

# PLEASE HELP I DON'T UNDERSTAND!!!! ASAPPPPPPPPTYYYYYYYYYYYYYYYYYYY B) A BAG CONTAINS SIX YELLOW JERSEYS

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YELLOW JERSEYS

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## INTRODUCTION

IN THE WORLD OF MATHEMATICS AND PROBLEM-SOLVING, WORD PROBLEMS OFTEN LEAVE STUDENTS AND ENTHUSIASTS SCRATCHING THEIR HEADS. THEY SEEM STRAIGHTFORWARD AT FIRST GLANCE BUT CAN QUICKLY BECOME CONFUSING WHEN TRYING TO DECIPHER THE DETAILS AND UNDERLYING CONCEPTS. ONE SUCH PROBLEM THAT HAS GAINED ATTENTION IS TITLED: "A BAG CONTAINS SIX YELLOW JERSEYS." DESPITE ITS SIMPLE WORDING, MANY FIND IT CHALLENGING TO APPROACH AND SOLVE EFFECTIVELY.

THIS ARTICLE AIMS TO BREAK DOWN THIS PROBLEM STEP-BY-STEP, PROVIDING CLARITY AND GUIDANCE. WHETHER YOU'RE A STUDENT STRUGGLING WITH PROBABILITY, COMBINATORICS, OR SIMPLY TRYING TO UNDERSTAND HOW TO INTERPRET WORD PROBLEMS, THIS COMPREHENSIVE GUIDE WILL HELP YOU NAVIGATE THROUGH THE COMPLEXITIES. WE'LL EXPLORE RELATED CONCEPTS, PROVIDE EXAMPLES, AND OFFER STRATEGIES TO SOLVE SIMILAR PROBLEMS CONFIDENTLY.

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## UNDERSTANDING THE PROBLEM CONTEXT

WHAT DOES "A BAG CONTAINS SIX YELLOW JERSEYS" MEAN?

AT ITS CORE, THIS PHRASE SUGGESTS A SCENARIO INVOLVING A COLLECTION OR SET OF ITEMS—SPECIFICALLY JERSEYS—AND THEIR ATTRIBUTES, SUCH AS COLOR. THE KEY POINTS TO CONSIDER INCLUDE:

- THE TOTAL NUMBER OF JERSEYS IN THE BAG.
- THE COLORS OF JERSEYS PRESENT.
- ANY ADDITIONAL DETAILS SUCH AS THE NUMBER OF JERSEYS OF EACH COLOR, THEIR ARRANGEMENTS, OR CONDITIONS UNDER WHICH THEY ARE SELECTED.

HOWEVER, THE PHRASE AS IT STANDS MAY SEEM INCOMPLETE WITHOUT ADDITIONAL INFORMATION. PROBLEMS INVOLVING BAGS AND JERSEYS OFTEN INCLUDE QUESTIONS ABOUT:

- HOW MANY JERSEYS OF A CERTAIN COLOR ARE IN THE BAG?
- WHAT IS THE PROBABILITY OF DRAWING A JERSEY OF A PARTICULAR COLOR?
- HOW MANY WAYS CAN JERSEYS BE ARRANGED OR SELECTED?
- IF JERSEYS ARE REPLACED AFTER SELECTION, WHAT ARE THE IMPLICATIONS?

THE PHRASE "SIX YELLOW JERSEYS" INDICATES THAT AMONG THE JERSEYS IN THE BAG, THERE ARE SIX THAT ARE YELLOW. BUT IT DOESN'T SPECIFY WHETHER THESE ARE THE ONLY JERSEYS OR IF THERE ARE OTHER COLORS OR TYPES OF JERSEYS PRESENT.

## TYPICAL TYPES OF QUESTIONS RELATED TO JERSEYS IN A BAG

TO BETTER UNDERSTAND HOW TO APPROACH SUCH PROBLEMS, LET'S REVIEW COMMON QUESTIONS THAT MIGHT FOLLOW THIS SCENARIO:

1. COUNTING JERSEYS OF SPECIFIC COLORS
  - HOW MANY JERSEYS OF EACH COLOR ARE IN THE BAG?
2. PROBABILITY QUESTIONS

- WHAT IS THE PROBABILITY OF DRAWING A YELLOW JERSEY?
- WHAT IS THE PROBABILITY OF DRAWING A NON-YELLOW JERSEY?

