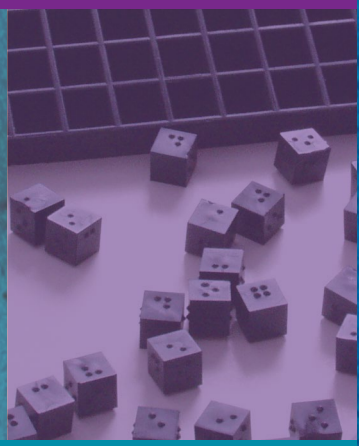
MathBuilders

Sorting



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MathBuilders

Sorting

AMERICAN PRINTING HOUSE

MathBuilders
Sorting

American Printing House for the Blind
Louisville, KY 40206

American Printing House for the Blind
Resource Services
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Credits

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Introduction

Before entering school, very young children use basic skills of classifying and sorting. These may be the first and most fundamental of all our thinking skills. It would be almost impossible for anyone to get through the day without classifying and sorting anything. For example, we classify when we purchase what we deem essential versus non-essential items. We sort and classify when we put dishes and silverware away e.g., plates, bowls, spoons, forks, etc. Without the ability to understand how people, events, or objects are both similar and different, the world can be a very chaotic place.

Children actually develop classification and sorting abilities to help them make sense of their world. Evidence of these developing sorting and classifying skills can be seen when a young child calls a dog, “kitty,” or refers to any man as “daddy.” These often humorous events belie a powerful thinking tool that will eventually become more accurate with time and experience.

When young children correctly apply identity labels such as “leaf” and “shoe” to objects, they are actually using a form of classification. Whenever a child accurately names an unfamiliar

object, which belongs to a familiar pre-identified group, he or she is actually classifying. For example, a young child may never have had a raisin oatmeal cookie, but when given one, he or she can readily identify it as a cookie. He or she has developed the concept of and a label for "cookieness," thus he or she has labeled this object as a cookie.

Many classification experiences are the direct result of sorting activities, such as sorting clothes to put in different drawers of a dresser e.g., socks in top drawer, shirts in middle drawer, and pants in bottom drawer. Sorting tasks for students may be independently chosen and carried out by the student or they can be teacher directed.

Young children can actually classify before they have the exact language with which to label or give names to the objects, describe the likeness, or justify the reason for belonging to a group. On the other hand, they must have an understanding of concepts such as "put together," "alike," and "belong together" when used in instructions. The ability to classify relies on having concepts and labels for identities, attributes, purposes, locations, positions, etc. The acquisition of concepts and labels such as these should be an integral part of the early mathematics curriculum.

Students will also use classifying and sorting skills to study aspects of mathematics, such as patterning, number and the development of number sense, graphing, geometry, and measurement. Once they enter school, most mathematics curricula initially ask students to put together things that are the same in some way, to identify and/or describe how they are the same, and to put them together in a different way sorting and categorizing.

Young students should experience sorting many different types and collections of materials, including themselves and their classmates. These sorting and classifying activities will be even more valuable if they can be tied to a problem-solving situation. Sorting and classifying items on the basis of concepts such as: “as many as,” “more than,” or “less than” leads to ways of ordering sets. Children should be given the opportunity to order objects using many different attributes. Initially, students will compare two items and identify which one has more or less of a given attribute, such as length, width, texture, or shape. They will then move on to ordering three things, which will allow them to begin sequencing. This type of activity will eventually help students to develop the ability to place a fourth, fifth, etc. item in the correct position in an already existing sequence.

Like sorting and classifying, ordering skills also lay a foundation for later study and experience with such mathematics as number and number sense, measurement and geometry. Ordering activities can also help students develop problem solving skills involving the creation of logical sequences.

Patterning is a very important component of mathematical thinking used in all areas of the curriculum e.g., patterns of letters in words. It is basic to mathematical insight. A pattern is a sequence of objects, events, or ideas that repeats. The ability to find, extend, and create patterns requires students to analyze and reflect as well as notice similarities, differences, and essential features. Successful students of mathematics are able to recognize patterns throughout the curriculum.

By the use of real objects, pictures, and drawings, students can be made aware of simple patterns. They can likewise practice seeing, describing, extending and completing, or repeating patterns. They can be asked merely to perceive and repeat or extend a pattern; they can be asked to describe a pattern or to explain why they think a particular item comes next; or they can be encouraged to make a pattern of their own and describe it.

The first patterns students encounter should be strong, quite obvious, and uncomplicated. Patterns can be made up of concrete objects, pictures, designs in weaving and stitchery, symbols, etc., and should not always be strictly linear.

Pattern recognition can also encompass many aspects of problem solving. Looking for and recognizing patterns is a problem solving strategy students will use as long as they continue to study and use mathematics. Therefore, exposing children to patterning activities within problem-solving experiences gives them an early start.

Classifying, sorting, ordering, and patterning are concepts that underlie most all areas of mathematics. Once a child is able to sort and classify objects and see the collections formed as entities, then he or she can classify sets of items as equivalent or nonequivalent and order them on the basis of quantity and identify patterns within. But, in order to associate number with these processes, the identities and attributes of the objects must be disregarded. Hence, experiences in classifying, sorting, ordering, and patterning provides the necessary background for the higher degree of abstraction required for other areas of mathematics that the student is likely to encounter in later years of schooling.

The objectives for each lesson were identified by an APH focus group and aligned to the Principles and Standards for School Mathematics (NCTM 2000). Standards are listed with the permission of the National Council of Teachers of Mathematics (NCTM). NCTM does not endorse the content or validity of these alignments.

Some children will need more time and experience with matching, sorting, and making patterns than others. The following lessons, as a rule, provide only one worksheet per lesson. If your student needs more practice, less difficult activities or more challenging activities, use products like Picture Maker, Shape Board, or Focus in Math that will allow you to create problems and activities to meet your child's specific needs.

As you use the worksheets with your students, please note that the directions for Kindergarten will ask the student to "find" the answer. Students may tell the answer, show the answer, or mark the answer in the fashion he or she has been taught. In grades 1-3 the directions will ask the students to "mark" the answer. Some teachers may want the child to color the answer, underline the answer, mark with stickers or wikki-stixs, or designate their answer in another fashion. The

directions are not specific in how to "mark" the answer in order to allow for individual differences.

Literature plays an important role in the learning process. There are many good children's books that reinforce math concepts. Following is a brief list of books you may want to use to introduce or reinforce the concepts of matching, sorting, and patterning. Not all are available in braille and some are dependent on pictures to convey meaning.

- Adams, Pam. *There was an old lady who swallowed a fly.* New York: Penguin, 2000.
- Ahlberg, Allan. *The baby's catalogue.* New York: Puffin, 1984.
- Hutchins, Pat. *Don't forget the bacon.* Boston: Houghton Mifflin, 1991. [braille]
- Lobel, Arnold. "A lost button." *Frog & Toad are friends.* New York: Harper & Row, 1970. [braille]
- Martin, Bill Jr. *Brown Bear, Brown Bear, what do you see?* New York: H. Holt, 1992. [braille]
- McGrath, Barbara Barbieri. *The Cheerios counting book: 1, 2, 3.* New York: Scholastic, 1998.

- Morris, Ann. *Shoes, shoes, shoes.* New York: Lothrop, Lee and Shephard, 1995.
- Murphy, Stuart J. *Beep, beep, vroom, vroom.* New York: HarperCollins Publishers, 2000.
- Murphy, Stuart J. *A pair of socks.* New York: Scholastic, 1996. [braille]
- Numeroff, Laura Joffee. *If you give a mouse a cookie.* New York: Harper & Row, 1985. [braille]
- Reid, Margarette S. *The button box.* New York: Dutton Children's Books, 1990. [braille]
- Szekers, Cyndy. *Toby counts his marbles.* New York: Little Simon, 2000.
- Wood, Audrey. *The Napping House.* San Diego: Harcourt, Brace & Jovanovich, 1984. [braille]

Learning Objectives

Kindergarten

MA K-1*	Match pairs of identical common objects.
MA K-2*	Match by size.
MA K-3*	Match by shape.
MA K-4*	Match by color or texture.
MA K-5*	Identify the one object in a set of objects that is very different.
MA K-6*	Identify the one object in a set of objects that is different in only one way.
MA K-7	Recognize patterns.
MA K-8*	Describe patterns.
MA K-9*	Identify the object or shape that does not belong in a simple pattern of two or three objects or shapes.

MA K-10* Extend a simple pattern of two or three objects or shapes by repeating the pattern at least two more times.

MA K-11 Create simple patterns of two or three objects or shapes repeated at least two times.

First Grade

MA 1-1* Order a set of five or more objects by size.

MA 1-2* Sort a group of objects into three or four sets based on size when shape, color, and texture may be different.

MA 1-3* Sort a group of objects into three or four sets based on shape when size, color, and texture may be different.

MA 1-4* Sort a group of objects into three or four sets based on color or texture when the shape and size may be different.

MA 1-5 Classify objects into two or three sets based on their composition.

MA 1-6	Sort a group of objects into three or four sets based on composition when shape and size may be different.
MA 1-7	Classify sets of objects into two or three sets based on function.
MA 1-8	Identify the one object in a group of objects that is different from the others in terms of function.
MA 1-9	Classify sounds or motions into sets.
MA 1-10*	Recognize and identify patterns.
MA 1-11*	Describe various patterns.
MA 1-12*	Identify patterns on the 100s chart.
MA 1-13*	Determine the missing piece of a pattern.
MA 1-14*	Extend patterns.
MA 1-15*	Transfer patterns from one format to another.

MA 1-16* Create patterns of objects or shapes in a repeating sequence, using at least two to four different objects or shapes, and repeating the pattern at least three times.

MA 1-17 Create predictable stories.

Second Grade

MA 2-1 Classify three dimensional objects according to various attributes: shape, size, texture, and color.

MA 2-2* Classify objects by two of the following attributes: shape, size, color, and texture.

MA 2-3* Classify objects by three of the following attributes: number, shape, size, color, and texture.

MA 2-4* Identify objects in a group that are not the same in shape, size, or texture.

MA 2-5* Extend patterns.

MA 2-6* Describe, analyze, and label patterns.

MA 2-7* Recognize and identify more complex patterns.

MA 2-8* Identify patterns in an addition table.

MA 2-9* Determine a missing piece of a more complex pattern.

MA 2-10* Transfer a pattern from one format to another.

MA 2-11* Create/develop patterns: linear patterns, repeated and growing, with letters, objects, sounds, or motions.

MA 2-12 Create predictable stories.

Third Grade

MA 3-1 Recognize and extend growing geometric patterns.

MA 3-2 Recognize and identify numeric patterns.

MA 3-3* Identify and describe patterns in a multiplication table.

*Worksheet included

Kindergarten

Learning Objectives

Kindergarten

MA K-1*	Match pairs of identical common objects.
MA K-2*	Match by size.
MA K-3*	Match by shape.
MA K-4*	Match by color or texture.
MA K-5*	Identify the one object in a set of objects that is very different.
MA K-6*	Identify the one object in a set of objects that is different in only one way.
MA K-7	Recognize patterns.
MA K-8*	Describe patterns.
MA K-9*	Identify the object or shape that does not belong in a simple pattern of two or three objects or shapes.

MA K-10* Extend a simple pattern of two or three objects or shapes by repeating the pattern at least two more times.

MA K-11 Create simple patterns of two or three objects or shapes repeated at least two times.

*Worksheet included

Materials Suggested for Lessons

A limited number of manipulatives are included in the kit that accompanies this unit. Additionally, you may want to use the following items to add variety and to give the child more experiences with objects from his or her environment.

Box K-3, K-4
Buttons, large and small, identical except
  for size K-6
Cranmer Abacus K-10
Cups plastic or paper K-1, K-5, K-9
Dice, pair of K-5
Dime K-6
Dominos K-5
Forks K-8
Glue for mounting shapes on cards K-4
Index cards K-4
Markers, colored K-8, K-9
Pencils K-1, K-5, K-6, K-8, K-9
Plates, paper K-5, K-9
Quarters K-6
Scissors K-5, K-9
Shapes
  from various fabrics K-4
  that match in color or texture K-4
Spoons K-8, K-9

MA K-1
Matching, Sorting, Patterning

Objective: The child is to match identical objects.

NCTM Standard: Algebra for Pre-K - 2 - Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Pairs of objects

- Matching circles
- Matching squares
- Matching triangles
- 2 Pencils
- 2 Paper cups

Worksheet MA K-1

Materials: *Listed materials are only suggestions. Feel free to substitute other appropriate materials including those from other math programs.*

Strategies: Give the child pairs of identical objects to examine and talk about. Be sure objects are exactly alike in size, shape, and texture.

> ***Contrast:*** *Providing a background that contrasts well with the objects will help a child use any remaining vision. This can be done by putting a brightly colored sheet of paper on the desk or table or in the Work-Play Tray.*

Put the pairs of objects in a box or tray and have children pick out matching pairs of objects and put them together on a Work-Play Tray.

> ***Work-Play Tray:*** *A child with severe visual impairment will find it easier to locate objects in a Work-Play Tray. This will limit the search area and keep the objects off the floor. A box or cake pan may be used instead. Although the Work-Play Tray may not be mentioned in the lessons, it is understood that it will be used.*

Rolling: *If rolling is a problem with shapes, put rubberized no-slip material or divider in a Work Play-Tray, or if objects are small enough, the child could work in egg cartons or large cupcake pans.*

Do Worksheet MA K-1.

Connections: Have the child identify the objects he or she selects. Think of other objects that usually come in matching pairs: socks, shoes, boots, mittens, gloves, etc.

