

Core Knowledge Science Program—Domain Map

Science Content

- Five senses and the associated body parts:

Sight: eyes

Hearing: ears

Smell: nose

Taste: tongue

Touch: skin

- Basic needs and taking care of your body:

Healthy foods and water

Air

Shelter and clothing

Rest

Cleanliness

Exercise

This unit contributes to meeting or exceeding the following Next Generation Science Standards:

K-LS1-1. Use observations to describe **patterns of what plants and animals (including humans) need to survive**.

Rationale:

This first unit of the CK Science program lays the early foundation for the developing understanding of what animals (including humans) need to survive ([DCI LS1.C](#)). This will be expanded in later Kindergarten units (Unit 2 *Animals & Their Needs* and Unit 3 *Plants & Farms*) as well as across the grades (e.g., Grade 1 Unit 4 *Living Things & Their Environments* and Grade 3 Unit 3 *Human Body: Cells & The Digestive System*).

This unit offers the opportunity to foreshadow learning that will support the following Next Generation Science Standards:

<p>1-PS4-4. Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.</p>	<p>Rationale:</p> <p>This unit directly contributes to a student’s developing understanding of DCI PS4.C, which is the core idea central to this Grade 1 standard. PS4.C begins its progression with the idea that “people use their senses to learn about the world around them. Their eyes detect light, their ears detect sound, and they can feel vibrations by touch.” (<i>Framework</i>, page 137) This core idea will be further supported by the later study of telescopes (Grade 3 Unit 3 <i>Light & Optics</i> as well as Grade 3 Unit 5 <i>Astronomy</i>) and the study of telephones (Grade 3 Unit 4 <i>Sound</i> and the biography of Alexander Graham Bell).</p>
<p>1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.</p>	<p>Rationale:</p> <p>As modeled by this Grade 1 standard, this Kindergarten unit “bundles” the disciplinary core ideas of LS1.A (Structure & Function) and LS1.D (Information Processing) to foster early learning about the cross-cutting concept of structure and function. This concept will be extended in Grade 1 through Unit 4 <i>Living Things & Their Environments</i> when there is also the opportunity to connect and apply these core ideas while addressing ESS3.A (Natural Resources) which addresses the question, “<i>How do humans depend on Earth’s resources?</i>”</p>

Potential Skills & Cross-Curricular Integrations

The connections listed below are intended as ideas for possible integration across this unit. Finding connections in math, in language arts, and in works of poetry, art, and music, may help you as you create meaningful learning experiences for your students. Connections such as these can help your students make links between various disciplines and deepen their understanding of this domain.

POTENTIAL CCSS Math Connections

K.MD.A.2 Directly compare two objects with a measurable attribute in common, to see which object has “more of”/“less of” the attribute, and describe the difference. (*K-LS1-1*)

MP.5 Use appropriate tools strategically. (*1-PS4-4*)

POTENTIAL CCSS ELA Connections

W.K.7 Participate in shared research and writing projects (e.g., explore a number of books by a favorite author and express opinions about them). (*K-LS1-1*)

POTENTIAL Cross-Curricular Connections

ELA: Poetry—“Time to Rise,” “Early to Bed,” and “My Nose”

Sayings & Phrases—“Look before you leap” and “Better safe than sorry”

Visual Arts: Elements of Art—Pablo Picasso, *Le Gourmet*

Looking and Talking about Works of Art—Mary Cassatt, *The Child’s Bath*

Music: Songs—“The Hokey Pokey”

Prior Knowledge

The Core Knowledge Preschool Sequence

Scientific Reasoning and the Physical World

Goal: *Demonstrate an initial understanding of the living world*

- Humans learn through their senses
- Human bodies are made up of many different parts
- Humans need to do certain things to grow and stay healthy
- Humans need to protect themselves in different ways

CKLA Preschool

- State that the five senses are sight, hearing, smell, taste, and touch
- State how each of the five senses helps us to experience the world
- Name human beings’ three basic needs: water, food, and shelter
- State that a body can heal itself when it is hurt or sick
- State that people stay healthy by exercising, resting, eating good foods, and staying clean

CKLA Kindergarten Objectives

The following objectives are addressed through the Core Knowledge Language Arts program (CKLA), which builds students’ background knowledge in certain domains of literature, science, and history. To learn more about how and why the Listening & Learning Strand of CKLA approaches science content through read-alouds and ELA instruction, [read more about the CKLA program](#).