### 3. COMBINATORIAL ARRANGEMENTS

- IN HOW MANY WAYS CAN JERSEYS BE ARRANGED?
- HOW MANY WAYS CAN A CERTAIN NUMBER OF JERSEYS BE SELECTED?

### 4. REPLACEMENT AND NON-REPLACEMENT SCENARIOS

- IF A JERSEY IS DRAWN AND REPLACED, HOW DOES THAT AFFECT PROBABILITIES?
- IF JERSEYS ARE DRAWN WITHOUT REPLACEMENT, WHAT ARE THE CHANCES OF CERTAIN OUTCOMES?

UNDERSTANDING THE SPECIFIC QUESTION AT HAND IS CRUCIAL TO DEVISING AN EFFECTIVE STRATEGY FOR SOLVING IT.

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## BREAKING DOWN THE COMPONENTS OF THE PROBLEM

### 1. CLARIFYING THE TOTAL NUMBER OF JERSEYS

THE FIRST STEP IN SOLVING ANY JERSEY OR BAG PROBLEM IS TO ESTABLISH THE TOTAL COUNT OF JERSEYS. FOR EXAMPLE:

- IF THE PROBLEM STATES: "A BAG CONTAINS 10 JERSEYS, 6 OF WHICH ARE YELLOW," THEN THE REMAINING 4 JERSEYS COULD BE OF OTHER COLORS.
- IF THE PROBLEM STATES: "A BAG CONTAINS ONLY 6 JERSEYS, ALL YELLOW," THEN THE TOTAL IS STRAIGHTFORWARD.

THE KEY IS TO IDENTIFY OR DEDUCE THE TOTAL NUMBER OF JERSEYS IN THE BAG.

### 2. DETERMINING THE DISTRIBUTION OF COLORS

ARE ALL JERSEYS OF THE SAME COLOR? OR ARE THERE MULTIPLE COLORS? THIS AFFECTS CALCULATIONS SIGNIFICANTLY.

- IF ONLY YELLOW JERSEYS ARE PRESENT, THE PROBABILITY OF DRAWING A YELLOW JERSEY IS 1.
- IF THERE ARE MULTIPLE COLORS, UNDERSTANDING HOW MANY JERSEYS OF EACH COLOR ARE PRESENT IS ESSENTIAL.

### 3. KNOWING THE SELECTION PROCESS

- WITH REPLACEMENT: AFTER DRAWING A JERSEY, IT IS PUT BACK INTO THE BAG, MAINTAINING THE INITIAL COUNT.
- WITHOUT REPLACEMENT: THE JERSEY IS NOT REPLACED, CHANGING THE TOTAL COUNT AND PROBABILITIES AFTER EACH DRAW.

THE APPROACH TO SOLVING THE PROBLEM VARIES DEPENDING ON THIS DETAIL.

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## COMMON PROBLEM-SOLVING STRATEGIES

### STRATEGY 1: RESTATE AND CLARIFY THE QUESTION

BEFORE ATTEMPTING TO SOLVE, ENSURE YOU UNDERSTAND WHAT IS BEING ASKED. WRITE DOWN WHAT IS KNOWN AND WHAT NEEDS TO BE FOUND.

### STRATEGY 2: IDENTIFY KNOWN DATA AND UNKNOWNNS

CREATE A LIST OF KNOWN QUANTITIES (E.G., NUMBER OF YELLOW JERSEYS, TOTAL JERSEYS) AND UNKNOWNNS (E.G., PROBABILITY OF DRAWING A YELLOW JERSEY).

