



## Lesson Plan

### Title: "FLATLAND: Mathematical fiction on gender stereotypes"

**Authors:** *LeTME: Department of Early Childhood Studies, University of Thessaly.*

**Curriculum links:** Mathematics (dot, line, surface, 2D & 3D shapes, regular and irregular shapes)

**Gender Equality Charter Mark category/subcategories:** Communities

#### Learning outcomes:

- To understand the social construction of gender roles (stereotypes, social rules and norms, gender as a historical matter interwoven at the intersections with other social identities such as social class through the use of symbols based on mathematical language
- To reflect on gender adherence and think of ways of breaking gender stereotypes

**Gender equality concepts:** Discuss gender roles and stereotypes as a social construction in an interdisciplinary framework using the mathematical fiction of Flatland

**Key vocabulary:** size, grow, shrink, count, re/present, how much more, how much less, nothingness, infinity, probability, risk.

**Age group:** 9-12 years old (primary school)

#### Lesson Plan Development

Starter Activity	Time	Resources needed
Step 1: Read/Narrate to your students a short version of Flatland, a fiction by E.A. Abbott, or show them a PowerPoint either created by you or found freely available on the internet.	20min	Book 'Flatland' Internet based resources. (see links below)
Step 2: Discuss the main characters and what they look like. Note on paper the ones you will focus on and the symbols the author uses to signify them (e.g. lines, triangles, squares, polygons, circles). Ask students to draw them and discuss the use of these symbols. What are the pros and cons of these symbols? Do they agree? Would they use them? Do they feel comfortable or uncomfortable with such use?	25min	2D shape models Paper, markers

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<p>Give students models of these shapes and create five columns, one for each shape.</p> <p>Ask students to study the shapes. Can they note down each shape's characteristics (e.g. number of sides, angles, etc., variation of figures)? Can they discuss again between them why, in their opinion, particular shapes are being used to symbolize particular social roles? Can they find any rationale for this?</p> <p>At this point take a second piece of paper to talk about gender and social roles, and note down how children experience them today. Ask students to create posters or concept maps to represent their ideas, hopes and fears. Ask them also to be critical about these processes of symbolization and, if possible, to identify alternatives</p>	
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### Main activities

Activity 1: Flandlanders in our classroom	Time	Resources needed
<p>Step 1: In small groups, students draw themselves as Flatlanders, create regular shapes according to Flatland's story and use models of their shapes. Students can also use humor and comics in order to agree or disagree with the story.</p>	20min	Colours, papers, scissors, etc
<p>Step 2: Discuss their characters' role in Flatland. Invite children to discuss how they behaved in a certain way.</p> <p><i>Why do lines behave like that (you can use a specific example)?</i></p> <p><i>Where did squares learn to be bossy and smart?</i></p> <p><i>Do families of lines teach them how to...?</i></p> <p>Step 3: Read them the Quotes 1 &amp; 2 from the book and discuss the roles of lines according to the story (Part 1, Section 4).</p> <p><i>What else can the lines do? They can create new shapes (all the shapes are made by lines)?</i></p> <p><i>They can move and fit all over Flatland. Despite what Flatlanders think about the lines, what does their shape provide them with?</i></p>	25min	<p>Papers, markers, etc.</p> <p>Quotes 1 &amp; 2 (Note iii below)</p> <p>Story 'The Dot and the Line' by Norton Juster (Note iv below)</p>

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At this point read the story 'The Dot and the Line', to talk more about the lines and the freedom of creating new shapes.		
<b>Activity 2: Creating irregular and free shapes</b>	<b>Time</b>	<b>Resources needed</b>
Step 1: Invite children to create irregular and free lines shapes this time, using only their imagination with no models. Use playdough to create regular and irregular shapes. Point out again the different methods of communication between the shapes in Flatland. According to the shape each child created, she/he uses the corresponding sense (touch, hearing, sight) to understand other shapes. <i>How does this freedom to create any shape you want made you feel?</i>	30min	Colours, papers, scissors, playdough etc.
Step 2: Discuss your experience of the previous activity. <i>How did you feel?</i> <i>What is the difference in using different senses to get to know someone?</i> <i>How we get to know someone better? (By using all our senses for example.)</i> <i>What does it mean, if we say we know a girl/a boy?</i> <i>Do we really know this person? How can we get to know others' identity?</i>	20min	
<b>Activity 3: Irregular shapes in Flatland</b>	<b>Time</b>	<b>Resources needed</b>
Step 3: Read to your students Quote 3 from the book and discuss how irregular shapes live in Flatland (Part 1, Section 7). <i>How does that make them feel?</i> <i>How could being an irregular shape change, what other Flatlanders expect of them?</i>	25min	Quote 3 (Note iii below)
<b>Activity 4: Changing the rules of Flatland</b>	<b>Time</b>	<b>Resources needed</b>
What could be changed in Flatland so that no one feels oppressed by their identity? Note down children's ideas and create a big painting of New Flatland.	30min	Colours, papers, scissors, etc.

