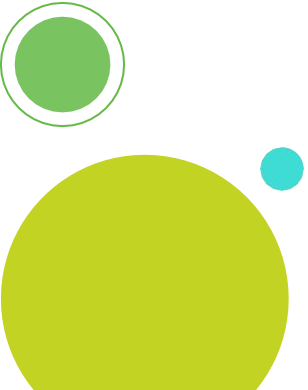
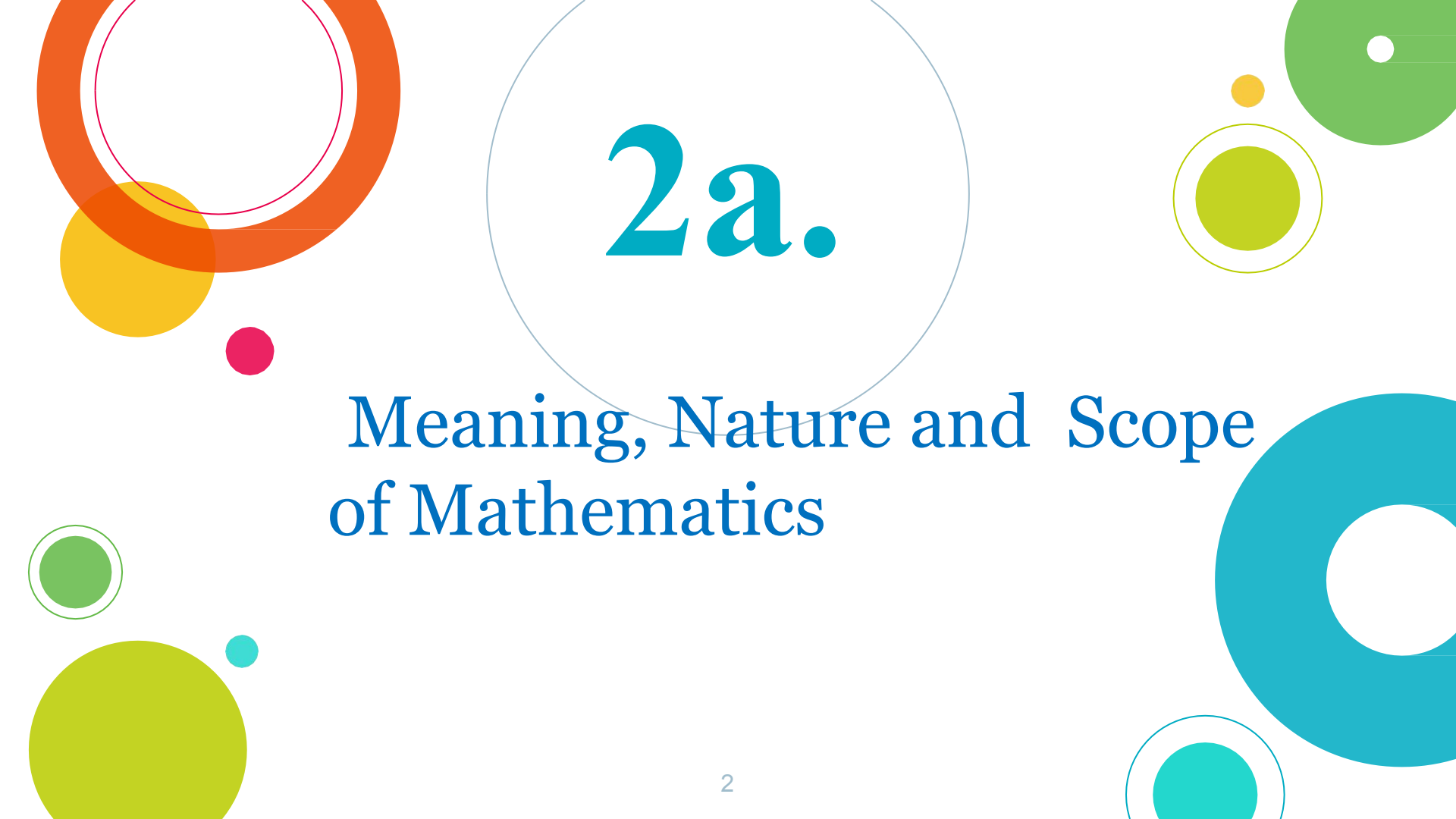




Unit 2: Introduction to the Teaching of Mathematics





2a.