### STRATEGY 3: USE PROBABILITY RULES

APPLY FUNDAMENTAL PROBABILITY PRINCIPLES:

- PROBABILITY OF AN EVENT = (NUMBER OF FAVORABLE OUTCOMES) / (TOTAL NUMBER OF POSSIBLE OUTCOMES)

#### STRATEGY 4: USE COMBINATORICS WHEN APPROPRIATE

FOR COUNTING ARRANGEMENTS OR SELECTION OPTIONS, USE COMBINATIONS AND PERMUTATIONS:

- COMBINATIONS: WHEN ORDER DOESN'T MATTER.

$$\binom{n}{k} = \frac{n!}{k!(n-k)!}$$

- PERMUTATIONS: WHEN ORDER MATTERS.

$$P(n, k) = \frac{n!}{(n-k)!}$$

#### STRATEGY 5: CONSIDER REPLACEMENT SCENARIOS

ADJUST CALCULATIONS BASED ON WHETHER JERSEYS ARE REPLACED AFTER EACH DRAW.

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#### EXAMPLE PROBLEMS AND SOLUTIONS

##### EXAMPLE 1: BASIC PROBABILITY OF DRAWING A YELLOW JERSEY

PROBLEM:

A BAG CONTAINS 10 JERSEYS, OF WHICH 6 ARE YELLOW. IF A JERSEY IS DRAWN AT RANDOM, WHAT IS THE PROBABILITY THAT IT IS YELLOW?

SOLUTION:

TOTAL JERSEYS = 10

YELLOW JERSEYS = 6

$$\text{PROBABILITY} = \frac{6}{10} = \frac{3}{5} = 0.6$$

ANSWER:

THERE IS A 60% CHANCE OF DRAWING A YELLOW JERSEY.

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##### EXAMPLE 2: MULTIPLE DRAWS WITHOUT REPLACEMENT

PROBLEM:

USING THE SAME BAG (10 JERSEYS, 6 YELLOW), IF TWO JERSEYS ARE DRAWN WITHOUT REPLACEMENT, WHAT IS THE PROBABILITY BOTH ARE YELLOW?

SOLUTION:

- PROBABILITY FIRST JERSEY IS YELLOW:  $\frac{6}{10} = \frac{3}{5}$

- AFTER REMOVING ONE YELLOW JERSEY, REMAINING JERSEYS: 9, WITH 5 YELLOW JERSEYS LEFT.

- PROBABILITY SECOND JERSEY IS YELLOW:  $\frac{5}{9}$

- COMBINED PROBABILITY:  $\frac{6}{10} \times \frac{5}{9} = \frac{3}{5} \times \frac{5}{9} = \frac{3}{9} = \frac{1}{3}$

ANSWER:

THERE IS A 33.33% CHANCE BOTH JERSEYS DRAWN ARE YELLOW.

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##### EXAMPLE 3: DRAWING JERSEYS WITH REPLACEMENT

#### PROBLEM:

IN THE SAME SCENARIO, IF TWO JERSEYS ARE DRAWN WITH REPLACEMENT, WHAT IS THE PROBABILITY BOTH ARE YELLOW?

#### SOLUTION:

- PROBABILITY FIRST JERSEY IS YELLOW:  $\frac{6}{10} = \frac{3}{5}$
- SINCE THE JERSEY IS REPLACED, THE PROBABILITIES REMAIN THE SAME FOR THE SECOND DRAW.
- PROBABILITY SECOND JERSEY IS YELLOW:  $\frac{6}{10} = \frac{3}{5}$
- COMBINED PROBABILITY:  $\frac{3}{5} \times \frac{3}{5} = \frac{9}{25} = 0.36$

#### ANSWER:

THERE IS A 36% CHANCE BOTH JERSEYS DRAWN ARE YELLOW WITH REPLACEMENT.

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#### KEY CONCEPTS TO MASTER

1. UNDERSTANDING PROBABILITIES
  - BASIC PROBABILITY CALCULATIONS.
  - COMPLEMENTARY PROBABILITIES.
  - CONDITIONAL PROBABILITIES.
2. COUNTING TECHNIQUES
  - PERMUTATIONS AND COMBINATIONS.
  - PERMUTATIONS WHEN ORDER MATTERS.
  - COMBINATIONS WHEN ORDER DOES NOT MATTER.
3. REPLACEMENT VS. NON-REPLACEMENT
  - HOW EACH AFFECTS PROBABILITIES.
  - WHEN TO APPLY EACH METHOD.
4. INTERPRETING WORD PROBLEMS
  - EXTRACT RELEVANT INFORMATION.
  - IDENTIFY WHAT IS KNOWN AND WHAT NEEDS TO BE FOUND.
  - VISUALIZE SCENARIOS WITH DIAGRAMS OR TABLES.

