Introduction to Geometry

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- Explain what Geometry is.
- Distinguish between Euclidean Geometry and non-Euclidean Geometry.

- Language Objectives:
  - Discuss the approach for flattening a beach ball
  - Explain what Euclidean Geometry is.
  - Write about the challenge in making accurate world maps.
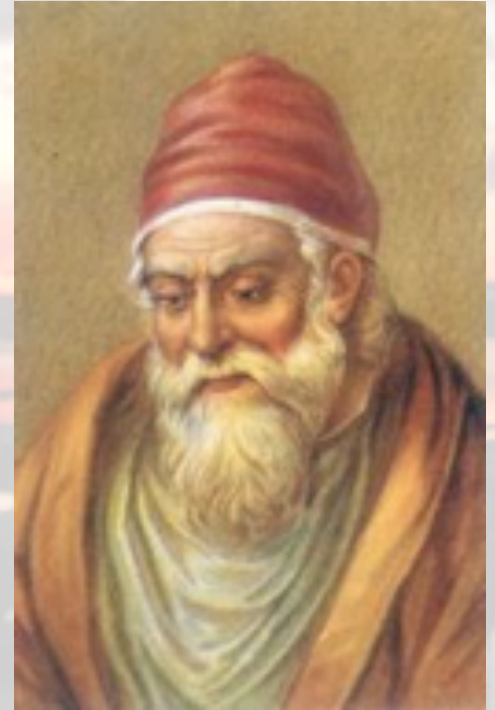
Geometry

- A branch of mathematics where we talk about shape, size, position, and space.

- One of the oldest branches of Mathematics

- It stretches back to about 3100 B.C.E.

- What do you think Geometry was used for in ancient times?

Ancient Geometry

- Surveying land

- Constructing buildings

- Measuring storage containers

- Astronomy

- Cartography

- Art

Euclid

- 300 BC

- Alexandria, Greece

- Into theory of math

- Father of Geometry
  - "Euclidean" Geometry

Exploration

- In your groups, blow up the beach ball.

- What shape is it?

Exploration

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- What shape is it?

- Cut the ball and make it flat.
  - You can make as many cuts as you want, but keep it in one piece
  - You can stretch it if you need to

Conclusions

- What happened when you tried to make it flat?

- Was anyone successful?

Euclidean vs Non

- Euclidean Geometry refers to any surface that you can flatten without distortion (stretching, bubbling, etc)

- Which of the figures on your paper would be Euclidean and which would be non-Euclidean?

- Euclidean is the only kind of Geometry we will actually be working with here.

Relations to the Earth

- Have you ever seen a map of the Earth?

- Are you familiar with the controversy?

Writing Exercise

- Write in your notebook:

  - Why are there so many different kinds of world maps?

  - Could you create one that preserved all the sizes perfectly and all the shapes perfectly?
    - If yes, explain how you would approach it.
    - If no, explain why.

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