

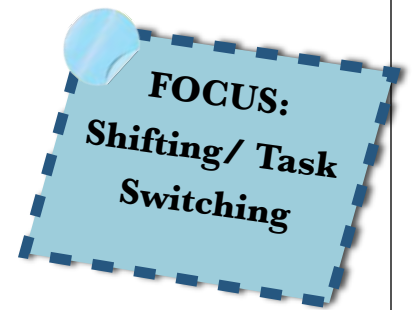
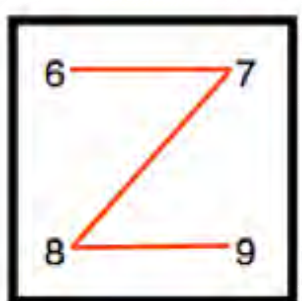
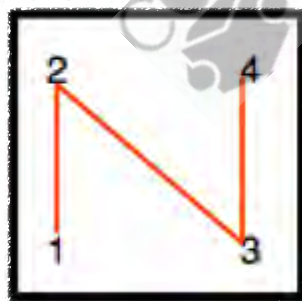
# SHIFTING PATTERNS

## LEARNING ABOUT SIZE AND VALUE WITH NUMBERS

### CURRICULUM TASK

#### Patterns and Reversal -- Z and N Test

One of the three components of Executive Functioning (or planning) is the ability for *shifting*. This ability is measured in the following task, requiring the participant to draw a line connecting a series of numbers within a box from smallest to largest in the correct sequence. The line drawn by the student will create either a “Z” pattern or an “N” pattern. This task also incorporates a reversal shift design which requires the student to shift their response from a Z to N shape, or N to Z shape. The Student Practice Set pages have 16 square frames on them. There are 4 numbers inside the square frame, one in each corner. The first few square frames may reinforce a stereotyped Z or N pattern, but then shift to the opposite. For example, the first four square frames could form a Z pattern, and then without notice, the patterns shift to N. This is an instance of reversal shift design.



#### Cognitive Processes:

*Planning/ Executive Functioning*  
*Simultaneous Processing*  
*Processing Speed*  
*Attention*

## Shifting Patterns Curriculum Instructions

### Description

There are two levels for the curriculum-based **Shifting Number Patterns** activities. The grade level corresponding to each level is based on general curricula for elementary schools. Level 1 tasks are recommended for students in Kindergarten to early grade one and require knowledge of number sequencing and addition by 1 and 2. Level 2 tasks are designed for students in grade 1. They require students to use their knowledge of number sequencing and addition by 1,2, 5, and 10 to complete the tasks.

Each item consists of a square frame with four numbers inside, one in each corner. The student must draw a line **connecting the numbers** within the box from **smallest to largest** in the correct sequence. Every fourth square frame will have only 3 numbers inside, one in each corner. The student will have to **fill in the missing number** and then draw a line connecting the numbers from smallest to largest.

The intention of the demonstration and sample items is to allow the student to discover the number pattern through their **own** thinking processes. The administrator should **not** mention what the rule is for the given set of numbers (i.e. adding by 2). This will allow the administrator to determine the child's understanding of the mathematical concept. If a child is unable to complete any of the sample items, the administrator should use questioning to help guide the child toward the correct response. In addition, more items should be provided for practice.

Following the demonstration and Sample items, the child will complete the Student Practice Set pages on their own. The administrator may time the child in order to track their progress.

### MATERIALS:

- Record Form
- Response Book
- Red Pencil
- Stop watch



### ADMINISTER:

- Demonstration A  
( items 1-4 )
- Sample A
- Student pages

### RECORD:

- Time to completion  
( in seconds )
- Number of items  
correct
- Observed and  
Reported Strategies  
(on Record form)

# SAMPLE ACTIVITY - MODULES FOR MATH

## *On the Record Form*

### Observed Strategies:

During the administration of this task, observe the strategy or strategies the child appears to be using.

Record these observations on the Record Form in the Observed Strategies column.

### Reported Strategies:

Once the student has completed a Student Practice Set page, point to it and say:

**Tell me how you did these.** (Point to the page completed by the child.)

**How did you know which numbers to connect?** (Allow time for child to respond. Clarify if necessary).

Record what the child says on the Record form in the Reported Strategies column of the Strategy Assessment Checklist.

## LEVEL 1

### TASK: Demonstration A ITEM 1

#### What the administrator says and does:

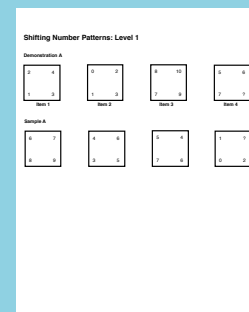
**“Look here** (point to demonstration A, item 1), **there are 4 numbers in this box. I am going to point to the numbers from smallest to largest. 1...2...3...4** (point to 1, 2, 3, 4). **Now I’m going to draw a line joining these numbers from smallest to largest.”**(Draw a line from 1 to 2 to 3 to 4).



**Immediately**  
correct **ALL** errors.  
Provide additional help as  
needed.

#### What the student sees:

“Shifting Number  
Patterns: Level 1” page  
in the Response Book





# SAMPLE ACTIVITY - MODULES FOR MATH

## TASK: Demonstration A

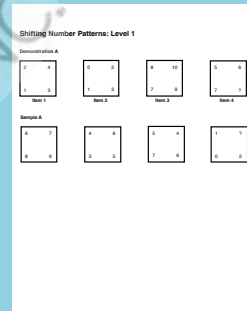
ITEM 2

### What the administrator says and does:

**“Lets do the next one.** (point to demonstration A, item 2). **There are 4 numbers in this box, too. Lets start by finding the smallest number. Can you point to the smallest number?** (Correct answer: 2). **What is the next number? And the next? And the last number? Now I am going to draw a line connecting these numbers, like you have told me, from smallest to largest”.**

### What the student sees:

“Shifting Number Patterns: Level 1” page in the Response Book



If response is **correct**, say: **“Good.”**

If response is **incorrect**: Provide guidance. For example, **“Is 2 a bigger number than 4?” The smallest number is 2. What number is next ?”**

### Immediately

correct **ALL** errors.  
Provide additional help as needed.

