To Parents and Adults at Home ...

Your child’s class is starting a mathematics unit on increasing and decreasing patterns. Recognizing and analysing patterns is an important part of mathematical thinking. Patterning concepts lead to work with algebra in higher grades.

In this unit, your child will:

- Identify, extend, create, and compare increasing patterns.
- Identify, extend, create, and compare decreasing patterns.
- Find pattern rules.
- Display number patterns on hundred charts.
- Use patterns to solve problems.

Patterns can be found all around us. Encourage your child to look for patterns around the home, and talk about them.

Here are some suggestions for activities you can do at home:

- Look for patterns in your family’s activities as marked on a calendar at home. What activities do you do daily? Twice a week? Every week?
- Use small objects like buttons or coins to make patterns that grow or shrink. Encourage your child to describe and extend the patterns.
- Count collections of nickels and dimes by 5s and by 10s. Count pennies by 2s.
- Find examples of geometric patterns in floor tiles or on game boards.
Lesson 1: Exploring Increasing Patterns

1. Use Pattern Blocks.
   Make the next 2 figures in each increasing pattern.
   a) 
      ![Pattern Blocks](image1.png)
      Figure 1  Figure 2  Figure 3
   b) 
      ![Pattern Blocks](image2.png)
      Figure 1  Figure 2  Figure 3

2. Write the pattern rule for each pattern in question 1.

Lesson 2: Creating Increasing Patterns

1. Start with 4 squares. Add 3 squares each time.
   Draw the first 3 figures of this pattern on grid paper.

2. Figure 3 is missing in this increasing pattern.
   ![Grid Pattern](image3.png)
   Figure 1  Figure 2  Figure 3  Figure 4

   Sketch what it should be.
   Explain how you know.
Lesson 3: Comparing Increasing Patterns

1. Look at this pattern.

   Figure 1  Figure 2  Figure 3  Figure 4

   a) Write the pattern rule.
   b) Make a different pattern that uses the same pattern rule.

2. Here is an increasing pattern.

   Figure 1  Figure 2  Figure 3  Figure 4

   Draw a pattern that uses:
   a) the same starting point but grows by a different amount
   b) a different starting point but grows by the same amount
Lesson 4: Increasing Number Patterns

1. Fill in the missing numbers. Write the pattern rule.
   a) 17, 27, 37, _____, _____, _____, _____
   b) 48, 50, _____, _____, _____, 58, _____

2. Write the first 6 numbers in each pattern.
   a) Start at 28. Add 10 each time.
   b) Start at 35. Add 5 each time.

3. Use numbers and words to describe this pattern.

<table>
<thead>
<tr>
<th>61</th>
<th>62</th>
<th>63</th>
<th>64</th>
<th>65</th>
<th>66</th>
<th>67</th>
<th>68</th>
<th>69</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>71</td>
<td>72</td>
<td>73</td>
<td>74</td>
<td>75</td>
<td>76</td>
<td>77</td>
<td>78</td>
<td>79</td>
<td>80</td>
</tr>
</tbody>
</table>

Lesson 6: Exploring Decreasing Patterns

1. Draw the next 2 figures in each decreasing pattern.
   a) Figure 1 Figure 2 Figure 3
   b) Figure 1 Figure 2 Figure 3

2. Write the pattern rule for each pattern in question 1.
Lesson 7: Creating and Comparing Decreasing Patterns

1. Here are 2 patterns.
   Pattern A
   \[
   \begin{array}{cccc}
   X \\
   X & X \\
   X & X & X \\
   X & X & X & X \\
   XX & XX & XX & XX \\
   \end{array}
   \]
   Figure 1 Figure 2 Figure 3 Figure 4

   Pattern B
   \[
   \begin{array}{cccc}
   XXX \\
   XXX & XXX \\
   XXX & XXX & XXX \\
   XXX & XXX & XXX & XXX \\
   \end{array}
   \]
   Figure 1 Figure 2 Figure 3 Figure 4

   a) Tell the pattern rule for each pattern.
   b) How are the patterns the same? How are they different?

Lesson 8: Decreasing Number Patterns

1. Copy each pattern. Write the pattern rule.
   Fill in the missing numbers.
   a) 85, 75, 65, ____ , ____ , ____ , ____
   b) 78, 76, ____ , ____ , ____ , 68, ____

2. Write the first 5 numbers in each pattern.
   a) Start at 66. Count back by 3s each time.
   b) Start at 75. Count back by 5s each time.

3. Use numbers and words to describe this pattern.

<table>
<thead>
<tr>
<th>80</th>
<th>79</th>
<th>78</th>
<th>77</th>
<th>76</th>
<th>75</th>
<th>74</th>
<th>73</th>
<th>72</th>
<th>71</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>69</td>
<td>68</td>
<td>67</td>
<td>66</td>
<td>65</td>
<td>64</td>
<td>63</td>
<td>62</td>
<td>61</td>
</tr>
</tbody>
</table>
### Game Cards: What’s the Pattern Rule?

#### Starting Point Cards

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Build Pattern Cards

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Add 1 square each time.</td>
<td>Add 1 square each time.</td>
<td>Add 2 squares each time.</td>
</tr>
<tr>
<td>Add 2 squares each time.</td>
<td>Add 3 squares each time.</td>
<td>Add 3 squares each time.</td>
</tr>
</tbody>
</table>