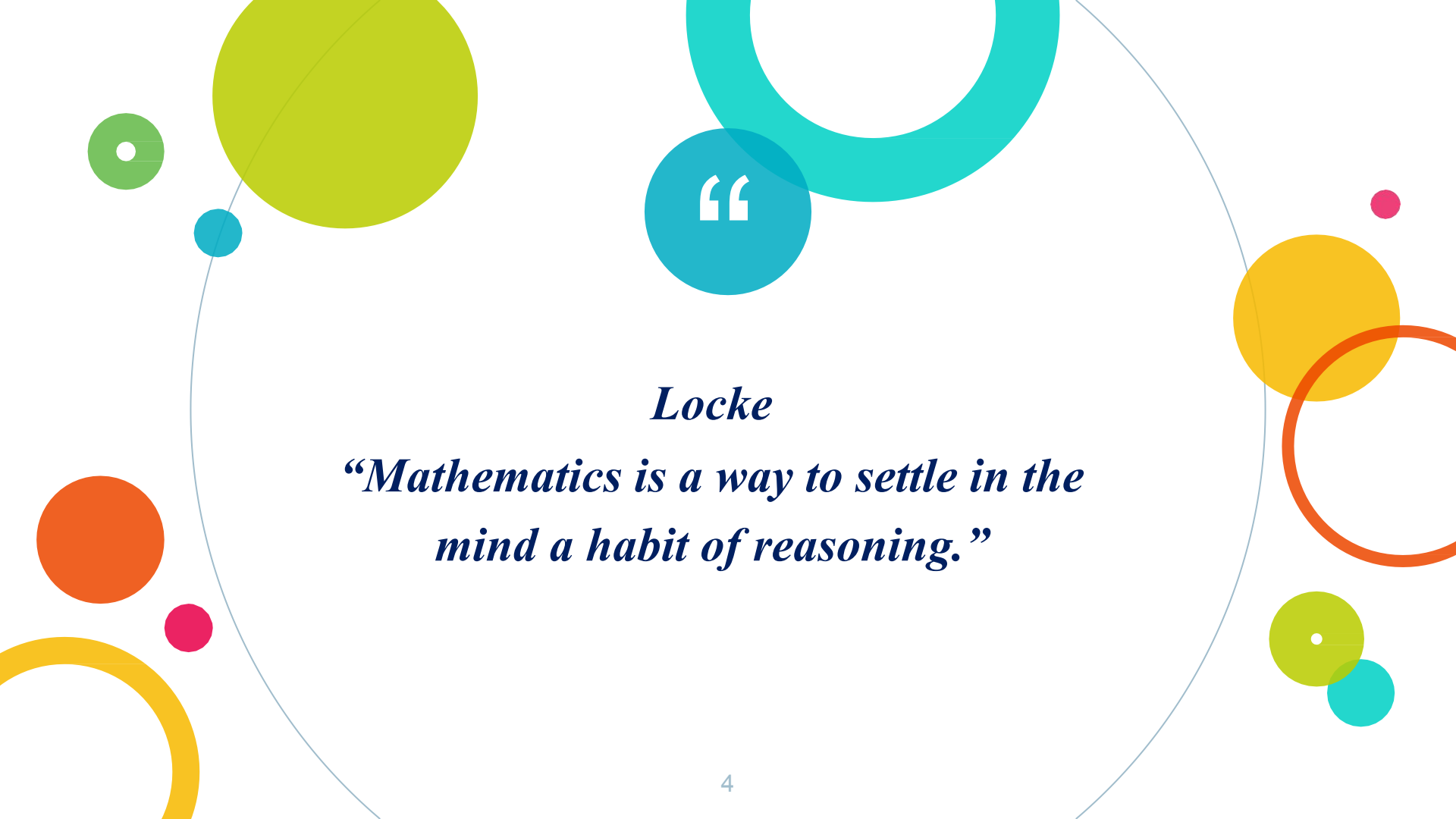
Meaning, Nature and Scope
of Mathematics



Learning Outcomes

This unit will focus on:

- ◎ Meaning of Mathematics
- ◎ Nature of Mathematics
- ◎ Scope of Mathematics

The background features a large, thin, light blue circle. Scattered around it are various colored circles and rings: a large lime green circle at the top left, a large teal ring at the top center, a large yellow circle at the top right, a large orange circle at the bottom left, and a large orange ring at the bottom right. Smaller circles in green, blue, pink, and teal are also scattered throughout.

“

Locke

*“Mathematics is a way to settle in the
mind a habit of reasoning.”*



Meaning of Mathematics

- ◎ Etymology:- The term “Mathematics” is derived from two Greek words:
- ◎ ‘Manthanein’ means ‘learning’
‘Techne’ means ‘an art (or) technique’ Mathematics means the art of learning related to disciplines (or) facilities.