MA K-2
Matching, Sorting, Patterning

Objective: The child will match objects according to size.

NCTM Standard: Algebra for Pre-K - 2 - Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

- Three circles, two the same size and one different
- Three rectangles, two the same size and one different
- Three triangles, two the same size and one different
- Three objects of choice from the kit, two the same size and one different

Worksheet MA K-2

Strategies: Place pairs of objects in front of the child and let the child examine them. Have the child tell whether the objects match in size or not.

Place three objects, two the same size and one different, in front of the child and let the child examine them. Have the child find the two objects in the group that are the same size.

Do Worksheet MA K-2.

Connections: Discuss things that are alike except for size: flower pots, shoes, milk cartons, etc. Look for examples.

MA K-3
Matching, Sorting, Patterning

Objective: The child will match objects according to shape.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Matching objects

- Assorted circles
- Assorted squares
- Assorted triangles
- Items of choice from the kit that match in shape
- Items from the classroom that match in shape
- Box for holding the various objects or Work-Play Tray

Worksheet MA K-3

Strategies: Place a number of objects in a box in front of the child. Give the child an object that

matches the shape of an object in the box. The objects do not have to be the same size, just the same shape. Be sure to point out the size differences if objects are not the same size. Have the child examine the objects in the box and find the object that is the same shape as the one he or she has. Continue with the other shapes in the box.

Do Worksheet MA K-3.

Connections: Have the child find familiar shapes in objects in the classroom or school: circles/door knob, rectangles/light switch, etc.

MA K-4
Matching, Sorting, Patterning

Objective: The child is to match objects according to color or texture.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Matching sets

- Matching textured squares
- Matching textured circles
- Matching textured triangles
- Items of choice from the kit that match in texture
- Shapes cut from various fabrics – good sources might be wallpaper and carpet sample books
- Index cards and glue to mount fabrics
- Box for holding the various objects or Work-Play Tray

Worksheet MA K-4

Strategies: Place a number of objects in a box in front of the child. Give the child an object that matches the texture of an object in the box. The objects do not have to be the same size, just the same texture. Be sure to point out the size differences if objects are not the same size. Have the child examine the objects in the box and find the object that is the same texture as the one he or she has. Continue with the other objects in the box.

Have the child use the textured squares, circles, triangles, or other objects to make matching sets.

Give the child three cards on which you have glued squares of fabrics in different colors and textures, such as red velvet, gold corduroy, and bright green felt. Put other shapes with the same colors and textures in a box on the table. You might use a red corduroy circle, a green velvet triangle, and a gold felt oval. Have the child find the shapes that match in texture or color. Repeat the activity several times.

Color vs. Texture: *With this activity, the blind child will match according to texture while the visually impaired child may be able to match by color as well as by texture. If you are uncertain whether the visually impaired child is using texture or color, you might try using the same textures but different colors and vice versa.*

Gluing fabric: *Fabric glued to a card feels different from fabric that is not glued. If the child is to match fabric on a card with loose fabric, mount* ***only the top of the fabric to the card, letting the bottom hang loose.***

Do Worksheet MA K-4.

Connections: Discuss other ways, besides size, shape, and texture or color, in which things can be alike or different. Here are some possibilities with some suggested items for demonstration:

- Light or heavy: Sensory Cylinder Set; feather and lead weight
- Soft or hard: cotton ball and rock
- Wet or dry: sponges or washcloths

MA K-5
Matching, Sorting, Patterning

Objective: The child is to identify the one object in a set of objects that is very different.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Sets of three objects, two of which are identical and one that is different

- Two identical circles and a square
- Two identical triangles and a circle
- Three selected item from the kit, two that are identical and one that is different
- A pair of dice and a domino
- Two identical pencils and a pair of scissors
- Two identical paper cups and a paper plate

Worksheet MA K-5

Strategies: Place a set of three objects in front of the child. Have the child examine the objects carefully and select the one that is different. Have the child tell how the one object differs from the other two.

Do Worksheet MA K-5.

Connections: Discuss how objects in each set are alike.

- Some are lightweight
- Some are found at a picnic
- Some are flat and smooth
- Some are made of plastic

Discuss any other similarities the child notices.

MA K-6
Matching, Sorting, Patterning

Objective: The child is to identify the one object in a set of objects that is different in only one way.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Sets of three objects, two of which are identical and one different in only one way

- Two smooth circles and one textured circle, all the same size
- Two textured triangles and one smooth triangle, all the same size
- Three items of choice from the kit, two matching and one that is different in one way
- Two short pencils and one longer pencil, all identical except for length
- Two large buttons and one small button, all identical except for size
- Two quarters and a dime

Worksheet MA K-6

Strategies: Place the two identical objects in front of the child. Have child name all the ways they are alike. Add the third object, making sure to mix up this new set of three. Have the child examine the objects carefully and select the one that is different. Encourage the child to tell what is different about the chosen object. Repeat this activity with several different sets of objects.

Do Worksheet MA K-6.

Connections: Have the child identify the objects in each set. Discuss likenesses and differences.

MA K-7
Matching, Sorting, Patterning

Objectives: The child will recognize a pattern.

NCTM Standard: Algebra – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Large geometric shapes
- Shapes with Velcro backing from the kit
- Story Board from the kit

Strategies: Using shapes such as large squares, triangles, and circles, make a simple pattern. Let the child examine the objects in the pattern. Make two other patterns, one of which is the same as the first pattern and one that is different from the first pattern. Have the child identify the pattern that is the same as the first one. Repeat the activity with different patterns made up of the same shapes.

Using a similar procedure, give the child the shapes with Velcro backing and the Story Board. Make three patterns, a simple pattern of two to three objects, one that matches the first pattern and one that is different. Have the child identify the pattern that is the same as the first one.

Extend the idea of patterns by making rhythm and sound patterns such as clap-stomp-stomp, or low note-high note, etc. Extend motion patterns with children doing the motions such as stand up-raise your hand-sit down or left foot out-kick-left foot down etc.

Braille three letters on small cards. Make multiple copies. Make patterns and have the child tell you about them.

Connections: Sing or play records of songs with sound and motion patterns such as *Hokey Pokey, Farmer in the Dell, Old MacDonald,* and *Father Abraham.*

MA K-8
Matching, Sorting, Patterning

Objective: The child is to describe patterns.

NCTM Standard: Algebra – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

Sets of objects for making patterns

- Two different geometric shapes, such as a square and a circle
- Two different shapes with Velcro backing from the kit
- Story Board from the kit
- Forks and spoons
- Markers and pencils

Worksheet MA K-8

Strategies: Set up a pattern of a square followed by two circles. Repeat the pattern. Have the child verbally identify the pattern as square-

circle-circle. Accept any answers for descriptions that make sense. Rearrange the objects to make a new pattern circle-square-circle. Have the child describe the new pattern.

Make another pattern with suggested items in the materials list. Have the child describe the pattern. Rearrange the items and have the child describe the new pattern.

Do Worksheet MA K-8.

Connections: Look for patterns in nature such as the seasons. Spring follows winter, summer follows spring, etc.

Look for patterns in the school day. Reading follows circle time, P.E follows lunch, etc.

Look for patterns in necklaces and other jewelry.

MA K-9
Matching, Sorting, Patterning

Objective: The child will identify the object or shape that does not belong in a simple pattern of two or three objects or shapes.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Large geometric shapes
- Shapes with Velcro backing from the kit
- Story board from the kit
- Paper plates, cups, spoons
- Pencils, markers, scissors

Worksheet MA K-9

Strategies: Set up matching patterns with paper plates and cups: plate-cup-plate; plate-cup-plate. Have the child identify the objects in the pattern. Replace the cup in the second

pattern with a spoon. Have the child review the objects in the first pattern and then tell which object in the second pattern is incorrect. Continue with other patterns using suggested materials.

Do Worksheet MA K-9.

Connections: Discuss how it is important to keep like things together so that it is easy to find them such as silverware, dishes, socks, shirts, shoes, etc.

MA K-10
Matching, Sorting, Patterning

Objective: The child will extend a simple pattern of two or three objects or shapes by repeating the pattern at least two more times.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Large and small geometric shapes
- Large and small shapes with Velcro backing from the kit
- Story Board from the kit
- Cranmer Abacus
- Bell bracelet and rattle from the kit

Worksheet MA K-10

Strategies: Set up a pattern of one big object and one small object and have on hand additional like objects. Have the child identify

the pattern as big-little. Let the child use the additional objects to extend the pattern one or two times, each time identifying the pattern.

Provide additional practice building a pattern using the objects in the kit with Velcro backing and the Story Board. Have the child identify the pattern and extend it.

Make a pattern on the Cranmer Abacus such as two columns of beads up and one column down and have the child identify the pattern and extend it.

Do a rhythm pattern, such as clap-stomp-clap and have the child repeat the pattern several times.

Do a sound pattern with the bell bracelet and rattle or other musical instruments and have the child extend it.

Do Worksheet MA K-10.

Connections: Have the child be on the lookout for repeated and growing patterns in songs such as the *Farmer in the Dell* and stories such as *The Three Little Pigs, The Little Red Hen,* and *The House That Jack Built.*

MA K-11
Matching, Sorting, Patterning

Objective: The child will create simple patterns of two or three objects or shapes repeated at least two times.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should analyze how both repeating and growing patterns are generated.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board from the kit

Strategies: Put the Story Board on a working surface. Have the child select objects from the kit to set up a pattern of three different shapes on the story board. Have the child identify or explain his or her pattern. Then have the child repeat the pattern at least two more times.

Follow a similar procedure using the Hundreds Board and Hundreds Board Manipulatives to set up a pattern and then extend it two more times.

Connections: Talk about places and things such as fences and stair rails where children have noticed patterns in their environment.

Ask students to look for patterns in the classroom and the school.

Use the stickers in the kit to have the student decorate his or her work by creating a pattern across the top of the page.

First Grade

Learning Objectives

First Grade

MA 1-1*	Order a set of five or more objects by size.
MA 1-2*	Sort a group of objects into three or four sets based on size when shape, color, and texture may be different.
MA 1-3*	Sort a group of objects into three or four sets based on shape when size, color, and texture may be different.
MA 1-4*	Sort a group of objects into three or four sets based on color or texture when the shape and size may be different.
MA 1-5	Classify objects into two or three sets based on their composition.
MA 1-6	Sort a group of objects into three or four sets based on composition when shape and size may be different.
MA 1-7	Classify sets of objects into two or three sets based on function.

MA 1-8	Identify the one object in a group of objects that is different from the others in terms of function.
MA 1-9	Classify sounds or motions into sets.
MA 1-10*	Recognize and identify patterns.
MA 1-11*	Describe various patterns.
MA 1-12*	Identify patterns on the 100s chart.
MA 1-13*	Determine the missing piece of a pattern.
MA 1-14*	Extend patterns.
MA 1-15*	Transfer patterns from one format to another.
MA 1-16*	Create patterns of objects or shapes in a repeating sequence, using at least two to four different objects or shapes, and repeating the pattern at least three times.
MA 1-17	Create predictable stories.

*Worksheet included

Materials Suggested for Lessons

A limited number of manipulatives are included in the kit that accompanies this unit. Additionally, you will need to use the following items in the lessons listed.

Animals, small stuffed toy 1-6, 1-8, 1-11
Bag, plastic 1-6
Block, wooden 1-6, 1-11
Board game 1-7
Box, for holding several things 1-2, 1-3, 1-5
Can, soda 1-6, 1-7
Checkers 1-7
Crayons 1-4, 1-8
Cups 1-7, 1-8, 1-11
  plastic 1-6
Dominos 1-7
Fork 1-8
Game markers, various colors 1-4
Glass 1-7, 1-8
Glove 1-6, 1-7, 1-8
Glue 1-8
Hundreds Board 1-12
Knife, plastic 1-6, 1-8
Markers, colored 1-4
Paste 1-8

MA 1-1
Matching, Sorting, Patterning

Objective: The child is to order a set of five or more objects by size.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

- Three sizes of circles
- Three sizes of triangles
- Three sizes of squares
- Five length sticks from kit
- Five pencils of different lengths

Worksheet MA 1-1

Materials: *Listed materials are only suggestions. Feel free to substitute other appropriate materials including those from other math programs.*

Strategies: Give the child sets of objects of graduated sizes in random order. Start with

sets of two objects and work up to sets of five or more. Have the child examine each set and arrange the objects in order from the smallest to the largest and then from largest to smallest.

Do Worksheet MA 1-1.

Connections: Discuss uses for different sizes of the same things. Discuss things that come in different sizes: flower pots, shoes, clothing, etc. Look for examples.

Use APH Shape Board with students who are having difficulty ordering, classifying, and sorting objects by size, shape, or color and need additional practice.

MA 1-2
Matching, Sorting, Patterning

Objective: The child is to sort a group of objects into three or four sets based on size when shape, color, and texture may be different.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Objects of various sizes

- Small objects: circles, triangles, squares, length sticks
- Middle-sized objects: circles, triangles, squares, length sticks
- Large objects: circles, triangles, squares, length sticks
- Three small boxes to use for sorting or Work-Play Tray
- Box for holding the various objects

Worksheet MA 1-2

Work-Play Tray: *A child with severe visual impairment will find it easier to locate objects in a Work-Play Tray. This will limit the search area and keep the objects off the floor. A box or cake pan may be used instead. Although the Work-Play Tray may not be mentioned in the lessons, it is understood that it will be used.*

Rolling: *If rolling is a problem with shapes, put rubberized no-slip material or divider in a Work Play-Tray, or if objects are small enough, the child could work in egg cartons or large cupcake pans.*

Strategies: Give the child a box of objects of various sizes: some small objects, some middle-sized objects, and some large objects. Also give the child a Work-Play Tray or three empty boxes. Have the child sort the objects into three or four sets. Have the child explain how he or she sorted the objects. Although the objects could be sorted by size, accept any other assortments the child can justify.

