cdab71b5085a2aad42>
3. Variant Limits Zone1- Orbits assessment [https://drive.google.com/open?id=1CGE4oGGPJBFT0F72bLy\\_12O5fRrR-sXz](https://drive.google.com/open?id=1CGE4oGGPJBFT0F72bLy_12O5fRrR-sXz)
4. Variant Limits Zone1/2 - Kahoot game <https://play.kahoot.it/#/k/5acd647b-a02b-4721-aa16-bb9d96c9829a>
5. Variant Limits\_Zone 3- Kahoot game <https://play.kahoot.it/#/k/0d154669-e31e-4fc1-a731-a240573bbef3>
6. Variant Limits Zone 4 - Kahoot game <https://play.kahoot.it/#/?quizId=51cb4317-5589-4759-80a5-f19079f36da6>

7. Infographics <https://www.easel.ly/infographic/w923hm>
8. Evaluation from students after using a beta version of this scenario  
[https://drive.google.com/open?id=1Z557KS\\_Uw8J\\_DJ\\_aWD2WwAzgX0ZAmnpU](https://drive.google.com/open?id=1Z557KS_Uw8J_DJ_aWD2WwAzgX0ZAmnpU)

## **Learning space**

*Where will the learning take place e.g. school classroom, local library, museum, outdoors, in an online space?*

- At first in the school lab to get acquainted with the game mechanism; working in pairs.
- Mainly at home with a few puzzles to solve as a task for next lesson (flipped classroom modality). Students (a few) that do not have a PC apt to running the game will pair with other mates.
- Discussion within the classroom will follow with pen and paper assessment and more in-depth work
- Some more work in the classroom with the following scheduling: 15 minutes game with BYOD/lab and 15 minutes discussion.
- Then again the same pattern home/flipped → class discussion and/or assessment in the next class. However as the students progressively understand the mechanism they will be asked to be more and more actively involved such as elaborating assessment exercises and then swapping with their mates.

## **Future Classroom Scenario Narrative**

*Describe the main ideas of the scenario.*

The general purpose of this scenario is to use [the Variant: Limits](#) game puzzles to train intuitive graphical understanding of limits and then transfer this understanding to analytical problems by solving more traditional exercises.

NOTE: In the Italian High School Curricula graphical approach to limits is ONLY an introductory part as the Final Exam Syllabus - with regard to Calculus - requires a further, bigger part of actual analytical/numerical calculations.

- As a warm up activity see the short video <https://youtu.be/QprKiJoMaJ4>  
Also see <https://betterexplained.com/articles/an-intuitive-introduction-to-limits/>  
In analogy to this, students will be asked to either find on the Web or elaborate a graph and the related situation involving limits.
- Students will play the game both in school and at home, whenever possible in BYOD modality.
- Discussion pit stops will be regularly planned to clarify mistakes and misconceptions
- Students have to convert a graph into common language and then reversely go back from words to graph. As a second step, they will work “translating” from words into mathematical notation and vice versa. This will give them mastering over the three different codes: common language, graphical and mathematical. This will be the assessment focus.

- Create your own puzzle! Ask students to produce their own piece of assessment to swap with mates. This will be in itself an assessment, as you need to understand a topic very well to be able to create quizzes! To keep in the gaming trend, the selected tool is Kahoot.
- Further integration of the intuitive knowledge gained from the game with a theoretical framework about limits and continuity will follow.
- Game achievements will be included into the final grade. With “game achievements” we mean both how fast and precisely pupils go from one zone to the other together with -not to make the game too competitive or discourage them- points for collaboration, punctuality and for each piece of further knowledge they produce.

This scenario has been polished after pilot testing. Driven by the necessity to reduce time further, mainly in the classroom. The learning Scenario is about all zones of the Variant: Limits videogame.

## Learning Activities

Link to the Learning Activities created with Learning Designer (<http://learningdesigner.org>)

<https://v.gd/wAzjJ4>

*This Future Classroom Scenario has been developed as part of the Triseum Pilot project. Find more Future Classroom Scenarios in the Future Classroom Lab website (<http://fcl.eun.org/directory>) and learn how to create your own scenarios by using the Future Classroom Toolkit (<http://fcl.eun.org/toolkit>).*



This work is licensed under a [Creative Commons Attribution-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-sa/4.0/)