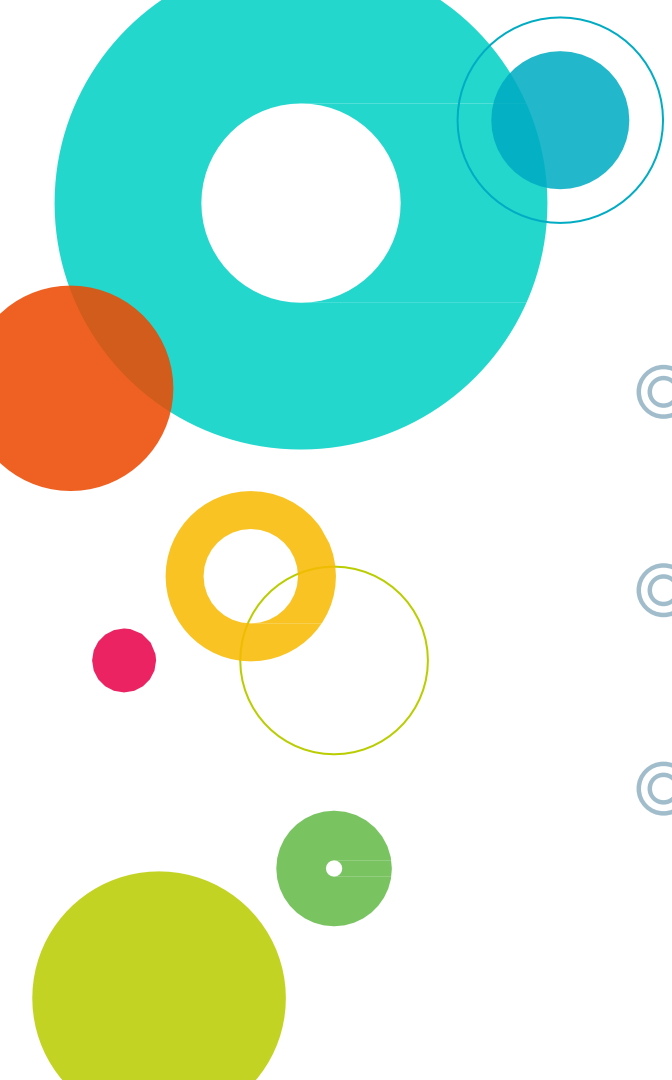
Meaning of Mathematics

- ◎ It is a science of number and space
- ◎ Has its own language in terms of signs, symbols, terms, operations etc.
- ◎ Uses/ requires intuition, logic, reasoning, analysis, construction, generality and individuality.



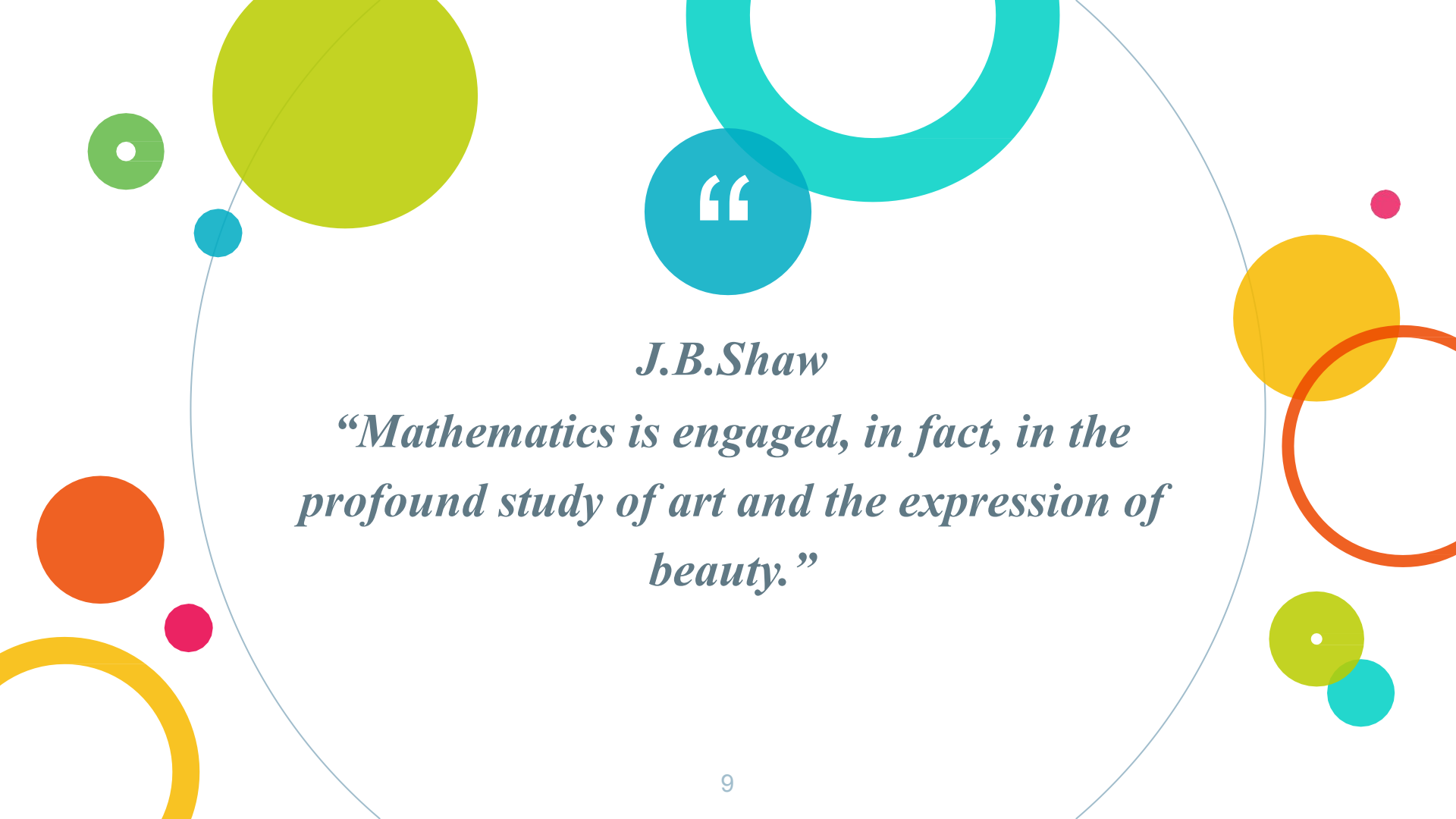
Meaning of Mathematics

- ◎ Helps in drawing conclusions and interpreting various ideas and themes.
- ◎ It is suited for dealing with abstract concept of any kind.
- ◎ Helps to solve problems of daily life.
- ◎ Has an aesthetic value and helps to admire the beauty of nature.