Do Worksheet MA 1-2.

Connections: Talk about things at school and at home that are usually sorted by size such as towels and washcloths, sheets and pillow cases,

bowls, pans, plates, etc.

Use APH Shape Board with students who are having difficulty ordering, classifying, and sorting objects by size, shape, or color and need additional practice.

MA 1-3
Matching, Sorting, Patterning

Objective: The child is to sort a group of objects into three or four sets based on shape when size, color, and texture may be different.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Objects of various shapes

- Assorted circles
- Assorted squares
- Assorted triangles
- Assorted rectangles
- Length sticks
- Three small boxes to use for sorting or Work-Play Tray
- Box for holding the various objects

Worksheet MA 1-3

Strategies: Give the child a box of objects of various shapes and a Work-Play Tray or three empty boxes. Have the child sort the objects into three or four sets. Have the child explain how he or she sorted the objects. If necessary, suggest that the child pay attention only to the shapes. Although the objects could be sorted by shape, accept any other assortments the child can justify.

Do Worksheet MA 1-3.

Connections: Talk about things at school and at home that are usually sorted by shape such as knives, forks, spoons, bowls, plates, etc.

MA 1-4
Matching, Sorting, Patterning

Objective: The child is to sort a group of objects into three or four sets based on color or texture when the shape and size may be different.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Objects in various bright, primary colors

- Plastic game markers
- Colored markers
- Crayons

Objects in various distinctive textures

- Smooth geometric shapes: circles, squares, triangles
- Textured geometric shapes: circles, squares, triangles
- Soft geometric shapes: circles, squares, triangles

Worksheet MA 1-4

Strategies: Have the child sort objects according to texture or color. Use objects made of distinctive textures and bright, primary colors. Have the child identify the texture and/or color of each set as is appropriate for his or her eye condition and visual functioning.

Do Worksheet MA 1-4.

Connections: Discuss things that might be sorted by color or texture and why, such as:

- Paper
- Towels and sheets
- Paint
- Carpet
- Clothing

MA 1-5
Matching, Sorting, Patterning

Objective: The child will classify objects into two or three sets based on their composition.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

- Cloth: squares of same size
- Plastic: squares of same size
- Paper: squares of same size
- Box for holding the various objects

Strategies: Put a box of items made of various materials on the table and have the child select objects to make sets made of the same material. Have the child think of other materials used to make things – wood, metal, glass, etc.

Connections: Discuss why it is important to know what things are made of. It will help you know how to take care of them and how you can expect to use them without breaking or

damaging them.

Read *The Three Little Pigs* and discuss the composition of each of the pigs' houses. Discuss other objects made of these materials.

MA 1-6
Matching, Sorting, Patterning

Objective: The child is to sort objects into three of four sets based on composition when shape and size may be different.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Objects made of various materials

- Wood: wooden block, wooden mixing spoon, pencil, wooden ruler
- Plastic: plate, cup, knife, plastic bag
- Metal: spoon, quarter, scissors, soda pop can
- Cloth: shirt, small stuffed toy, washcloth, glove

Strategies: Have the child sort objects according to the materials from which they are made. Have the child identify the material of each set.

Connections: Discuss properties of various materials and have children name objects that are made of the materials.

MA 1-7
Matching, Sorting, Patterning

Objective: The child will classify sets of objects into two or three sets based on function.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Related sets of objects

- Games: checkers, dominos, a board game
- School supplies: pencil, ruler, scissors
- Things from which to drink: glass, cup, soda can
- Clothing: shirt, glove, sweater

Strategies: Select one item from each of the four groups. Have the child examine and identify the item. Discuss the function of the items.

Give the child a box containing all of the above items and ask the child to sort the items by their function. Have the child explain how he or she

sorted the items. Accept any assortment the child can justify.

Connections: Look for and discuss other sets of objects that could be grouped together in various ways such as these related objects:

- Reading material: magazine, book, newspaper
- Bed linens: pillow, sheet, blanket
- Living: tree, dog, person
- Non-living: chair, desk, rug

MA 1-8
Matching, Sorting, Patterning

Objective: The child will identify the one object in a group of objects that is different from the others in terms of function.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Sets of four objects, three of which are related by function and one that is not

- Fork, knife, spoon, pencil
- Shirt, glove, sweater, stuffed animal
- Plate, cup, glass, ruler
- Paste, glue, tape, crayon

Strategies: Prepare sets of four objects, three of which are related by function and one that is unrelated. Have the child pick out the object that is not related to the others. Have the child explain why he or she selected the object.

Name groups of 4 objects in which one does not belong and see if the child can pick out the one that does not belong. Here are some examples:

- Dust mop, broom, vacuum cleaner, oven
- Pencil, pen, ruler, crayon
- Swing, car, van, bus
- Folding chair, table, bench, stool

Connections: Discuss how things are related. Have the child name four objects, one of which does not belong. This will help develop and check concepts about the child's environment.

MA 1-9
Matching, Sorting, Patterning

Objective: The child will classify sounds or motions into sets.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Musical instruments

- Bell bracelet from kit
- Rattle from kit

Strategies: Make a series of sound patterns such as high-low-high or soft-soft-loud with the instruments included in the kit or instruments you have in the classroom. Have the child classify the sounds into sets of high-low and loud-soft. Let the child try to duplicate the sound.

Have the child do sets of motions, such as stand up, sit down, cross ankles, walk in place, walk forward three steps, hop in place, hop forward, wave hands, and wave arms. Have the child

classify the motions he or she made into sets – such as those involving legs, those involving hands and arms, those occurring in place, those that caused you to change location, etc. Ask the child to think of other motions and classifications.

Do the *Hokey Pokey, the Bunny Hop*, and other songs, which include sound and motion patterns.

Connections: You might want to start a rhythm band and make simple instruments for it – a can with a few pebbles, a couple of sticks to hit together, an empty coffee can drum, etc. Then have the child listen for rhythm patterns in songs such as loud-soft-soft, loud-soft-loud-soft, 3/4 time, or 4/4 time.

MA 1-10
Matching, Sorting, Patterning

Objective: The child will recognize and identify patterns.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Circles, squares
- Rectangles, triangles
- Items of choice from the kit

Worksheet MA 1-10

Strategies: In this lesson the child is working to identify a pattern. Use the objects to build a repeating pattern. Have the child examine each pattern and identify the objects in it. Then have the child identify the pattern. The child may describe the pattern by naming the object and the sequence such as "circle-square; circle-

square.” In the next lesson the child will learn to name the pattern with letters. The following patterns are suggestions for the teacher to use in setting up patterns.

- a b
- a b b
- a a b
- a a b b

Next give the child groups of objects, some of which make a pattern and some which do not. Have the child identify the ones that are patterns and the ones that are not. Here are some suggested groups with those that form patterns marked yes and those that do not marked no:

- a a b b a a b b — Yes
- a b b b a a b b a a — No
- a a a a b b b a b a — No
- a a a b b a a a b b — Yes
- a b b a b b a b b — Yes
- a a a a b b b a a b — No

Do Worksheet MA 1-10.

Connections: Look for patterns in the environment that the child can examine such as

patterns of walls and inset doorways, patterns in grates and louvers, or ornate stairways. Awareness of patterns and changes in patterns will aid in orientation and mobility.

Have the child describe the pattern of his or her school schedule. Are there daily patterns? Are there weekly patterns?

MA 1-11
Matching, Sorting, Patterning

Objective: The child will describe various patterns.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

One or two of each of the following items for making patterns

- Toy animals, blocks
- Circles
- Cups
- Squares, triangles

Worksheet MA 1-11

Strategies: Set up a pattern for the child with alternating animals and blocks. Have the child examine and describe the pattern: animal-block-animal. Help the child write or braille the names

of the objects in the pattern. Suggest that this pattern could also be identified with the letters a and b with a for animal and b for block. Write the pattern this way. Have the child use the suggested items beginning with the letters a, b, and c (animal, block, circle) to set up additional abc patterns and then describe and identify them with a for an item beginning with the letter "a" in the pattern, b for an item beginning with the letter "b", and c for an item beginning with the letter "c". Follow the same procedure for describing and writing the pattern.

Next, set up a pattern with a circle and a cup. Ask the child to describe the patterns with words and with letters. When the child discovers that both begin with "c", suggest that a could be used for the first item and *b* for the second item and so on. Help the child write the pattern. Continue making patterns with the items and writing the descriptions using a for the first item, *b* for the second item.

Do Worksheet MA 1-11.

Connections: Have the child write descriptions of the patterns found in their environment in the "Connections" from lesson 10. Have the child write the description first in words, then with letters to represent the words; wall-doorway; wall-doorway then abab.

MA 1-12
Matching, Sorting, Patterning

Objective: The child will identify patterns on the 100s chart.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Hundreds Board with Numbers

Worksheets MA 1-12 (a), MA 1-12 (b), and MA 1-12 (c)

Strategies: Have the child examine the APH Hundreds Board or use worksheet MA-12. The board and sheet will look like this:

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

Have the child look for patterns of numbers on the board or the worksheet. The child may find it helpful to place stickers on the worksheet to "mark" the patterns that he or she finds. The child can use a different sticker for each pattern that is identified. Please note that some patterns will overlap (counting by 5s and numbers that end in 5). Three copies of the Hundreds Worksheet are included for this activity. Have the child "mark" the following numbers on Worksheets MA 1-12 (a), (b), and (c) and describe the pattern that is made.

Use worksheets MA 1-12 (a), (b), and (c) to find:

- Numbers that end with 5
- Numbers that end with 2
- Numbers that end with 0
- Numbers which are the same in the tens place
- Numbers when skip counting by 2s
- Numbers when skip counting by 3s
- Numbers when skip counting by 5s
- Numbers that are all the same in the tens place and in the ones place 11, 22, 33, etc.

Connections: Have the child compare the 100s chart to the calendar. How are the 100s chart and the calendar the same? How are the 100s chart and the calendar different?

Counting on the Calculator: Show the child how he or she can count with a talking calculator. Enter "+", "1", "=" on the talking calculator. The calculator will announce "1". Enter "=" again and the calculator will announce "2". The calculator will announce the next number in the sequence each time the "=" is entered.

Skip Counting. Students can also skip count by 2, 5, 10 or any number by entering the "+", the

number, “=”. With each succeeding entry of “=” the calculator will announce the next number in the skip count.

MA 1-13
Matching, Sorting, Patterning

Objective: The child will determine a missing piece of a pattern.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board from the kit

Worksheet MA 1-13

Strategies: Using the manipulatives, form a line pattern on the Story Board. Repeat the pattern two more times. On the third series omit a piece of the pattern.

Explain to the child by saying, "We are going to play a game called 'What's Missing?'" Have the child tell you the pattern by examining the first two series. Have the child identify "what's

missing” in the blank space of the third series. The child should be able to use the order of the other pieces in the patterns to identify the missing piece of the pattern. Initially, you may want to put the first two series on one line and the series with the missing piece on a separate line. As the child improves in identifying a missing piece all objects can be placed in a one-line series.

Here are some patterns to get you started:

- a b
- a b c
- a a b
- a b b

Do Worksheet MA 1-13.

Connections: Continue creating other line patterns using common household objects such as silverware, Tupperware lids/containers, washcloths, etc. Omit a piece of the pattern each time and allow the child to determine the missing piece.

MA 1-14
Matching, Sorting, Patterning

Objective: The child will extend patterns.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board from the kit

Worksheet MA 1-14

Strategies: Set up a pattern of circle, square, triangle on the Story Board. Have the child identify the objects and the pattern. The child should be able to identify the first pattern as circle-square-triangle, and name the pattern with the letters a, b, c, with a being the first item, b the second, etc. Have the child tell you what would come next if the pattern were extended.

Then let the child select shapes to extend the

pattern at least two more times.

Have the child continue to make other patterns using different shapes. Have the child identify the objects, tell the pattern by naming the objects, tell the patterns by using letters to name the objects, and then extend the patterns.

Do Worksheet MA 1-14.

Connections: Have children identify the pattern found in the place setting at dinner: fork, plate, knife, spoon; abcd.

MA 1-15
Matching, Sorting, Patterning

Objective: The child will transfer patterns from one format to another.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Large geometric shapes
- Shapes with Velcro backing from the kit
- Story Board from the kit

Worksheet MA 1-15

Strategies: Set up a pattern with Velcro-backed shapes such as: a circle, a triangle, and a square on the Story Board. Have the child explore and name the pattern. Give the child the large geometric shapes to replicate the pattern at his or her work space.

Set up various patterns on the Story Board for

the child to replicate with the large geometric shapes. Students may need to hear the pattern repeated orally by the teacher in order to transfer the pattern to another representation.

- Two squares and one circle; aab
- One circle, one square, one triangle; abc
- One triangle and two circles; abb
- Two circles and two triangles; aabb

Next, have the child use the patterns of shapes to create patterns of sounds and motions. For example, the pattern of two squares and one circle could be clap-clap-stomp or wave your hand-wave your hand-slap your knee.

Finally, have the child write or braille letters to show each pattern.

Do Worksheet MA 1-15.

If you are using this worksheet for a group activity, you may want to transfer the pattern to sounds or motions.

