# Grade 4 Mathematics
Week of February 1 – February 5

Lesson 5.1: Patterns and Sequences

Lesson Materials
- Lessons for Section 5.1 Patterns and Sequences
- Equations Learning Guide (This PDF)

Use the link above to open the lessons for this section. Remember: on the lesson page, use the arrow next to the "Table of Contents" at the **top of the page** to move through the lessons. You can also click on the Table of Contents to open the menu so you can jump to a specific lesson page.
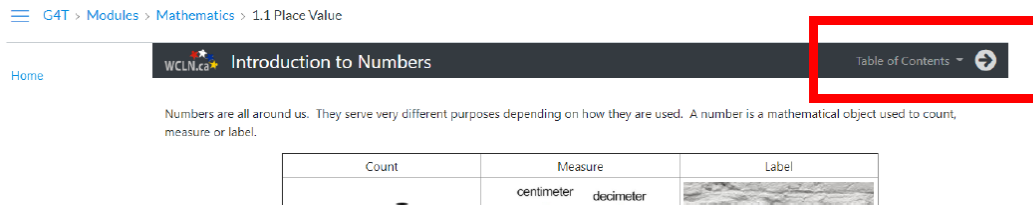
Work through the online lessons for this section. You can work at your own pace or follow the suggested schedule below. Complete the activities in your Learning Guide as you work through the lessons. You can print the Learning Guide, or, copy out the questions on a separate piece of paper. Be sure to try the games and practice quizzes as you make your way through the online lesson book.

Suggested Lesson Schedule

Monday	Thursday
• Introduction • Increasing Patterns 1 • LG 5.1 p. 1-2, #1-3	• Increasing and Decreasing Patterns • LG p. 6-7, #13
Tuesday • Increasing Patterns 2 • LG p. 3-4, #4-7	**Friday** • Using Words to Describe Patterns • LG p. 7-8, #14-15
Wednesday • Decreasing Patterns • LG p. 4-6, #8-12	

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Name: _____

UNIT 5 LEARNING GUIDE – EQUATIONS

INSTRUCTIONS:

Using a pencil complete the following questions as you work through the related lessons. Show ALL of your work as is explained in the lessons. Do your best and always ask questions if there is anything that you don't understand.

5.1 PATTERNS AND SEQUENCES

1. STEP 1: Find the gap between pairs of numbers in the sequence.
    STEP 2: Say the last number in the sequence with your fist closed. Count by ones until you have raised fingers based on the gap between the numbers.
    STEP 3: Each number in the sequence is called a term. Continue adding terms to extend the sequence.

    a) ◯ ◯ ◯ ◯ ◯ ◯
        5, 7, 9, 11, 13, _____,_____

    b) ◯ ◯ ◯ ◯ ◯ ◯
        4, 9, 14, 19, 24, _____,_____

    c) ◯ ◯ ◯ ◯ ◯
        2, 10, 18, 26, _____,_____

    d) ◯ ◯ ◯ ◯
        154, 157, 160, _____,_____

2. Match each sequence with the phrase that describes it:

    a) A …. Increases by 4 each time
        B …. Increases by different amounts

        _____ 2 , 6 , 11 , 17
        _____ 2 , 6 , 10 , 14

b)   A …. Increases by 3 each time
         B …. Increases by different amounts

         _____ 32 , 35 , 38 , 41
         _____ 42 , 45 , 50 , 57

c)   A …. Increases by 5 each time
         B …. Increases by different amounts

         _____ 242 , 247 , 253 , 260
         _____ 422 , 427 , 432 , 437

3.   a) Noah has $139 in savings. Noah gets a weekly allowance of $8 and saves it all. How much money will they have after the fourth week?

         ◯   ◯   ◯   ◯

_____,_____, _____,_____,_____

         b) George's puppy is 12 cm tall in the first month. It grows 4 cm in each month that follows.
         How tall is George's puppy after four months?

         ◯   ◯   ◯   ◯

_____,_____, _____,_____,_____

         c) Sally wants to buy a basketball that cost $47. She saves $12 in the first month and $7 in each month that follows. How many months does it take her to save enough money? Write a sequence to solve.

         It takes _____ months.

4. Write a sequence on a chart to solve:

A saltwater crocodile is about 23 cm long when it is born. In the first four months, it grows 5 cm every month. How long is a two-month old? A four-month old?

- On the following chart, first fill in the circles to show how much the number will increase or "go up" each month.

- Then, fill in the numbers. Remember, the crocodile is about 23 cm long at birth.

Birth		◯
1 month old		◯
2 months old		◯
3 months old		◯
4 months old		

5. Like tree trunks, dinosaur bones have growth rings that show yearly periods of rapid and slow growth. By studying growth rings in Tyrannosaurus bones, scientists can estimate how fast the animal was growing at different times in its life and how old individual animals were when they died.

a) Between about 14 and 18 years of age, the animal gained almost 70 kilograms a month! How many kilograms did this animal gain in 6 months during this growth period?

```
    +70      +70       +70       +70
0 ,  70 ,  140 , _____, _____, _____, _____
 (1 month) (2 months)  (3 months)  (4 months)  (5 months)  (6 months)
```

b) A 14-year-old T-Rex is 300 cm long and grows 14 cm every month. Complete the sequence to answer the questions:

A. How long is it at the age of 14 years and 1 month? _____

B. 14 years and 2 months? _____

C. 14 years and 6 months? _____

```
300,    _____, _____, _____, _____, _____, _____
14 years + ( 1 month)  (2 months)  (3 months)  (4 months)  (5 months)  (6 months)
```

