

Google Earth Education

CUBE AND CUBE ROOTS

TIME [160 minutes]

OVERVIEW

Students will use the Google Earth Voyager Story on Ramanujan to see how quality education impacted his research in mathematics and outlook.

Quality education has a positive impact on young minds for a cleaner and healthier world.

SUBJECT/TOPIC	AGE LEVEL 13 -14 years
Mathematics / Cubes	Grade VIII
 Learning Objectives Students will be able to To understand cube numbers and their properties Identify Hardy – Ramanujan numbers To identify different patterns in cube numbers. To identify whether a number is a perfect cube or not. Students will be able to use a visual understanding to make connections to area and volume as applications of squares, square roots and cubes, cube root Extend understanding of squares to cubes and cube roots visually creating the connection between volume and perfect cubes. 	Inquiry [The essential question that will guide the lesson.] • Why do we call some patterns linear and what do they look like graphically so students understand how to identify non-linear patterns? Of course students will study linear patterns more closely in later units as well.

Materials Needed [List of all the materials and resources needed for the lesson.]

- ➢ Warm up problems for PK testing.
- Text Book- NCERT text book for Mathematics Class VIII
- Access to Google earth
- Student Internet Access

Lesson Summary [Brief description of each part of the lesson.]

• Engage:

The square activity is meant as the follow-up to perfect squares and extends the conceptual understanding already established with squares into cubes and also cube roots.

I wanted to take full advantage of this visual modeling by asking students to make connections to perimeter, area, and volume.

• Explore:

Teachers introduce the first source of information using an Earth story about Ramanujan.

This will lead to 1729 which is the smallest no. which can be expressed as a sum of two cubes in two different ways. $1729 = 1^3 + 12^3 = 10^3 + 9^3$

Students record observations or evidence as it relates to the inquiry.

Students identify relationships or patterns and form a hypothesis based on information gained.

• Explain:

Elicit the answers from their observation and generalize the result as a set of rules.

Students will be asked to write perfect cubes from 1to 30 and relate it to cube roots later.

Co – relation between volume of a cube and a cube number.

• Revise:

Students have an idea of the contribution of Indian mathematician Ramanujan and is able to identify the Hardy – Ramanujan Number.

• Apply:

The extension activity asks students to apply cubes, and cube roots to geometry application using perimeter, area, and volume.

The extension also begins to move students towards graphing and looking for patterns in the graph. Graphing correctly is a major focus of eighth grade math as is looking for patterns such as liner (perimeter), quadratic (area), and cubic (volume).

Sustainable Development Goals

Quality Education

Ensure inclusive and equitable quality education and promote life –long learning opportunities for all.

Culminating Task/Assessment [One sentence describing how student mastery of learning objectives will be assessed.] Students will identify the best strategy for imparting Education to the house keeping employees of the School and to the children in slum areas and encourage others to take action and garner support their strategy.

Textbook Chapter [How is this lesson plan related to the student's textbook? Which chapter and which lesson is covered here?]

The chapter of 'Cube & Cube Roots" is covered here.

In this the main focus is on cube of numbers and its properties.

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Google Earth Link

https://earth.google.com/earth/rpc/cc/drive?state=%7B%22ids%22%3A%5B %221KYAfRGwCxkN7nKB8IM4VEpQepIWYFmXY%22%5D%2C%22act ion%22%3A%22open%22%2C%22userId%22%3A%221106435607034688 12184%22%7D&usp=sharing