



How Can We Group and Sequence Living Things?

Focus: Students will practise sequencing and grouping living things according to one or more observable physical characteristics.

Specific Curriculum Outcomes

Students will be expected to:

- 9.0 sequence or group materials and objects
[GCO 2]

Performance Indicators

Students will be expected to:

- infer a rule that has been used to group or sequence students or other living things
- use a rule to group or sequence themselves, objects relating to living things, or living things as represented by images, according to observable physical characteristics

NOTES:

Attitude Outcome Statements

Encourage students to:

- appreciate the importance of accuracy [GCO 4]
- work with others in exploring and investigating [GCO 4]

Cross-Curricular Connections

Math

It is expected that students will:

- demonstrate an understanding of measurement as a process of comparing (identifying attributes that can be compared; ordering objects) [1SS1]

English Language Arts

Students will be expected to:

- communicate information and ideas effectively and clearly, and to respond personally and critically [GCO 2]
- interpret, select, and combine information using a variety of strategies, resources, and technologies [GCO 5]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• IWB Activity 4 • IWB Activity 5	• index cards (optional) • interlocking cubes • construction paper • scissors • markers or crayons • various beans and seeds in separate clear containers • sunflower seeds • animal figurines • images of different animals, at least one per student	• Set up mini-centres with various images of animals as well as beans and seeds for sequencing and grouping. • Prepare index cards with sorting and grouping rules for students. • Locate an online video showing egg-sorting machines at work. (See Additional Resources on page 83.)	• group • height • length • sequence • size

Science Background

- People have been coming up with ways to classify the various forms of life according to their observable physical characteristics for thousands of years.
- Today, in biology, living things are grouped according to a system of classification consisting of eight major levels, or taxa. These levels, in order of increasing specificity, are domain, kingdom, phylum, class, order, family, genus, and species.
- In the five-kingdom system, all plants belong to one kingdom (Plantae) while all animals belong to another (Animalia). Fungi, protists, and

monera make up the other three. (Protists and monera are organisms consisting of one cell only.)

- Each kingdom is then further subdivided. Modern scientists classify with the help of microscopic and DNA evidence along with evidence observable with the unaided eye.

Possible Misconceptions

- Students may become confused about the difference between sequencing and grouping, and in which situations each is appropriate. Help students by giving examples of characteristics that can be sequenced and characteristics that can be grouped, such as the following:
 - Sequencing is appropriate for a measurable feature or characteristic with a range of possible values, such as size, length, or height that can be placed in a logical order (e.g., smallest to largest).
 - Grouping is appropriate for a feature or characteristic with a finite number of defined attributes, such as body covering type (fur, feathers, scales, or skin). It would not make sense to sequence animals based on body covering since there is no logical order that can be imposed based on that feature.

Discuss with students characteristics that could be either grouped or sequenced, such as number of legs (none, two, four, eight, etc.).

ACTIVATE

Grouping and Sequencing Students

Ahead of time, choose several rules by which you can group or sequence students. Be sure to choose characteristics that students can observe directly. Examples of rules might include:

Grouping rules

- hair colour (blonde, black, brown or red)
- male or female
- glasses or no glasses
- wearing jeans, a skirt, or something else (3 groups)

Sequencing rules

- height (shortest to tallest)
- shoe (foot) size (smallest to biggest)
- hair length (longest to shortest)

Choose five to ten students to come to the front of the class. Without telling the class what you are doing, sort them into groups according to your chosen rule. Have the students try to figure out the rule. Encourage them to share their reasoning out loud.

Have those students sit down. Choose another five to ten students. Sort them into a sequence according to a new rule and have the students try to figure out the sequencing rule. Encourage them to share their reasoning.

CONNECT

Self-Grouping and Self-Sequencing

Have students work in groups to come up with rules to group or sequence themselves based on various observable characteristics such as height, shoe size, glasses or no glasses, hair length, etc. (Alternatively, provide rules on index card and have students draw a rule at random.) Once they have completed their grouping or sequencing, have them call you over to infer the rule they used.

Provide construction paper, crayons or markers, and scissors. Students can work in pairs tracing each other's foot and then sequence the cut-outs in order of length. Consider providing interlocking cubes so that students can measure the length and write the measurement on their cut-out. Display the finished cut-outs on the wall in sequence.

Grouping and Sequencing Living Things

In mini-centres, provide objects that students can group and sequence such as the following:

- beans and seeds in small, clear containers (sequence by size)
- sunflower seeds (group by number of stripes on seeds)
- cut-out pictures of animals and/or animal figurines (group based on body coverings or number of legs; sequence based on size of animal represented)

Students may even sequence the plants they are growing and observing according to their height, or group them according to number of leaves. (See the Growing Plants investigation in the How Do We Describe Living Things? teaching plan on pages 20–21.)

CONSOLIDATE

Kinesthetic Grouping and Sequencing

Provide each student with an image of a different animal. Call out sequencing or grouping rules and have students move to sort themselves according to each rule. (Students could use their Focus Animal for this activity.) Examples of rules to use:

- sequencing: smallest animal to biggest animal
- sequencing: longest tail to shortest tail
- grouping: number of legs
- grouping: type of body covering (fur, scales, feathers, etc.)

IWB Activity:

- Invite students to sort animals according to physical characteristics using Activity 4: *Sorting animals* (see the Teacher's Website).



IWB Activity:

- Students can use Activity 5: *Sequencing animal tracks* to sequence tracks by size and then identify the animal that made each track (see the Teacher's Website).



Independent Grouping and Sequencing

Have students choose materials from the mini-centres for the Grouping and Sequencing Living Things activity on page 27, and make a collage to illustrate a grouping or sorting rule. For example, they could create a collage using sunflower seeds grouped according to number of stripes, or a collage showing beans and seeds sequenced according to size.

EXPLORE MORE



Sorting Eggs

Have students investigate how eggs are sorted by size before being sold to the public. Videos are available for viewing online that show egg-sorting machines at work. After viewing one of these videos, have students ask and record questions they have about the process on the I Wonder Wall. Prompt students by asking questions such as:

- **How does the sorting machine work?**
- **Why are eggs sorted by size before being sold?**
- **Why are some eggs discarded?**
- **Why are the eggs different sizes if they all come from the same type of animal?**

Students can conduct further research to try to answer their questions.