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#### COMMON MISTAKES TO AVOID

- ASSUMING ALL JERSEYS ARE OF THE SAME COLOR WHEN THE PROBLEM STATES OTHERWISE.
- MIXING REPLACEMENT SCENARIOS; ENSURE THE PROBLEM SPECIFIES WHETHER JERSEYS ARE REPLACED.
- MISAPPLYING PROBABILITY FORMULAS; ALWAYS DOUBLE-CHECK THE TOTAL OUTCOMES AND FAVORABLE OUTCOMES.
- IGNORING THE ORDER WHEN IT MATTERS; DISTINGUISH BETWEEN PERMUTATIONS AND COMBINATIONS.

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#### ADDITIONAL TIPS FOR SOLVING JERSEY AND BAG PROBLEMS

- DRAW DIAGRAMS OR MODELS TO VISUALIZE THE PROBLEM.
- CREATE A TABLE LISTING COUNTS OF JERSEYS TO KEEP TRACK OF REMAINING QUANTITIES.
- BREAK DOWN COMPLEX QUESTIONS INTO SMALLER PARTS.
- PRACTICE WITH VARIOUS SCENARIOS TO BUILD CONFIDENCE AND INTUITION.
- REVIEW BASIC PROBABILITY AND COMBINATORICS CONCEPTS REGULARLY.

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#### CONCLUSION

THE PHRASE "A BAG CONTAINS SIX YELLOW JERSEYS" MIGHT SEEM SIMPLE AT FIRST, BUT IT OPENS THE DOOR TO A VARIETY OF COMPLEX AND INTERESTING PROBLEMS INVOLVING PROBABILITY, COUNTING, AND LOGICAL REASONING. THE KEY TO MASTERING THESE PROBLEMS LIES IN CAREFULLY ANALYZING THE QUESTION, UNDERSTANDING THE RELEVANT CONCEPTS, AND APPLYING THE APPROPRIATE MATHEMATICAL TECHNIQUES.

REMEMBER TO:

- CLARIFY WHAT IS KNOWN AND WHAT IS ASKED.
- DETERMINE THE TOTAL NUMBER OF JERSEYS AND THEIR DISTRIBUTION.
- DECIDE WHETHER THE JERSEY DRAWING IS WITH OR WITHOUT REPLACEMENT.
- USE PROBABILITY RULES AND COMBINATORIAL FORMULAS AS NEEDED.
- PRACTICE SIMILAR PROBLEMS TO BUILD CONFIDENCE.

WITH PATIENCE AND SYSTEMATIC ANALYSIS, YOU'LL BE ABLE TO APPROACH AND SOLVE JERSEY AND BAG PROBLEMS EFFECTIVELY. KEEP PRACTICING, AND DON'T HESITATE TO SEEK FURTHER EXPLANATIONS OR EXAMPLES TO STRENGTHEN YOUR UNDERSTANDING. HAPPY PROBLEM-SOLVING!

## FREQUENTLY ASKED QUESTIONS

### WHAT IS THE MAIN PROBLEM OR QUESTION IN THE STATEMENT 'A BAG CONTAINS SIX YELLOW JERSEYS'?

THE STATEMENT SUGGESTS THERE IS A PROBLEM OR QUESTION RELATED TO THE CONTENTS OF A BAG THAT CONTAINS SIX YELLOW JERSEYS, POSSIBLY ABOUT COUNTING, IDENTIFYING, OR SELECTING JERSEYS.

