

## Mini-Map for M.EE.HS.S.CP.1-5

Subject: Mathematics

Statistics and Probability—Conditional Probability and the Rules of Probability (S.CP)

Grade: 10

### Learning Outcome

| DLM Essential Element   | Grade-Level Standard   |
|---|--|
| <p><b>M.EE.HS.S.CP.1-5</b> Identify when events are independent or dependent.</p> | <p><b>M.S.CP.1</b> Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events (“or,” “and,” “not”).</p> <p><b>M.S.CP.2</b> Understand that two events <math>A</math> and <math>B</math> are independent if the probability of <math>A</math> and <math>B</math> occurring together is the product of their probabilities, and use this characterization to determine if they are independent.</p> <p><b>M.S.CP.3</b> Understand the conditional probability of <math>A</math> given <math>B</math> as <math>P(A \text{ and } B)/P(B)</math>, and interpret independence of <math>A</math> and <math>B</math> as saying that the conditional probability of <math>A</math> given <math>B</math> is the same as the probability of <math>A</math>, and the conditional probability of <math>B</math> given <math>A</math> is the same as the probability of <math>B</math>.</p> <p><b>M.S.CP.4</b> Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities.</p> <p><b>M.S.CP.5</b> Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations.</p> |

## Linkage Level Descriptions

| Initial Precursor   | Distal Precursor  | Proximal Precursor  | Target  | Successor   |
|---|---|---|---|---|
| Form pairs of objects by matching two objects sharing a specified attribute. Contrast or distinguish objects based on attributes such as shape, size, texture, and numerical pattern. Compare items by attributes such as size, shape, and texture. | Group together objects by attribute values such as shape or size (e.g., group together a square, a rectangle, and a rhombus as they all have four sides). | Recognize possible or impossible outcomes of a simple event. Communicate understanding that a simple event results in a single outcome (e.g., picking a penny from a jar of coins). | Determine if two events are independent or dependent. Communicate understanding that two events are independent if the product of probabilities of two independent events equals the probability of both events occurring together. | Communicate understanding that compound events are comprised of two or more simple events (e.g., getting a heads and an even number when you toss a coin and roll a die). |

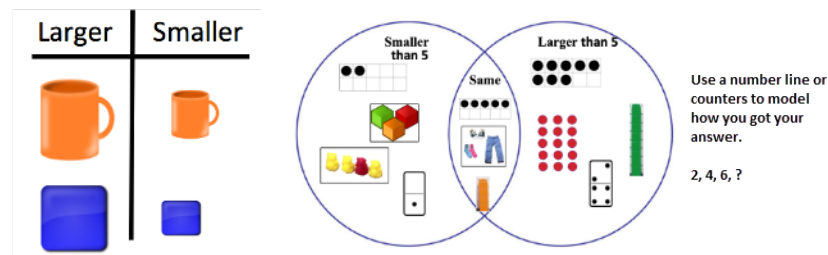
## Initial Precursor and Distal Precursor Linkage Level Relationships to the Target

### *How is the Initial Precursor related to the Target?*

In order to identify events as independent or dependent (i.e., probability), students begin by learning about attributes, numbers, and measurement. Educators draw student attention to new objects or stimuli, label and describe them (e.g., “this is a circle, so it won't have any sides”, “this egg carton has 12 spaces, so it is likely that 12 eggs will fit into those spaces”, “this book is a small book, so it's impossible for it to get bigger”) and students observe, feel, or otherwise interact with the items.

### *How is the Distal Precursor related to the Target?*

Proportional understanding is key when working toward describing events as independent or dependent (i.e., probability). Educators provide many opportunities for students to classify (i.e., group) items based on their size (e.g., compare two or more items and determine which is larger or smaller), amount (e.g., numbers larger or smaller than a given number), and distance between numbers (e.g., skip counting by 2, 5, or 10). Educators should also take care to use words like will, won't, might, likely, unlikely (e.g., “these will go in the same group”, “these won't go in the same group”) when working with sets. While students do not need to say these words, they do need to learn the meanings.

