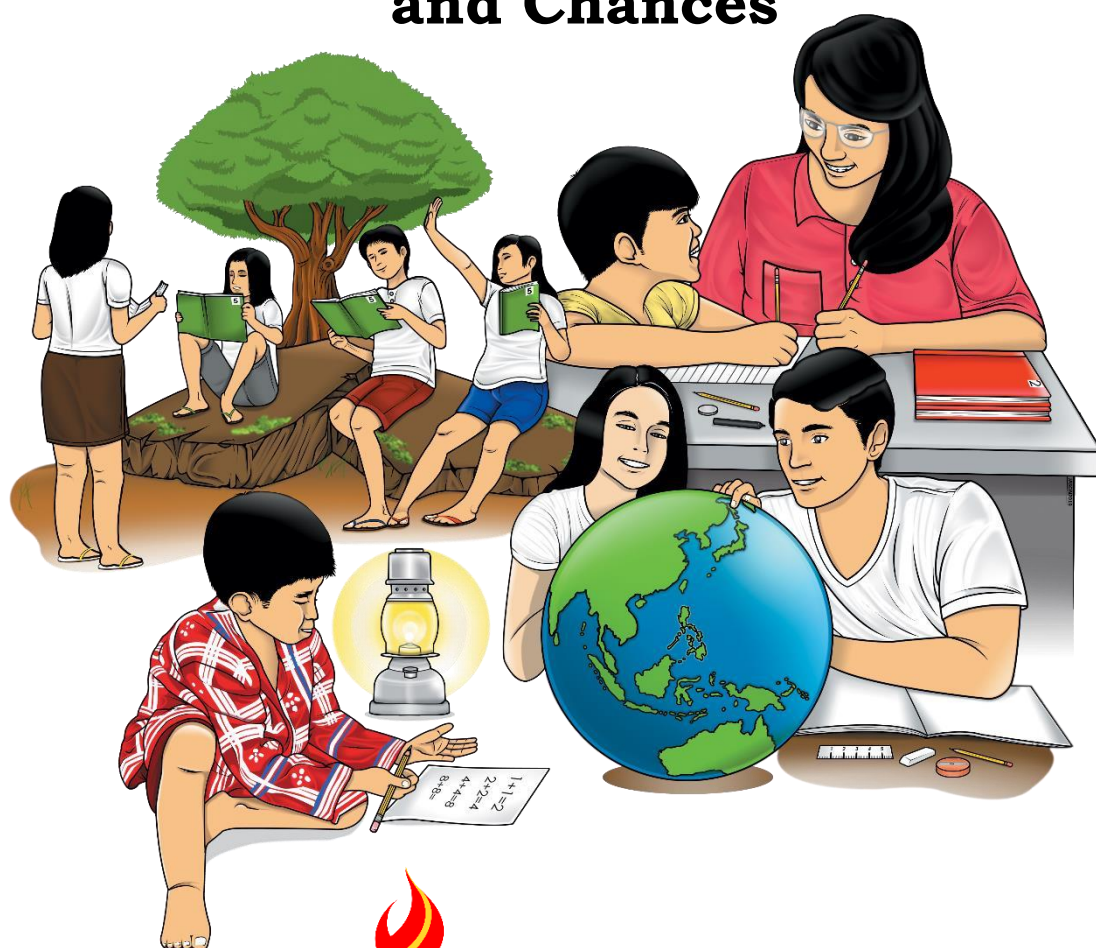DepED
DEPARTMENT OF EDUCATION

Mathematics

Quarter 4 – Module 7:
Making Lists and Diagrams of Outcomes and Telling the Number of Favorable Outcomes and Chances

ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 6
Alternative Delivery Mode
Quarter 4 – Module 7: Making Lists and Diagrams of Outcomes and Telling the Number of Favorable Outcomes and Chances
First Edition, 2020

6

Mathematics

Quarter 4 – Module 7:

Making Lists and Diagrams of Outcomes and Telling the Number of Favorable Outcomes and Chances

DepED

DEPARTMENT OF EDUCATION

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

What I Need to Know

This module was designed and written with you in mind. It is here to help you master the skills in making listings and diagrams of outcomes and telling the number of favorable outcomes and chances using these listings and diagrams. The scope of this module allows you to use it in many different learning situations. The language used recognizes your diverse vocabulary level. The lessons are arranged to follow the standard sequence of your course. But the order in which you read them can be changed to match with the textbook you are now using.