### WHAT TYPES OF QUESTIONS CAN BE ASKED ABOUT A BAG WITH SIX YELLOW JERSEYS?

QUESTIONS CAN INCLUDE HOW MANY JERSEYS ARE THERE, HOW MANY ARE YELLOW, IF THERE ARE OTHER COLORS, OR HOW TO SELECT A JERSEY RANDOMLY.

### HOW CAN I DETERMINE THE PROBABILITY OF SELECTING A YELLOW JERSEY FROM THE BAG?

SINCE ALL JERSEYS ARE YELLOW AND THERE ARE SIX IN TOTAL, THE PROBABILITY OF SELECTING A YELLOW JERSEY IS 6 DIVIDED BY THE TOTAL NUMBER OF JERSEYS IN THE BAG.

### IF THERE ARE OTHER COLORS IN THE BAG, HOW DO I FIND OUT HOW MANY YELLOW JERSEYS THERE ARE?

YOU NEED ADDITIONAL INFORMATION, SUCH AS THE TOTAL NUMBER OF JERSEYS IN THE BAG OR THE NUMBER OF JERSEYS OF OTHER COLORS, TO DETERMINE HOW MANY ARE YELLOW.

### WHAT IS THE SIGNIFICANCE OF THE 'ASAPPPPPPPPTYYYYYYYYYYYYYYYYYYY B)' IN THE QUESTION?

IT INDICATES URGENCY AND EXCITEMENT, SUGGESTING YOU NEED QUICK HELP UNDERSTANDING OR SOLVING THE PROBLEM RELATED TO THE JERSEYS.

### COULD THIS BE A PART OF A MATH PROBLEM OR WORD PROBLEM? HOW SHOULD I

## APPROACH IT?

YES, IT SOUNDS LIKE A MATH OR LOGIC PROBLEM. APPROACH IT BY IDENTIFYING WHAT IS BEING ASKED—SUCH AS COUNTING, PROBABILITY, OR ARRANGEMENT—AND USE RELEVANT FORMULAS OR REASONING STEPS.

## HOW CAN I GET HELP IF I STILL DON'T UNDERSTAND THE PROBLEM?

ASK FOR CLARIFICATION FROM A TEACHER, TUTOR, OR PEER, AND PROVIDE MORE DETAILS ABOUT THE PROBLEM TO GET SPECIFIC GUIDANCE. BREAKING DOWN THE PROBLEM INTO SMALLER PARTS CAN ALSO HELP UNDERSTAND IT BETTER.

## ADDITIONAL RESOURCES

UNDERSTANDING THE PROBLEM: A DEEP DIVE INTO THE BAG CONTAINING SIX YELLOW JERSEYS

WHEN CONFRONTED WITH A PROBLEM OR PUZZLE LIKE "A BAG CONTAINS SIX YELLOW JERSEYS," IT'S ESSENTIAL TO APPROACH IT SYSTEMATICALLY. SUCH PROBLEMS OFTEN STEM FROM PROBABILITY, COMBINATORICS, OR LOGICAL REASONING SCENARIOS. THIS COMPREHENSIVE REVIEW AIMS TO CLARIFY WHAT THIS STATEMENT COULD IMPLY, EXPLORE RELATED MATHEMATICAL CONCEPTS, AND GUIDE YOU THROUGH POTENTIAL INTERPRETATIONS AND SOLUTIONS. WHETHER YOU'RE A STUDENT PREPARING FOR EXAMS, A PUZZLE ENTHUSIAST, OR SOMEONE SEEKING CLARITY, THIS DETAILED BREAKDOWN WILL HELP YOU UNDERSTAND EVERY FACET OF THIS SEEMINGLY SIMPLE YET POTENTIALLY COMPLEX STATEMENT.

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## BREAKING DOWN THE PHRASE: "A BAG CONTAINS SIX YELLOW JERSEYS"

BEFORE DIVING INTO ANY CALCULATIONS OR FURTHER INTERPRETATIONS, LET'S ANALYZE THE CORE COMPONENTS OF THIS STATEMENT:

- A BAG: AN ENCLOSED CONTAINER THAT HOLDS MULTIPLE ITEMS.
- CONTAINS: INDICATES THAT THE ITEMS (JERSEYS) ARE INSIDE THE BAG.
- SIX YELLOW JERSEYS: THE EXACT NUMBER OF JERSEYS IN THE BAG, ALL OF WHICH ARE YELLOW.

