

LessonTitle: Patterns, Patterns, and More Patterns		Pre 5.9
Utah State Core Pre-algebra Standards 2.1, 2.3 Process Standards 1-5		
Summary		
This lesson involves the exploration of visual and numeric patterns and sequences. Students must analyze the patterns, generalize rules, and use the patterns to solve problems		
Enduring Understanding	Essential Questions	
Working with patterns is at the heart of mathematics. Generalizing and communicating about patterns enables problem solving, reasoning and critical thinking.	How do we identify and describe patterns? How do we use patterns to make predictions and solve problems?	
Skill Focus	Vocabulary Focus	
<ul style="list-style-type: none"> • Finding and communicating about patterns and sequences. • Making predictions and problem solving 		
Assessment		
Materials		
Launch		
Explore		
Summarize		
Apply		

Directions:

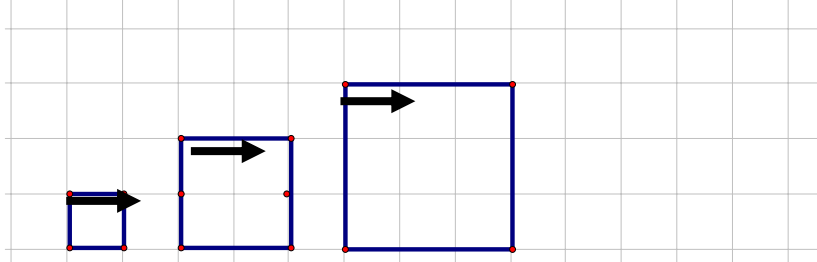
The exploration of patterns and sequences is very basic to algebraic thinking. Do not underestimate the value.

There are many pattern and sequence problems found below. The teacher may wish to use some of them as starters, some as group-work and others as homework.

Pre 5.9

Patterns, Patterns and More Patterns

1a) The following pattern shows the number of blocks Richard jogs each day with his new exercise program. Draw the figure for Day 4 and write the number of blocks Richard will jog.



b) Complete the table.

Day	1	2	3	4	5	8	14		
Blocks	4	8	12					64	92

c) Explain the pattern rule you used.

d) Tell how you found the number of days when you knew the number of blocks.

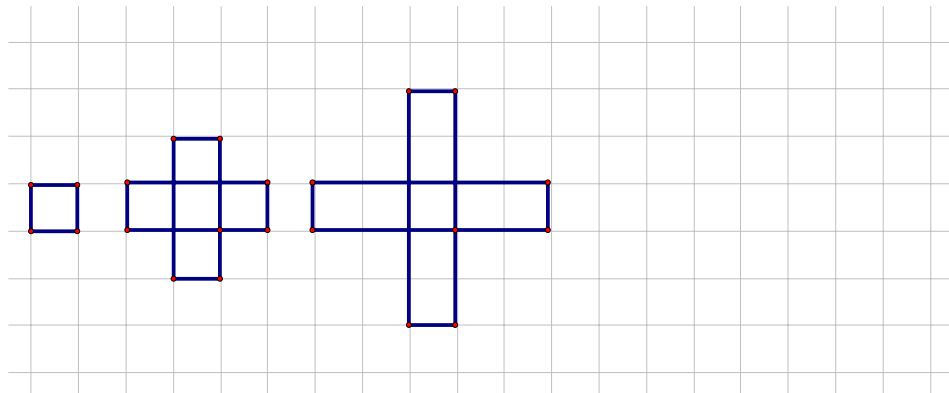
2a) In the following pattern the length of the sides of each square is 1 unit. Draw Figure 4 and write the area.

