

ATTRIBUTES AND PATTERNS WITH BUTTONS

Performance Standard 8A.B

Sort, create and analyze patterns using attribute buttons, verbalize sorting rules and patterns:

1. *Mathematical knowledge*: Identify attributes, recognize patterns and determine the missing item;
2. *Strategic knowledge*: Sort the buttons correctly by attributes, analyze the patterns and restate the pattern using letters;
3. *Explanation*: Explain how they sorted the buttons and why.

Procedures

1. *In order to describe numerical relationships using variables and patterns(8A)*, students should experience sufficient learning opportunities to develop the following:
 - Sort, classify, and order objects by multiple properties.
 - Create rules for multiple sortings in a single set.
 - Recognize, describe and extend geometric and numeric patterns.
 - Create patterns concretely and numerically to match a given letter description (AAB) and make predictions.
 - Change patterns by manipulation of concrete materials.
2. This assessment is given to individual students with a teacher recording sheet.
 - Give students a complete set of attribute buttons. Students should be familiar with the attributes of this manipulative (shape, size, color, and number of holes).
 - Direct students to sort, classify and pattern the buttons as directed on the teacher recording sheet.
3. Assess using the following guide to determine performance level of the student's work:
 - A student who exceeds the standard must receive 14 or more points.
 - A student who meets the standard must receive 12 or 13 points.
 - A student who is approaching the standard must receive 10 or 11 points.
 - A student who is starting to meet the standard must receive 8 or 9 points.
 - A student who is not yet starting to meet the standard must receive less than 8 points.

Examples of Student Work follow

Resources

- Teacher recording sheet
- Attribute buttons
- Mathematics Rubric

Time Requirements

- 15 - 20 minutes and should be given individually

NAME _____ DATE _____

ATTRIBUTES AND PATTERNS WITH BUTTONS

Teacher Recording Sheet

1 Point each

Teacher: "Put all the small green triangles in a pile. "

Yes _____ No _____ _____ point

Comments

Teacher: "Put all of the two-holed circles in a pile."

Yes _____ No _____ _____ point

Comments

Teacher: "Find the big red circle with 2 holes."

Yes _____ No _____ _____ point

Comments

2 points each – 1 point for sorting, 1 point for correct rule

Teacher: "Sort the buttons any way you can and tell me your sorting rule." Ask them to do this 3 times.

#1 Sorting Rule _____ point

Comments

#2 Sorting Rule _____ point

Comments

#3 Sorting Rule _____ point

Comments

1 point each

Teacher: "I am going to create some patterns now and I want you to continue them"

Pattern #1 (AAB with color) _____ point

Comments

Pattern #2 (AABB with size) _____ point

Comments

Pattern #3 (ABC with shape) comments _____ point

Comments

1 Point

Teacher: "My last pattern is an ABC pattern. Now I am going to change this last pattern and I want you to tell me how I've changed it and what letters match the new pattern."

(Use the ABC shape pattern and take out the C shapes. The resulting pattern is an AB pattern.)

_____ point

Comments

1 point each

Create the following pattern with the two-holed attribute buttons:

Big red circle, small red circle, big yellow circle, small yellow circle, big blue circle, small blue circle, big green circle, small green circle.

Teacher: Study the pattern I have made. I want you to close your eyes and I'm going to take a piece of this pattern away and when you open them you will tell me what I have removed.

Remove the small blue circle.

Yes _____ No _____ _____ point

Remove the big yellow circle.

Yes _____ No _____ _____ point

Total Points ____/15

NAME _____

DATE

12-3

ATTRIBUTES AND PATTERNS WITH BUTTONS

Teacher Recording Sheet

1 Point each

Teacher: "Put all the small green triangles in a pile."

Yes _____ No X 0 point

Comments Put all green triangles in pile, large and small

Teacher: "Put all of the two-holed circles in a pile."

Yes X No _____ 1 point

Comments

Teacher: "Find the big red circle with 2 holes."

Yes X No _____ 1 point

Comments

2 points each - 1 point for sorting, 1 point for correct rule

Teacher: "Sort the buttons any way you can and tell me your sorting rule." Ask them to do this 3 times.

#1 Sorting Rule

"2 holes and not 2 holes" 1+1 point

Comments

#2 Sorting Rule

"triangles and not triangles" 1+1 point

Comments

#3 Sorting Rule

"red and not red" 1+1 point

Comments

1 point each

Teacher: "I am going to create some patterns now and I want you to continue them"

Pattern #1 (AAB with color) 1 point

Comments

Pattern #2 (AABB with size) 1 point

Comments

Pattern #3 (ABC with shape) comments 0 point

Comments

1 Point

Teacher: "My last pattern is an ABC pattern. Now I am going to change this last pattern and I want you to tell me how I've changed it and what letters match the new pattern."

(Use the ABC shape pattern and take out the C shapes. The resulting pattern is an AB pattern.)

1 point

Comments "You took out all the 'Cs'. ABABAB

1 point each

Create the following pattern with the two-holed attribute buttons:

Big red circle, small red circle, big yellow circle, small yellow circle, big blue circle, small blue circle, big green circle, small green circle.

Teacher: Study the pattern I have made. I want you to close your eyes and I'm going to take a piece of this pattern away and when you open them you will tell me what I have removed.

Remove the small blue circle.

Yes X No _____ 1 point

Remove the big yellow circle.

Yes X No _____ 1 point

Total Points 13/15

NAME _____

DATE _____

12-10

ATTRIBUTES AND PATTERNS WITH BUTTONS

Teacher Recording Sheet

1 Point each

Teacher: "Put all the small green triangles in a pile."

Yes X No _____ 1 point

Comments

Teacher: "Put all of the two-holed circles in a pile."

Yes X No _____ 1 point

Comments

Teacher: "Find the big red circle with 2 holes."

Yes X No _____ 1 point

Comments

2 points each – 1 point for sorting, 1 point for correct rule

Teacher: "Sort the buttons any way you can and tell me your sorting rule." Ask them to do this 3 times.

#1 Sorting Rule 1+1 point

Comments "The ones that have 2 holes and the ones that don't have 2 holes"

#2 Sorting Rule 1+1 point

Comments "squares and non-squares"

#3 Sorting Rule 1+1 point

Comments (red and yellow) and (green and blue)

1 point each

Teacher: "I am going to create some patterns now and I want you to continue them"

Pattern #1 (AAB with color) 0 point

Comments "That's confusing"
"ABB" "big big small small small big small big..."

Pattern #2 (AABB with size) 1 point

Comments "I know! That one's easy!"

Pattern #3 (ABC with shape) comments 1 point

Comments "I can see it already! (as I was making it)"

1 Point

Teacher: "My last pattern is an ABC pattern. Now I am going to change this last pattern and I want you to tell me how I've changed it and what letters match the new pattern."

(Use the ABC shape pattern and take out the C shapes. The resulting pattern is an AB pattern.)

Comments 1 point

"C
AB AB AB"

1 point each

Create the following pattern with the two-holed attribute buttons:

Big red circle, small red circle, big yellow circle, small yellow circle, big blue circle, small blue circle, big green circle, small green circle.

Teacher: Study the pattern I have made. I want you to close your eyes and I'm going to take a piece of this pattern away and when you open them you will tell me what I have removed.

Remove the small blue circle.

Yes X No _____ 1 point

Remove the big yellow circle.

Yes X No _____ 1 point