THE PHRASE IS STRAIGHTFORWARD BUT CAN HAVE VARIOUS IMPLICATIONS DEPENDING ON THE CONTEXT. FOR EXAMPLE:

- IS THE PROBLEM ABOUT PROBABILITY (E.G., DRAWING JERSEYS AT RANDOM)?
- IS IT ABOUT COMBINATORICS (E.G., NUMBER OF WAYS TO SELECT JERSEYS)?
- IS IT ABOUT UNDERSTANDING THE COMPOSITION OF THE BAG (E.G., ARE ALL JERSEYS YELLOW OR ARE THERE OTHER COLORS)?
- ARE THERE MISSING DETAILS, SUCH AS TOTAL NUMBER OF JERSEYS OR OTHER COLORS?

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## POSSIBLE CONTEXTS AND INTERPRETATIONS

UNDERSTANDING THE PHRASE IN DIFFERENT CONTEXTS HELPS US GRASP THE POTENTIAL QUESTIONS AND SOLUTIONS.

### 1. THE BAG CONTAINS ONLY YELLOW JERSEYS

SCENARIO:

THE SIMPLEST INTERPRETATION IS THAT THE BAG CONTAINS EXACTLY SIX YELLOW JERSEYS, AND NO OTHER ITEMS OR COLORS ARE INVOLVED.

IMPLICATION:

ANY QUESTIONS ABOUT THE PROBABILITY OF DRAWING A YELLOW JERSEY WOULD BE TRIVIAL: THE PROBABILITY IS 100%. SIMILARLY, IF ASKED ABOUT THE NUMBER OF JERSEYS, IT'S SIX.

POSSIBLE QUESTIONS:

- HOW MANY JERSEYS ARE IN THE BAG?
- WHAT'S THE PROBABILITY OF DRAWING A YELLOW JERSEY?
- IF WE DRAW TWO JERSEYS WITHOUT REPLACEMENT, WHAT'S THE PROBABILITY BOTH ARE YELLOW?

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## 2. THE BAG CONTAINS MULTIPLE JERSEYS OF DIFFERENT COLORS

SCENARIO:

THE PHRASE MIGHT BE INCOMPLETE OR SIMPLIFIED. PERHAPS THE BAG CONTAINS MORE THAN SIX JERSEYS, WITH SIX BEING YELLOW, AND OTHERS OF DIFFERENT COLORS.

IMPLICATION:

QUESTIONS BECOME MORE INTERESTING, INVOLVING PROPORTIONS, PROBABILITIES, AND COMBINATIONS.

EXAMPLE:

- TOTAL JERSEYS: 10 (6 YELLOW, 4 OTHER COLORS)
- WHAT'S THE PROBABILITY OF DRAWING A YELLOW JERSEY?
- WHAT'S THE PROBABILITY OF DRAWING TWO YELLOW JERSEYS IN A ROW?

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## 3. THE JERSEYS ARE NOT JERSEYS AT ALL, BUT A DIFFERENT ITEM

SCENARIO:

THE TERM "JERSEYS" COULD BE A PLACEHOLDER OR A TYPO, OR THE PROBLEM MIGHT INVOLVE DIFFERENT OBJECTS RESEMBLING JERSEYS.

IMPLICATION:

IT EMPHASIZES THE IMPORTANCE OF UNDERSTANDING THE ACTUAL ITEMS INVOLVED AND THEIR PROPERTIES.

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## KEY MATHEMATICAL CONCEPTS UNDERLYING THE PROBLEM

DEPENDING ON THE CONTEXT, DIFFERENT MATHEMATICAL TOOLS APPLY. LET'S DELVE INTO CORE CONCEPTS RELEVANT TO UNDERSTANDING AND SOLVING PROBLEMS INVOLVING ITEMS IN A BAG.