Meaning of Mathematics

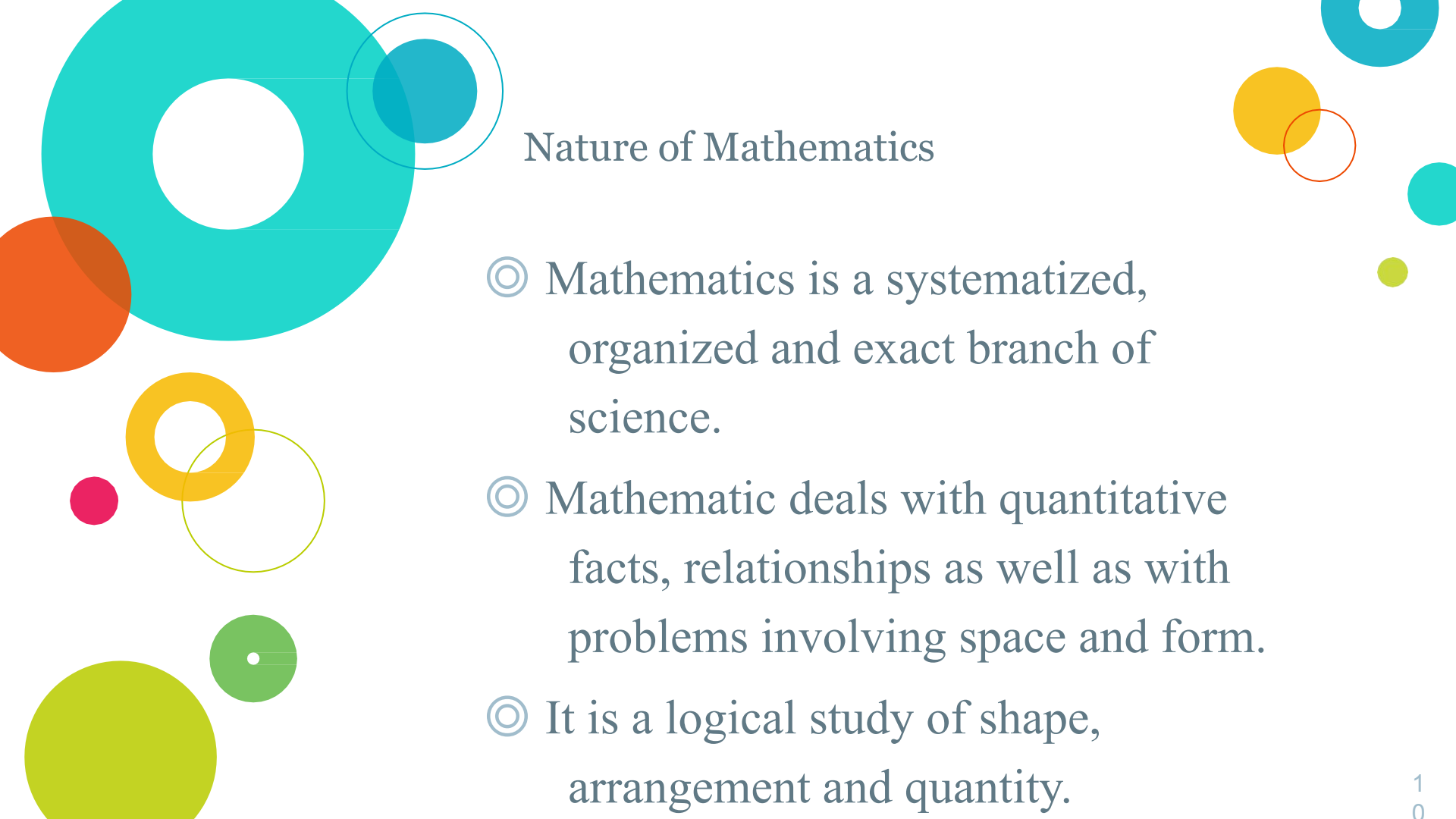
- ◎ Mathematics relies both on logic and creativity
- ◎ Practical Purposes i.e. how mathematics applies to their work?
- ◎ Intrinsic Interests i.e. Essence of mathematics lies in its beauty and intellectual challenge.

A decorative background featuring a large, thin, light blue circle. Scattered around it are various colored circles and rings: a large yellow-green circle at the top left, a large teal ring at the top center, a large orange circle at the bottom left, a large yellow circle at the bottom right, and several smaller circles in green, blue, orange, and pink. A blue circle containing white quotation marks is positioned above the text.

“

J.B.Shaw

*“Mathematics is engaged, in fact, in the
profound study of art and the expression of
beauty.”*



Nature of Mathematics

- ◎ Mathematics is a systematized, organized and exact branch of science.
- ◎ Mathematic deals with quantitative facts, relationships as well as with problems involving space and form.
- ◎ It is a logical study of shape, arrangement and quantity.



