Concept: Patterns, Patterns, Patterns

Name:

COMPUTER COMPONENT

Instructions: In UMATH X follow the **Content Menu** path:

Algebra > Patterns, Patterns, Patterns

Work through all Sub Lessons of the following Lessons **in order**:

- *Output is Pattern*
- *Object Patterns*
- *Number Patterns*
- *Sequences*
- *Generating & Comparing Number Patterns*
- *Sum of a Sequence*
- *Patterns to Formulas*
- *Factor Pairs in Arrays*
- *Prime and Composite*
- *Common Factors/GCF*
- *Patterns in the Multiplication Table*
- *Sieve of Eratosthenes*
- *Patterns with 9*

As you work through the computer exercises, you will be prompted to make notes in your notebook/math journal.

Patterns are all around us…

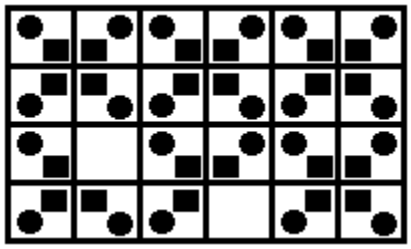
OFF COMPUTER EXERCISES

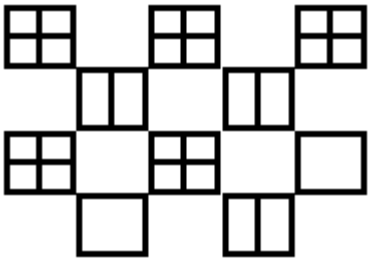
1. Extend each picture pattern by drawing the next 5 shapes.

(a)  _____ _____ _____ _____ _____

(b)  _____ _____ _____ _____ _____

(Complete each picture pattern by drawing the missing pieces.)

(c) 

(d) 

2. Extend each number pattern by writing the next 5 numbers.

(a) 34, 39, 44, 49, 54, _____, _____, _____, _____, _____

(b) 2, 6, 14, 30, 62, _____, _____, _____, _____, _____

(c) 11, 6, 9, 4, 7, _____, _____, _____, _____, _____

(d) 5, 5, 10, 15, 25, _____, _____, _____, _____, _____

(e) 4, 5, 7, 10, 14, _____, _____, _____, _____, _____

3. A pattern of blocks looks like this:

How many blocks would be in the 7^{th} design? _____

How many blocks would be in the 10^{th} design? _____

How many blocks would be in the 13^{th} design? _____

Explain your thinking. Did you need to draw each pattern to determine the 10^{th} design? Is there a more efficient way?

---

4. Write the formula for the following patterns.

(a)

COLUMN 1	COLUMN 2
1	2
2	6
3	10
4	14
5	18

The formula is: _____

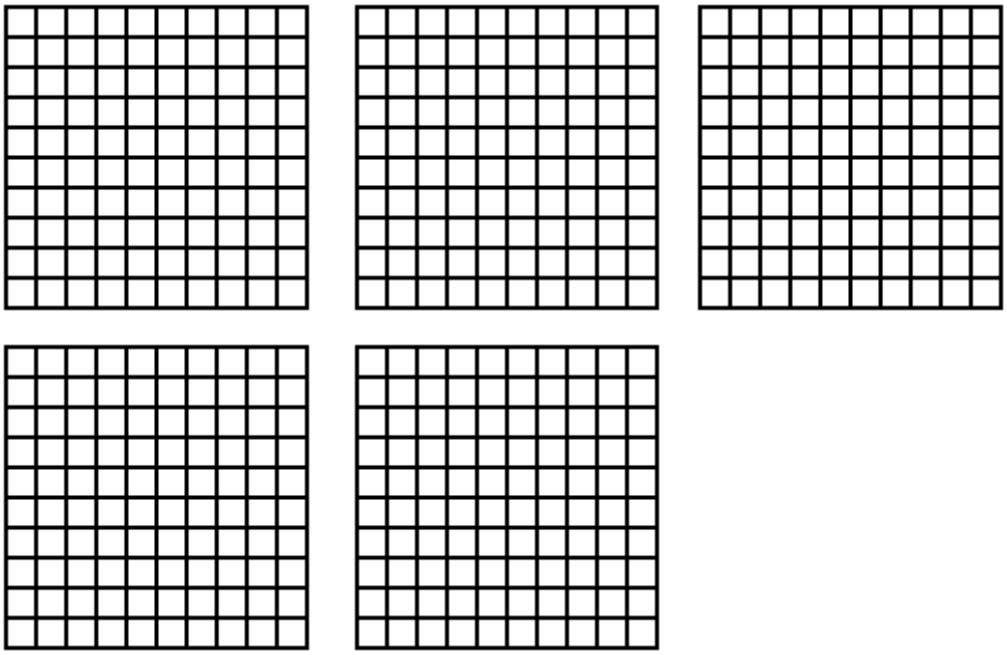
(b)

