# THE STUDENT WORKSHEET (LKPD)

Number Pattern

Name :
1.
2.
3.
4.

## TOPICS

- **SQUARE NUMBER PATTERN**

- **TRIANGULAR NUMBER PATTERN**

# STUDENT WORKSHEET (LKPD) NUMBER PATTERN

## LLEARNING OUTCOMES

| Element Algebra | At the end of phase D students can recognize, predict and generalize patterns in the form of arrangements of objects and numbers. (C2) |
|---|---|

## LEARNING OBJECTIVES

1. 1.Students are able to generalize formulas (nth term) of a number pattern. (C2)
2. Students can solve problems related to odd number patterns, even number patterns, square number patterns and triangular number patterns by generalizing previous patterns. (C4)

## INSTRUCTION OF USING WORKSHEET

1. Read the prayer before starting to work on the LKPD
2. Fill in the group identity on the LKPD
3. Read and understand the objectives contained in this LKPD.
4. Read and understand the description of the material contained in the LKPD.
5. Work on each problem to measure your understanding of the material in the LKPD.
6. If you have difficulty in studying LKPD, discuss it with friends or ask the teacher.

| Sintaks Pembelajaran *Discovery Learning* | |
|---|---|
|  | Fase 1 : *Stimulation* |
|  | Fase 2 : *Problem Statement* |
|  | Fase 3 : *Data Collection* |
|  | Fase 4 : Data Processing |
|  | Fase 5 : *Verification* |
|  | Fase 6 : *Generalization* |

# WORKSHEET (LKPD)
# SQUARE NUMBER PATTERN

## Activity 1

### Stimulation

Given a problem:

Mrs. Rani wants to organize a birthday party for her son. One of the dishes provided is donuts. Mrs. Rani wants to arrange the donuts on the dining table to be served to the guests. To make it look interesting, Mrs. Rina arranged the donuts to form a pattern. She starts arranging with the first box containing 1 donut, the second box containing 4 donuts, the third box containing 9 donuts, and so on. If Mrs. Rani wants to prepare as many donuts as needed, how many donuts must be prepared to arrange the 6th box of donuts?

If illustrated as follows

| 1st box | 2nd box | 3rd box | ...... etc ...... |

### Problem Statement

**Look at the pattern !**

Pattern -     1          2                3

Based on the above problems, what shape do you see in the pattern ? ...........

# NUMBER PATTERN

## WORKSHEET (LKPD)
## SQUARE NUMBER PATTERN

### Data Collection

Represent the number pattern you have obtained with a symbol in the shape of a red donut.
(  ) to represent each digit

**Square Number Pattern**

| Pattern Representation |  |  |  |  | |
|---|---|---|---|---|---|
| **Arrangment To** | 1 | 2 | 3 | 4 | etc ($n$) |
| **The Quantity** | 1 | ...... | ......... | ......... | |

### Data Processing

In determining the square number pattern formula, we can apply the concept of multiplication, look at the pattern that has been drawn before. Let's multiply the sum of the rows with the sum of the columns in each number sequence, then look and complete the table below!
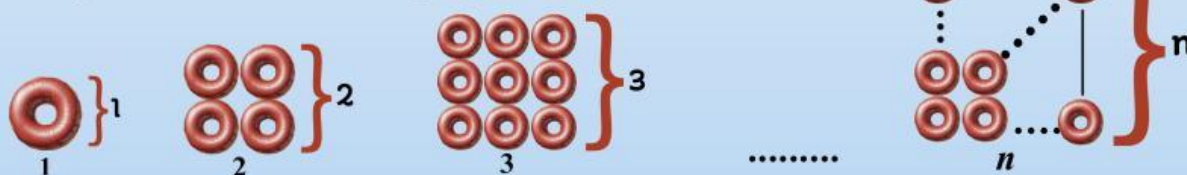


| $U_1$ | $U_2$ | $U_3$ | ....... | $U_n$ |
|---|---|---|---|---|
| 1 x 1 | ..... x 2 | ..... X ..... | ....... | ..... X ..... |

So, we can write the formula for the square number pattern of the nth order is

$U_n$ = ............ X ............

## WORKSHEET (LKPD)
## SQUARE NUMBER PATTERN

### Verification

From the representation stage that has been made.

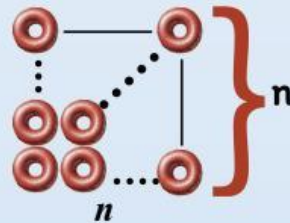1. In the arrangement of the numbers, do they have the same or different increasing patterns ?

   ..............................................................................................................................

2. Then how to determine the number pattern above ?

   ..............................................................................................................................