Figure 1 area _____

Figure 2 area _____

Figure 3 area _____

Figure 5 area _____



b) Complete the Table

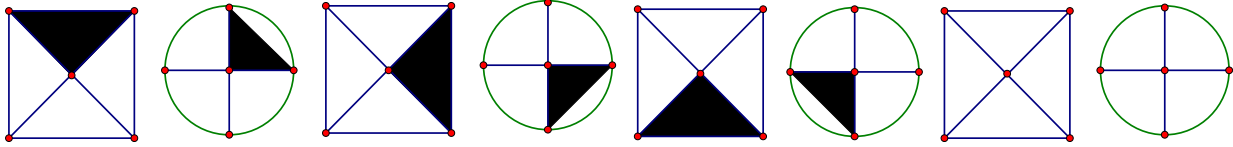
Figure	1	2	3	4	5	7	10	
Area (Square Units)	1	5	9	13				45

c) Explain the pattern rule you used.

d) Tell how you found the figure number when you knew the area.

3) Building Patterns:

a) Color in the missing parts of the pattern.



b) A display in a grocery store has soup cans stacked with 25 cans in the bottom row, 23 cans in the second row from the bottom, 21 cans in the third row from the bottom, etc.

How many soup cans are in the sixth row from the bottom? _____

What is the maximum number of rows possible in the display? _____

What is the maximum number of cans possible in the display? _____

4) Number Patterns: Write the next two numbers in each pattern.

a) 1, 1/3, 1/9, 1/27, 1/81, _____, _____, _____ b) 1.4, 1.9, 2.4, 2.9, _____, _____, _____

c) 1/2, 2/3, 3/4, 4/5, 5/6, _____, _____, _____ d) 80, 40, 20, 10, _____, _____, _____

e) 36, 33, 30, 27, _____, _____, _____ f) 1, 2, 4, 7, 11, _____, _____, _____

g) -2, 4, -8, 16, -32, _____, _____, _____ h) a, b, d, g, k, _____, _____, _____

5) Complete the table. Explain and write a rule for the pattern.

a) Explanation:

Number of Tickets	1	2	3	4	5	6	7
Total cost	\$3	\$6	\$9	\$12	\$15		

Rule:

b) Explanation:

Hours	1	2	3	4	5	6	7
Miles Driven	25	50	75	100	125		

Rule:

c) Explanation

Number of rides	0	1	2	3	4	5	8
Admission Charge	\$4	\$6	\$8	\$10	\$12		

Rule:

d) Explanation:

Feet	1	2	3	4	5	6	10
Yards	$\frac{1}{3}$	$\frac{2}{3}$	1	$1+\frac{1}{3}$	$1+\frac{2}{3}$		

Rule

6) Use the patterns to solve the problems below.

a) Lauren began her garden with 3 rosebushes. She plans to plant 2 new bushes every year. How many rosebushes will she have in the third year after she started her garden? Show your thinking.

b) Lee is wearing a striped tie. The first stripe is blue, the second stripe is green, and the third is yellow. Then the pattern repeats. What color is the eleventh stripe? _____

If the tie has a total of 40 stripes, how many of each color are there? How do you know?

c) Alicia started a volunteer group to help keep parks clean. In January, she was the only member. In February, she found 2 new members. In March, each group member found 2 new members. How many members did the group have at the end of March? _____

If the pattern continues, with each member finding 2 new members each month, how many members will the group have at the end of May? How did you find your answer?

d) Jason filled a row of 100 grid squares by writing his name over and over. What letter did he write in the 86th square? Explain how you found your answer.

e) A tank contains 16,000 gallons of oil. Each day, one-half of the oil in the tank is used and not replaced. How much oil is left in the tank at the end of the seventh day?

- f) The table shows the number of cars in a mall parking lot at different times. If the pattern continues, how many cars will be in the lot at noon? _____
 When will there be 600 cars in the lot? _____

Time	9 a.m.	9:30 a.m.	10:00 a.m.	10:30 a.m.
Number of cars	50	100	150	200

- g) The table shows the freshman class enrollment at Math University. If the pattern continues, how many students will be in the freshman class of 2005?

Year	1997	1998	1999	2000
Students	1000	980	950	910

Challenge: Phil is trying to figure out what method his boss uses to pay him. The first week he worked, Phil was paid only \$4. The next week he was paid \$15, then \$40, then \$85, and then \$156. Determine how much Phil will be paid for each of the next two weeks. Explain your method.