Grade 1 Science, Quarter 1, Unit 1.1

Physical Features of Humans

Overview

Number of instructional days: 11 (1 day = 20–30 minutes)

Content to be learned

- Observe, identify, and record the external features of humans.
- Observe physical features and those of parents and classmates.
- Compare physical features with those of parents and classmates.

Science processes to be integrated

- Observe and identify physical features of organisms.
- Identify the function of external features of organisms.
- Identify similarities and differences among organisms based on observations.
- Use scientific processes and tools, including the five senses, to make observations, make comparisons and communicate findings.

Essential questions

- What are some external features of humans and how are they used?
- How are you alike and different from other humans?

Written Curriculum

Grade-Span Expectations

LS 4 - Humans are similar to other species in many ways, and yet are unique among Earth's life forms.

LS4 (K-4) FAF -8

Identify what the physical structures of humans do (e.g., sense organs – eyes, ears, skin, etc.) or compare physical structures of humans to similar structures of animals.

LS4 (K-2)-8 Students demonstrate an understanding of human body systems by …

8b observing, identifying, and recording external features of humans ~~and other animals.~~

LS4 (K-4) POC -9

Distinguish between characteristics of humans that are inherited from parents (i.e., hair color, height, skin color, eye color) and others that are learned (e.g., riding a bike, singing a song, playing a game, reading).

LS4 (K-2) –9 Students demonstrate an understanding of human heredity by …

9a observing and comparing their physical features with those of parents, classmates ~~and other organisms.~~

Clarifying the Standards

Prior Learning

In kindergarten, students identified the five senses and used the senses to identify objects in the environment.

Current Learning

Students in grade 1 no longer focus on identifying the senses, but continue to use them as tools of observation in order to observe, identify, and record external features of humans, and to observe and compare their physical features with those of parents and classmates (e.g., eye color, hair color, height, skin color). The concepts in this unit of study are new to first grade students and should be taught at the developmental level of instruction.

Students will make observations of physical features and record their data using class pictographs, class Venn diagrams, or class bar graphs. If possible, students can then gather information, about biological parents using photographs or information sheets. They should make comparisons and then record their observations, data, and conclusions in their science notebooks or journals. This information could then be used to make a personal feature card similar to that of an athlete trading card or to create an "All About Me" poster, mobile, book, or pamphlet.

Future Learning

In grade 2, students will observe, identify, and record external features of humans, and will extend their learning to include other animals. They will identify the senses needed to meet survival needs for a given situation. Students will observe and compare their physical features with those of parents and classmates. Additionally, they will compare their physical features with those of other organisms. Grade 2 students will also identify that some behaviors are learned.

In grades 3–4, students will demonstrate an understanding of the human body systems by showing connections between external and internal body structures (i.e., organs and systems) and how they help humans survive. They will compare and analyze external features and characteristics of humans and other animals. Students will demonstrate an understanding of human heredity by identifying similarities that are inherited from a biological parent. Additionally. they will identify that some behaviors are learned and some behaviors are instinctive.

Additional Findings

At this level, children should be finding out about themselves and developing ideas about how people live, grow, eat, move, and use their senses to learn about the world around them. Students' observations of organisms should focus on external features. They may be able to identify some major internal organs and have simple views of their functions, but those should not be emphasized (*Benchmarks for Science Literacy*, p.128). The association of internal organs and how they function as a system is generally not understood until the age of 10. Between the ages of 7 and 9, students can, however, recognize how functional parts work together (*Making Sense of Secondary Science*, p. 26). Therefore, primary children should make observations about and describe the function of the external features of humans.

Children do distinguish people from other living things, but they don't necessarily understand that humans are a kind of animal (*Making Sense*, p. 21). Children need not be coerced into understanding this idea, but they should explore the similarities and differences between people and animals. As they progressively find similarities and differences among human beings and between human beings and other animals, they see where the animal classification is usefully applied to people and where it is not (*Benchmarks*, p.128).

Children of this level think each organ has its own independent function (e.g., the eyes are for seeing, the brain is for thinking, the stomach is for digesting food.) Only later will students learn how organs work in coordinated ways to form systems. Because young students have difficulty understanding the complexity of internal organs and systems, it is best to limit the discussion of these topics to only what is necessary in response to questions (*Benchmarks,* p. 136).