### PROBABILITY THEORY

PROBABILITY HELPS DETERMINE THE LIKELIHOOD OF SPECIFIC OUTCOMES WHEN RANDOMLY SELECTING ITEMS.

- BASIC PROBABILITY FORMULA:

$$P(\text{EVENT}) = \frac{\text{NUMBER OF FAVORABLE OUTCOMES}}{\text{TOTAL NUMBER OF OUTCOMES}}$$

- APPLICATION IN THE BAG SCENARIO:

IF THE BAG CONTAINS 6 YELLOW JERSEYS AND, SAY, 4 OTHER JERSEYS, TOTAL = 10, THEN:

$$P(\text{DRAWING A YELLOW JERSEY}) = \frac{6}{10} = 0.6$$

## COMBINATORICS

WHEN CONSIDERING MULTIPLE PICKS, ARRANGEMENTS, OR COMBINATIONS, COMBINATORICS BECOMES ESSENTIAL.

- NUMBER OF WAYS TO SELECT JERSEYS:

IF SELECTING K JERSEYS FROM N, THE NUMBER OF COMBINATIONS:

$$\binom{N}{K} = \frac{N!}{K!(N-K)!}$$

- PERMUTATIONS:

IF ORDER MATTERS, PERMUTATIONS ARE RELEVANT.

## EXPECTED VALUE AND PROBABILITIES IN MULTIPLE DRAWS

- EXPECTED NUMBER OF YELLOW JERSEYS IN MULTIPLE DRAWS:

FOR EXAMPLE, IF DRAWING 2 JERSEYS WITHOUT REPLACEMENT, THE EXPECTED NUMBER OF YELLOW JERSEYS CAN BE COMPUTED USING PROBABILITIES.

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## COMMON PROBLEMS AND HOW TO APPROACH THEM

LET'S EXPLORE TYPICAL QUESTIONS THAT MIGHT INVOLVE A BAG WITH SIX YELLOW JERSEYS.

### QUESTION 1: WHAT'S THE PROBABILITY OF DRAWING A YELLOW JERSEY IN A SINGLE RANDOM DRAW?

GIVEN:

- TOTAL JERSEYS: N (UNKNOWN OR KNOWN)
- YELLOW JERSEYS: 6

SOLUTION:

- IF TOTAL IS KNOWN, PROBABILITY:

$$P(\text{YELLOW}) = \frac{6}{N}$$

- IF TOTAL IS UNKNOWN, THE PROBLEM CANNOT BE SOLVED WITHOUT ADDITIONAL INFORMATION.

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### QUESTION 2: WHAT'S THE PROBABILITY OF DRAWING TWO YELLOW JERSEYS

## CONSECUTIVELY WITHOUT REPLACEMENT?

GIVEN:

- TOTAL JERSEYS: N
- YELLOW JERSEYS: 6

SOLUTION:

- FIRST DRAW:

$$P_1 = \frac{6}{N}$$

- AFTER REMOVING ONE YELLOW JERSEY:

- REMAINING JERSEYS:  $(N - 1)$

- REMAINING YELLOW JERSEYS: 5

- PROBABILITY SECOND DRAW:

$$P_2 = \frac{5}{N - 1}$$

- COMBINED PROBABILITY:

$$P(\text{BOTH YELLOW}) = P_1 \times P_2 = \frac{6}{N} \times \frac{5}{N - 1}$$

NOTE:

THIS CALCULATION ASSUMES THE TOTAL NUMBER OF JERSEYS IS KNOWN AND THAT WE ARE DRAWING WITHOUT REPLACEMENT.

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## QUESTION 3: IF THE BAG CONTAINS ONLY YELLOW JERSEYS, WHAT IS THE PROBABILITY OF DRAWING A YELLOW JERSEY?

ANSWER:

IT'S 100% OR PROBABILITY = 1, BECAUSE ALL JERSEYS ARE YELLOW.

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## EXPANDING THE SCENARIO: MULTIPLE COLORS AND PROBABILITIES

OFTEN, PROBLEMS INVOLVE MULTIPLE COLORS, WHICH COMPLICATE CALCULATIONS BUT PROVIDE RICHER LEARNING OPPORTUNITIES.

