

The learner will demonstrate an understanding of classification and patterning.

Notes and textbook references

# 5

## ***5.01 Sort and classify objects by two attributes.***

**A.** Play “I’m thinking of a student.” Give clues to describe a student. Child will identify the person from the clues. Play the same game with children giving clues.

“I’m thinking of a girl.”

“The girl has on tennis shoes.”

“This girl is wearing jeans.”

“This girl has black hair.”

“This girl has on a pink shirt.”

“This girl has on a belt.”

**B.** Play “20 Questions” to guess what (who) is “It”. At first have students choose an “It”. The teacher asks questions to help children understand the game. Later students can play with teacher or student with student.

“Does “It” have legs?”

“Is this thing alive?”

“Is “It” a person?”

“Does “It” have fur?” etc.

**C.** Have students classify foods into the four food groups.

- Bring samples of food or go on a magazine “food hunt” and cut out pictures of food.
- Sort and classify plastic food models, real food, or pictures on a table or floor graphing grid. Make a pictorial graph to show how the foods are classified.
- Reclassify foods by color. Create a second graph. What can you say in comparing them?
- Have a tasting party.

**D.** Give each pair of students an object. Have them describe it, naming as many attributes as possible. Share the list with another group and have the second group identify what is being described.

**E.** Order six or seven classmates from shortest to tallest.

**F.** Given a collection of containers, have student order them according to the amount of water (rice, beans, etc.) they will hold. Be certain to have student check the order. Ask student to suggest how the seriation could be checked rather than telling the child what to do.

**G.** Have student paste 4 pictures in the correct order to show a sequence. Or ask the student to draw three or four pictures to illustrate a favorite story. Have the student put them in the correct sequence.

*Students working together may decide on rules or the teacher may suggest ways to sort. Some children have difficulty forming rules and consistently carrying out their own guidelines, but they are able to follow others' specific directions.*

*The importance of language in learning mathematics cannot be overlooked. As students are grouping objects, ask them to give reasons for the sorting. When students work in groups, ask them to agree upon a rule(s) before they begin to sort the materials. Having to clarify the criteria for classifying encourages children to use descriptive vocabulary they might not otherwise use.*

**H.** Have children line up according to a rule. See whether individuals know where/when to go. "All children who brought their lunch line up at the door." "Boys get in line." "Children who sit at table 3 may get in line." "Students who brought their library books back may get in line." "All students with tennis shoes may get in line."

**I.** Direct students to sort Relationshapes (or other attribute materials) by color, or size, or shape, or any other single attribute. Ask child to tell about the groups.

**J.** Have student put classroom objects with other things that are just the same. For example, blocks go on the shelf, pencils in the pencil can, coats go on the coat hooks, and Unifix cubes go in the tub. Have student sort books into ones read and ones not read. Choose a book from the latter group to read this week.

**K.** Invite different students to the front, placing them into groups one by one (ex. students with jeans and those with short pants). Ask another student, “Which group do you belong in?” Have child explain.

**L.** Line up students by two criteria: Observe whether students know when to get in line: Students with umbrellas and raincoats go first, then students with umbrellas, then students with raincoats, finally children with neither.

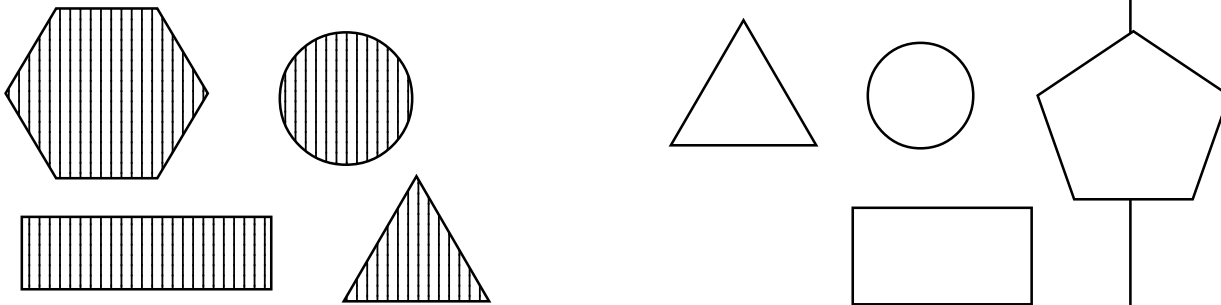
**M.** Give each student a shape made from construction paper. Ask those with large green circles to stand. Have students with small blue triangles to stand. (Use Hap Palmer Song.)