Nature of Mathematics

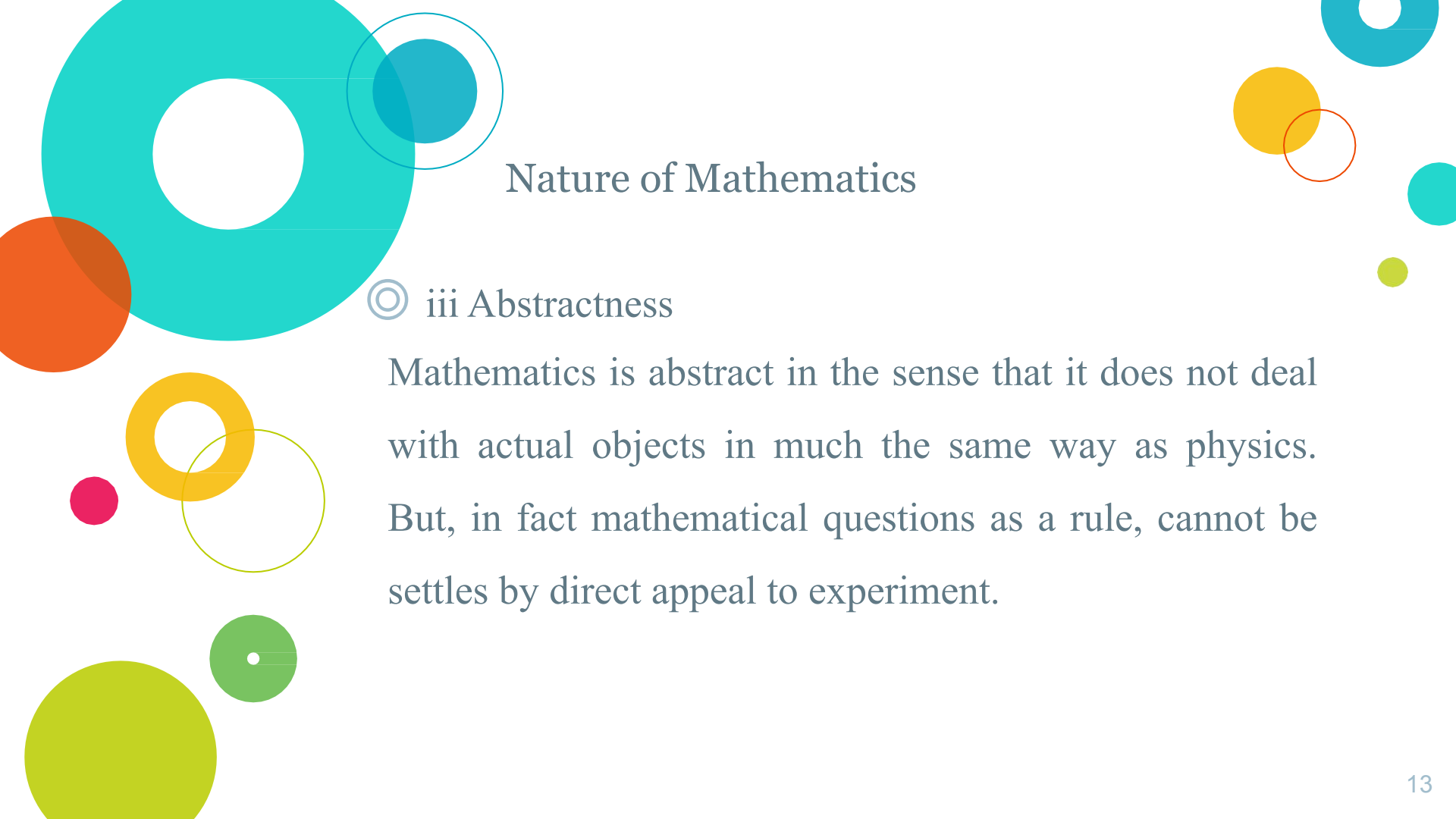
i. *Science of logical reasoning*: In mathematics the results are developed through a process of reasoning. Reasoning in mathematics possesses a number of characteristics such as,

- ◎ Simplicity
- ◎ Accuracy
- ◎ Certainty of Results
- ◎ Originality
- ◎ Verification / Conclusions follow naturally from the facts when logical reasoning is applied to the facts.



Nature of Mathematics

- ⊙ ii. Mathematical Language and Symbolism: It has its own unique language and symbols.
- ⊙ Mathematical language and symbols cut down on lengthy statements. Helps in the expression of ideas and concepts in exact form.
- ⊙ It is free from verbosity, helps to point out clear and exact expression of facts. E.g — Writing $(a-b)^2 = a^2 - 2ab + b^2$ in words. || Symbols which are peculiar and unique to mathematics.