... you may repeat the activities as many times as your lesson plan necessitates

### Reflection / Evaluation

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Discuss with children what we could do in real life so that no one feels oppressed by their identity.

Create rules and symbols (using mathematical forms) that signify equality, justice and inclusion for all and counteract stereotypes and norms that tend to oppress certain groups of people.

Suggested follow-up activities	Time	Resources needed
Watch parts of the movies for Flatland's story. Ask the students to watch the movie, without listening to the story. Just watch the visual representation.  What do they observe? What do they notice in these three different representations of this land called Flatland? How could Flatlanders change their strict social roles?	30min	Find the movies in Notes Section below (Note v).
Write a story/ scenario of how it can be changed so that everyone is equal. You can use children's suggestions from Activity 4.	30min	
Create a stop motion video of your story/ scenario. You can use your final drawing of Flatland from Activity 4 as an inspiration for your video.	45min	Playdough, papers, colours, markers, scissors, etc., a camera, a computer.

## NOTES

### Note i:

Abbott, E. (1884). *Flatland: A Romance of many Dimensions*. Seeley and Co: London.  
Free online distribution by Internet Archive (2007), in EN:  
<https://archive.org/details/flatlandromance00abbouoft/page/n11/mode/2up>

**Note ii:** Abbott, E. (1884). *Flatland: A Romance of many Dimensions (Illustrated)*. Seeley and Co: London.

Free online distribution by Gutenberg.org (2008), in EN:  
<http://www.gutenberg.org/files/201/201-h/201-h.htm>

**Note iii:** *The 3 quotes from E., Abbott (1884). Flatland: A Romance of many Dimensions (Illustrated)*. Seeley and Co: London Free online distribution by Gutenberg.org (2008), in EN:

Quote 1: Part 1. This World, Section 4. Concerning the Women

*If our highly pointed Triangles of the Soldier class are formidable, it may be readily inferred that far more formidable are our Women. For if a Soldier is a wedge, a Woman is a needle; being, so to speak, ALL point, at least at the two extremities. Add to this the power of making herself practically invisible at will, and you will perceive that a Female, in Flatland, is a creature by no means to be trifled with.*

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Quote 2: Part 1. This World, Section 4. Concerning the Women

*The Laws concerning Women are naturally much more stringent. But a general view of the Code may be obtained from the following summary:*

1. *Every house shall have one entrance in the Eastern side, for the use of Females only; by which all females shall enter "in a becoming and respectful manner" and not by the Men's or Western door. [Note: When I was in Spaceland I understood that some of your Priestly circles have in the same way a separate entrance for Villagers, Farmers and Teachers of Board Schools ('Spectator', Sept. 1884, p. 1255) that they may "approach in a becoming and respectful manner."]*
2. *No Female shall walk in any public place without continually keeping up her Peace-cry, under penalty of death.*
3. *Any Female, duly certified to be suffering from St. Vitus's Dance, fits, chronic cold accompanied by violent sneezing, or any disease necessitating involuntary motions, shall be instantly destroyed.*

Quote 3: Part 1. This World, Section 7. Concerning Irregular Shapes

*The Irregular is from his birth scouted by his own parents, derided by his brothers and sisters, neglected by the domestics, scorned and suspected by society, and excluded from all posts of responsibility, trust, and useful activity. His every movement is jealously watched by the police till he comes of age and presents himself for inspection; then he is either destroyed, if he is found to exceed the fixed margin of deviation, or else immured in a Government Office as a clerk of the seventh class; prevented from marriage; forced to drudge at an uninteresting occupation for a miserable stipend; obliged to live and board at the office, and to take even his vacation under close supervision; what wonder that human nature, even in the best and purest, is embittered and perverted by such*

**Note iv:** Juster, N. (1929). *The Dot & the Line: A Romance in Lower Mathematics*. SeaStar Books: New York. Free online distribution by Internet Archive (2007), in EN: <https://archive.org/details/dotlinero00just>

**Note v:**

**Movie i:** [Flatland: The Film \(2007\)](#)

**Movie ii:** [Flatland: The Movie \(2016\)](#), trailer

**Movie iii:** [Flatlandia \(1982\)](#)

**Movie iv:** [Flatland \(1965\)](#)

**Note vi:** Find more information about 'Flatland: A romance of many dimensions' in [Wikipedia](#).

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