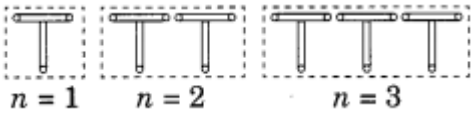
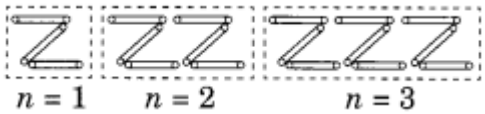
SNBP International & Sr. Secondary School, Chikhali, Pune.
Affiliation No. 1130703
Academic session 2024-25
Notes-(Term-2)
Sub-math

Prepared by -Pranjali Patil L-11 Algebra

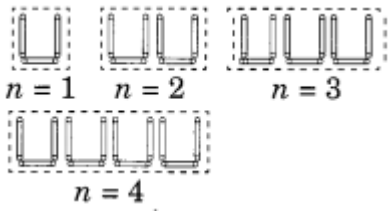
Ex 11.1 Class 6 Maths Question 1.
Find the rule which gives the number of matchsticks required to make the following match-sticks patterns. Use a variable to write the rule.
(a) A pattern of letter T as T
(b) A pattern of letter Z as Z
(c) A pattern of letter U as U
(d) A pattern of letter V as V
(e) A pattern of letter E as E
(f) A pattern of letter S as S
(g) A pattern of letter A as A
Solution:

(a) 

Number of matchstieks required to make the pattern of T
For n = 1 is 2 x n
For n = 2 is 2 x n
For n = 3 is x n
∴ Rule is 2n where n is number of Ts.

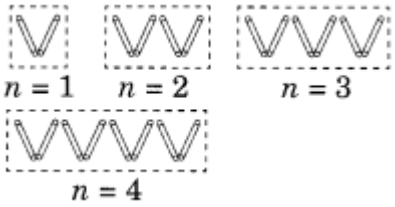
(b) 

Number of matchstieks required to make the pattern of Z.
For n = 1 is 3 x n
For n = 2 is 3 x n
For n = 3 is 3 x n
∴ Rule is 3n where n is number of Zs.

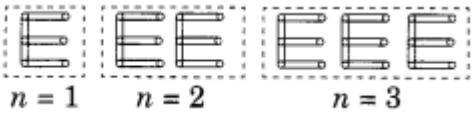
(c) 

Number of matchstieks required to make the pattern U.
For n = 1 is 3 x n

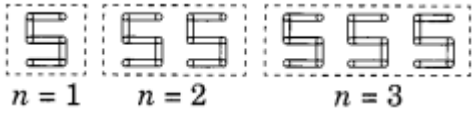
For n = 2 is 3 x n
For n = 3 is 3 x n
For n = 4 is 3 x n
∴ Rule is 3n where n is number of Us.

(d) 

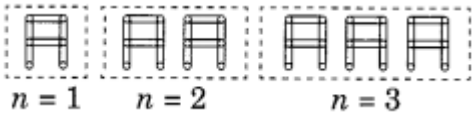
Number of matchstieks required
For n = 1 is 2 x n
For n = 2 is 2 x n
For n = 3 is 2 x n
For n = 4 is 2 x n
∴ Rule is 2n where n is number of Vs.

(e) 

Number of matchstieks required
For n = 1 is 5 x n
For n = 2 is 5 x n
For n = 3 is 5 x n
∴ Rule is 5n where n is number of Es.

(f) 

Number of matchstieks required
For n = 1 is 5 x n
For n = 2 is 5 x n
For n = 3 is 5 x n
∴ Rule is 5n where n is number of Ss.

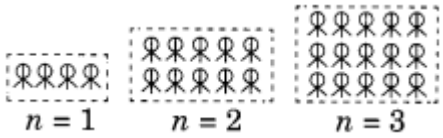
(g) 

Number of matchstieks required
For n = 1 is 6 x n
For n = 2 is 6 x n
For n = 3 is 6 x n
∴ Rule is 6n where n is number of As.

Ex 11.1 Class 6 Maths Question 2.
We already know the rule for the pattern of letters L, C and F. Some of the letters from Ql.

(given above) give us the same rule as that given by L. Which are these? Why does this happen?
Solution:
Rule for the following letters
For L it is 2n
For C it is 2n
For V it is 2n
For F it is 3n
For T it is 3n
For U it is 3n
We observe that the rule is same of L, V and T as they required only 2 matchstieks.
Letters C, F and U have the same rule, i.e., 3n as they require only 3 sticks.

Ex 11.1 Class 6 Maths Question 3.
Cadets are marching in a parade. There are 5 cadets in a row. What is the rule which gives the number of cadets, given the number of rows? (use n for the number of rows.)
Solution:
Number of cadets in a row = 5
Number of rows = n



Number of cadets
For n = 1 is 5 x n
For n = 2 is 5 x n
For n = 3 is 5 x n
∴ Rule is 5n where n is the number of rows.