### EXAMPLE SCENARIO:

- TOTAL JERSEYS: 10
- YELLOW JERSEYS: 6
- BLUE JERSEYS: 4

QUESTIONS:

- A) WHAT'S THE PROBABILITY OF DRAWING A YELLOW JERSEY?
- B) WHAT'S THE PROBABILITY OF DRAWING A BLUE JERSEY?
- C) WHAT'S THE PROBABILITY OF DRAWING TWO JERSEYS, BOTH YELLOW?

- D) WHAT'S THE PROBABILITY OF DRAWING ONE YELLOW AND ONE BLUE IN TWO DRAWS?

SOLUTIONS:

- A)  $P(\text{YELLOW}) = \frac{6}{10} = 0.6$

- B)  $P(\text{BLUE}) = \frac{4}{10} = 0.4$

- C) BOTH YELLOW IN TWO DRAWS (WITHOUT REPLACEMENT):

$$P = \frac{6}{10} \times \frac{5}{9} = \frac{6 \times 5}{10 \times 9} = \frac{30}{90} = \frac{1}{3}$$

- D) ONE YELLOW AND ONE BLUE (ORDER MATTERS OR NOT):

- FOR YELLOW FIRST, THEN BLUE:

$$\frac{6}{10} \times \frac{4}{9} = \frac{24}{90} = \frac{4}{15}$$

- FOR BLUE FIRST, THEN YELLOW:

$$\frac{4}{10} \times \frac{6}{9} = \frac{24}{90} = \frac{4}{15}$$

- TOTAL:

$$\frac{4}{15} + \frac{4}{15} = \frac{8}{15}$$

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## COMMON MISUNDERSTANDINGS AND PITFALLS

WHEN DEALING WITH "A BAG CONTAINS SIX YELLOW JERSEYS," LEARNERS OFTEN ENCOUNTER CONFUSION. HERE ARE COMMON MISCONCEPTIONS AND HOW TO AVOID THEM:

- ASSUMING TOTAL NUMBER OF JERSEYS IS 6:

THE STATEMENT ONLY CONFIRMS THAT SIX JERSEYS ARE YELLOW; TOTAL JERSEYS COULD BE HIGHER.

- CONFUSING "CONTAINS" WITH "EXCLUSIVELY CONTAINS":

THE BAG MIGHT CONTAIN ONLY YELLOW JERSEYS OR A MIX; CONTEXT MATTERS.

- NEGLECTING THE DIFFERENCE BETWEEN WITH AND WITHOUT REPLACEMENT:

PROBABILITIES CHANGE DEPENDING ON WHETHER JERSEYS ARE REPLACED AFTER DRAWING.

- IGNORING THE IMPORTANCE OF TOTAL COUNTS:

PROBABILITIES ARE ONLY MEANINGFUL WHEN TOTAL COUNTS ARE KNOWN.

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## PRACTICAL APPLICATIONS AND REAL-WORLD ANALOGIES

UNDERSTANDING SUCH PROBLEMS ISN'T JUST ACADEMIC; IT HAS REAL-WORLD RELEVANCE:

- INVENTORY MANAGEMENT:

KNOWING HOW MANY ITEMS OF A CERTAIN TYPE ARE IN STOCK.

- QUALITY CONTROL:

DETERMINING THE LIKELIHOOD OF SELECTING DEFECTIVE ITEMS FROM A BATCH.

- GAMBLING AND GAMES:  
CARD GAMES, LOTTERIES, AND OTHER CHANCE-BASED ACTIVITIES.

- SPORTS AND UNIFORMS:  
MANAGING TEAM JERSEYS, ENSURING PROPER DISTRIBUTION.

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## CONCLUDING THOUGHTS AND RECOMMENDATIONS

- CLARIFY

## Please Help I Don T Understand Asapppppppppptyyyyyyyyyyyyyyyyyy B A Bag Contains Six Yellow Jerseys

Please Help I Don T Understand Asapppppppppptyyyyyyyyyyyyyyyyyy B A Bag Contains Six Yellow  
Jerseys

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