Student Name: _____

Class: _____

Due Date: _____

Introduction to Number Patterns

Essential Understanding:

Number patterns are sequences of numbers that follow a specific rule or relationship. Recognizing and extending these patterns is an essential skill in mathematics, as it helps us understand and describe the world around us.

Section 1: Identifying Number Patterns

Identify the next three numbers in each of the following patterns:

1. 2, 5, 8, 11, 14, ___

2. 1, 4, 7, 10, 13, ___

3. 3, 6, 9, 12, 15, ___

4. 10, 15, 20, 25, 30, ___

5. 2, 6, 12, 20, 30, ___

Section 2: Creating Number Patterns

Create your own number patterns using the given operations:

1. **Addition Pattern:** Start with 5 and add 3 each time. List the first 6 terms of the pattern.

2. **Subtraction Pattern:** Start with 20 and subtract 2 each time. List the first 6 terms of the pattern.

3. **Multiplication Pattern:** Start with 2 and multiply by 3 each time. List the first 6 terms of the pattern.

4. **Division Pattern:** Start with 24 and divide by 2 each time. List the first 6 terms of the pattern.

Section 3: Extending Number Patterns

Extend each of the following patterns by the next four terms:

1. 1, 2, 4, 8, 16, ___

2. 3, 6, 12, 24, 48, ___

3. 2, 4, 8, 16, 32, ___

4. 5, 10, 20, 40, 80, ___

5. 1, 3, 9, 27, 81, ___

Extension Activity 1: Research and Present

Research a real-world application of number patterns and prepare a short presentation to share with the class.

Some examples include:

- Finance: compound interest, investment growth
- Science: population growth, chemical reactions
- Architecture: design patterns, geometric shapes

Extension Activity 2: Pattern Puzzle

Solve the following number pattern puzzle:

2, 5, 10, 17, 26, ___

What is the next number in the pattern? Explain your reasoning.

Extension Activity 3: Create a Story

Create a short story that incorporates number patterns in a meaningful way.

This could involve a character who uses patterns to solve a problem or achieve a goal.

Conclusion

By completing this homework assignment, you have demonstrated your understanding of number patterns and mathematical relationships.

Remember to always show your working and calculations, and to check your answers carefully.

Success Criteria

To successfully complete this assignment, ensure you:

- Correctly identify and extend the given number patterns.
- Accurately create your own number patterns using addition, subtraction, multiplication, and division.
- Clearly show your working and calculations for each question.
- Complete the extension activities (if undertaken) to a high standard, demonstrating creativity and understanding.

Parent/Guardian Notes

To support your child with this assignment:

- Encourage independence, but be available to guide them if they get stuck.
- Check their understanding periodically to ensure they are not struggling with the patterns.
- Discuss real-world applications of number patterns to help them see the relevance and importance of this mathematical concept.
- Help your child manage their time effectively to complete the assignment within the given timeframe.
- Praise their effort and progress, not just their results, to foster a positive attitude towards learning mathematics.

Answers

Section 1:

1. 17, 20, 23
2. 16, 19, 22
3. 18, 21, 24
4. 35, 40, 45
5. 42, 56, 72

Section 2:

1. 5, 8, 11, 14, 17, 20
2. 20, 18, 16, 14, 12, 10
3. 2, 6, 18, 54, 162, 486
4. 24, 12, 6, 3, 1.5, 0.75

Section 3:

1. 32, 64, 128, 256
2. 96, 192, 384, 768
3. 64, 128, 256, 512
4. 160, 320, 640, 1280
5. 243, 729, 2187, 6561