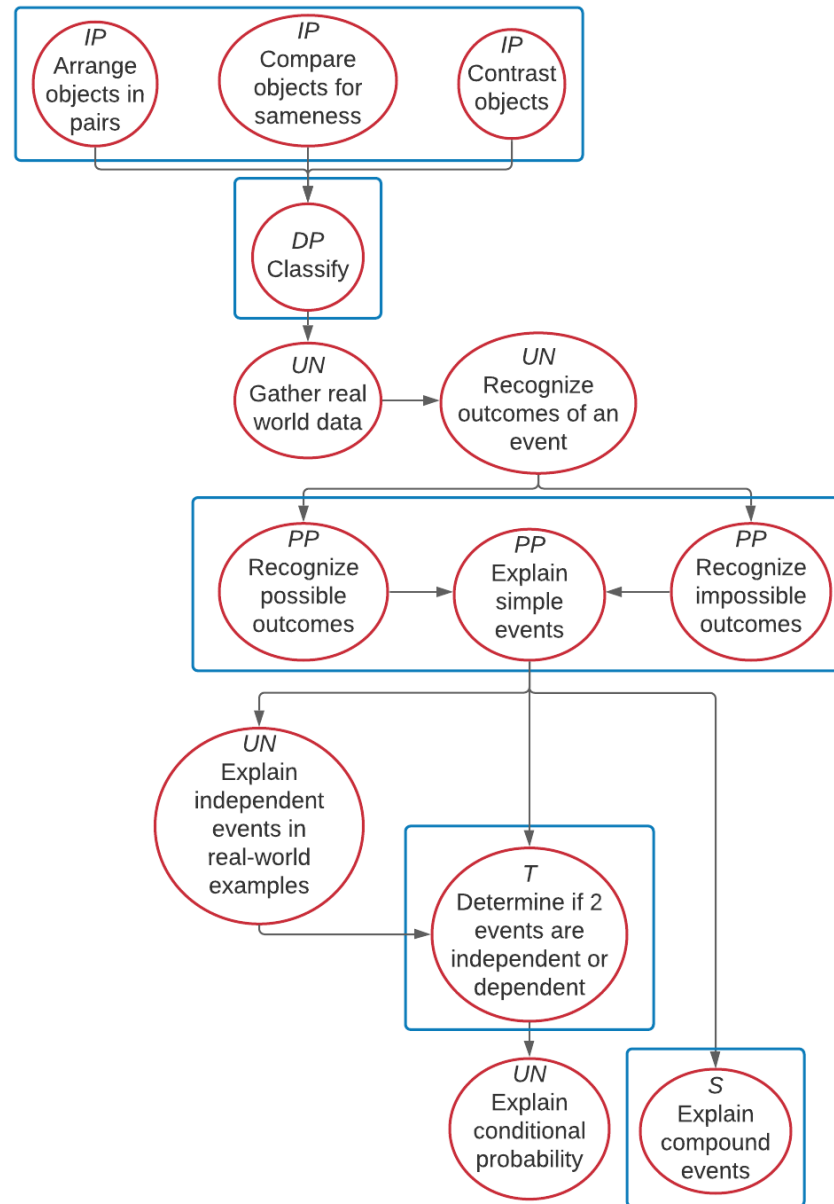


## Instructional Resources

| Released Testlets  |
|--|
| See the <a href="#">Guide to Practice Activities and Released Testlets</a> . |
| Using Untested (UN) Nodes  |
| See the document <a href="#">Using Mini-Maps to Plan Instruction</a> .       |

[Link to Text-Only Map](#)

**M.EE.HS.S.CP.1-5** Identify when events are independent or dependent.



| Map Key                     |                    |
|-----------------------------|--------------------|
| IP                          | Initial Precursor  |
| DP                          | Distal Precursor   |
| PP                          | Proximal Precursor |
| T                           | Target             |
| S                           | Successor          |
| UN                          | Untested           |
| Boxes indicate tested nodes |                    |