If you are using this worksheet for an independent activity, you may want to use letters or shapes to transfer the pattern to a different format.

Connections: Continue creating other patterns of sounds and motions by using various patterns of shapes and various household objects. For example, an abc pattern could be tap two spoons together, shake a box of rice, tap an empty coffee can drum.

MA 1-16
Matching, Sorting, Patterning

Objective: The child will create patterns of objects or shapes in a repeating sequence, using at least two to four different objects or shapes, and repeating the pattern at least three times.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should analyze how both repeating and growing patterns are generated.

Suggested Materials:

- Geometric shapes of various sizes, shapes, and texture
- Shapes with Velcro backing from the kit
- Story Board from the kit

Worksheet MA 1-16

Strategies: Give the child an opportunity to examine the many shapes and textures in the kit. Have the child make a pattern using objects of his or her choice, such as little circle-big circle-little square. Have the child describe the pattern that he or she made. Have the child

repeat the pattern at least three times. Repeat the activity, having the child use other objects to make patterns.

Do Worksheet MA 1-16.

Connections: Have the child make necklaces with beads, pasta, or other objects strung in repeated patterns. Ziti, penne, and rigatoni are good choices for stringing in a pattern.

Have the child make a pattern on a strip of paper using classroom tools such as a hole punch, scissors, and/or stapler. Have the child repeat the pattern on the strip at least three times.

Have the child use stickers included in this kit to make a pattern on a strip of paper. Have the child repeat the pattern at least three times.

MA 1-17
Matching, Sorting, Patterning

Objective: The child will create predictable stories.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should analyze how both repeating and growing patterns are generated.

Suggested Materials:

One of the following books:

The Little Red Hen
The Gingerbread Man
The Three Billy Goats Gruff
The Three Little Pigs
The Very Hungry Caterpillar
If You Give a Mouse a Cookie

Choose one of the above stories. These should be available in your school library. Read the story to the child. Discuss the patterns in the story. Have the child identify the elements of the patterns, such as repeated dialog, repeated events, or repeated actions.

Use the predictable story to help the child understand that patterns help us know what will come next in a story.

Ask the child to help develop another scenario in the selected story.

What would happen if the Little Red Hen had met a different animal? What would they have said?

What would have happened if the Gingerbread Man had met a different animal? Let the child select an animal and tell the story with the appropriate conversation.

Have the child write a new scene in the story you selected to read.

Connections: Ask the child to identify other predictable stories he or she knows. What are the elements that make the book predictable? Look for predictable stories in the library.

Second Grade

Learning Objectives

Second Grade

MA 2-1	Classify three dimensional objects according to various attributes: shape, size, texture, and color.
MA 2-2*	Classify objects by two of the following attributes: shape, size, color, and texture.
MA 2-3*	Classify objects by three of the following attributes: number, shape, size, color, and texture.
MA 2-4*	Identify objects in a group that are not the same in shape, size, or texture.
MA 2-5*	Extend patterns.
MA 2-6*	Describe, analyze, and label patterns.
MA 2-7*	Recognize and identify more complex patterns.
MA 2-8*	Identify patterns in an addition table.

MA 2-9*	Determine a missing piece of a more complex pattern.
MA 2-10*	Transfer a pattern from one format to another.
MA 2-11*	Create/develop patterns: linear patterns, repeated and growing, with letters, objects, sounds, and motions.
MA 2-12	Create predictable stories.

*Worksheet included

Materials Suggested for Lessons

A limited number of manipulatives are included in the kit that accompanies this unit. Additionally, you will need to use the following items in lesson 2-1.

Balls
- golf 2-1
- tennis 2-1

Beads 2-1
Blocks 2-1
Box, solid three-dimensional of various sizes 2-1
Cubes
- sugar 2-1

Cylinders
- coffee can 2-1
- from the Sensory Cylinder Set 2-1
- small unopened cans 2-1

Dice 2-1
Marbles 2-1

MA 2-1
Matching, Sorting, Patterning

Objective: The child will classify three dimensional objects according to various attributes: shape, size, texture, and color.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

A box of solid three-dimensional objects of various sizes

- Cylinders: small unopened cans, pegs from the Peg Kit, cylinders from the Sensory Cylinder Set
- Cubes: small closed boxes, sugar cubes, plain building blocks, dice
- Balls: golf balls, tennis balls, marbles, round beads

Materials: *Listed materials are only suggestions. Feel free to substitute other appropriate materials including those from other math programs.*

Contrast: *Providing a background that contrasts well with the objects will help a child use any remaining vision. This can be done by putting a brightly colored sheet of paper on the desk or table or in the Work-Play Tray.*

Strategies: Have the child sort and classify the objects from the box as many ways as he or she can. The child might start with such things as shape or size of these three-dimensional objects.

Rolling: *If rolling is a problem with shapes, put rubberized no-slip material or divider in a Work Play-Tray, or if objects are small enough, the child could work in egg cartons or large cupcake pans.*

Here are some suggestions to get the child to focus on special attributes of these three-dimensional shapes:

Have the child find all the objects that have at least two flat sides. The child should pick out cylinders and cubes. Put the objects back into the box.

Have the child find all of the biggest objects – the biggest cube, the biggest ball, and the biggest cylinder. Then put the objects back into the box.

Have the child find all of the smallest objects – the smallest ball, the smallest cube, and the smallest cylinder. Put everything back in the box.

Have the child find all of the things that are round and will roll. The child should pick cylinders and balls. Put everything back into the box.

Have the child think of other ways that the items could be grouped. Have the child sort by the attribute he or she chose.

Connections: As the child examines the various objects and identifies their attributes, help the child identify the objects and discuss their use.

If available in your school, use 3D attribute solids to provide additional practice for the child.

MA 2-2
Matching, Sorting, Patterning

Objective: The child will classify objects by two of the following attributes: shape, size, color, and texture.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

- Geometric shapes in three sizes, shapes, and textures

Worksheet MA 2-2

Color: *If you are working with a low vision child who is able to distinguish color, colors could be varied rather than textures or could be used as an additional attribute.*

Strategies: Give the child three random shapes from the Suggested Materials. Shapes can be arranged in a Work-Play Tray with dividers or 3 small boxes. Ask the child to see if two of the three shapes match in two of these ways:

shape, size, or texture. If they do, have the child tell which two ways they matched.

Here are some examples:

Large textured circle, medium textured circle, large smooth circle – two big circles match in size and shape or textured circles that match in shape and texture

Medium textured square, small textured circle, medium smooth square - two medium squares match in size and shape

Small smooth circle, small textured square, small smooth square – two small squares match in size and shape or small circle and small smooth square match in size and texture

Medium smooth circle, medium soft square, large soft square – two soft squares match in shape and texture

Large soft triangle, large soft circle, large smooth triangle – two large triangles match in shape and size or large soft circle and large soft triangle match in size and texture

Have the child select items from the group of shapes that match in at least two ways. Have the

child identify these two attributes.

Do Worksheet MA 2-2.

Connections: Use buttons of various shapes, sizes, colors, and textures to continue to build on the child's concept development. Give the child 3 random buttons. Ask the child to see if the group of buttons can be sorted in two different ways. Have the child tell how the buttons in each group are alike. Repeat with other buttons.

MA 2-3
Matching, Sorting, Patterning

Objective: The child will classify objects by three of the following attributes: number, shape, size, color, and texture.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

- Geometric shapes in three sizes, shapes, and textures

Worksheet MA 2-3

Strategies: Give the child 3 groups such as the following and ask the child to tell in what 3 ways the groups are alike and what ways they are different:

1. Two small smooth circles, 2 small textured circles, 2 small soft circle – alike in shape, size, number; different texture
2. Two small smooth squares, 2 small textured squares, 2 small soft squares

– alike in shape, size, and number; different texture

3. One large textured triangle, 1 medium textured triangle, 1 small textured triangle – alike in shape, texture, and number; different size
4. Two medium soft triangles, 2 medium soft circles, 2 medium soft squares – alike in size, texture, and number; different shape

Continue giving the child 3 groups and having the child look for sets that are alike in 3 ways or different in only 1 way.

Have the child select items from the shapes or groups of shapes to form new groups based on a given attribute:

1. Make 3 groups that match in size, number, and shape but are different in texture.
2. Make 3 groups that match in texture, number, and size but are different in shape.
3. Make 3 groups that match in number, shape, and texture but are different in size.

Do Worksheet MA 2-3.

Connection: Use buttons of various shapes, sizes, colors, and textures to continue to build on

the child's concept development. Give the child a random set of buttons. Ask the child to see if the group of buttons can be sorted in three different ways. Have the child tell how the buttons in each group are alike. Repeat with other buttons.

MA 2-4
Matching, Sorting, Patterning

Objective: The child will identify objects in a group that do not match in shape, size, or texture.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should sort, classify, and order objects by size, number, and other properties.

Suggested Materials:

Sets of objects such as the following:

- Geometric shapes in three sizes, shapes, and textures

Worksheet MA 2-4

Strategies:

Have the child use the set of objects to find:

- things that are round
- things that have square sides
- things that have triangular sides

Have the child find:

- things that are little
- things that are big

Have the child find:

- things that are rough/textured
- things that are smooth

Have the child find:

- things that are not round
- things that do not have square sides
- things that do not have triangular sides

Be sure to have the child put all the objects back into each original set and mix them up before making additional sets.

Do Worksheet MA 2-4.

Connections: Use buttons of various shapes, sizes, colors, and textures to continue to build on the child's concept development. Give the child a handful of random buttons. Have the child find buttons that are not round. Repeat this activity using a new handful of buttons each time, having the child find each of the types of buttons that do not have the other various attributes listed in "Strategies".

MA 2-5
Matching, Sorting, Patterning

Objective: The child is to extend patterns.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board from the kit

Worksheet MA 2-5

Strategies: Using the Story Board and the shapes with Velcro backing create a pattern with the child that uses at least four different shapes. Have the child repeat the pattern at least three times. This is an exercise that is introduced in Kindergarten and reinforced in first and second grade. Use simple patterns such as abcd to begin and then advance to more complex patterns.

Do Worksheet MA 2-5.

Connections: Give the child 1” raised-line graph paper and let him or her glue small objects. Use pretzels, Cheerios®, and M & Ms® or other small objects to create a pattern on raised-line graph paper in the squares. Extend this pattern over the graph paper.

MA 2-6
Matching, Sorting, Patterning

Objective: The child will describe, analyze, and label patterns.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board from the kit

Worksheet MA 2-6

Strategies: Ask the child to use the objects to create a repeating pattern on the Story Board with three objects of his or her choice.

Have the child tell what objects are in each pattern he or she made and how the objects are arranged. Then have the child use letters to name the objects; *a* for the first object, *b* for the second object, and c for the third object. Have

the child write the pattern. (If the child is not familiar with labeling patterns with letters of the alphabet refer to lesson MA 1-11.)

Make a new pattern using objects. Have the child identify the pattern. Have the child label the pattern by writing the pattern using letters to represent the pattern. Repeat the exercise with different objects and more complex patterns.

Here are some patterns you may use:

- a b c
- a b b a
- a a b b c c
- a b c d
- a b c d d
- a b a c

Do Worksheet MA 2-6.

Connections: Have the child use his or her braillewriter to create patterns for classmates to construct.

MA 2-7
Matching, Sorting, Patterning

Objective: The child will recognize and identify more complex patterns.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board from the kit

Worksheet MA 2-7

Strategies: Provide the child with the Story Board and shapes with Velcro backing. Explain to the child that you will name a pattern and the child will construct the pattern with objects. Begin with a simple abc pattern. Help the child recognize that he or she will need to select three types of objects to make this pattern. Help the child construct the pattern with objects and extend at least two more times.

Continue with more complex patterns:

1. a b a c
2. a a b b c
3. a a b c c
4. a b b c c
5. a a b b c c
6. a a b c
7. a b b c
8. a b c c
9. a b a b b
10. a b a a b

Do Worksheet MA 2-7.

Connections: Extend the child's pattern knowledge while incorporating science. If weather permits, have child gather small objects outdoors such as sticks, rocks, leaves, acorns, seeds, grass, bark, etc. Repeat steps in "Strategies" to make various complex patterns.

MA 2-8
Matching, Sorting, Patterning

Objective: The child will identify patterns in the addition table.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

Worksheet MA 2-8 (a), MA 2-8 (b), MA 2-8 (c), MA 2-8 (d), and MA 2-8 (e)

Strategies: Use one of the addition charts provided with this exercise. Review the chart with the child. Note the "+" sign in the upper left hand corner. How is this like the hundreds chart? How is it different from the hundreds chart? Make sure the child understands how to use the chart to find the answers to addition problems.

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

Have the child look for patterns of numbers on the worksheet. The child may find it helpful to place stickers on the worksheet to “mark” the patterns that he or she finds. The child can use a different sticker for each pattern that is identified. Please note that some patterns will overlap. An additional copy of the addition table is included for this activity. Have the child “mark” the following numbers on Worksheet MA 2-8 (e).

- Horizontal rows of consecutive numbers
- Columns of consecutive numbers

- A horizontal row and a column that are the same
- Diagonal rows of like numbers - the longest of which has eleven tens
- Diagonal rows of consecutive numbers – twelve, fifteen or seventeen

Do Worksheet MA 2-8 (a), (b), (c), and (d).

Connections: Skip Counting. Review with the student how to skip count on the calculator (MA 1-12). Students can skip count on their talking calculators by 2, 5, 10 or by any number by entering the "+", the number, "=". With each succeeding entry of "=" the calculator will announce the next number in the skip count.