By the end of grade 2, students should know that people have different external features, such as the size, shape, and color of hair, skin, and eyes, but they are more like one another than like other animals (*Benchmarks*, p.128). In addition, the human body has parts that help it seek, find, and take in food, eyes and noses to detect food, and other body parts that help to get food, and the senses can warn individuals about danger (*Benchmarks*, p.136).

Notes About Resources and Materials

Suggested Reading

- Afoff, A. (2000). *Touch The Poem*. New York: Blue Sky Press.
- Aliki. (1991). *My Five Senses*. New York: Harper Collins.
- Cole, J. (1994). *You Can't Smell a Flower with Your Ear.* New York: Grosset & Dunlap/Penguin USA.
- Hill Nettleton, P. (2006). *Look, Listen, Taste, Touch and Smell: Learning About Your Five Senses.* Mankato, MN: Picture Window Books/Capstone.
- Keller, H. (2006) *Nosy Rosie.* New York: Greenwillow Books/Harper Collins.
- Kroll, V. (1993). *Naomi Knows It's Springtime.* Honesdale, PA: Boyds Mills Press.
- Raschka, C. (2006). *Five For a Little One.* New York: Antheneum Books/Simon and Schuster.
- Hinshaw Patent, D. (1989). *Grandfather's Nose: Why We Look Alike or Different.* London: Franklin Watts.
- May, J. (1970). *Do You Have Your Father's Nose? The Story of Human Heredity*. Mankato, MN: Creative Co.
- Pomerantz, C. (1969). *Why You Look Like You Whereas I Tend To Look Like Me.* Frenchs Forest, Australia: Addison Wesley/Pearson Education.

Helpful Websites

- www.Education.com
- www.PBSkids.org/zoom/activities
- www.TeachtheChildrenWell.com

Grade 1 Science, Quarter 1, Unit 1.2

Properties of Objects

Overview

Number of instructional days: 11 (1 day = 40 minutes)

Content to be learned

- Identify, compare, and sort objects by similar or different physical properties.
- Record observations/data about physical properties.
- Use attributes of properties to state why objects are grouped.
- Use simple tools to explore the property of weight.
- Describe that objects change in temperature by adding or subtracting heat.

Science processes to be integrated

- Make and record observations in order to describe changes that occur.
- Observe and identify physical properties of objects.
- Compare and sort objects using physical properties.
- Use tools to measure physical properties.

Essential questions

- How are physical properties used to identify and sort objects?
- How can tools be used to observe, describe, and record observations of the physical properties of objects?
- What happens to objects when we add or take away heat? Explain.

Written Curriculum

Grade-Span Expectations

PS1 - All living and nonliving things are composed of matter having characteristic properties that distinguish one substance from another (independent of size or amount of substance).

PS1 (K-4) INQ –1

Collect and organize data about physical properties in order to classify objects or draw conclusions about objects and their characteristic properties (e.g., temperature, color, size, shape, weight, texture, flexibility).

PS1 (K-2)–1 Students demonstrate an understanding of characteristic properties of matter by …

1a identifying, comparing, and sorting objects by similar or different physical properties (e.g., size, shape, color, texture, smell, weight).

1b recording observations/data about physical properties.

1c using attributes of properties to state why objects are grouped together (e.g., things that roll, things that are rough).

PS1 (K-4) SAE –3

Use measures of weight (data) to demonstrate that the whole equals the sum of its parts.

PS1 (K-2)–3 Students demonstrate an understanding of conservation of matter by…

3a using simple tools (e.g. balance scale, see-saw) to explore the property of weight.

PS2 (K-4) SAE+INQ – 6

Experiment, observe, or predict how heat might move from one object to another.

PS2 (K-2)–6 Students demonstrate an understanding of energy by…

6b describing that objects change in temperature by adding or subtracting heat.

Clarifying the Standards

Prior Learning

Kindergarten students identified, compared, and sorted objects by similar or different physical properties (e.g., size, shape, color, texture, smell, and weight). They used attributes of properties to state why objects are grouped together (e.g., things that roll, things that are rough), and they used simple tools to explore the property of weight (e.g., balance and seesaw).