Ex 11.1 Class 6 Maths Question 4.
If there are 50 mangoes in a box, how will you write the total number of mangoes in terms of the number of boxes? (Use b for the number of boxes.)
Solution:
Number of boxes = b
Number of mangoes in a box = 50
Number of mangoes,
For n = 1 is 50 x b
For n = 2 is 50 x b
For n = 3 is 50 x b
∴ Rule is 50b where b represents the number of boxes.

Ex 11.1 Class 6 Maths Question 5.
The teacher distributes 5 pencils per student. Can you tell how many pencils are needed, given the number of students? (Use s for the number of students.)
Solution:
Number of students = s
Number of pencils distributed per students = 5
Number of pencils required
For n = 1 is 5 x s

For n = 2 is 5 x s
For n = 3 is 5 x s
∴ Rule is 5s where s represents the number of students.

Ex 11.1 Class 6 Maths Question 6.
A bird flies 1 kilometre in one minute. Can you express the distance covered by the bird in terms of is flying time in minutes? (Use t for flying time in minutes.)
Solution:
Distance covered in 1 minute = 1 km.
The flying time = t
Distance covered
For n = 1 is 1 x t km
For n = 2 is 1 x t km
For n = 3 is 1 x t km
∴ Rule is 1.t km where t represents the flying time.

Ex 11.1 Class 6 Maths Question 7.
Radha is drawing a dot Rangoli (a beautiful pattern of lines joining dots with chalk powder. She has a dots in a row. How many dots will her rangoli have for r rows? How many dots are there if there are 8 rows? If there are 10 rows?
Solution:
Number of rows = r
Number of dots in a row drawn by Radha = 8
∴ The number of dots required
For r = 1 is 8 x r
For r = 2 is 8 x r
For r = 3 is 8 x r
∴ Rule is 8r where r represents the number of rows.
For r = 8, the number of dots = 8 x 8 = 64
For r = 10, the number of dots = 8 x 10 = 80

Ex 11.1 Class 6 Maths Question 8.

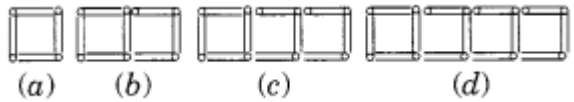
Leela is Radha's younger sister. Leela is 4 years younger than Radha. Can you write Leela's age in terms of Radha's age? Take Radha's age to be x years.
Solution:
Radha's age = x yeas.
Given that Leela's age
= Radha's age – 4 years
= x years – 4 years
= (x – 4) years

Ex 11.1 Class 6 Maths Question 9.
Mother has made laddus. She gives some laddus to guests and family members, still 5 laddus remain. If the number of laddus mother gave away is l, how many laddus did she make?
Solution:
Given that the number of laddus given away = l

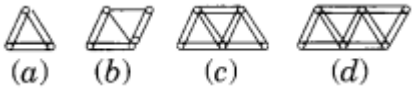
Number of laddus left = 5
∴ Number of laddus made by mother = l + 5

Ex 11.1 Class 6 Maths Question 10.
Oranges are to be transferred from larger boxes into smaller boxes. When a large box is emptied, the oranges from it fill two smaller boxes and still 10 oranges remain outside. If the number of oranges in a small box are taken to be x, What is the number of oranges in the larger box?
Solution:
Given that, the number of oranges in smaller box = x
∴ Number of oranges in bigger box = 2(number of oranges in small box) + (Number of oranges remain outside)
So, the number of oranges in bigger box = 2x + 10

Ex 11.1 Class 6 Maths Question 11.
(a) Look at the following matchstick pattern of square. The squares are not separate. Two neighbouring squares have a common matchstick. Observe the patterns and find the rule that gives the number of matchsticks in terms of the number of squares.
(Hint: If you remove the vertical stick at the end, you will get a pattern of Cs)



(b) Following figure gives a matchstick pattern of triangles. As in Exercise 11(a) above, find the general rule that gives the number of matchsticks in terms of the number of triangles.



Solution:
(a) Let n be the number of squares.
∴ Number of matchsticks required
For n = 1 is 3 x n + l = 3n + 1 = 4
For n = 2is 3 x n + l = 3n + 1 = 7
For n = 3is 3 x n + l = 3n + 1 = 10
For n = 4is 3 x n + l = 3n + 1 = 13
∴ Rule is 3n + 1 where n represents the number of squares.

(b) Let n be the number of triangles.
∴ Number of matchsticks required
For n = 1 is 2n + 1 = 3
For n = 2 is 2n + 1 = 5
For n = 3 is 2n + 1 = 7
For n = 4 is 2n + 1 = 9
∴ Rule is 2n + 1 where n represents the number of matchsticks.

Exercise 11.1

Question 1:

Find the rule which gives the number of matchsticks required to make the following matchstick patterns. Use a variable to write the rule.

(a) A pattern of letter T as **T**

(b) A pattern of letter Z as **Z**

(c) A pattern of letter U as **U**

(d) A pattern of letter V as **V**

(e) A pattern of letter E as **E**

(f) A pattern of letter S as **S**

(g) A pattern of letter A as **A**

Answer:

(a)

From the figure, it can be observed that it will require two matchsticks to make a **T**. Therefore, the pattern is $2n$.