Review with the student how to skip count on the hundreds chart and the addition chart.

MA 2-9
Matching, Sorting, Patterning

Objective: The child will determine a missing piece of a more complex pattern.

NCTM Standard: Algebra for Pre-K - 2 - Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board

Worksheet MA 2-9

Strategies: Set up a pattern on the Story Board using three to four different shapes with Velcro backing. Repeat the pattern at least two times omitting one of the items in the pattern the second time. Have the child identify the pattern, tell which object is missing from the pattern, and find the object to complete the pattern.

Here are some patterns to get you started:

a b c
a b a c
a b b
a b b a c c
a b b c c c
a b a c a d
a a b b c c
a b c c

Do Worksheet MA 2-9.

Connections: Give the child 1” raised-line graph paper and four kinds of small objects picked up in a nature walk or use pretzels, M & Ms®, or other small objects. Have the child create a pattern by placing one object in a square and repeating the pattern at least two times. Have the child omit one object in the third repetition of the pattern and give his or her pattern with a missing piece to another student to solve.

MA 2-10
Matching, Sorting, Patterning

Objective: The child will transfer a pattern from one format to another.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should recognize, describe, and extend patterns such as sequences of sounds and shapes or simple numeric patterns and translate from one representation to another.

Suggested Material:

- Shapes with Velcro backing from the kit
- Story Board
- Bell bracelet and rattle from the kit

Worksheet MA 2-10

Strategies: Arrange two or three different kinds of objects to make a simple pattern on the Story Board. Have the child describe the pattern and write letters to show the pattern.

Have the child use the letter description to make the pattern with different shapes.

Have the child transfer the pattern again into a loud-soft sound pattern with the bell bracelet or rattle.

Finally have the child create a motion pattern based on the same simple pattern.

Follow the same procedure for additional simple patterns, beginning with shapes, transferring the pattern to written letters, then to sounds, and to motions. Here are some simple patterns you may use:

- a b
- a b b
- a b c
- a b a c

Do Worksheet MA 2-10.

Connections: Discuss ways that patterns are transferred in real life. Reading music and then singing or playing it, using written directions for assembling something or following a recipe for making food. Encourage students to come up with others.

MA 2-11
Matching, Sorting, Patterning

Objective: The child will create/develop patterns: linear, repeated, and growing patterns with letters, objects, sounds, and motions.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should analyze how both repeating and growing patterns are generated.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board

Strategies: Review with the child the meaning of the following kinds of patterns:

- Linear – a pattern that continues in a line
- Repeated – a small pattern that is repeated over and over again – ababab.

Introduce the concept of a growing pattern.

- Growing – a pattern that beginssmall but keeps increasing in size a, ab, abc, abcd, or ab, aabb, aaabbb, or ab, abb, abbb,...

(Notice that a linear pattern can be a repeated pattern or a growing pattern.)

Review songs that have a growing pattern such as *Old MacDonald Had a Farm* or *I Know an Old Lady Who Swallowed a Fly*. Help the child identify the pattern. What happened each time a new animal was added to the song? Did the pattern change? How did it change? Help the child to understand the growing pattern in each verse.

Use the Story Board and the geometric shapes with Velcro backing to build a simple pattern: circle-square. Have the child identify and describe the pattern. Add a new series to the same pattern; circle-circle-square-square. Ask the child to identify the new pieces in the pattern. What has changed? Ask the child to predict what will come next? Ask the child to extend the pattern one more time.

Continue to create new patterns that grow using the shapes and the Story Board. Have the student identify the first sequence of the pattern, identify the growing change in the pattern, and extend the growing pattern.

Do Worksheet MA 2-11.

Connections: Have the child use stickers to create a growing pattern on a strip of paper.

Have the child make necklaces with pasta in a growing pattern. Ziti, penne, and rigatoni are good choices for stringing a growing pattern.

MA 2-12
Matching, Sorting, Patterning

Objective: The child will create predictable stories.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should analyze how both repeating and growing patterns are generated.

Suggested Materials:

- None

Strategies: Review the idea that predictable stories are ones where we can tell what someone is going to say or do or what is going to happen next. Use stories listed in the introduction to this unit to illustrate or review the concept. Have the child predict that the wolf in *The Three Little Pigs* will say, "I'll huff and I'll puff and I'll blow your house down," and that the giant in *Jack and the Beanstalk* will say, "Fe, fi, fo, fum! I smell the blood of an Englishman," throughout each story. Discuss how the child knew what each character would say. What was the pattern in each of the stories?

Share with the child the following vignettes and see if he or she can predict what someone is going to say or do or what is going to happen to complete them. Use props if desired to act out the stories.

1. The phone rang. / Mom picked it up. / She said, / "Hello."
2. John opened the refrigerator. / Something crashed. / He got the mop. / He cleaned up the mess.
3. Mr. Hicks slammed the car door. / He put on his seat belt. / He started the engine. / Then he drove away.
4. Elaine told a story. / Everyone listened. / The story was funny. / Everyone laughed.
5. Larry went to the library. / He found a book he liked. / He checked it out. / He read it.
6. It was Sara's birthday. / She wanted a new ball. / She got a box with a bow on it. / It was a ball.

Finally, have the child try composing a predictable story or vignette.

Connections: Visit the library to find other predictable stories. Have the student identify and review the predictable elements in a story as he or she reads.

Third Grade

Learning Objectives

Third Grade

MA 3-1 Recognize and extend growing geometric patterns.

MA 3-2 Recognize and identify numeric patterns.

MA 3-3* Identify and describe patterns in a multiplication table.

*Worksheet included

Materials Suggested for Lessons

A limited number of manipulatives are included in the kit that accompanies this unit. Additionally, you will need to use the following items in the lessons listed.

Braillewriter 3-2
Geometric shapes
  28 matching 3-1
Index cards 3-2
Marker, black 3-2

MA 3-1
Matching, Sorting, Patterning

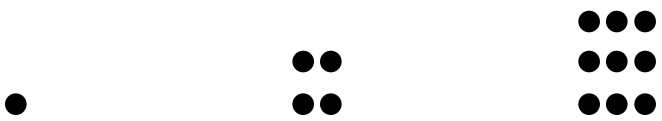
Objective: The child will recognize and extend growing geometric patterns.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should describe, extend, and make generalizations about geometric and numeric patterns.

Suggested Materials:

- Shapes with Velcro backing from the kit
- Story Board

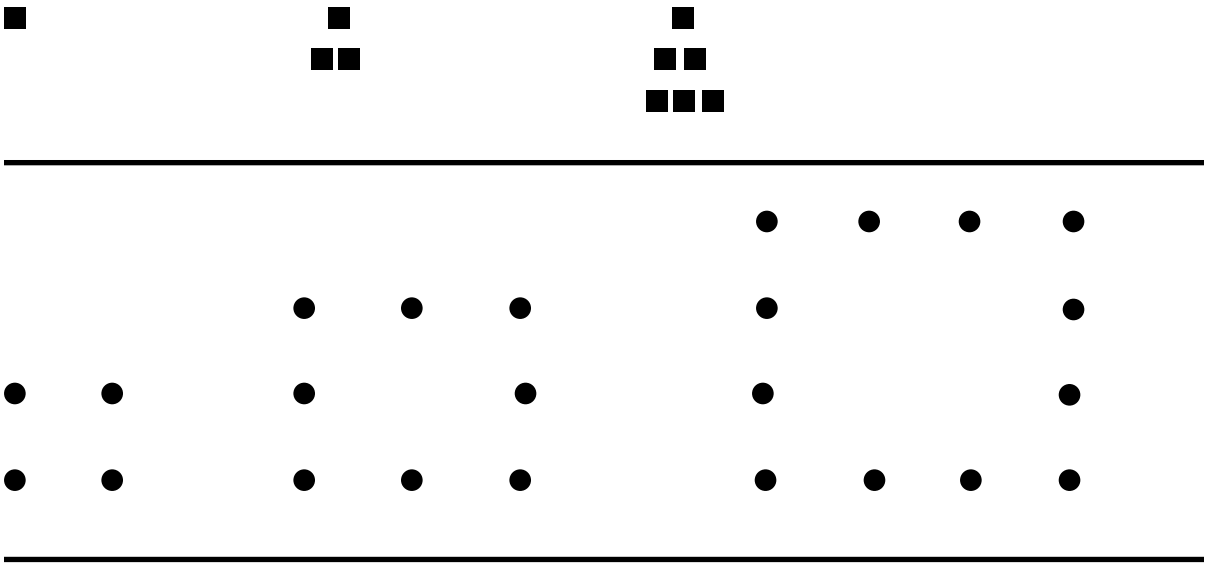
Strategies: Using manipulatives create the following pattern on the Story Board:

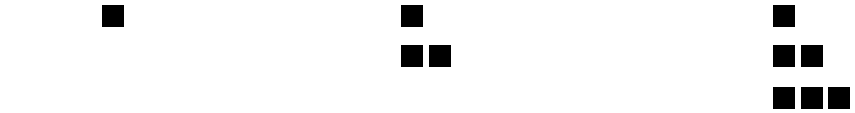


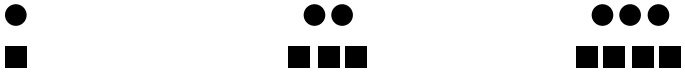
Have the child examine the pattern. What changes each time? What stays the same? Do you see a pattern? What would the next series or group look like in this pattern? Have the child use manipulatives to extend the pattern.

Review with the child the terms: linear pattern, repeating pattern, and growing pattern. Which type of pattern is the pattern we have built?

Use manipulatives and the Story Board to create the following patterns and have the child identify the pattern and extend the pattern. (There are not enough manipulatives in the kit to keep the same shape with all of these patterns. You will need to use additional cardboard shapes that you have cut for some examples.)







Have the student use the shapes to create a growing pattern. Have the child explain his or her pattern and identify the elements that are growing.

Connections: Take the child to visit a wallpaper store or a floor covering store and notice how some tactual geometric patterns are made and repeated over and over. Also look for examples of woven patterns to share.

MA 3-2
Matching, Sorting, Patterning

Objective: The child will recognize and identify numeric patterns.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should describe, extend, and make generalizations about geometric and numeric patterns.

Suggested Materials:

- Index cards with the numbers 1-10 in braille or large print
- Braillewriter or black marker
- Blank index cards

Strategies: Explain to the child that you are going to play "Guess my Pattern". Give the child the cards labeled 1-10. Have the child hand you one card of his or her choice. You will apply a rule or pattern to the number on the card and give the child back his or her card and a new card on which you have written a second number in braille or large print. The child is to determine the pattern you are using to get the new number.

If the child hands you a card labeled “1”, you apply the rule for your pattern “+3”, and hand back the card labeled “1” and a new card labeled “4.” Have the student place the cards side by side so he or she may use this pair as a reference. Have the student continue to give you new numbers until he or she can correctly name the pattern.

As the child becomes more proficient at the game use the multiplication facts.

Connections: For more advanced students introduce Pascal’s Triangle in which there are multiple patterns used to create the next line in the triangle.

MA 3-3
Matching, Sorting, Patterning

Objective: The child will identify and describe patterns in a multiplication table.

NCTM Standard: Algebra for Pre-K - 2 – Understand patterns, relations, and functions. All students should represent and analyze patterns and functions, using words, tables, and graphs.

Suggested Materials:

- Stickers from kit

Worksheets MA 3-3 (a), MA 3-3 (b), MA 3-3 (c), MA 3-3 (d), and MA 3-3 (e)

Strategies: Use one of the multiplication charts provided with this exercise. Review the chart with the child. Note the "x" sign in the upper left hand corner. How is this like the addition chart? How is it different from the addition chart? Make sure the child understands how to use the chart to find the answers to multiplication problems.

Have the child look for patterns of numbers on one of the worksheets. The child may find it helpful to place stickers on the worksheet to

"mark" the patterns that he or she finds. The child can use a different sticker for each pattern that is identified. Two copies of the Multiplication Worksheet are included for this activity.

X	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Have the child find and "mark" the following numbers on Worksheet MA 3-3 (a) and MA 3-3 (b) and describe the pattern that is made.

- a vertical column and horizontal row of consecutive numbers from 1-10
- a vertical column and a horizontal row of consecutive numbers from 1-9 in the tens place and from 0 - 9 backwards in the ones place

- a vertical column and horizontal row of numbers ending in either 0 or 5
- ten pairs of like numbers diagonally across from each other
- a vertical column and horizontal row of numbers whose digits when added together all equal 9
- a vertical column and a horizontal column that shows skip counting by 3s

Do worksheet MA 3-3 (c), (d), and (e).

Connections: Have the child look for other charts that demonstrate numerical patterns in his or her science book.

Assessment Check List

Objective	Fall	Winter	Spring	Notes
Kindergarten				
MA K-1 Match pairs of identical common objects.				
MA K-2 Match by size.				
MA K-3 Match by shape.				
MA K-4 Match by color or texture.				
MA K-5 Identify the one object in a set of objects that is very different.				

Objective	Fall	Winter	Spring	Notes
MA K-6 Identify the one object in a set of objects that is different in only one way.				
MA K-7 Recognize patterns.				
MA K-8 Describe patterns.				
MA K-9 Identify the object or shape that does not belong in a simple pattern of two or three objects or shapes.				

Objective	Fall	Winter	Spring	Notes
MA K-10 Extend a simple pattern of two or three objects or shapes by repeating the pattern at least two more times.				
MA K-11 Create simple patterns of two or three objects or shapes repeated at least two times.				