After going through this module, you are expected to:

1. make listings and diagrams of outcomes and tell the number of favorable outcomes and chances using these listings and diagrams.

What I Know

Directions: Read and answer the following problems. Use appropriate methods like listing, tree diagram and table/grid in solving each item. Write your answers on your answer sheet.

1. There are four balls (red, blue, orange, green) inside the bag and three chips (yellow, black, white) in another bag. How many possible outcomes will there be if a ball and a chip are drawn from the bags?

2. Annie has 4 shirts and 2 pairs of pants. How many different outfits can she possibly wear?

3. Two coins are tossed at the same time. Find all the possible ways the coins can land.

4. A car manufacturer makes 3 models of cars; Innova, Revo and Corolla. These cars are all available in a choice of 4 colors: red, green, blue, and orange. How many different cars are available?

5. The table below shows the tops and pants Karen has in her closet. How many possible combinations of outfits Karen can wear?

Tops	Pants
T-Shirt Blouse	Black Blue Red Green

<table>
<tr><td>**Lesson**
1</td><td>**Making Lists and Diagrams of Outcomes and Telling the Number of Favorable Outcomes and Chances**</td></tr>
</table>

In the previous lessons you have learned about probability by performing experiments and recording outcomes. This time we will focus on making listings and diagrams of outcomes and tell the number of favorable outcomes and chances using these listings and diagrams.

What's In

Directions: Solve the problem using different ways. Write your answers on your answer sheet.

This is a menu posted on the wall of a snack house.

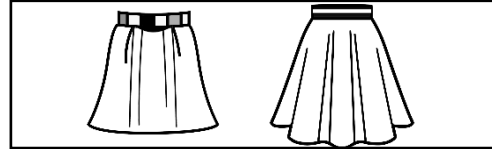| **Burgers**	**Beverages**
Hamburger	Hot Chocolate
Cheese Burger	Iced Tea
	Orange Juice

How many different ways can you order for a snack?
   a. Solve through the listing method
   b. Solve through a tree diagram

3

What's New

Emilia wants to attend a birthday party. She had these outfits in her closet. How many possible combinations of outfits can she wear?

How will you solve this problem?

What is It

In dealing with probability, every experiment has a set of possible outcomes called a sample space.

A **sample space** is a list of all the possible outcomes in an activity or experiment. We can identify sample spaces in a number of ways including lists, tree diagrams and tables or grids.

A. Listing Outcomes – is one of the systematic processes of writing the sample spaces. It is simple listing every possible outcome. Listing or counting all the possible outcomes enables us to calculate the probability of any particular even occurring.

Examples:

1. Ben has four kinds of fruits namely mango, guava, banana and apple in his fruit basket. He wants to eat two kinds of fruits. What would be the possible combinations of fruits he has?

   Possible Combinations:
   - mango, guava
   - mango, banana
   - mango, apple
   - guava, banana
   - guava, apple
   - banana, apple

4

The list shows that there are 6 possible combinations of fruits.

2. Roy goes to a coffee shop. He chooses one drink and one snack. The table below shows what the coffee shop offers.

Drink	Snack
Tea Coffee	Brownie Muffin Pastry

Write down all the possible combinations of drink and snack that Roy can order.

- tea, brownie
- tea, muffin
- tea, pastry

- coffee, brownie
- coffee, muffin
- coffee, pastry

The list shows that there are 6 possible combinations.

B. **Tree Diagram** is a tool or drawing with "line segments" to provide visual representation of the different possible "paths" for the outcomes.

Examples:
1. How many snacks combinations can you make with one food choice and one fruit choice?