ITEM 3



**Student on their own.**

### What the administrator says and does:

Give the child the red pencil and say, **“Now you do this one** (point to demonstration A, item 3). **Start at the smallest number. Draw a line joining the numbers from smallest to largest.**(Student should draw a line from 7 to 8 to 9, then 10).



# SAMPLE ACTIVITY - MODULES FOR MATH

## TASK: Demonstration A

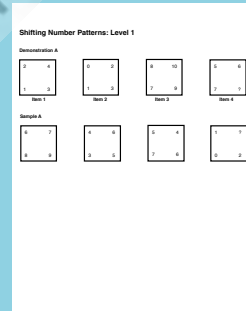
ITEM 4

### What the administrator says and does:

**“Now lets look at this last box** (point to demonstration A, item 4). **You will see that there are only three numbers instead of four. Your job is to decide what the missing number is and write it down beside the question mark.** (Allow time for child to writing missing number). **Now, I want you to connect the four numbers from smallest to largest, just like we did with the last three boxes. Are you ready?** (Provide clarification, if necessary). **Begin!”**

### What the student sees:

“Shifting Number Patterns: Level 1” page in the Response Book



**Immediately**  
correct **ALL** errors.

Provide additional help as  
needed.

If the response is **correct**, say: **“Good.”**

If the response is **incorrect** say: **“Where is the smallest number?** (Allow time for child to respond). **Ok, lets draw a line connecting the numbers from smallest to largest. What number do you think goes next?** (Allow time for child to respond). **Good!** (Continue to probe the child as needed).

## Sample A

### What the administrator says and does:

**“Now you do these** (point to the second row, Sample A in a sweeping motion from the child's left to right). **Start with the numbers in the first box. Draw a line connecting the numbers from smallest to largest. Then, move on to the next box until you reach the last box.** (point to the last box). **The last box will only have 3 numbers. Your job is to decide what the missing number is and write it down beside the question mark. Are you ready?** (Provide clarification, if necessary). **Begin!”**



# SAMPLE ACTIVITY - MODULES FOR MATH

## TASK: Shifting Number Patterns

### STUDENT PRACTICE SET 1

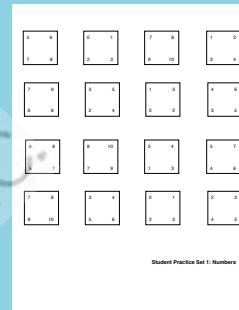
#### What the administrator says and does:

**“Look at this page. There are more of these tasks for you to do. I want you to do these** (point to the first row in a sweeping motion from the child's left to right), **then these** (point to the second row in a sweeping motion from the child's left to right) **row by row until you are all done. I don't want you to skip any of the boxes. Work as quickly as you can! If you make a mistake, cross it out, write the correct answer and keep going. Remember to draw your lines joining the numbers from smallest to largest. Are you ready?** (Provide clarification, if necessary). **Begin!”**

*\*Start timing and record the time to completion.  
Monitor and record strategy use.*

#### What the student sees:

“Student Practice Set 1:  
Numbers page in the  
Response Book



### STUDENT PRACTICE SET 1A

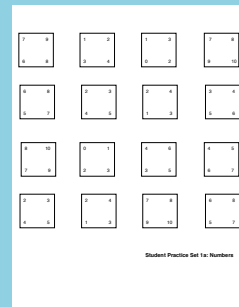
#### What the administrator says and does:

**“Now, do these** (point to the four rows from the child's left to right, top to bottom in a sweeping motion). **We are going to do the same thing we did on the first sheet. Remember to work as quickly as you can! Are you ready?** (Provide clarification, if necessary). **Begin!”**

*\*Start timing and record the time to completion.  
Monitor and record strategy use.*

#### What the student sees:

“Student Practice Set 1a:  
Numbers” page in the  
Response Book



**Immediately**  
correct **ALL** errors.  
Provide additional help as  
needed.

# SAMPLE ACTIVITY - MODULES FOR MATH

## Shifting Patterns

Level 1: Demonstration A and Sample A

### Demonstration A

2	4
1	3

Item 1

0	2
1	3

Item 2

8	10
7	9

Item 3

### Sample A

6	7
8	9

4	6
3	5

5	4
7	6

# SAMPLE ACTIVITY - MODULES FOR MATH

5	6
7	8

0	1
2	3

7	8
9	10

1	2
3	4

7	9
6	8

3	5
2	4

1	3
0	2

4	6
3	5

6	8
5	7

8	10
7	9

2	4
1	3

5	7
4	6

7	8
9	10

3	4
5	6

0	1
2	3

2	3
4	5

**Student Practice Set 1: Numbers**



# SAMPLE ACTIVITY - MODULES FOR MATH

7	9
6	8

1	2
3	4

1	3
0	2

7	8
9	10

6	8
5	7

2	3
4	5

2	4
1	3

3	4
5	6

8	10
7	9

0	1
2	3

4	6
3	5

4	5
6	7

2	3
4	5

2	4
1	3

7	8
9	10

6	8
5	7

**Student Practice Set 1a: Numbers**