

# 06\_Discrete Math

Content Area: **Math**  
Course(s):  
Time Period: **Full Year**  
Length: **3 Weeks**  
Status: **Published**

## **General Overview, Course Description or Course Philosophy**

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The middle school Guided Study Program is a two-pronged program. It parallels the grade-level math curriculum to reinforce and/or preview concepts taught in the grade-level math class and prepares students for success on state-mandated assessments by targeting individual student mathematical deficiencies. Guided Study marking period grades are based upon participation/preparation, classwork, and summative assessments and are reported as: O (Outstanding), S (Satisfactory), or U (Unsatisfactory).

## **OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS**

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### **Objectives:**

- Introduce fundamental concepts of discrete mathematics and their applications.
- Develop problem-solving and logical reasoning skills through discrete mathematical problems.
- Explore topics such as logic, set theory, combinatorics, and graph theory.
- Apply discrete mathematics principles to real-world scenarios and puzzles.
- Foster an appreciation for the role of discrete mathematics in computer science and other fields.

### **Essential Questions:**

- What is discrete mathematics, and how does it differ from continuous mathematics?
- How can logical reasoning and critical thinking be applied to solve problems in set theory and combinatorics?
- In what ways can graph theory be used to model and solve real-world problems, such as network connections and routes?
- What is the role of discrete mathematics in fields like computer science, cryptography, and decision-making?
- How can we analyze and make predictions based on patterns and relationships in discrete data?

### **Enduring Understandings:**

- Discrete mathematics deals with countable, distinct elements and provides tools for analyzing and solving problems in various contexts.
- Logical reasoning and problem-solving skills are essential in tackling challenges in real life.
- Graphs can model relationships and connections between objects, helping us solve problems involving networks and paths.
- Discrete mathematics has practical applications in fields like computer science.
- Identifying and analyzing patterns in discrete data can lead to insights and predictions in real-world scenarios.

## CONTENT AREA STANDARDS

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MA.7.NS.A.1	Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.
MA.7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
MA.7.SP.C.7a	Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events.

## RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

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LA.K-12.NJSLSA.R7	Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
CS.K-12.2.d	Evaluate and select technological tools that can be used to collaborate on a project.
TECH.K-12.P.4	Demonstrate creativity and innovation.
TECH.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
TECH.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.

## STUDENT LEARNING TARGETS

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Refer to the 'Declarative Knowledge' and 'Procedural Knowledge' sections.

### Declarative Knowledge

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Students will understand that:

- Discrete math provides student insight into how mathematics is by decision- makers.
- Discrete math is an important tool for modeling a variety of real-world situations.

### Procedural Knowledge

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Students will be able to:

- Explain the Fundamental Counting Principle.
- Apply the multiplication principle of counting (permutations and combinations).
- Use vertex-edge graphs to find the shortest route.

## **EVIDENCE OF LEARNING**

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Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

### **Formative Assessments**

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- Do Now before each lesson
- Exit tickets at the end of each lesson and/or series of chunks of learning

### **Summative Assessments**

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This course allows students flexibility in the demonstration of their understanding at the conclusion of the unit:

- traditional/standardized assessment
- performance task
- project

## **RESOURCES (Instructional, Supplemental, Intervention Materials)**

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- [IXL](#)
- CMP3: Samples and Populations, What Do You Expect?

## **INTERDISCIPLINARY CONNECTIONS**

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- Computer Science / Design Thinking

## **ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS**

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See link to Accommodations & Modifications document in course folder.