FOOD CHOICES	**FRUIT CHOICES**
Burger Siopao	Melon Guava Banana Papaya

Solution:

Outcomes

5
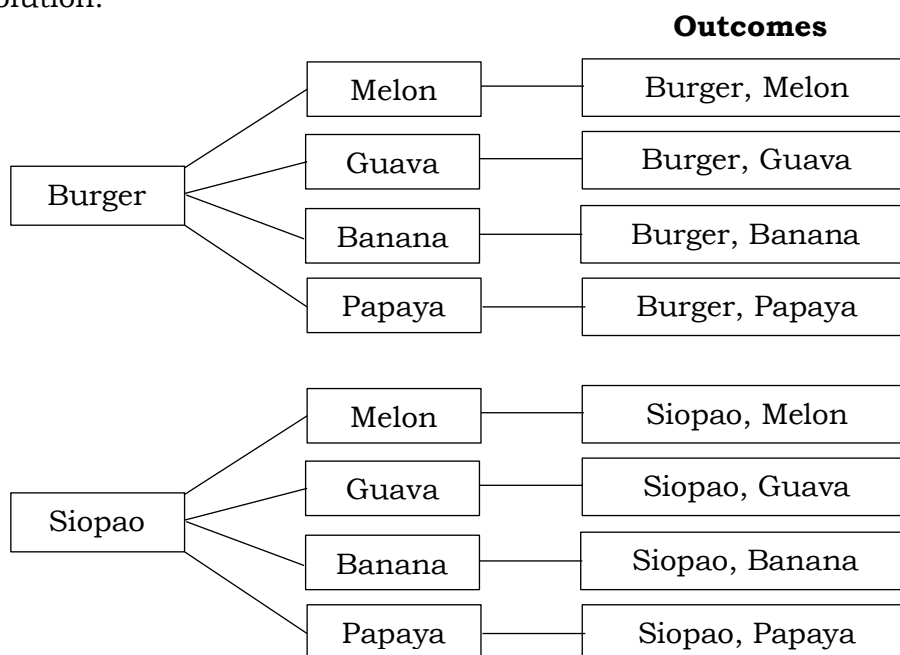
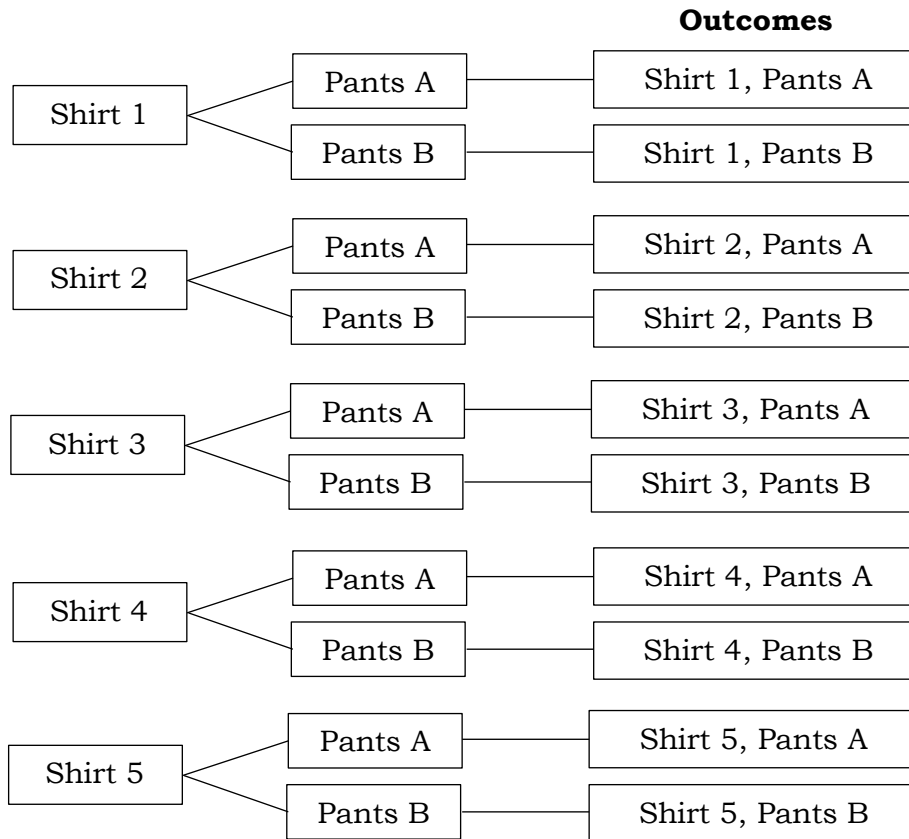*Based on the tree diagram, there are 8 possible outcomes.*