Nature of Mathematics

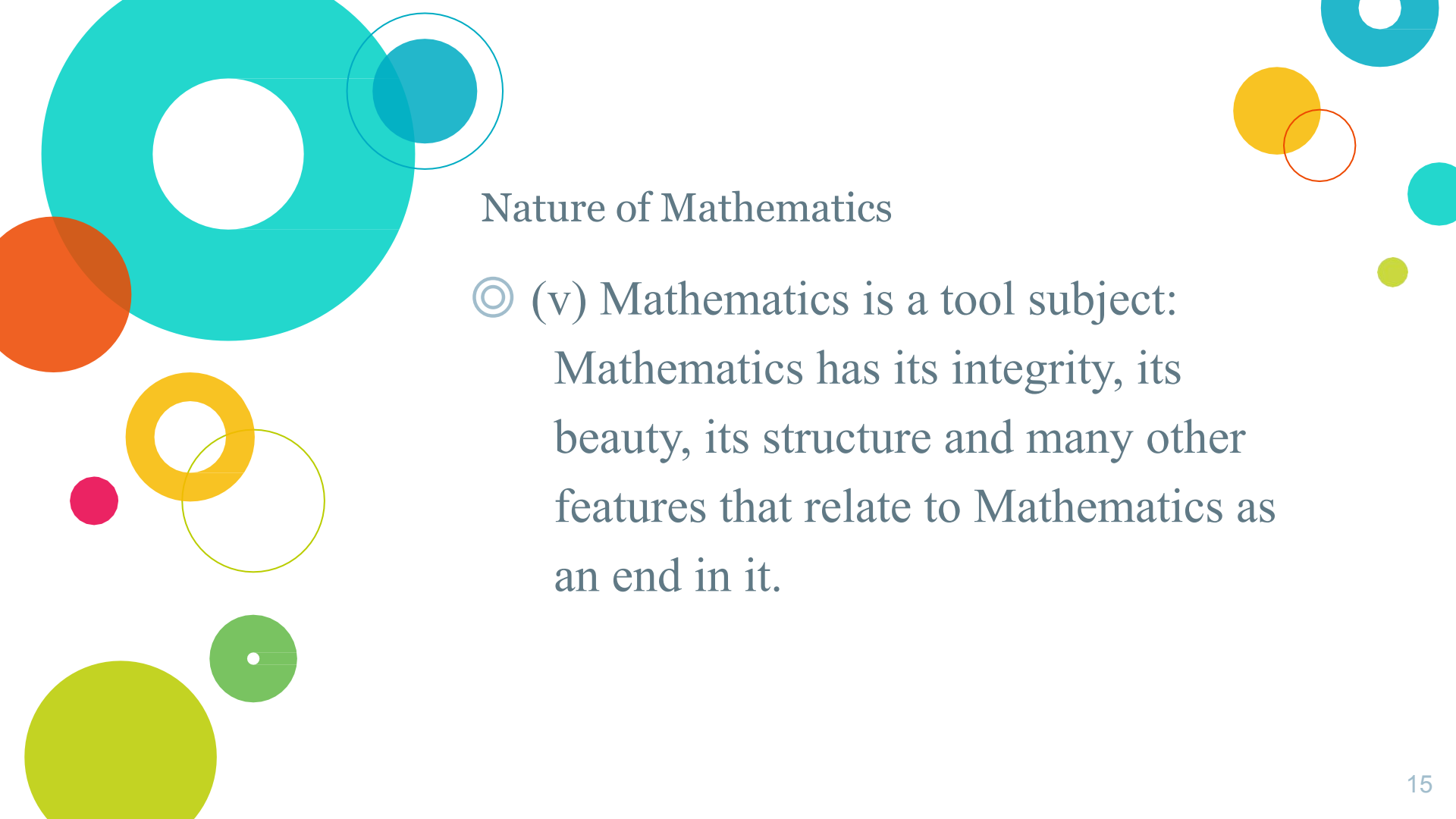
⊙ iii Abstractness

Mathematics is abstract in the sense that it does not deal with actual objects in much the same way as physics. But, in fact mathematical questions as a rule, cannot be settled by direct appeal to experiment.



Nature of Mathematics

- © (iv) Mathematics deals with the art of drawing conclusions: To familiarise children with a mode of thought which helps them in drawing right conclusions and inferences. Hence, the learner can check whether (or) not he has drawn the correct conclusions, permit the learner to begin with simple and very easy conclusions, gradually move over to more difficult and complex ones.

The slide is decorated with various geometric shapes. On the left, there is a large cyan ring, an orange circle, a yellow ring, a pink circle, a green circle, and a large green circle. On the right, there is a yellow circle, a cyan circle, a green circle, and a small cyan circle. The shapes are scattered across the slide, some overlapping each other.

Nature of Mathematics

- © (v) Mathematics is a tool subject:
Mathematics has its integrity, its
beauty, its structure and many other
features that relate to Mathematics as
an end in it.



Nature of Mathematics

- © (vi) Mathematics is an intellectual game:
Mathematics can be treated as an intellectual game with its own rules and abstract concepts, it is mainly a matter of Puzzles, paradoxes and problem solving
– a sort of healthy mental exercise.



Nature of Mathematics

- © (vii) Mathematics involves an intuitive method: Intuition when applied to Mathematics involves the concretization of an idea not get stated in the form of some sort of operations (or) examples. Intuition is to anticipate what will happen next and what to do about it. It implies the act of grasping the meaning (or) significance (or) structure of a problem without explicit reliance on the analytic mode of thought.