Objective	Fall	Winter	Spring	Notes
Grade 1				
MA 1-1 Order a set of five or more objects by size.				
MA 1-2 Sort a group of objects into three or four sets based on size when shape, color, and texture may be different.				
MA 1-3 Sort a group of objects into three or four sets based on shape when size, color, and texture may be different.				

Objective	Fall	Winter	Spring	Notes
MA 1-4 Sort a group of objects into three or four sets based on color or texture when the shape and size may be different.				
MA 1-5 Classify objects into two or three sets based on their composition.				
MA 1-6 Sort a group of objects into three or four sets based on composition when shape and size may be different.				

Objective	Fall	Winter	Spring	Notes
MA 1-7 Classify sets of objects into two or three sets based on function.				
MA 1-8 Identify the one object in a group of objects that is different from the others in terms of function.				
MA 1-9 Classify sounds or motions into sets.				
MA 1-10 Recognize and identify patterns.				

Objective	Fall	Winter	Spring	Notes
MA 1-11 Describe various patterns.				
MA 1-12 Identify patterns on the 100s chart.				
MA 1-13 Determine the missing piece of a pattern.				
MA 1-14 Extend patterns.				

Objective	Fall	Winter	Spring	Notes
MA 1-15 Transfer patterns from one format to another.				
MA 1-16 Create patterns of objects or shapes in a repeating sequence, using at least two to four different objects or shapes, and repeating the pattern at least three times.				
MA 1-17 Create predictable stories.				

Objective	Fall	Winter	Spring	Notes
Grade 2				
MA 2-1 Classify three dimensional objects according to various attributes: shape, size, texture, and color.				
MA 2-2 Classify objects by two of the following attributes: shape, size, color, and texture.				

Objective	Fall	Winter	Spring	Notes
MA 2-3 Classify objects by three of the following attributes: number, shape, size, color, and texture.				
MA 2-4 Identify objects in a group that are not the same in shape, size, or texture.				
MA 2-5 Extend patterns.				
MA 2-6 Describe, analyze, and label patterns.				

Objective	Fall	Winter	Spring	Notes
MA 2-7 Recognize and identify more complex patterns.				
MA 2-8 Identify patterns in an addition table.				
MA 2-9 Determine a missing piece of a more complex pattern.				
MA 2-10 Transfer a pattern from one format to another.				

Objective	Fall	Winter	Spring	Notes
MA 2-11 Create/ develop Patterns: linear patterns, repeated and growing, with letters, objects, sounds, or motions.				
MA 2-12 Create predictable stories.				

Objective	Fall	Winter	Spring	Notes
Grade 3				
MA 3-1 Recognize and extend growing geometric patterns.				
MA 3-2 Recognize and identify numeric patterns.				
MA 3-3 Identify and describe patterns in a multiplication chart.				

Appendix A

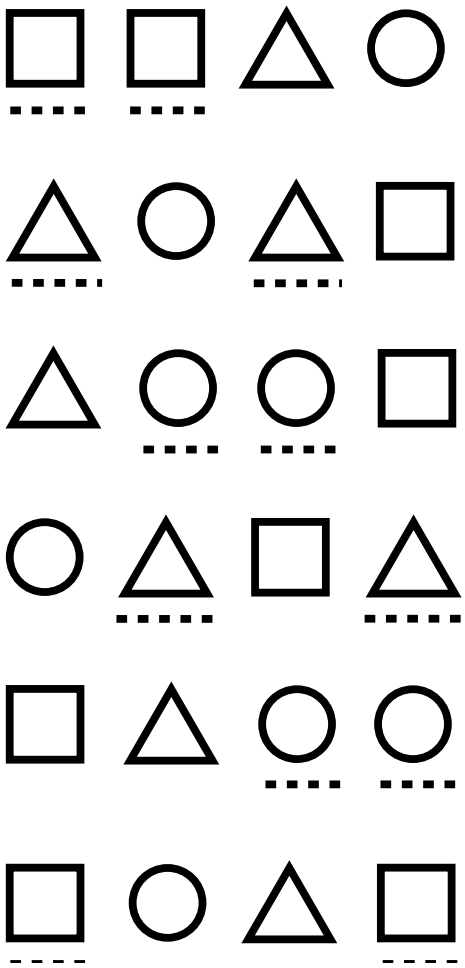
Appendix A

Related Math Materials available from the American Printing House for the Blind

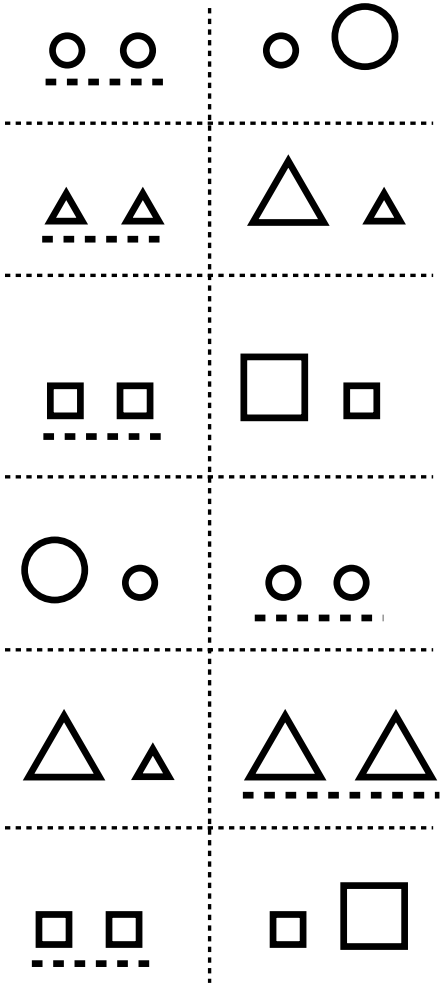
Matching, Sorting, Patterning	Catalog Number
Chang Tactual Diagram Kit	1-03130-00
Focus in Mathematics	1-08280-00
Game of Squares	1-08430-00
Graphic Art Tape	1-08878-00
Large Textured Block	1-03820-00
Peg Kit	1-03420-00
Puzzle Form Board Kit	1-03721-00
Seated Parquetry Set	1-03650-00
Sensory Cylinder Kit	1-03670-00
Small, Medium, and Large Circles, Set II	1-08600-00

Answer Key for Worksheets

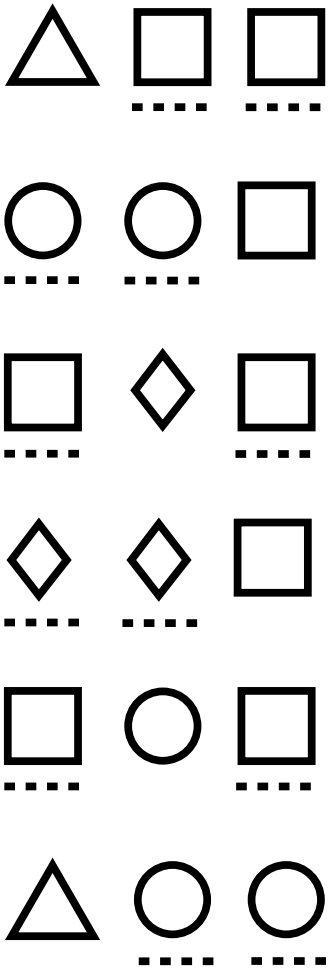
MA K-1 Matching, Sorting
Find two that are the same.



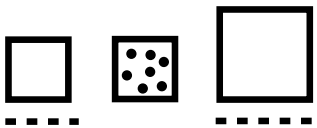
MA K-2 Matching, Sorting
Find the pairs that are the same size.

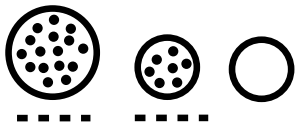


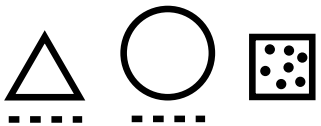
MA K-3 Matching, Sorting
Find two that are the same shape.

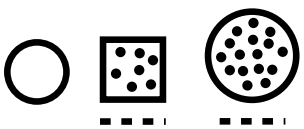


MA K-4 Matching, Sorting
Find two that feel the same - bumpy or smooth.

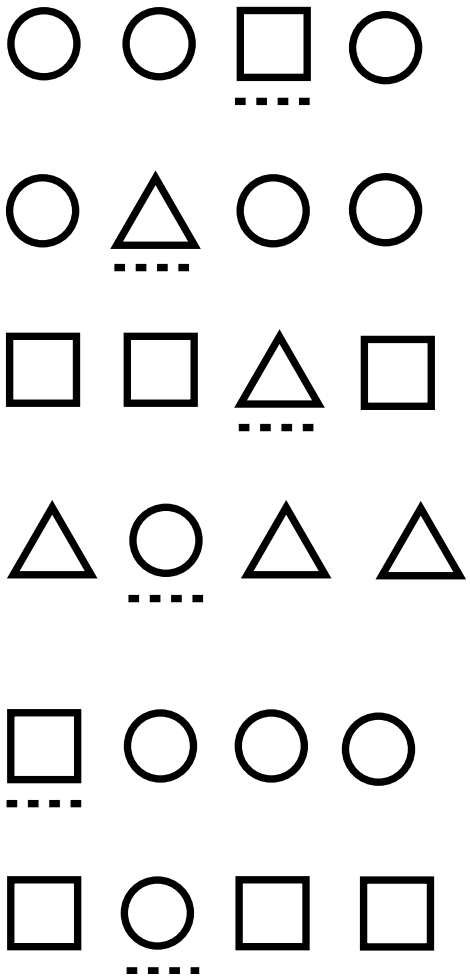




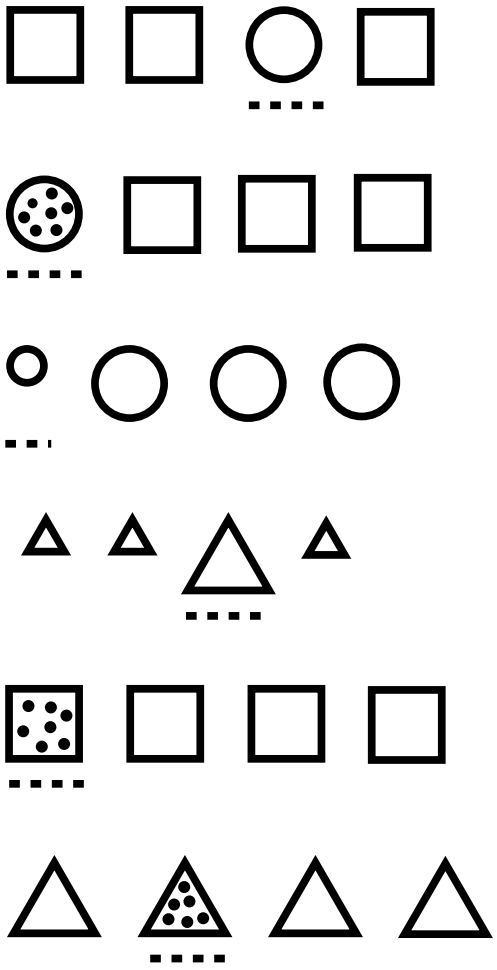




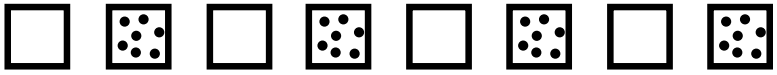
MA K-5 Matching, Sorting
Find one that is not the same.



MA K-6 Matching, Sorting
Find one that is not the same.



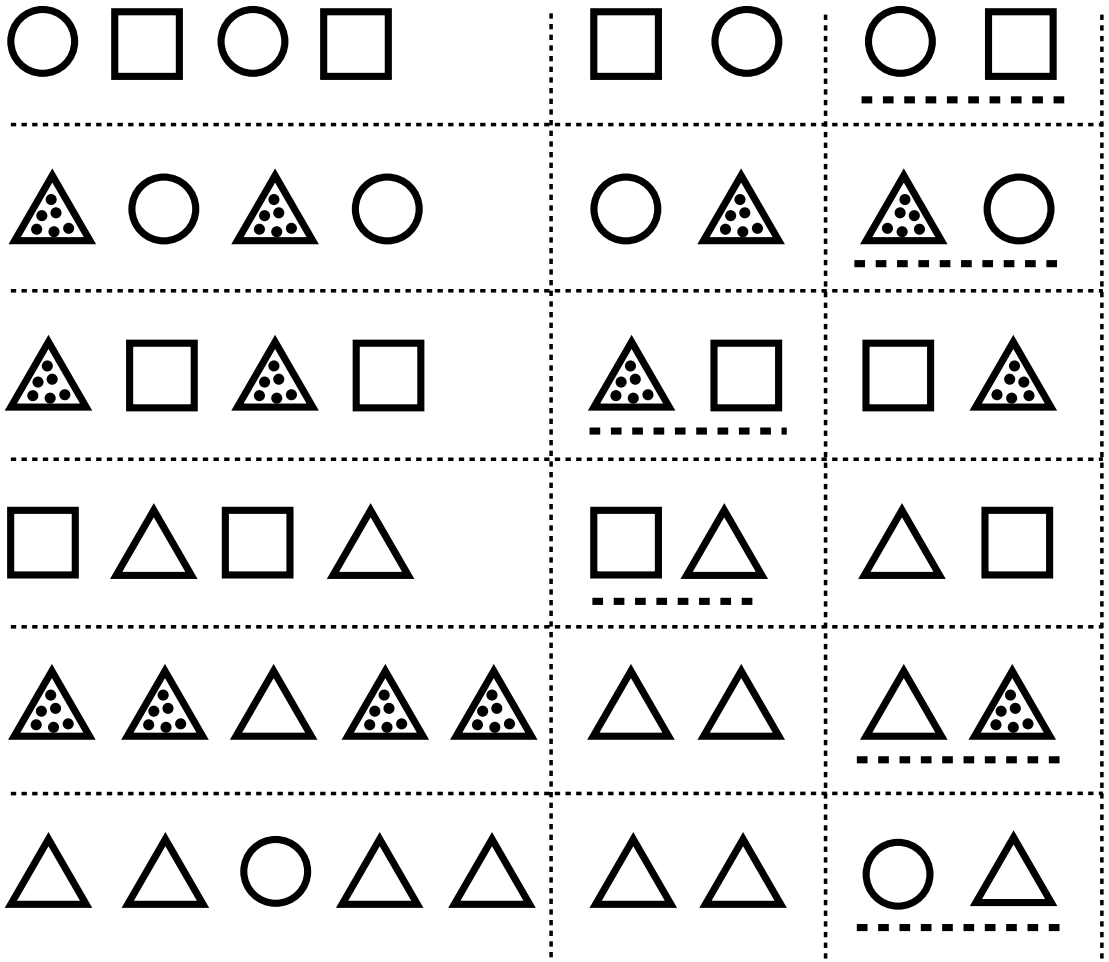
MA K-8 Matching, Sorting
Find the pattern in each line. What shapes are in it?