6. At birth, a baby blue whale weighs 2700 kg. Each hour it gains 4 kilograms.

        A.   How much does a two-hour-old baby weigh? _____

        B.   A 4-hour old? _____

        C.   BONUS: How much does a 24-hour old whale weigh? _____

2700, _____, _____, _____, _____, _____, _____
Birth.   (1 hour)   (2 hours)   (3 hours)   (4 hours)   (5 hours)   (6 hours)

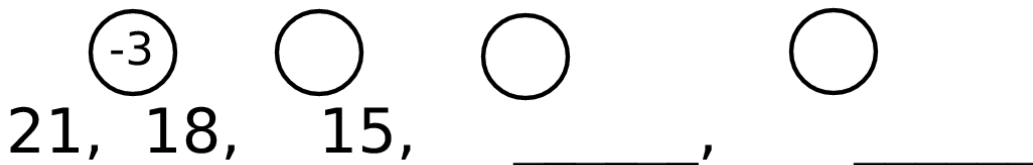7. Create a word problem that goes with the sequence:
    7 , 9 , 11 , 13 , _____ , _____

8.   **STEP 1**: Find the gap between pairs of numbers in the sequence. Check that the gap is always the same. If so, record the gap.
STEP 2: Say the last known number in the sequence and count backward based on the known gap to find the next number in the sequence.
STEP 3: Each number in the sequence is called a term. Continue adding terms to extend the sequence.
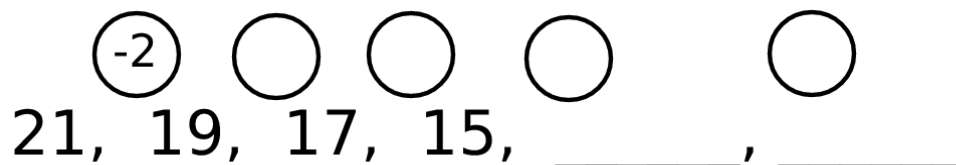
a)
(-3)   ( )   ( )   ( )
21, 18,   15,   _____ ,   _____

b)
(-2) ( ) ( ) ( )   ( )
21, 19, 17, 15,   _____ , _____

c)
( ) ( ) ( )   ( )   ( )
47, 40, 33, _____ , _____ , _____

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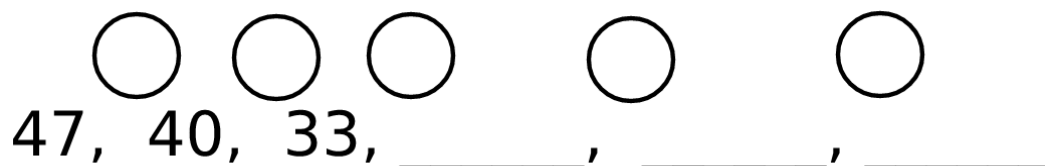
d)

○ ○ ○   ○   ○

236, 231, 226, ____ , _____ , _____

9. Match each sequence with the phrase that describes it:

a)   A …. Decreases by 4 each time
        B …. Decreases by different amounts

_____ 22 , 18 , 14 , 10
_____ 22 , 18 , 13 , 8

b)   A …. Decreases by 3 each time
        B …. Decreases by different amounts

_____ 32 , 29 , 25 , 20
_____ 42 , 39 , 36 , 33

c)   A …. Decreases by 5 each time
        B …. Decreases by different amounts

_____ 242 , 237 , 232 , 227
_____ 242 , 237 , 233 , 230

10. A candle is 27 cm tall. It melts 2 cm every hour. How tall is the candle after 4 hours of burning?

○   ○   ○   ○

_____ , _____ , _____ , _____ , _____

11. Chris gets a monthly allowance of $20. After the first week he has $16 left, after the second week he has $12, and after the third week he has $8. If this pattern continues, how much money will she have after the fourth week?

○   ○   ○   ○

_____ , _____ , _____ , _____ , _____

12. Holli has $171 in savings. Holli spends about $5 per week. How much money will she have after the fourth week?

○ ○ ○ ○

_____,_____, _____,_____,_____

13 . In the following sequences, the gap between the numbers increases or decreases. Look for a pattern in the way the gap changes. Use the pattern to extend the number sequence.

a)

○ ○ ○ ○ ○

3, 5, 8, 12, ____, _____

b)

○ ○ ○ ○ ○

12, 15, 20, 27, ____, _____

c)

○ ○ ○ ○ ○

5, 7, 11, 17, ____, _____

d)

○ ○ ○ ○ ○

18, 17, 15, 12, ____, _____

e)

○ ○ ○ ○ ○

44, 42, 38, 32, ____, _____

f)

〇 〇 〇 〇 〇

51, 50, 47, 42, _____, _____

g)

〇 〇 〇 〇 〇 〇

210, 205, 195, 180, 160, _____, _____

14. Extend the sequences according to the rules:

a) (Start at 12. Add 15.) 12 , 27 , _____ , _____ , _____ , _____

b) (Start at 177. Subtract 12.) 177 , 165 , _____ , _____ , _____ , _____

c) (Start at 12. Add 102.) 12 , 114 , _____ , _____ , _____ , _____

d) (Start at 276. Subtract 21.) 276 , 255 , _____ , _____ , _____ , _____

e) (Multiply by .2) 3 , 6 , _____ , _____ , _____ , _____ , _____

f) (Add two previous numbers.) 1, 2 , 3 , 5 , 8 , _____ , _____ _____ , _____

15. Give the pattern rule. Start at _____. Add/Subtract _____ each time. Then, extend the pattern.

a) 2 , 6 , 10 , 14 , _____ , _____

_____

b) 32 , 29 , 26 , 23 , _____ , _____

_____

c) 422 , 427 , 432 , 437 , _____ , _____

_____

d) 32 , 36 , 40 , 44 , _____ , _____

_____

e) 560 , 554 , 548 , 542 , _____ , _____

_____