

# What Is Geometry?

Geometry is the visual study of shapes, sizes, patterns, and positions. It occurred in all cultures, through at least one of these five strands of human activities:

1. building/structures (building/repairing a house, laying out a garden, making a kite, ...)
2. machines/motion (using a pry-bar, riding a bike, sawing a board, swinging, ...)
3. navigating/star-gazing (How do I get from here to there?, using maps, ...)
4. art/patterns (designs, symmetries, representations, ...).
5. measurement (How big is it?, How far is it?, ...)

M: Some mathematicians think that all of geometry developed from these activities in various cultures around the world.

**Worksheet 1** (Individual Work). Write a story about some of your various experiences with geometric ideas. You can talk about experiences in the classroom, but more important write about experiences outside of the classroom. Think broadly – if you are not sure whether something “counts” as geometry then write about it and tell why you are in doubt.

**Worksheet 2** (Group Work). Share the individual experiences with the group and the group produces a combined list of geometric experiences and explain in what ways they relate to geometry.

T: Now let us try to classify each of our experiences into the five strands.

S1: But some of our experiences seem to fit under more than one strand.

T: Can you give us an example?

S2: I want to go quickly to the park on my bicycle but first I have to repair the basket, which has fallen partially off.

S1: Yes. Repairing the basket is in the building strand.

S3: Deciding the quickest route to the park is in the navigating strand.

S2: And pedaling, steering, and balancing my bicycle is in the machines and motion strand.

S4: And I like to have my bike painted with cool designs and that would be in the art/pattern strand.

S5: We would use measurement to know how far we traveled to the park and how long it took to get there.

**Worksheet 3** (Group Work). Take the list of experiences that the group has developed and classify them into one of the five strands and include an “other” strand for experiences that don’t seem to fit. Also, some experiences and activities may fit into more than one strand – in this case list it under each of the strands that apply but identify what aspect of the experience puts it into a particular strand. As you think about each strand, are there other activities that humans do that would fit into that strand?

**Worksheet 4** (Class Work). Each group reports back to the whole class and the lists are combined into a class list. Discuss as a class the things put under “other”. If there is something that does fit into any of the five strands, then can you agree on a description of a sixth strand that it would fit in?

M: If you find what you think is a sixth strand within geometry then write up your description of it and describe why you think it does fit into the other strands. Share this with other students in other classes and share it with me. Maybe you will show me something I haven’t thought of.