MA K-9(a) Matching, Sorting
Find the shape that does not belong in each pattern.

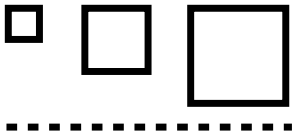
MA K-9(b) Matching, Sorting
Find the shape that does not belong in each pattern.

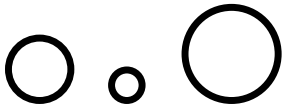
MA K-10 Matching, Sorting
Find the next two shapes for each pattern.



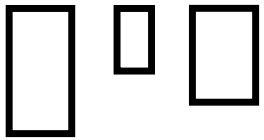
MA 1-1(a) Matching, Sorting

In each row there is a set of three shapes. Mark the sets that are in order from largest to smallest or from smallest to largest.

1 

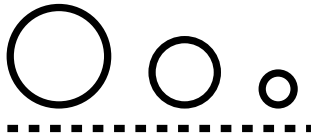
2 

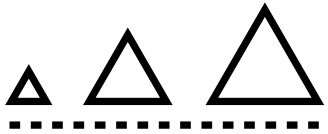
3 

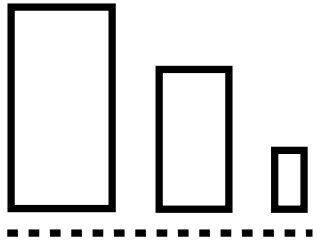
4 

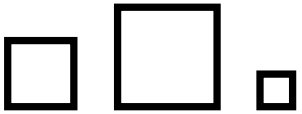
MA 1-1(b) Matching, Sorting

In each row there is a set of three shapes. Mark the sets that are in order from largest to smallest or from smallest to largest.

5 

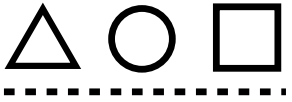
6 

7 

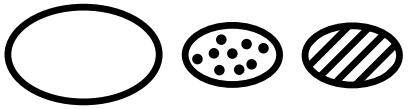
8 

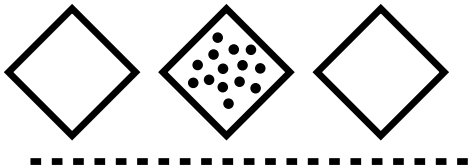
MA 1-2(a) Matching, Sorting
In each row there is a set of three shapes. Mark the sets that are the same size.

1 

2 

3 

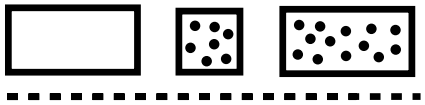
4 

5 

MA 1-2(b) Matching, Sorting

In each row there is a set of three shapes. Mark the sets that are the same size.

6



7

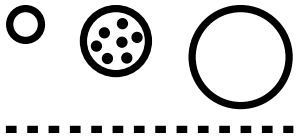
8

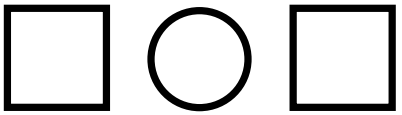
9

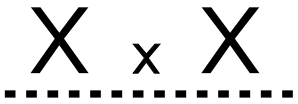
10

MA 1-3 (a) Matching, Sorting

In each row there is a set of three shapes. Mark the sets that are the same shape.

1 

2 

3 

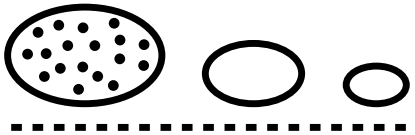
4 

5 

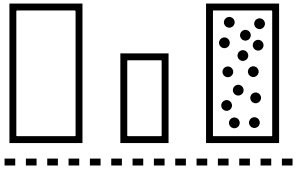
MA 1-3 (b) Matching, Sorting

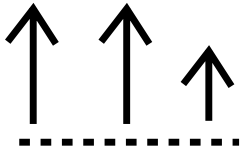
In each row there is a set of three shapes. Mark the sets that are the same shape.

6 

7 

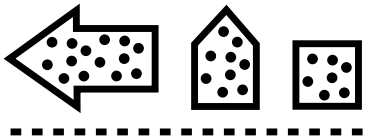
8 

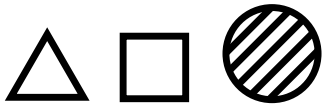
9 

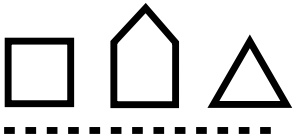
10 

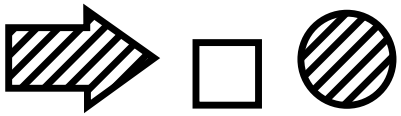
MA 1-4 (a) Matching, Sorting

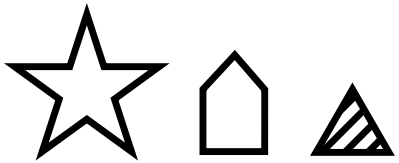
In each row there is a set of three shapes. Mark the sets that are the same texture.

1 

2 

3 

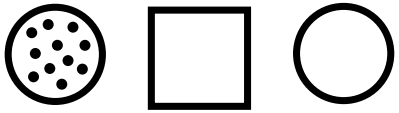
4 

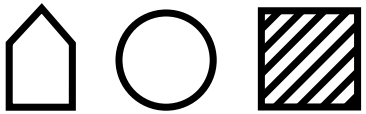
5 

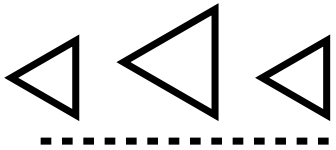
MA 1-4 (b) Matching, Sorting

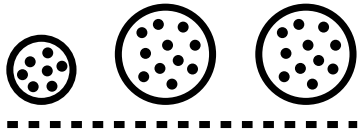
In each row there is a set of three shapes. Mark the sets that are the same texture.

6 

7 

8 

9 

10 

MA 1-10 (a) Matching, Sorting
Each line has a row of shapes. Mark the lines in which the shapes make a pattern.

1 

2 

3 

4 

5 

MA 1-10 (b) Matching, Sorting

Each line has a row of shapes. Mark the lines in which the shapes make a pattern.

6 

7 

8 

9 

10 

MA 1-11 (a) Matching, Sorting
In each line the shapes make a pattern. On the line below the shapes write letters to describe the pattern.

1 

(a, b, c)

2 

(a, b)

3 

(a, b, c)

4 

(a, a, b, c)

MA 1-11 (b) Matching, Sorting

In each line the shapes make a pattern. On the line below the shapes write letters to describe the pattern.

5 

(a, b, b, c)

6 

(a, b, c, c)

7 

(a, a, b, c)

8 

(a, b, b)

MA 1-12 (a) Matching, Sorting (1 of 3 sheets)
Find a different pattern on each hundred chart. Describe your pattern.

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

MA 1-12 (b) Matching, Sorting (2 of 3 sheets)
Find a different pattern on each hundred chart. Describe your pattern.

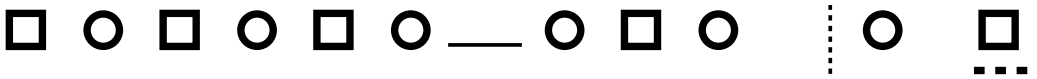
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

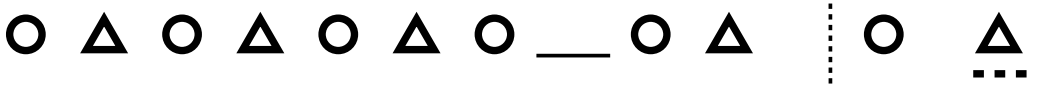
MA 1-12 (c) Matching, Sorting (3 of 3 sheets)
Find a different pattern on each hundred chart. Describe your pattern.

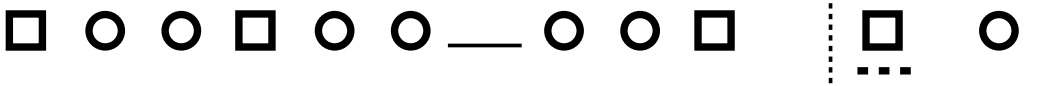
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

MA 1-13(a) Matching, Sorting

In each line there is a pattern with a missing shape. After the dotted line there are two shapes. Mark the shape that shows the missing part of the pattern.

1 

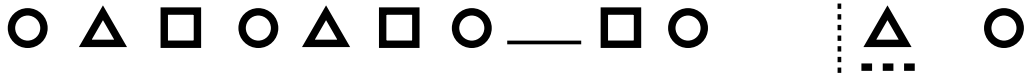
2 

3 

4 

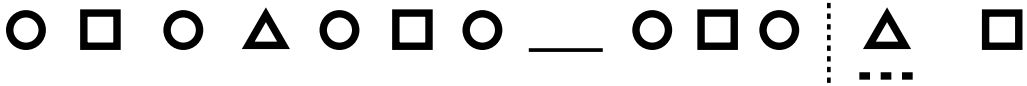
MA 1-13(b) Matching, Sorting

In each line there is a pattern with a missing shape. After the dotted line there are two shapes. Mark the shape that shows the missing part of the pattern.

5 

6 

7 

8 

MA 1-14(a) Matching, Sorting

In each line the shapes make a pattern. After the dotted line there are two shapes. Mark the shape that should come next in the pattern.

1 

2 

3 

4 

MA 1-14(b) Matching, Sorting

In each line the shapes make a pattern. After the dotted line there are two shapes. Mark the shape that should come next in the pattern.

5 

6 

7 

8 

MA 1-15 Matching, Sorting

Make the patterns in each row a different way. Use letters, shapes, motions or sounds.

1 X X O X X O

2 O X O X O X

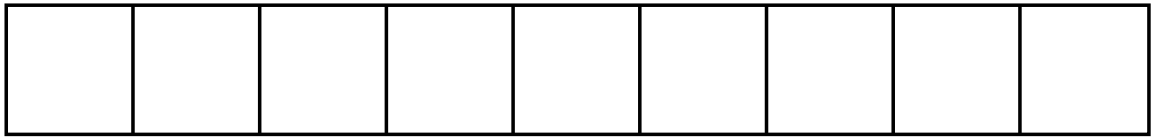
3 X O O X O O

4 O O X O O X

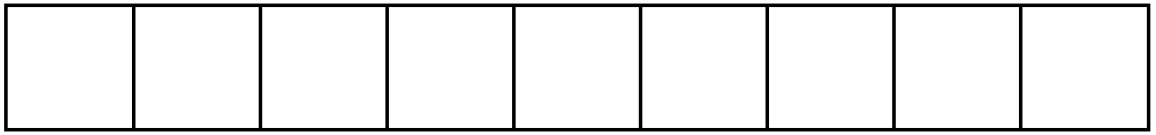
MA 1-16 Matching, Sorting

Use the boxes below to make a pattern with stickers or shapes. Repeat your pattern two times.

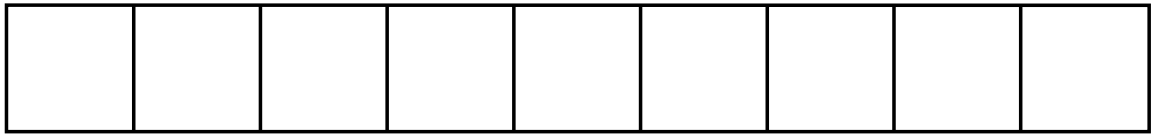
1



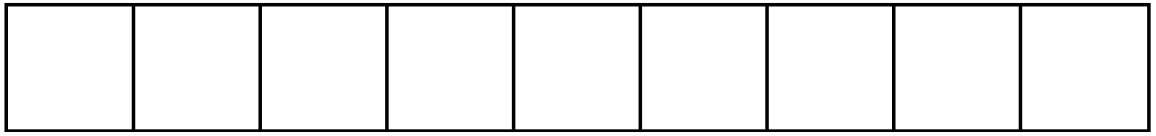
2



3



4

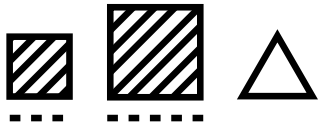


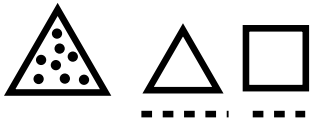
MA 2-2 Matching, Sorting

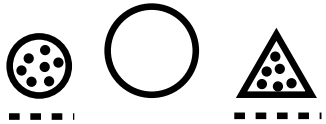
In each row there are three shapes. Mark the two shapes that are alike in two ways: shape, size or texture.

