Part One: This World

1—Of the Nature of Flatland

- Who is the narrator of Flatland?
- Since Flatland is a plane, all shapes must appear as what?
- How many dimensions does Flatland have?
- Using shapes drawn and cut from paper, demonstrate how residents of Flatland appear to each other.

2—Of the Climate and Houses of Flatland

- The houses were what shape? Why?
- What helps Flatlanders determine direction?

3—Concerning the inhabitants of Flatland

- How long were most inhabitants?
- What was the shape and ranking of women?
- What are the various shapes and ranks of the men?
- Abbott depicts social class as visible by physical form in Lineland. In what way is social class physically visible in Spaceland (or our world)?
- How did male children differ from their fathers? What was the significance of this?

Additional Information:

Abbott's description of a circle as a polygon of so many sides that it can't be distinguished from a circle is an example of Abbott using exemplary math. A regular *n*-gon with *n* very large is approximately a circle, but the radius *r* of that circle depends on the length of side *d* of the polygon.

$$r = (d/2)\, \mathrm{cosec}(\pi/n).$$

In order to approximate a given circle by a series of regular *n*-gons, for increasing *n*, the sides must shrink as *n* increases. For a circle of radius *r*, the side of the polygon must get closer and closer to
$2\pi r/n$.

(Abbott/Stewart, p. 44)

Darwinian influence was shaking up Victorian England in the late 1800s. Many in Victorian society accepted a misreading of Darwin, allowing for the worst kind of "Social Darwinism"—it's OK to ignore the poor because it will lead to an improved human species. (However, Abbott's school, the City of London School, was actually quite progressive and egalitarian.)
(Abbott/Stewart, p.45)

4—Concerning the Women

- Why do women have a separate entrance?
- What must women do when walking in public places?
- Describe the characteristics of Flatland women. What does this satirical writing say about the Victorian view of women?

5—Of Our Method of Recognizing One Another and
6—Of Recognition by Sight

- What are the three methods Flatlanders use to recognize one another? What are the advantages and disadvantages of each?

7—Concerning Irregular Figures

This chapter makes a case for regularity or symmetry. Although stressing symmetry, Abbott is mathematically careful when he states that "If our sides were unequal our angles *might be* unequal." He is obviously aware that there are exceptions.

- Give an example of a polygon with unequal sides, but with equal angles.
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Rigid Victorian England had little tolerance for irregularity or lack of conformity. Abbott's satire is particularly biting here, as he explains that Flatlanders propose "painlessly and mercifully" consuming irregular offspring. This is very much like Swift's *A Modest Proposal for Preventing the Children of the Poor People in Ireland from being a Burden to their Parents or Country and for Making Them Beneficial to the Public* (1729):

> I have been assured by a very knowing American of my acquaintance in London, that a young, healthy
> child, well-nursed, is at a year old a most delicious, nourishing and wholesome food, whether stewed,
> roasted, baked, or boiled, and I make no doubt that it will equally serve in a fricassee, or a ragout.
> (Swift as quoted by Abbott/Stewart, p. 78)

- Discuss possible effects of statements such as Abbott's or Swift's. What are the pros and cons of using irony or satire to make a point? Is this approach likely to be effective in changing attitudes? Will members of Victorian society "get it" and reconsider their own behaviors and attitudes? Or will the extremeness of the satire cause them to be outraged and feel morally superior? Give your opinion and explain why you have that opinion.
- How do you think Victorians would deal with people with special needs such as physical or mental challenges? What would their view be of special education? What might Victorians have done with Einstein (who was a very poor student in school)?

8—Of the Ancient Practice of Painting and
9—Of the Universal Colour Bill

- The Victorians worried about the destructive influence of popular culture on the classics—"dumbing down" the culture. In Abbott's story, they worried about the

reduction of the Art of Sight Recognition because it was less needed with the addition of color. Give an example of this worry about "dumbing down" the culture today.
- Explain how the coloring of women and priests could cause women to be mistaken for priests? Demonstrate this with paper circles and lines.
- In the passage on mistaking women for priests on pages 28-30 in *Flatland*, how does this discussion imply more intelligence in women than earlier passages in *Flatland*?

10—Of the Suppression of the Chromatic Sedition

During the Victorian era, the English social system was struggling toward greater equality—first for the common man and then for women, noble or common. (Oddly enough, it was the conservative views of Queen Victoria—a woman, obviously—who discouraged universal rights.)