Current Learning

In grade 1, students are taught at the reinforcement level of instruction to identify, compare, and sort objects using physical properties. At the developmental level of instruction, students learn to record observations/data about physical properties, and to use attributes of properties to state why objects are grouped together. Students can use simple graphs and drawings as they learn to record their observations in science notebooks or journals.

At the reinforcement level of instruction, students use simple tools (e.g., balance scale, seesaw) to explore the property of weight. Centers/stations can be used to give students opportunities to measure the weight of a wide variety of objects. They should use science tools such as balances and seesaws with nonstandard units of measure.

Additionally, at the developmental level of instruction, students describe the changes that occur in temperature when heat is added to or subtracted from an object. Students will first need experiences measuring temperature with thermometers that have had the number scales removed, in order to recognize that when temperature increases, the red liquid in the thermometer moves up, and when temperature decreases, the red liquid moves down. Students should then have the opportunity to use thermometers to observe and describe changes in temperature in objects when cooled by ice or refrigeration, or when heated by a heat source such as a hot pad, sunlight, lamp, or body heat.

Future Learning

In grade 2, students will describe the properties of solids and liquids, and identify and compare solids and liquids. They will make logical predictions about the changes in the state of matter when adding or taking away heat (e.g., ice melting, and water freezing). Students will demonstrate an understanding of conservation of matter by using simple tools (e.g., balance scale, and seesaw) to explore the property of weight. Additionally, students will demonstrate an understanding of energy by describing that objects change in temperature by adding or subtracting heat.

In grades 3–4, students will demonstrate an understanding of characteristic properties of matter by identifying, comparing, and sorting objects by similar or different physical properties (e.g., size, shape, color, texture, smell, weight, temperature, flexibility). They will cite evidence (e.g., prior knowledge, data) to support conclusions about why objects are grouped/not grouped together. They will demonstrate an understanding of physical changes by observing and describing physical changes (e.g., freezing, thawing, tearing a piece of paper). Students will demonstrate an understanding of conservation of matter by measuring the weight of objects to prove that all matter has weight. They will use measures of weight to prove that the whole equals the sum of the parts, and will show that the weight of an object remains the same despite a change in its shape. Students will show an understanding of energy by describing how heat moves from warm objects to cold objects until both objects are the same temperature, and they will show that heat moves from one object to another causing temperature change (e.g., when land heats up, it warms the air).

Additional Findings

During the early years, children's natural curiosity leads them to explore the world by observing and manipulating common objects and materials in their environment. Children compare, describe, and sort as they begin to form explanations of the world. Developing a subject-matter knowledge base to formulate explanations and formulate predictions requires many experiences over a long period of time. Through the observation, manipulation, and classification of common objects, children reflect on the similarities and differences of objects. Describing, grouping, and sorting objects and materials is possible early in the K–4 grade range. Teachers should provide multiple opportunities for children to explore using simple tools, such as magnifiers and measuring devices (*National Science Education Standards*, p.123).

Young children have a difficult time understanding a complex concept such as energy. They have intuitive notions of energy—for example, energy is needed to get things done; humans get energy from food. Teachers should build on the intuitive notions of students. By experimenting with light, heat, and sound, students can begin to understand that energy can be observed, measured, and controlled without requiring them to memorize technical definitions (*National Science Education Standards*, p. 126).

According to *Benchmarks for Science Literacy*, energy is a mysterious concept even though its various forms can be precisely defined and measured. Energy is a major exception to the principle that students should understand ideas before being given labels for them. Children benefit from talking about energy before they are able to define it. At the simplest level, children can think of energy as something needed to make things go, run, or happen. Heat energy, itself is a surprisingly difficult idea for students, who thoroughly confound it with the idea of temperature. (p. 81).

Notes About Resources and Materials

Additional Materials

- Mason, A. (2005). *Touch It! Materials Matter and You* (Primary Physical Science). Toronto, Canada: Kids Can Press.

Websites

- To make thermometers: www.ehow.com or www.weatherwizkids.com
- www.sciencekids.co.nz
- www.pppst.com
- www.fossweb.com
- www.brainpopjr.com