Domain Anthology, The Five Senses

- Identify and describe the five senses: sight, hearing, smell, taste, and touch
- Identify the body parts associated with the five senses
- Provide simple explanations about how the eyes, ears, nose, tongue, and skin work
- Describe how the five senses help people learn about their world

- Describe some ways people take care of their bodies
- Describe some ways the five senses help protect people from harm
- Describe the experiences and challenges of someone who is blind or deaf
- Explain the contributions of Ray Charles
- Explain the contributions of Helen Keller

What Students Will Learn in Future Grades

Core Knowledge Sequence

Grade 1 *The Human Body*

- Body Systems: Skeletal, Muscular, Digestive, Circulatory, and Nervous Systems
- Germs, Diseases, and Preventing Illness

Grade 2 *The Human Body*

- Cells, Digestive and Excretory Systems, and a Healthy Diet

Grade 3 *The Human Body*

- The Muscular, Skeletal, and Nervous Systems
- How the Eyes and Ears Work

Grade 4 *The Human Body*

- The Circulatory and Respiratory Systems

Grade 5 *The Human Body*

- Changes in Human Adolescence

Core Vocabulary

The following list contains the Core Vocabulary words suggested for purposeful integration across this Kindergarten unit. **Boldfaced** terms could be introduced and/or reviewed with students using a Word Work activity, as modeled by the [Core Knowledge Language Arts program](#) (CKLA). The inclusion of the words on this list does not mean that students are immediately expected to be able to use all of these words on their own. However, through repeated exposure across the lessons, students should acquire a good understanding of most of these words and begin to use some in conversation.

Basic Needs of Your Body

needs, survive, alive, health(y), food, **shelter**, clothing, **air**, water, protect, **rest**, sleep, tired, exhausted, grow, age, temperature, huddle

Sight

eye, **vision**, light, color, brightness, shade, look, seeing, sight, iris, pigment, **pupil**, eyeball, eyelid, lens, blink, squint, **blindness**, focus, image, visual, visible, **reflection**, **glasses**, eye doctor, contact lens, nearsighted, farsighted

Taking Care of Your Body

exercise, pulse, sports, sweat, **cleanliness**, bath(e), hygiene, disease, germs, harm, organ, **nutrients**, fat, protein, carbohydrate, **senses**, brain, **system**, habits, aware, sometimes, often

Hearing

sound, ear, hearing, vibrate, movement, **eardrum**, inner/outer ear, invisible, **waves**, echo, volume, soft, quietly, whisper, loud, shout, yell, voice, vocal, deafness, hearing aid, **audio**, radio, stereo, speaker, microphone

<p>Smell</p> <p><i>nostrils, nose, scent, smell, inhale, odor, sweet, sour, smoky, perfume, sniff, stench, stink, receptors, molecules, mucus, nasal</i></p> <p>Touch</p> <p><i>skin, touch, feel, sensation, sensitive, nerves, grab, texture, rough, smooth, soft, bumpy, furry, slippery, sharp, dull, hot, cold, grab, push, rub, numb</i></p>	<p>Taste</p> <p><i>taste buds, flavor, sweet, salty, sour, bitter, flavorful, bland, digest, tongue, mouth, throat, palate, saliva, teeth, swallow, pucker, congested, chemical, reaction, prefer</i></p>
--	---

Potential Misconceptions

Students have been shown to learn significantly more science when their teachers demonstrate strong knowledge of potential student errors, and when the teacher plans accordingly (Sadler & Sonnert, 2016). The following incorrect statements serve as a sampling of the “intuitive theories” or “alternative conceptions” that students and teachers may actively use to describe their thinking, and which might interfere with the process of learning. The details following each statement are not intended to imply the scope of instruction for this grade, but instead provide a clearer sense of what students (of all ages) often misunderstand and/or overgeneralize when investigating and describing scientific ideas.

<p>Misconception: “There is a ‘map’ of taste buds on the tongue. For example, taste buds for sweet tastes are on the tip of the tongue and bitter taste buds are at the back of the tongue.”</p> <p>Specialized taste buds for all tastes are actually spread all throughout the tongue, not necessarily grouped together. And, contrary to popular belief, taste buds are not just on the tongue—they also line the soft palate at the roof of the mouth, as well as the epiglottis, the flap in your throat that blocks food from entering the windpipe.</p> <p>Misconception: “There are only four tastes: sweet, salty, sour, and bitter.”</p> <p>Scientists agree that there is at least one additional taste called “umami” for the savory taste of glutamate, a substance common in Japanese foods as well as in meats such as bacon. Umami can be translated from Japanese as “good taste” or “deliciousness.”</p>	<p>Misconception: “Humans have only five senses.”</p> <p>Scientists define anywhere between nine to twenty different human senses depending on the scope of their investigation. Examples beyond the five senses we typically think of include the sensation of thirst; the sensations of pain and itchiness (which actually involve two different mechanisms than those involved in the generalized senses of touch and pressure); the sensation of color (cone cells in the eye send color information to the brain); and the sensation of brightness (rod cells in the eye send information to the brain about shade/brightness).</p> <p>Key points for instruction:</p> <p>It is important for teachers to remember that the nervous system—the brain in particular—plays an important part in all human senses. For example, the eye captures light from your surroundings, but it is the brain that processes this information. The importance of the brain relative to sight can be highlighted using optical illusions.</p>
--	---

During research studies, fourth-graders have been shown to understand that the brain helps the body, but they do not always realize that body parts help the brain (Johnson & Wellman, 1982).