COLUMN 1	COLUMN 2
1	4
2	7
3	10
4	13
5	16

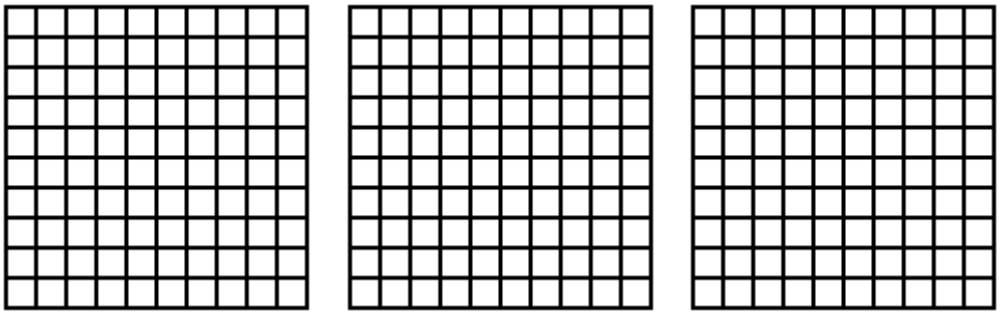
The formula is: _____

5.

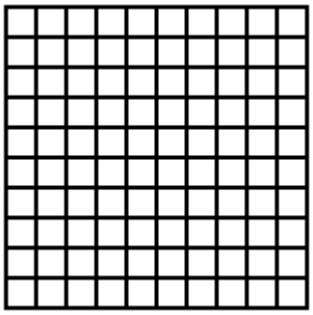
(a) Draw all the possible rectangles containing 16 squares.



(b) Draw all the possible rectangles containing 8 squares.



For thought… Is a square a rectangle?



6.
(a) Circle the numbers that are prime numbers.

31	8	12	5	13	3	40	7	18

(b) Circle the numbers that are composite numbers.

2	83	71	85	43	6	1	27	14

Is it possible to have an even number that is prime? If so, give an example

_____

How many composite numbers, ending in '7', can you come up with. NOTE: List as many as you can up to 100.

_____

7. ***MATH IN ACTION***

First, some interesting chocolate facts:

- Cacao is a tree, native to South America, whose seeds are the source of cocoa and chocolate.
- Chocolate manufacturers currently use 40% of the world's almonds and 20% of the world's peanuts.
- The U.S. produces more chocolate than any other country but the Swiss consume the most, followed closely by the English. Americans prefer milk chocolate, but dark chocolate's popularity is growing rapidly.

www.tea-or-chocolate.com/chocolate-facts.html

There are 36 peanut chocolate bars, 12 almond chocolate bars, and 30 dark chocolate bars. We want to put the same number of each chocolate bar into boxes to sell.

How many of each chocolate bar will go in the boxes, to ensure that they all have exactly the same contents?

Remember: If it is possible, it is always a good idea to show your solutions to a problem using pictures/diagram, numbers and words. This will allow for you to demonstrate your thought process in a variety of ways.

Pictures/Diagrams	***Numbers/Calculation***
Words/Written Explanation	How many boxes can we have? What is this number called?

8.
(a) Complete this multiplication table by filling in the boxes.

X	1	2	3	4	5	6	7	8	9	10	11	12
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												

(b) What is the Sieve of Eratosthenes and how does it help you find the prime numbers from up to 100? Try listing those prime numbers in the space below.

_____

_____

_____

(c) What is the pattern of the multiples of 9? Show a few examples by adding the digits in the multiples.

_____

_____

_____