Algebra/Geometry Institute Summer 2006

Lesson Plan 1: Patterns and Sequence

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Grade Level: 6

1 Teaching Objective:

Mississippi Mathematics Framework (Sixth)

1. Apply the use of algebraic functions, patterns, sequences, and language

c. Recognize and continue a number pattern and/or geometric representation.

Objective: The student will recognize and continue established patterns

2 Instructional Activities:

Introducing the Lesson

Background information

A pattern is an arrangement of things repeated in an orderly, recognizable fashion. Numbers in a problem that are not given can be found by using established pattern.

The teacher begins by explaining that patterns in nature can show natural events. Examples would include the teacher drawing leaves, trees, or anything in nature using patterns. The teacher will also introduce key vocabulary: *rule, sequence, term, and term number*.

A sequence is an ordered list of objects or numbers, for example 3, 6, 9, 12, ...

Term Number	1	2	3	4	
Term	3	6	9	12	

Whole Group Practice Activity

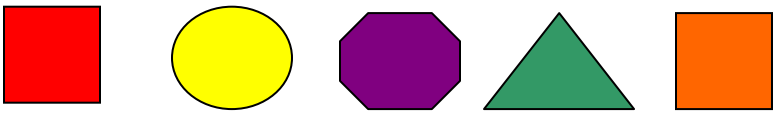
Draw a large circle on the board. Place two prime numbers in the center of the circle. Then have the students name any number. If the number they name fits in the pattern, write it in the circle. If it does not fit the pattern, write it outside the circle. Continue allowing students to name numbers until they figure out what the pattern is.

Pattern Block Activity

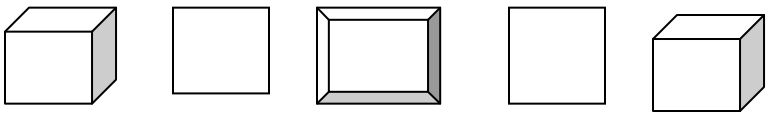
Students will use pattern blocks and work in pairs to construct a pattern. They will extend a pattern and state a rule for the pattern. To create a pattern, you use a rule. What is your rule for the pattern?

Guided Practice Activity

Ex. 1



For each figure: 1) look at the pattern, 2) state the rule, and 3) give the next two terms



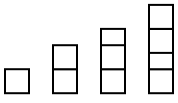
Ex. 2

1, 3, 5, 7, 9, 11, _____, _____, _____

Ex. 3

2, 4, 8, 16, 32, _____, _____, _____

Ex. 4



, _____, _____, _____

Activity- Crafty Calculations

1. **Make a transparency of the sample input-output tables shown below**
2. **Label an index card with an answer for each problem on each input/output table.**
3. **Construct the table and distribute it to each student.**

Activity- Crafty Calculations
Frequency Table

Steps

1. Explain how to recognize the rule to continue the output.
2. Distribute a labeled index card to each student. Then place the previously produced transparency on an overhead projector. Explain that in an input/output table, a rule is established, and then the answer is placed in the output side of the table.
3. Point out the first three input and output numbers on the first table. Have students identify the rule and find the next number for the output.
4. Have the student who has the index card labeled with the next number in the output table write the number in the correct place on the chart.
5. Continue the process to complete the table on the other two charts.

Input	Output
4	14
7	17
9	19
20	
6	
8	
0	
175	
14	
1.0	
3	
11	

Input	Output
4	16
7	28
9	36
1	
6	
10	
2	
12	
22	
8	
14	
11	

Input	Output
100	98
5	3
12	
17	
22	
2	
0	
-5	
52	
46	
32	
55	

3. Materials and Resources:

Billstein, Bill, Williamson, Jim Middle Grades Math Thematics Book 1, McDougal Littell, 2005.
Pattern Blocks
Pencil
Paper
1 transparency of input/output table
Transparency marker
Labeled index cards for each student

4. Assessment:

Assess student understanding of recognizing and continuing established patterns through small group activities and independent practice exercises. Have students construct their own input/output tables. Direct students to fill in the first three input/output functions. Then have students exchange papers with classmates to continue the pattern on the new paper.

Once students are comfortable with addition and subtraction patterns, set up input/output tables involving multiplication and division.

Give students practice identifying multiples of a number using patterns. Create a hundred chart table for each student. Direct them to fill in the multiples for numbers 1-10 with different colors. Some numbers may have more than one color. This allow students to see the multiples using the color patterns.

Yellow- multiples of 2
Red – multiples of 5
Red & Yellow multiples of 2 and 5
Blue, Red, and Yellow- multiples of 2, 5, and 10

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Input	Output
1	12
2	24
3	36
4	48
5	
6	
7	
8	
9	
10	
11	
12	