

Educational Level:

Higher Education

Subject Area

Mathematics

Time required

45 minutes



## VISUALISE AND EXPLORE

### NATURAL NUMBERS WITH AUGMENTED REALITY

#### Overview

This resource can be used as part of a pre-Calculus or Calculus course, as part of the study of sets of numbers and as a foundation topic for algebra, series and later on, limits.

With this resource, students can explore some of the ideas surrounding the set of Natural numbers (counting numbers), their characteristics and some of their uses in real life. Aero allows for exploration and engagement with the challenges that the scene presents to the student.

There are two challenges in the scene:

- 1) The student will have to explore different 3-D polyhedra to come up with a relation between their faces, edges and vertices. In other words, the student will have to find Euler's formula.
- 2) The student will explore the square pyramidal numbers to find the  $n$ -th number.

The Aero scene will present the student with different texts and images, explaining different aspects of the Natural numbers and what the student needs to do in the challenges. Students will need to discuss and reflect with their peers and teacher about what they see and learn in the scene.

By using this resource, students will extend their knowledge of Natural numbers in an exploratory way. These ideas are foundational to other more advanced topics such as series and limits, which are key to Calculus.

Teachers can adapt the outline to their own context and requirements. Teachers can produce their own relevant questions of what students explored in this resource, as part of the formative or summative assessment scheme of their course.

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## Supporting tools and resources



## Outline

Step	Time	Description
1 Preparation	5 min	Ask students to open the mobile version of Adobe Aero and scan the QR code (this will open the scene).
2 Learn	20 min	Ask students to explore the scene and try the challenges included in it.
3 Evaluate	15 min	Students should discuss what they saw with their peers and teacher: what are the Natural numbers? What are their characteristics? What are their uses in real life? How can these be used in other parts of mathematics? These conversations can lead to more in-depth discussions of other sets of numbers and how they are different to the Natural numbers.
4 Share	5 min	Respond to any question left unanswered.

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