(b)

From the figure, it can be observed that it will require three matchsticks to make a **Z**. Therefore, the pattern is $3n$.

(c)

From the figure, it can be observed that it will require three matchsticks to make a **U**. Therefore, the pattern is 3*n*.

(d)

From the figure, it can be observed that it will require two matchsticks to make a **V**. Therefore, the pattern is 2*n*.

(e)

From the figure, it can be observed that it will require five matchsticks to make an **E**. Therefore, the pattern is 5*n*.

(f)

From the figure, it can be observed that it will require five matchsticks to make a **S**. Therefore, the pattern is 5*n*.

(g)

From the figure, it can be observed that it will require six matchsticks to make an **A**. Therefore, the pattern is $6n$.

Question 2:

We already know the rule for the pattern of letters L, C and F. Some of the letters from some of the letters out of (a) T, (b) Z, (c) U, (d) V, (e) E, (f) S, (g) R give us the same rule as that given by L. Which are these? Why does this happen?

Answer:

It is known that L requires only two matchsticks. Therefore, the pattern for L is $2n$. Among all the letters given above in question 1, only T and V are the two letters which require two matchsticks.

Hence, (a) and (d)

Question 3:

Cadets are marching in a parade. There are 5 cadets in a row. What is the rule which gives the number of cadets, given the number of rows? (Use n for the number of rows.)

Answer:

Let number of rows be n.

Number of cadets in one row = 5

Total number of cadets = Number of cadets in a row × Number of rows

$= 5n$

Question 4:

If there are 50 mangoes in a box, how will you write the total number of mangoes in terms of the number of boxes? (Use b for the number of boxes.)

Answer:

Let the number of boxes be b.

Number of mangoes in a box = 50

Total number of mangoes = Number of mangoes in a box × Number of boxes

$= 50b$

Question 5:

The teacher distributes 5 pencils per student. Can you tell how many pencils are needed, given the number of students? (Use s for the number of students.)

Answer:

Let the number of students be s.

Pencils given to each student = 5

Total number of pencils

= Number of pencils given to each student × Number of students

$= 5s$

Question 6:

A bird flies 1 kilometer in one minute. Can you express the distance covered by the bird in terms of its flying time in minutes? (Use t for flying time in minutes.)

Answer:

Let the flying time be t minutes.

Distance covered in one minute = 1 km

Distance covered in t minutes = Distance covered in one minute × Flying time

$= 1 \times t = t$ km

Question 7:

Radha is drawing a dot Rangoli (a beautiful pattern of lines joining dots with chalk powder. She has 9 dots in a row. How many dots will her Rangoli have for r rows? How many dots are there if there are 8 rows? If there are 10 rows?

Answer:

Number of dots in 1 row = 9

Number of rows = r

Total number of dots in r rows = Number of rows × Number of dots in a row

$= 9r$

Number of dots in 8 rows = $8 \times 9 = 72$

Number of dots in 10 rows = $10 \times 9 = 90$

Question 8:

Leela is Radha's younger sister. Leela is 4 years younger than Radha. Can you write Leela's age in terms of Radha's age? Take Radha's age to be x years.

Answer:

Let Radha's age be x years.

Leela's age = Radha's age − 4

= $(x - 4)$ years

Question 9:

Mother has made laddus. She gives some laddus to guests and family members; still 5 laddus remain. If the number of laddus mother gave away is l, how many laddus did she make?

Answer:

Number of laddus given away = l

Number of laddus remaining = 5

Total number of laddus = Number of laddus given away + Number of laddus remaining

= $l + 5$

Question 10:

Oranges are to be transferred from larger boxes into smaller boxes. When a large box is emptied, the oranges from it fill two smaller boxes and still 10 oranges remain outside. If the number of oranges in a small box are taken to be x, what is the number of oranges in the larger box?

Answer:

Number of oranges in one small box = x

Number of oranges in two small boxes = $2x$

Number of oranges left = 10

Number of oranges in the large box = Number of oranges in two small boxes + Number of oranges left

= $2x + 10$

Question 11:

(a) Look at the following matchstick pattern of squares. The squares are not separate. Two neighbouring squares have a common matchstick. Observe the patterns and find the rule that gives the number of matchsticks in terms of the number of squares. (Hint: if you remove the vertical stick at the end, you will get a pattern of Cs.)

(a) (b) (c) (d)

(b) The given figure gives a matchstick pattern of triangles. Find the general rule that gives the number of matchsticks in terms of the number of triangles.

(a) (b) (c) (d)

Answer:

(a) It can be observed that in the given matchstick pattern, the number of matchsticks are 4, 7, 10, and 13, which is 1 more than thrice of the number of squares in the pattern.

Hence, the pattern is $3n + 1$, where n is the number of squares.

(b) It can be observed that in the given matchstick pattern, the number of matchsticks are 3, 5, 7, and 9, which is 1 more than twice of the number of triangles in the pattern.

Hence, the pattern is $2n + 1$, where n is the number of triangles.

QUICK RESOURCES

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