1 

2 

3 

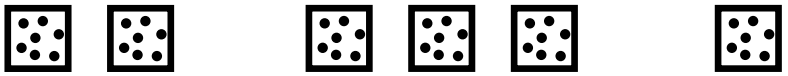
4 

5 

MA 2-3 Matching, Sorting
On a separate sheet of paper write the one way the three sets are different.

1 (shape)

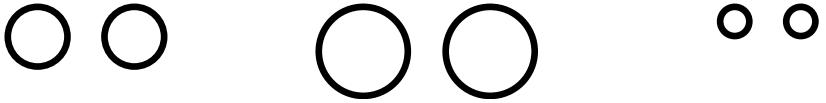
2 (number)



3 (number)

4 (texture)

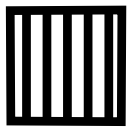
5 (size)



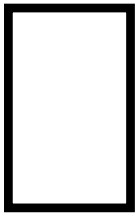
MA 2-4(a) Matching, Sorting

Use these shapes to answer the questions on MA 2-4(b).

a

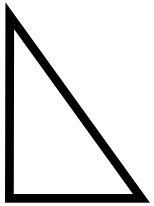


b

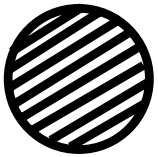


c

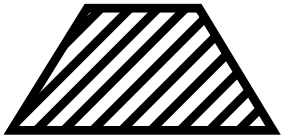
d



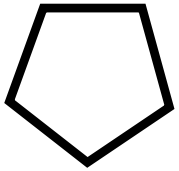
e



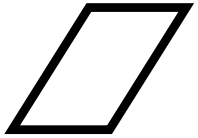
f



g



h



MA 2-4(b) Matching, Sorting

On a sheet of paper write the letter of shapes on MA 2-4 for each problem.

1 Shapes that are not smooth.
(a, e, f)

2 Shapes that are not round.
(a, b, d, f, g, h)

3 Shapes that are not triangles.
(a, b, c, e, f, g, h)

4 Shapes that are not squares.
(b, c, d, e, f, g, h)

5 Shapes that are not 4-sided.
(d, e, f, g)

6 Shapes that do not have 3 or more sides.
(c, e)

MA 2-5 Matching, Sorting

What comes next? In each line there is a pattern. On a separate sheet of paper write the names of the next three shapes in the pattern.

1 

(circle) (square) (circle)

2 

(square) (triangle) (square)

3 

(circle) (square) (square)

4 

(square) (triangle) (square)

5 

(circle) (square) (triangle)

6 

(triangle) (circle) (square)

MA 2-6 Matching, Sorting
In each line the shapes make a pattern. On a separate sheet of paper write letters to show the pattern you found.

1 
(a,b,c)

2 
(a,b,c,c)

3 
(a,a,b,c)

4 
(a,a,b,b)

5 
(a,b,b,c,d)

6 
(a,b,c,d,d)

MA 2-7 Matching, Sorting

On each line there is a pattern. Use stickers to create the pattern in the boxes two times.

1 a, a, b, c

2 a, b, b, c

3 a, b, c, d

4 a, b, c, c

MA 2-8(a) Matching, Sorting (1 of 2 sheets)
Find these sums on the addition chart and mark them with stickers to make a pattern. Number signs have been left off the chart.

	Down		Across
A.	0	+	0
B.	1	+	1
C.	2	+	2
D.	3	+	3
E.	4	+	4
F.	5	+	5
G.	6	+	6
H.	7	+	7
I.	8	+	8
J.	9	+	9
K.	10	+	10

Tell about the pattern you made. (The answers form a diagonal pattern from 0 on the top left to 20 on the bottom right.)

MA 2-8(a) Matching, Sorting (2 of 2 sheets)

+	0	1	2	3	4	5	6	7	8	9	10
0	(0)	1	2	3	4	5	6	7	8	9	10
1	1	(2)	3	4	5	6	7	8	9	10	11
2	2	3	(4)	5	6	7	8	9	10	11	12
3	3	4	5	(6)	7	8	9	10	11	12	13
4	4	5	6	7	(8)	9	10	11	12	13	14
5	5	6	7	8	9	(10)	11	12	13	14	15
6	6	7	8	9	10	11	(12)	13	14	15	16
7	7	8	9	10	11	12	13	(14)	15	16	17
8	8	9	10	11	12	13	14	15	(16)	17	18
9	9	10	11	12	13	14	15	16	17	(18)	19
10	10	11	12	13	14	15	16	17	18	19	(20)

MA 2-8(b) Matching, Sorting (1 of 2 sheets)
Find these sums on the addition chart and mark them with stickers to make a pattern. Number signs have been left off the chart.

	Down		Across
A.	3	+	2
B.	3	+	4
C.	4	+	3
D.	5	+	2
E.	5	+	4

Tell about the pattern you made. (The answers form a square pattern with 5, 7, 9, and 7 in the corners and a 7 in the middle.)

MA 2-8(b) Matching, Sorting (2 of 2 sheets)

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	(5)	6	(7)	8	9	10	11	12	13
4	4	5	6	(7)	8	9	10	11	12	13	14
5	5	6	(7)	8	(9)	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

MA 2-8(c) Matching, Sorting (1 of 2 sheets)
Find these sums on the addition chart and mark them with stickers to make a pattern. Number signs have been left off the chart.

	Down		Across
A.	2	+	6
B.	3	+	5
C.	4	+	4
D.	5	+	3
E.	6	+	2

Tell about the pattern you made. (The answers form a diagonal line of 8's from lower left to upper right.)

MA 2-8(c) Matching, Sorting (2 of 2 sheets)

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	(8)	9	10	11	12
3	3	4	5	6	7	(8)	9	10	11	12	13
4	4	5	6	7	(8)	9	10	11	12	13	14
5	5	6	7	(8)	9	10	11	12	13	14	15
6	6	7	(8)	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

MA 2-8(d) Matching, Sorting (1 of 2 sheets)
Find these sums on the addition chart and mark them with stickers to make a pattern. Number signs have been left off the chart.

	Down		Across
A.	3	+	4
B.	4	+	3
C.	4	+	5
D.	5	+	2
E.	5	+	6
F.	6	+	3
G.	6	+	5
H.	7	+	4

Tell about the pattern you made. (The answers form a diamond or kite shape with three 7's on the upper left side and three 11's on the lower right side. Two 9's complete the other two sides.)

MA 2-8(d) Matching, Sorting (2 of 2 sheets)

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	(7)	8	9	10	11	12	13
4	4	5	6	(7)	8	(9)	10	11	12	13	14
5	5	6	(7)	8	9	10	(11)	12	13	14	15
6	6	7	8	(9)	10	(11)	12	13	14	15	16
7	7	8	9	10	(11)	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

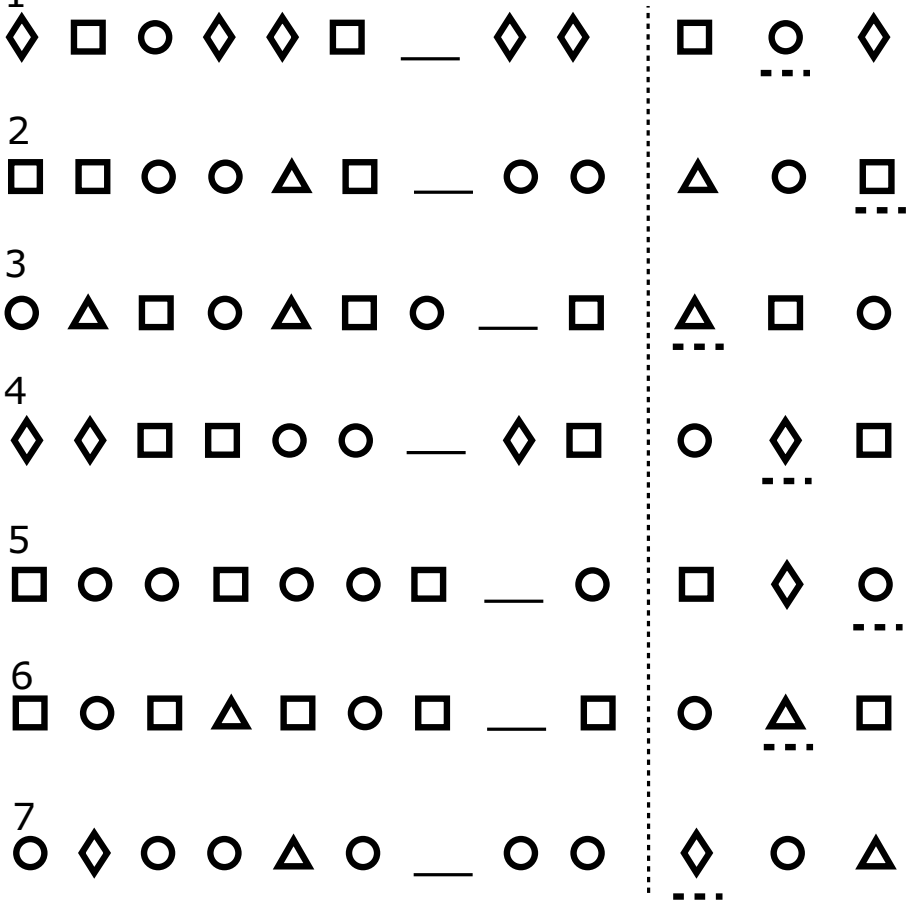
MA 2-8(e) Matching, Sorting

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12
3	3	4	5	6	7	8	9	10	11	12	13
4	4	5	6	7	8	9	10	11	12	13	14
5	5	6	7	8	9	10	11	12	13	14	15
6	6	7	8	9	10	11	12	13	14	15	16
7	7	8	9	10	11	12	13	14	15	16	17
8	8	9	10	11	12	13	14	15	16	17	18
9	9	10	11	12	13	14	15	16	17	18	19
10	10	11	12	13	14	15	16	17	18	19	20

MA 2-9 Matching, Sorting

In each line there is a set of shapes that make a pattern but one piece is missing. After the dotted line there are three shapes. Mark the shape that is the missing piece.

1



2

3

4

5

6

7

MA 2-10 Matching, Sorting
On each line there is a pattern. Make the pattern another way using shapes, stickers, sounds, or motions.

1

2

3

4

5

MA 2-11 Matching, Sorting

In each row there is a pattern. Mark the rows that have a growing pattern.

1 

2 

3 

4 

5 

6 

MA 3-3(a) Matching, Sorting

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

MA 3-3(b) Matching, Sorting

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

MA 3-3 (c) Matching, Sorting (1 of 2 sheets)
Find these products on the multiplication charts and mark them with stickers to make a pattern. Tell about the pattern you made. Number signs have been left off the chart.

A. 1 x 1
B. 2 x 2
C. 3 x 3
D. 4 x 4
E. 5 x 5
F. 6 x 6
G. 7 x 7
H. 8 x 8
I. 9 x 9
J. 10 x 10

MA 3-3(c) Matching, Sorting (2 of 2 sheets)

x	1	2	3	4	5	6	7	8	9	10
1	(1)	2	3	4	5	6	7	8	9	10
2	2	(4)	6	8	10	12	14	16	18	20
3	3	6	(9)	12	15	18	21	24	27	30
4	4	8	12	(16)	20	24	28	32	36	40
5	5	10	15	20	(25)	30	35	40	45	50
6	6	12	18	24	30	(36)	42	48	54	60
7	7	14	21	28	35	42	(49)	56	63	70
8	8	16	24	32	40	48	56	(64)	72	80
9	9	18	27	36	45	54	63	72	(81)	90
10	10	20	30	40	50	60	70	80	90	(100)

MA 3-3(d) Matching, Sorting (1 of 2 sheets)
Find these products on the multiplication charts and mark them with stickers to make a pattern. Number signs have been left off the chart. Tell about the pattern you made.

A. 3 x 5
B. 5 x 5
C. 5 x 3
D. 5 x 7
E. 7 x 5

MA 3-3(d) Matching, Sorting (2 of 2 sheets)

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	(15)	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	(15)	20	(25)	30	(35)	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	(35)	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

MA 3-3(e) Matching, Sorting (1 of 2 sheets)
Find these products on the multiplication charts and mark them with stickers to make a pattern. Number signs have been left off the chart. Tell about the pattern you made.

A. 2 x 5
B. 3 x 4
C. 3 x 6
D. 4 x 3
E. 4 x 7
F. 5 x 2
G. 5 x 8
H. 6 x 3
I. 6 x 7
J. 7 x 4
K. 7 x 6
L. 8 x 5

MA 3-3(e) Matching, Sorting (2 of 2 sheets)

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	(10)	12	14	16	18	20
3	3	6	9	(12)	15	(18)	21	24	27	30
4	4	8	(12)	16	20	24	(28)	32	36	40
5	5	(10)	15	20	25	30	35	(40)	45	50
6	6	12	(18)	24	30	36	(42)	48	54	60
7	7	14	21	(28)	35	(42)	49	56	63	70
8	8	16	24	32	(40)	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Notes

Notes

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