2. Jemar is going to a party. He has 5 new shirts and 2 new pairs of pants in his cabinet. How many possible combinations of shirts and pants can he have?

Solution:

Outcomes

| Shirt 1 | Pants A | Shirt 1, Pants A |
| | Pants B | Shirt 1, Pants B |

| Shirt 2 | Pants A | Shirt 2, Pants A |
| | Pants B | Shirt 2, Pants B |

| Shirt 3 | Pants A | Shirt 3, Pants A |
| | Pants B | Shirt 3, Pants B |

| Shirt 4 | Pants A | Shirt 4, Pants A |
| | Pants B | Shirt 4, Pants B |

| Shirt 5 | Pants A | Shirt 5, Pants A |
| | Pants B | Shirt 5, Pants B |

Based on the tree diagram, there are 10 possible combinations of shirts and pants.

C. **Table** or **grid of outcomes** is a table where the first row and first column represent the elements that need to be combined.

Examples:

1. A boy and a girl are to be randomly chosen to represent their class. The boy
   is chosen from Nory, Kelvin, and Raffy. The girl is chosen from Lucy, Jean,
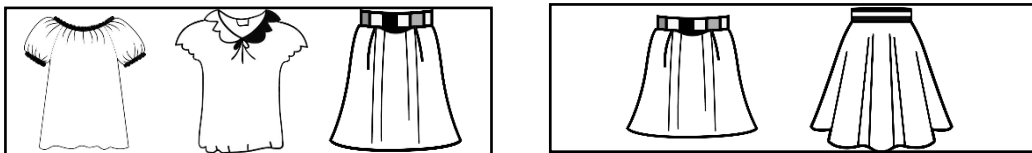   Mary, Nancy, and Millene. Find the sample spaces for this problem.

Solution:

Girls / Boys	Lucy	Jean	Mary	Nancy	Millene
Nory	*Nory, Lucy*	*Nory, Jean*	*Nory, Mary*	*Nory, Nancy*	*Nory, Millene*
Kelvin	*Kelvin, Lucy*	*Kelvin, Jean*	*Kelvin, Mary*	*Kelvin, Nancy*	*Kelvin, Millene*
Raffy	*Raffy, Lucy*	*Raffy, Jean*	*Raffy, Mary*	*Raffy, Nancy*	*Raffy, Millene*

Based on the table or grid above, there are 15 possible outcomes.

2. Now, let us try to answer the problem above.
Emilia wants to attend a birthday party. She has these outfits in her closet. How many possible combinations of outfits can she wear?

Solution:

Based on the table or grid above, there are 6 possible combinations of outfits that Emilia can wear.

7

What's More

Directions: Read and answer the problem below. Write your answer on your answer sheet.

James wants to order snacks. Here's the menu:

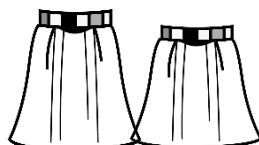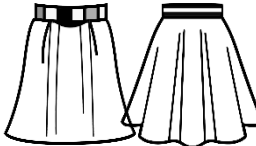| **Burgers** |
| :---: |
| Mushroom Burger |
| Bean Burger |
| Cheese Burger |
| |
| **Beverages** |
| Green tea |
| Buko juice |
| Lemon water |
| Hot chocolate |
| Ginger tea |

How many ways can he order snacks? Make a list of the possible outcomes using any of the methods discussed.