**N.** Sort capital letters by all straight lines, all curved lines, and both straight and curved lines. Given pictures of animals, mark those that have fur and live in the forest. Ask student to tell about each grouping.

**O.** Play “Guess My Rule”. Teacher or another student sorts objects and asks student to explain the rules that were used.

*Notes and textbook references*

*The Hap Palmer song - “The Shapes that Surround You” would be appropriate here. It’s on the CD titled “Can a Jumbo Jet Sing the Alphabet?”*



“These have stripes.”

“These do not have stripes.”

**P.** Have student make an attribute train. Each “car” must be different from the previous one in two ways. (It is a simpler task if the directions say “different in at least two ways.” The more difficult task is to make the cars different in “two and only two ways.”) Have student explain the differences as the new pieces are added.

**Q.** Give students materials (Relationshipapes, pasta, keys, buttons, etc.) and ask them to put the objects into some kind of groups. Students must be able to explain the groupings.

**R.** Ask child to organize the books in the reading area. Have student explain the groupings.

**S.** Have students organize items in class store. Explain how things are arranged. Why do certain items go together? Have students sort pictures of foods into groups and then explain how they are classified.

**T.** Have students cut pictures from magazines. Ask child to classify them and paste them on pages according to the rule the child has made. Have student explain. **Note:** Students might work in groups to create a catalog that would interest first-grade students.

**U.** Read The Button Box by Margaret Reid. Give each child a small handful of buttons and have the children sort the buttons. Have the children explain the rules they used for sorting. Record the groups by tracing and coloring the buttons.

**V.** Give partners a bag of Fun Fruits. Have children estimate how many are in the bag, then open and count. Have children sort their Fun Fruits and explain how they sorted. This could be by color or type.

## ***5.02 Use Venn diagrams to illustrate similarities and differences in two sets.***

*As students are sorting the objects into groups, Venn diagrams are useful tools to help students look closely at similarities and differences in sets. What may appear to be two different sets, may at second (or third) glance have internal differences that call for additional sorting. For example, 5.01 O has shapes sorted by stripes and no stripes. Examining the set of striped shapes (a similarity), some have straight sides and others have curved sides (differences). Likewise the non-striped shapes have these characteristics also. Giving students the opportunity to re-visit their sorting strengthens their ability to discern these subtleties. The Blackline Masters V - xx provide templates for this additional use of the activities suggested for 5.01.*

*A Three Hat Day* by Laura Geringer

After reading *A Three Hat Day*, the students are asked to recall the three hats R.R. Pottle wore to the store. The teacher can model wearing three hats or get a student volunteer. The teacher asks how many different ways these three hats can be worn and asks the students to record all the possible arrangements. Students can then share the different ways they solved the problem. The teacher may wish to make overheads or a poster of the various solutions for all to see.

### ***5.03 Create and extend patterns, identify the pattern unit, and translate into other forms.***

*A thorough understanding of the concept of pattern is important for all students. It is an understanding of patterns that helps to bring order into the child's environment and allows the child to make predictions. Patterns are studied in mathematics, and they are found in all content areas. Read pattern stories and poems, use patterns in art, and look for patterns in science as students are creating patterns in mathematics.*

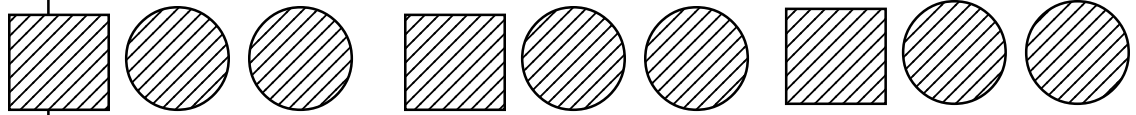
**A.** Begin a simple AB pattern at a concrete level and have student continue it. For example, clap, snap, clap, snap, clap, snap... green cube, yellow cube, green cube, yellow cube, yellow cube ... stand up, sit down, stand up, sit down, stand up, sit down ... Ask child to explain what the pattern is. Ask child to show the same pattern with different actions. Ask child to describe the pattern using letters.

**B.** Observe whether children participate correctly in pattern songs and dances.

**C.** Provide templates, stamps or stickers for child to use in copying a pattern. Ask student to explain the pattern you have created and to continue the pattern. Use adding machine tape and have student repeat pattern to create bulletin board borders.

