

Classroom Diagnostic Tools
Grade Band Summary, Instructional Shifts, and Diagnostic Category Skills List –
Science Grades 3–5
Printing Instructions

To provide the Grade Band Summary and Diagnostic Category Skills List to your students or their parents/guardians in pamphlet format, use the following steps.

1. With this document open, click File, then Print.
2. If your printer allows you to print double-sided pages:
 - a. Under Settings, Document, select Print Custom Range, and enter 2-3.
 - b. Select Print on Both Sides and Flip Pages on Short Edge.
3. If your printer does not allow you to print double-sided pages:
 - a. Print only page 2.
 - b. Reload the pages into your printer and print page 3 on the back of page 2 with the pages turned along the short edge.
4. Place the page in front of you with page 2 (Science Grades 3–5 Summary; Big Ideas in Science; Biological Sciences; and Physical Sciences) facing up. Fold the right side in first and then the left side so the cover of your pamphlet is the first page.

Science Grades 3–5 Summary

In Science Grades 3 through 5, instructional time should focus on seven unifying themes: (1) use models and patterns to make predictions, draw inferences, or explain scientific and technological concepts; (2) describe the relationships among the parts of a system; (3) design, implement, record, explain, and justify safe and effective laboratory procedures; (4) identify examples of the relationship(s) between structure and function in the living world; (5) use appropriate technologies to make precise quantitative measurements; (6) measure, describe, or classify organisms, objects and/or materials by basic characteristics, their changes, and their uses; (7) describe the flow of energy from the sun, throughout the earth system.

Big Ideas in Science

1. The Earth system changes constantly as air, water, soil, and rock interact, and Earth is a part of a larger Sun-Earth-Moon system.
2. All living things are made of parts that have specific functions.
3. Energy exists in many forms and can be changed from one form to another (transformed) as it moves through a system.
4. Different characteristics of plants and animals help some populations survive and reproduce in greater numbers.

Biological Sciences

- Identify life processes of living things (e.g., growth, digestion, respiration).
- Compare similar functions of external characteristics of organisms (e.g., anatomical characteristics: appendages, type of covering, body segments).
- Describe how different parts of a living thing work together to provide what the organism needs (e.g., parts of plants: roots, stems, leaves).
- Identify characteristics for plant and animal survival in different environments (e.g., wetland, tundra, desert, prairie, deep ocean, forest).
- Explain how specific adaptations can help a living organism survive (e.g., protective coloration, mimicry, leaf sizes and shapes, ability to catch or retain water).
- Differentiate between inherited and acquired traits (e.g., scars, injuries).
- Explain how inherited traits help organisms survive and reproduce in different environments.
- Explain how certain behaviors help organisms survive and reproduce in different environments.
- Describe the relationships between organisms in different food webs.

Physical Sciences

- Describe and classify matter in terms of its observable properties (e.g., weight, mass, shape, size, color, texture, and state).
- Classify a substance as a solid, a liquid, or a gas.
- Recognize and identify how water goes through phase changes (i.e., evaporation, condensation, freezing, and melting).
- Describe how water changes from one state to another.
- Identify differences between chemical and physical changes of matter.
- Identify basic forms and sources of energy (e.g., sun, heat, light, sound).
- Identify simple transformations of energy (e.g., eating food to get energy, rubbing hands together to create heat).
- Identify characteristic properties of matter that are independent of mass and volume.
- Describe how energy exists in many forms (e.g., electrical, mechanical, chemical, heat, light, sound) and can be transformed within a system.
- Describe how heat energy is usually a byproduct of an energy transformation.
- Distinguish between kinetic and potential energy.
- Explain that energy is conserved.
- Identify and describe an object's motion (e.g., start/stop, push/pull, up/down, left/right, faster/slower, spinning).
- Describe an object's position in terms of its relationship to another object or stationary background (e.g., behind, beside, on top of, above, below).

Diagnostic Category Skills List

The Nature of Science

- Identify appropriate tools or instruments for specific tasks and describe the information they can provide (e.g., measuring: length-ruler, mass-balance scale, volume-beaker, temperature-thermometer; making observations: hand lens, binoculars, telescope).
- Generate questions about objects, organisms, or events that can be answered through scientific investigations.
- Design and describe an investigation (a fair test) to test one variable.
- Observe a natural phenomenon (e.g., weather changes, length of daylight/night, movement of shadows, animal migrations, growth of plants), record observations, and then make a prediction based on those observations.
- State a conclusion that is consistent with the information/data.
- Classify systems as either human-made or natural (e.g., human-made systems [balancing systems, tops, wheel and axle systems, pencil sharpeners from manual to electric] and natural systems [plants, animals, water cycle, stream]).
- Make predictions based on patterns in natural systems (e.g., phases of the moon, time [day, month, and year], weather, seasons).
- Describe how models are used to better understand the relationships in natural systems (e.g., water cycle, Sun-Earth-Moon system, ecosystems, observe and draw a diagram to show the effects of flowing water in a watershed).

Earth/Space Sciences

- Differentiate between abrupt changes in Earth's surface (e.g., earthquakes, volcanoes, meteor impacts, landslides) and gradual changes in Earth's surface (e.g., lifting up of mountains, wearing away by erosion).
- Explain how geological processes observed today (e.g., erosion, changes in the composition of the atmosphere, volcanic eruptions, earthquakes) are similar to those in the past.
- Compare the general characteristics of the inner planets of our solar system (i.e., size, orbital path, surface characteristics, and moons).
- Explain how the motion of the Sun-Earth-Moon system relates to time (e.g., days, months, years).
- Describe motions of the Sun-Earth-Moon system.

Additional Materials and Resources can be found at:

<http://www.pdesas.org/>

or

<https://pa.drctdirect.com/>

Science Grades 3–5 Grade Band Summary and Diagnostic Category Skills List

The Science summary for grades 3–5 describes the unifying themes upon which instructional time should be focused. The Big Ideas in Science describe practices that students should engage in throughout their learning in Science. The Diagnostic Category Skills List provides descriptions of skills that students can be expected to demonstrate within each Diagnostic Category while taking the Classroom Diagnostic Tools for Science. While this list does not include every possible skill that students may encounter within the CDT, it does provide a representative sample for each diagnostic category. Additionally, science instruction should not address these as discrete skills but rather incorporate them with the Big Ideas in Science as a part of an integrated curriculum.