What I Have Learned

A sample space is a list of all the possible outcomes in an activity or experiment. It is important to have the knowledge in identifying all of these possible outcomes. We can identify sample spaces in a number of ways including lists, tree diagrams and tables or grids.

- **Listing Outcomes** is one of the systematic processes of writing the sample spaces. It is simply listing every possible outcome. Listing or counting all the possible outcomes enables us to calculate the probability of any particular event occurring.

- **Tree Diagram** is a tool or drawing with "line segments" to provide visual representation of the different possible "paths" for the outcomes.

- **Table** or **grid of outcomes** is a table where the first row and first column represent the elements that need to be paired to identify all possible outcomes.

What I Can Do

Directions: Read and solve the following problems. Write your answer in your answer

sheet.

1. Gethel wants to eat her breakfast. She chooses between bread and cereal, and four choices of what to drink: coffee, kalamansi juice, tea, or water. List the possible combinations of breakfast Gethel can make.

2. A pair of dice is rolled. How many possible combinations are there in rolling a pair of dice? Use appropriate method in finding all the possible combinations.

3. Kezia wants to buy a car. She can buy a Toyota or Ford. The cars available are in gray or black colors. How many options she can choose from? Use appropriate method in finding possible options.

Assessment

A. Read and answer the following problems. Then, write the letter of the correct answer on your answer sheet.

1. A certain type of bag comes in white or black and in a small or large size. How many combinations are possible?
   A. 2   B. 3   C. 4   D. 6

2. Gythro picks a number from 1 to 4 and chooses the color red, green, or yellow. What is the total number of outcomes?
   A. 6   B. 9   C. 12   D. 24

3. A certain brand of shoes comes in five sizes and six colors. Find the number of possible outcomes.
   A. 9   B. 18   C. 24   D. 30

9

4. Zina has a choice of 2 colors of pants and 3 colors of shirts. How many different outfits can she wear?

      A. 4   B. 6   C. 7   D. 8

5. Which shows the sample space for flipping two coins?

      A. H, T   C. HT,HH

      B. HH, TT   D. HH, HT, TH, TT

B. Read and answer the problem below. Write your answers on your answer sheet.

        A convenient store sells ice cream in cup or in cone in either vanilla or chocolate flavor. Each flavor has three choices of toppings namely: nuts, strawberries and cherries.

        How many combinations of ice cream would there be? Solve using listing or diagram.

Additional Activities

Directions: Read and solve the problem below. Write your answer on your answer sheet.

        Joy has a black and green pants with white, yellow, blue and red shirts in her cabinet. How many different choices of pants and shirts can she wear?

        Write the possible outcomes in either listing, tree diagram and tabular form.

Answer Key

What's In

a. Listing Method

Hamburger, Hot Chocolate	Cheeseburger, Hot Chocolate
Hamburger, Iced Tea	Cheeseburger, Iced Tea
Hamburger, Orange Juice	Cheeseburger, Orange Juice

b. Tree Diagram

Outcomes

Hamburger → Hot Chocolate → Hamburger, Hot Chocolate
Hamburger → Iced Tea → Hamburger, Iced tea
Hamburger → Orange Juice → Hamburger, Orange Juice

Cheeseburger → Hot Chocolate → Cheeseburger, Hot Chocolate
Cheeseburger → Iced Tea → Cheeseburger, Iced tea
Cheeseburger → Orange Juice → Cheeseburger, Orange Juice

Possible outcomes: 6

What's More

(mushroom burger, green tea)
(mushroom burger, buko juice)
(mushroom burger, lemon water)
(mushroom burger, hot chocolate)
(mushroom burger, ginger tea)
(bean burger, green tea)
(bean burger, buko juice)
(bean burger, lemon water)
(bean burger, hot chocolate)
(bean burger, ginger tea)
(cheese burger, green tea)
(cheese burger, buko juice)
(cheese burger, lemon water)
(cheese burger, hot chocolate)
(cheese burger, ginger tea)