Nature of Mathematics

- © (viii) Mathematics is the science of precision & accuracy: It is perhaps the only subject which can claim certainty of results. In Mathematics, the results are either right (or) wrong, accepted (or) rejected. There is no midway possible between rights and wrong. Mathematic can decide whether (or) not its conclusions are right.



Nature of Mathematics

- ◎ (ix) Mathematics requires the application of rules and concept to new situations: The students can always verify the validity of mathematical rules and relationships by applying them to novel situations.



Nature of Mathematics

- © (x) Mathematics deals with generalization and classification: Mathematics provides ample exercise in combining various results under one head, in making schematic arrangements and classifications. When the pupil evolves his own definitions, concept and theorems,



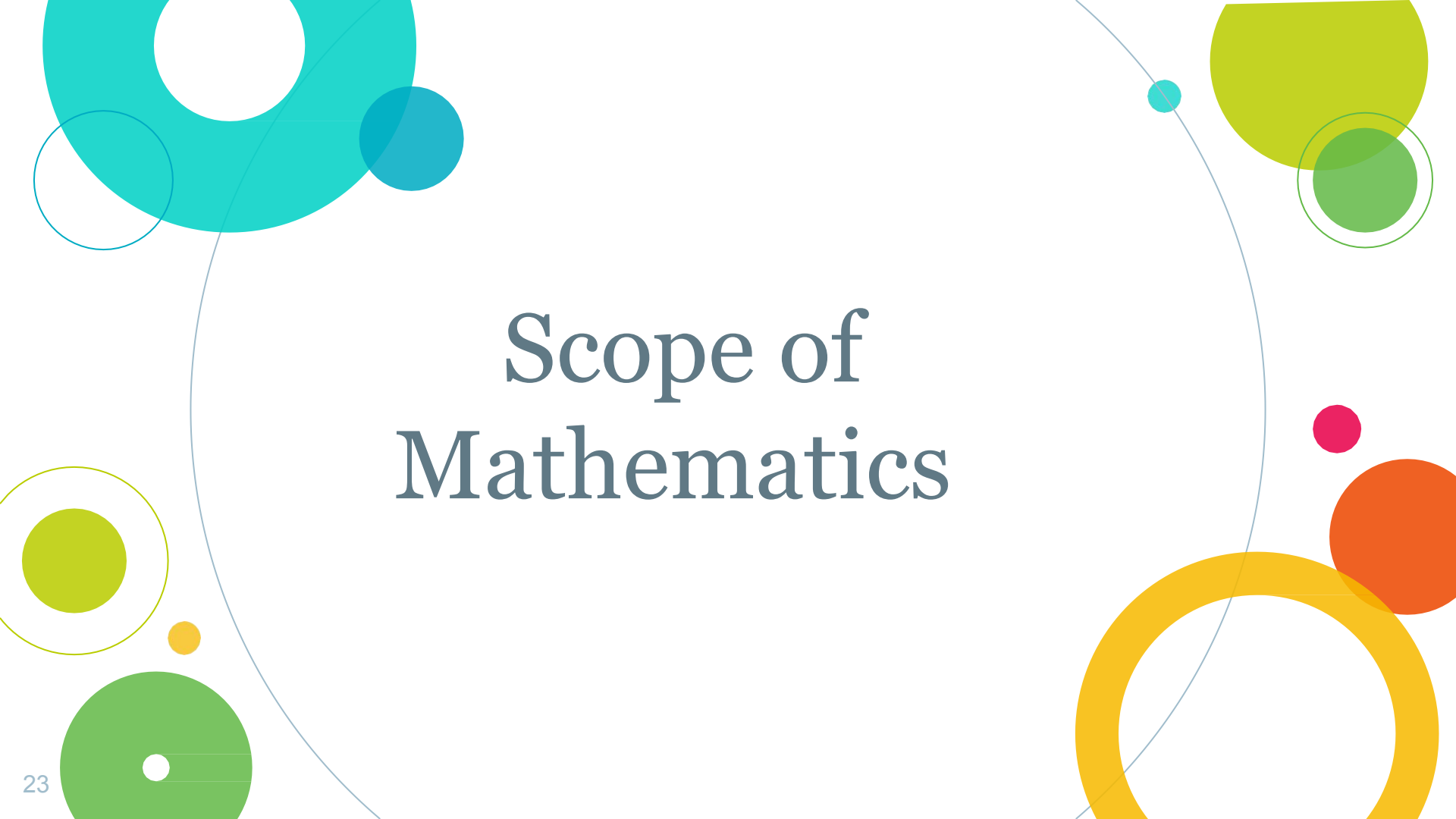
Nature of Mathematics

- © (xi) Mathematics is study of structures:
A mathematical structure should be
some sort of arrangement, formation
(or) result of putting together of parts.



Nature of Mathematics

- © (xii) Mathematics is an abstract
Science: Mathematical concepts are
abstract in the sense that they cannot
be seen (or) felt in the physical world.