**From the above calculations, it is obtained:**
Formula of square number pattern

$$(\ldots\ldots) \times (\ldots\ldots)$$



So Mrs. Rani problem to find out the quantity of donuts in the 6th donut box can use the formula:

$Un = \ldots\ldots \times \ldots\ldots$     →    **1. Write Down The Formula**

$= (\ldots\ldots) \times (\ldots\ldots)$     →    **2. Fill With The Number**

$= \ldots\ldots\ldots$     →    **3. Calculate The Result**

So, the number of donuts to prepare to arrange the 6th donut box is ................ donuts.

# WORKSHEET (LKPD)
# TRIANGULAR NUMBER PATTERN

**Activity 2**

**Stimulation**

During the school vacation, Susan and Santi traveled to Jogjakarta. One of the tourist attractions they both visited was Ngayogyakarta Hadiningrat Palace. Ngayogyakarta Palace keeps many antique objects belonging to the previous kings. The items are neatly stored in the wards around the palace. At the front of the ward there are many miniature houses called jodhangan. The roof of the jodhangan is arranged in such a way that it looks neat. Take a look at the picture beside

**Problem Statement**

*Look at the pattern !*

Based on the above problems, the shape of the jodhangan roof forms a pattern

Nth Pattern -     1          2              3
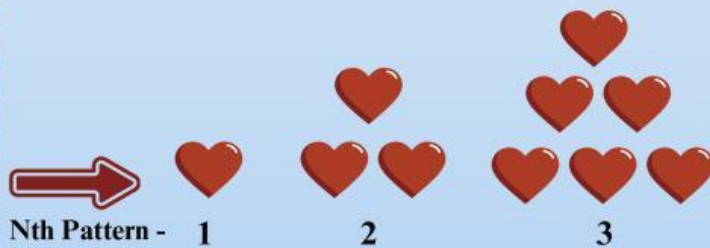
*Based on the above problems, what shape do you see in the pattern ? ...........*
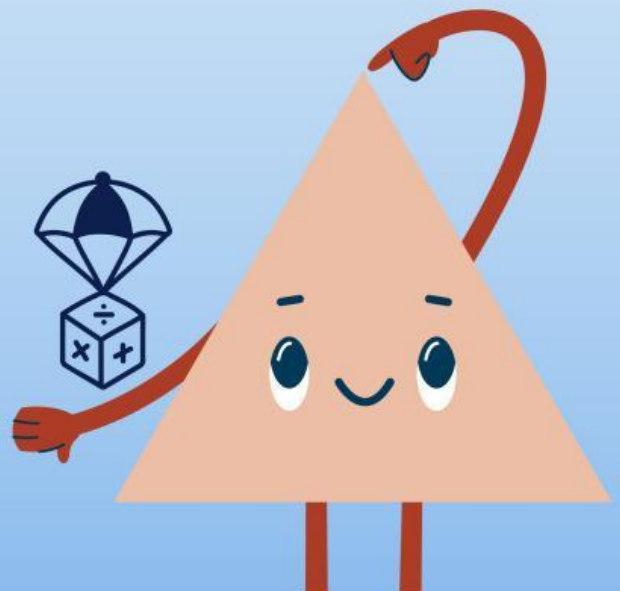
## WORKSHEET (LKPD)
## TRIANGULAR NUMBER PATTERN

**Data Collection**

Represent the number pattern you have obtained with a heart-symbol ( ❤ ) to represent each number

**Triangular Number Pattern**

| Pattern Representation | ❤ | ❤❤ | ❤❤❤ | ❤❤❤❤ | |
|---|---|---|---|---|---|
| Nth-Arrangement | 1 | 2 | 3 | 4 | dst ($n$) |
| Amount | 1 | 3 | ........ | ......... | |

# WORKSHEET (LKPD)
# TRIANGULAR NUMBER PATTERN

**Data Processing**

In determining the odd number pattern formula, we can apply the concept of operations on integers, namely multiplication and division operations, pay attention to the pattern that has been drawn before. Then fill and complete the table below!

| Nth-term | Shape Pattern | Object Generalization | Amount of Pattern | Calculation |
|---|---|---|---|---|
| $U_1$ |  |  | 1 | $\dfrac{(1) \times (2)}{2}$ |
| $U_2$ |  |  | 3 | $\dfrac{(2) \times (3)}{2}$ |
| $U_3$ |  |  | 6 | $\dfrac{( \dots ) \times ( \dots )}{2}$ |
| ....... | ................ | ...................... | ......... | ...................... |
| $U_n$ |  |  $n + 1$ $n$ | .......... | $\dfrac{( \dots\dots ) \times ( \dots\dots )}{2}$ |

## WORKSHEET (LKPD)
## TRIANGULAR NUMBER PATTERN

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### Generalization

From the representation stage that has been made.

1. In the arrangement of the numbers, do they have the same or different increasing patterns ?

   .................................................................................................................................

2. Then    how    to    determine    the    number    pattern    above    ?

   .................................................................................................................................

*From the above calculations, it is obtained:*

Formula of tiangular number pattern

$$\frac{(\,\ldots\ldots\,) \times (\,\ldots\ldots\,)}{2}$$

$n + 1$

$n$