- Discuss how the Color Sedition demoralized the Circles and brought about the suppression of color.
- Color came to be allowed only for illustrating some mathematical properties. How is color used today to illustrate math?

11—Concerning our Priests and
12—Of the Doctrine of Our Priests

- Explain the Flatland version of "gene therapy"?
- In Flatland and in Victorian England, social pedigree outweighs everything else. What is the discussion about "invisible" irregularities in women saying about Victorian society?
- Although A. Square makes an appeal for educating women, what reason does he give? Why do you think Abbott uses this kind of reasoning?

Part II: Other Worlds

A tour of alternative dimensions begins in Part Two.

13—How I had a Vision of Lineland

- In Lineland, what shape are the King and Men? What shape are the women?
- Why do you think Abbott takes A. Square to Lineland, a simpler world of only one dimension?
- What is he preparing the Victorian reader to consider?

14—How I vainly tried to explain the nature of Flatland

- How does the King of Lineland determine length (what Lineland calls Space)?
- A. Square tries to explain Flatland by Cartesian coordinates. What does this mean and how does Square do this? What is the result—how does the King react?

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15—Concerning a Stranger from Spaceland and
16—How the Stranger Vainly Endeavored to Reveal to Me in Words the Mysteries of Spaceland

- When A. Square shows his grandson (the bright little Hexagon) how to determine the area of a square by squaring a side (a square with three inch sides, for instance, has an algebraic meaning—3 squared, and also has a geometric meaning—the area of a square), what analogy does the bright little Hexagon suggest? What is A. Square's reaction?
- What is the only way the visiting Sphere can exhibit his shape to A. Square?
- Demonstrate how Sphere exhibits his shape in Flatland, using a sphere (such as a ball) and a flat surface.
- A being from Spaceland can view the "insides" of a being from Flatland. (The interior of a polygon is not visible to a Flatlander because the edges get in the way, but to a Spacelander, the "insides" are visible.) By analogy, it follows that a creature from the fourth dimension could do what?
- Just as A. Square turns on Lord Sphere because he doesn't understand and is afraid, give one or more examples of how people in our world tend to do this with anything they don't understand or that seems too unusual.

17—How the Sphere, Having in Vain Tried Words, Resorted to Deeds and
18—How I came to Spaceland, and What I Saw There

- Although Abbott is a clergyman and is serious about his profession, he doesn't mind poking fun at it as well. What does he call the message he has come to proclaim to A. Square?
- After A. Square is pushed out of Flatland into Spaceland, the Sphere attempts to visit Flatland's High Council and explain the third dimension. Why do you think the High Council silenced the Sphere? Do you think governing bodies ever do this today (silence what they don't agree with or understand)? Give a possible example of this happening.
- What happened to A. Square's brother, the Chief Clerk? Why did it happen?

19—How, Though the Sphere Showed Me other Mysteries of Spaceland, I Still Desired More; and What Came of It

- At first, A. Square has trouble perceiving a solid as it looks irregular to him. This is due to being unaccustomed to what three elements that allow two-dimensions to perceive three (as our eyes must do)?
- Accepting the three-dimensional world, A. Square now wants Sphere to show him the next world of further dimensions in which one may peer into the insides of the Sphere. Explain how A. Square continues the analogy as proof of a fourth dimension, using terminal points. And, how does he do this, using bounding points?

20—How the Sphere encouraged me in a vision

- A. Square dreams of Pointland with no dimensions where a single, lone point is, yet he is self-content. He states, "To be self-contented is to be vile and ignorant, to aspire is better than to be blindly and impotently happy." What do you think this statement means? In what ways do you agree or disagree with this statement?

21—How I Tried to Teach the Theory of Three Dimensions to my Grandson, and With What Success and
22—How I then Tried to Diffuse the Theory of Three Dimensions by Other Means, and of the Result

- A Square discovers he cannot demonstrate the third dimension to his grandson because an initial state that lies entirely within the Flatland plane can never leave that plane. As stated by Stewart, "A. Square can no more move things "Upward, not Northward" than we can make a rabbit disappear from our universe by giving it the right push." (Abbott/Stewart, p.190) What is the grandson's reaction to Square's explanations?
- What happens after A. Square forgets himself at the Local Speculative Society meeting and tells about his experiences with the third dimension?