*It is important when establishing a pattern to show at least three repeats before assuming a student can recognize and continue it.*

**D.** Have student continue more complex patterns. Ask student to explain the pattern unit. Ask student to make the same pattern with different materials. For example, the pattern below is ABB. It might be translated into “hands up , clap, clap”.

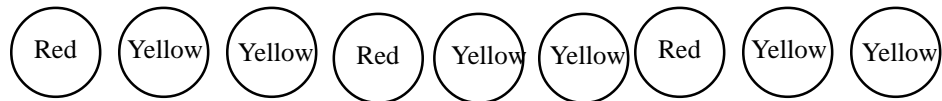


**E.** Given pictures of objects arranged in linear patterns, ask child to identify what comes next. Ask student to make a similar pattern with different materials.

**F.** Have student choose their favorite holiday or season (each student’s may be different). Give them a basic pattern and have them each create a holiday place mat with the same pattern but with figures that relate to their special day. For example, tell student the pattern is ABC.

**G.** Have students discover patterns with 2’s, 5’s, and 10’s on hundred boards. Use Unifix cubes or other markers to cover the numbers. Record these patterns by coloring 100 charts to show each sequence. At an abstract level, write the sequence.

**H.** Use two-color counters to build and continue patterns. Have students continue patterns such as:



Then have children stamp or color to make their own strips - exchange strips with classmates and have them continue the patterns.

**I.** Have student lead the class in an action pattern. The child makes up an action pattern or arranges fellow students into a pattern. Have student explain the pattern.

**J.** Given Unifix cubes, pattern blocks, or other interesting materials, have students make a pattern. Ask child to explain the pattern.

**K.** Provide stamps, templates, crayons, paper shapes, etc. Have students make borders on place mats or picture frames. Create wrapping paper. Ask students to explain the pattern.

**L.** Read to students the story of the “Princess and the Pea”. Have students design pattern strips to be the mattresses for the girls in the story. Ask children to dictate sentences about the story. Give a group the assignment to sequence the sentences correctly and then make a bulletin board using their “mattresses” on the girls’ beds. This activity is featured in the *Addenda* series published by the National Council of Teachers of Mathematics.

**M.** Show student a simple pattern with pattern blocks or Unifix cubes that has an error. Ask student to tell about your pattern and notice whether the error is discovered. What needs to be changed?

**N.** Using objects from the classroom, create patterns which have errors. Ask students to identify the error and correct it.

**O.** Child identifies patterns in children’s clothing or in wallpaper samples. Ask child to explain the pattern.

**P.** Take students on pattern walks. Have students tell their partners about the patterns they see around the school such as tiles, bricks, blinds, etc.

**Q.** Have students identify environmental patterns by finding pictures in magazines to illustrate them. Ask students to make a display and explain it. Such displays might include pictures of the four seasons or pictures showing the day-night cycle or pictures showing the usual meal cycle or pictures of a collection of floor tiles or a series of window patterns in large buildings.

*Ten Black Dots* by Donald Crews

Read the book *Ten Black Dots* to the class. Tell them that you have written your own *Dots* book but it is still in draft form. Show it to the class. It should have colored dots with a variety of patterns. How can you complete your story? Have the students suggest patterns and a plot to help you. Perhaps students would like to write their own *Dots* book.

# Using Manipulatives

Here are some guidelines for the use of manipulatives in your classroom. Don't give up if you have a difficult lesson. When students understand your expectations, you will witness their increased understanding and enjoyment of lessons that involve manipulatives.



- **Allow time for free exploration.** This is especially true if the items are new to students. Having time to explore the items will lessen the temptation to play with them during instruction.
- **Set the ground rules before beginning.** State your expectations briefly and positively. Students need to know the parameters of behavior and the purpose of the activity.
- **Pre-package the materials so they are easy to distribute and collect.** Ziploc bags, buckets, trays, egg cartons, film canisters, etc. will help with distribution, clean-up, and storage.
- **Collect materials before discussion begins to keep students' attention.** This does not mean take them away before students have completed tasks. Students are encouraged to verbalize during the activities and model the concepts and operations.
- **Allow students to use manipulative materials until they are ready to give them up.** Children should have easy access to the materials during lessons and especially in problem-solving situations. Modelling and acting-out are important strategies to foster.
- **Be on the look-out for miscellaneous "junk" which will, in time, become your "treasures".** A wide assortment of materials is a boon when sorting activities, patterns, geometric models, and storyboard lessons need to be organized.