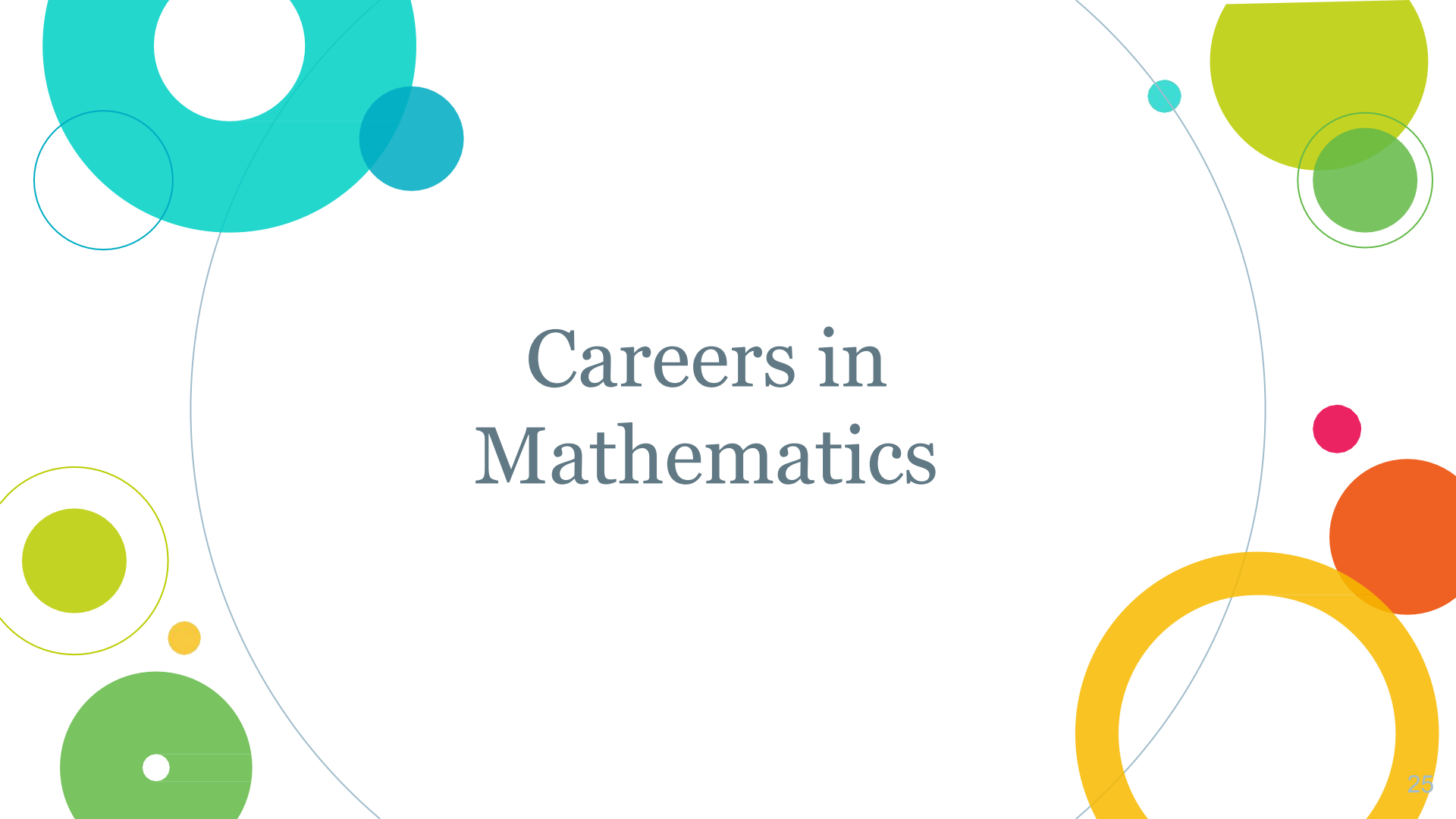
The slide features a central title surrounded by various geometric shapes. In the top-left, there is a large teal ring and a smaller teal circle. In the top-right, there is a large lime green circle and a smaller green circle with a white outline. In the bottom-left, there is a large green circle with a white center, a smaller yellow circle, and a small orange circle. In the bottom-right, there is a large yellow ring, a small pink circle, and a large orange circle. A thin, light blue arc curves around the central text area.

Scope of Mathematics



Scope of Mathematics: Skills developed through Mathematics

- ◎ Critical Thinking
- ◎ Problem Solving
- ◎ Analytical Thinking
- ◎ Quantitative Reasoning
- ◎ Time management
- ◎ Logical Argument and Illogical Argument

The slide features a central title surrounded by various geometric shapes. In the top-left, there is a large teal ring, a smaller teal circle, and a thin blue circle. The bottom-left contains a green circle with a white center, a small orange circle, and a thin yellow circle. The top-right has a large yellow-green circle, a smaller green circle with a thin green outline, and a small teal circle. The bottom-right includes a large orange circle, a small pink circle, and a large yellow ring. A thin, light blue arc curves around the central text area.

Careers in Mathematics



The background features a large, thin, light blue circle that spans most of the width of the slide. Various colorful geometric shapes are scattered around it: a large teal ring in the top left, a small teal circle next to it, a lime green circle in the top right, a green circle with a white outline next to it, a pink circle in the middle right, an orange circle in the bottom right, a yellow ring in the bottom right, a green circle with a white dot in the bottom left, a lime green circle with a white outline next to it, and a small orange circle between them.

Thank you