Possible outcomes: 15

What I Know

1. 12
2. 8
3. 4
4. 12
5. 8

What I Can Do

1. (bread,coffee),
(bread, kalamansi juice),
(bread, tea),
(bread, water)
(cereal coffee),
(cereal, kalamansi juice),
(cereal, tea),
(cereal, water)

2. 36

3. 4

11

Assessment

A.
1. C
2. C
3. D
4. B
5. D

B. By Listing Method

(Cup, Vanilla, Nuts)	(Cup, Vanilla, Strawberries)	(Cup, Vanilla, Cherries)
(Cone, Vanilla, Nuts)	(Cone, Vanilla, Strawberries)	(Cone, Vanilla, Cherries)
(Cup, Chocolate, Nuts)	(Cup, Chocolate, Strawberries)	(Cup, Chocolate, Cherries)
(Cone, Chocolate, Nuts)	(Cone, Chocolate, Strawberries)	(Cone, Chocolate, Cherries)

By Tree Diagram

Answer: 8

A. Listing Outcomes

(black pants, white shirt)	(green pants, white shirt)
(black pants, yellow shirt)	(green pants, yellow shirt)
(black pants, blue shirt)	(green pants, blue shirt)
(black pants, red shirt)	(green pants, red shirt)
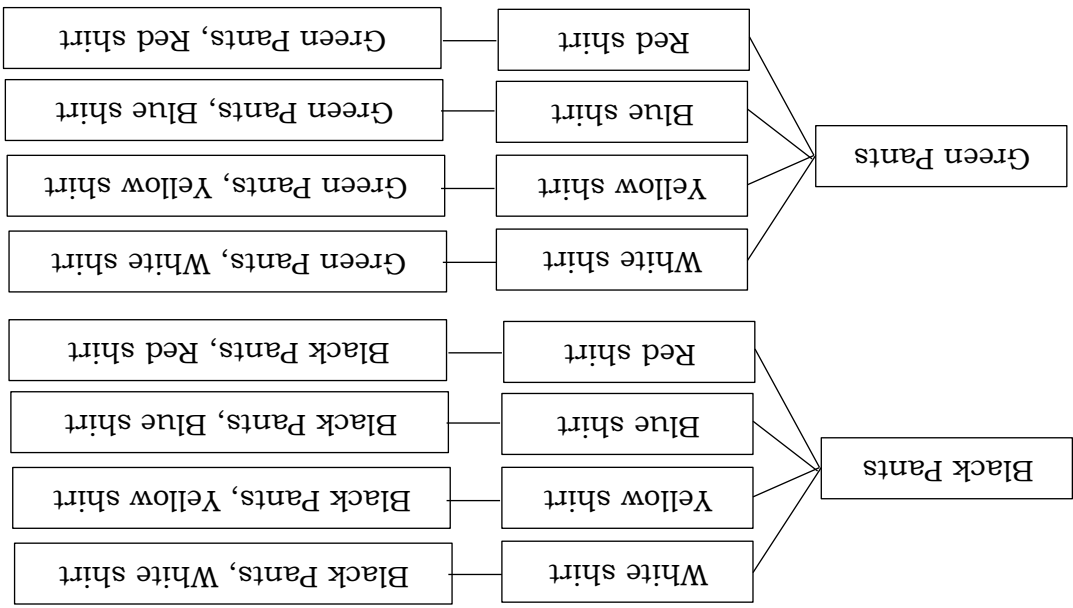
B. Tree Diagram

C. Table / Grid

Shirt \ Pants	white shirt	yellow shirt	blue shirt	red shirt
Black pants	Black pants, white shirt	Black pants, yellow shirt	Black pants, blue shirt	Black pants, red shirt
Green pants	Green pants, white shirt	Green pants, yellow shirt	Green pants, blue shirt	Green pants, red shirt

References:

Most Essential Learning Competencies (MELC) in Mathematics 6

Burgos, J. et al. (2016) 21st Century Mathletes. Philippines: Book Media Press Inc.

14