Potential Objectives for this Kindergarten Unit

The following assessment tasks serve as a sampling of how students can demonstrate mastery of lesson objectives. Each aligned objective and NGSS is noted in parentheses. In addition, the proposed timing (“beginning,” “middle,” or “end”) is noted in order to indicate approximately when the assessment should take place.

Beginning

- Distinguish between needs and wants
- Identify the basic needs of human beings
- Identify habits that keep our bodies healthy (K-LS1-1)
- Describe how we can keep our bodies safe from germs
- Describe how we can take care of our bodies

Middle

- Identify which organs allow us to see, hear, smell, taste, and touch
- Describe how the sense of sight helps us learn
- Describe how the pupil changes in bright light compared to little light
- Describe how the sense of hearing helps us learn
- Describe how the sense of hearing keeps us safe from harm (1-LS1-1)
- Identify devices that support people with limited vision and/or hearing
- Describe how the sense of smell helps us learn
- Classify scents as sweet or sour

End

- Describe how the sense of taste helps us learn
- Predict another sense that can also help us taste
- Classify foods as tasting sweet, salty, bitter, or sour
- Describe how the sense of touch helps us learn
- Describe how the sense of touch keeps us safe from harm (1-LS1-1)

Potential Big Guiding Questions

Essential Questions:

- How can we keep our bodies healthy?
- How do our senses help us meet our needs? (1-LS1-1)
- How do our senses help us learn about the world around us? (1-PS4-4)

RE: Basic Needs

- What do you need to survive?
- What is the difference between a need and a want?

RE: Taking Care of Your Body

- What activities do people in your area do to stay healthy?
- What food do you eat that is healthy/unhealthy?
- Why is cleanliness important?
- How do germs spread?

RE: The Senses

- Which parts of your body help you to (see, hear, smell, taste, or touch)?
- How does your sense of (sight, hearing, smell, taste, or touch) help to keep you safe from harm?
- How does the pupil change in bright light versus low light?
- What tools can be used to help people with limited vision and/or hearing?
- How do your senses work together (e.g., taste and smell)?

Potential Assessment Opportunities

The following assessment tasks serve as a sampling of how students can demonstrate mastery of lesson objectives. Each aligned objective or NGSS is noted in parentheses. In addition, the proposed timing (“beginning,” “middle,” or “end”) is noted to indicate the approximate point in time the assessment would take place.

Example #1: (Beginning of Unit 1; also see Potential Activities Example #3)

{Evaluates Student Mastery of Objective: Describe how we can keep our bodies safe from germs}

Advance Preparation: This assessment requires a bag of glitter and several sheets of paper towels, wipes, and bowls for groups of 2–3 students.

Task Assessment: Sprinkle small amounts of glitter on students’ hands and on their tables. This glitter represents “germs.” When provided with paper towels, wipes, and a bowl of soapy water, students will work in groups of two or three to problem-solve how to remove the “germs” on their table and on their hands. As students share their solutions, ask them to describe how quickly they were able to remove the “germs” (e.g., “Were you able to wipe away all of the glitter from the table with one swipe?”) and what that tells them about protecting their bodies from real germs.

Example #2: (Middle of Unit 1)

{Evaluates Student Mastery of Objective: Identify which organs allow us to see, hear, smell, taste, and touch}

Advance Preparation: Create the assessment handout by dividing a piece of paper into two columns. On the left side of the paper, moving from top to bottom, draw (or insert) images of a nose, eye, ear, tongue, and hand. On the right side, draw (or insert) images of objects that one could smell, see, hear, taste, or touch.

Task Assessment: When provided with a two-column matching activity—described above—students will match each organ to the object which corresponds with each sense.

Potential Activities & Procedures

The following activities or procedures serve as a sampling of what instruction could look like in this unit. Each example was specifically designed to contribute to one or more of the aforementioned objectives. In addition, the proposed timing (“beginning,” “middle,” or “end”) is noted in order to indicate approximately when the activity should be conducted during this unit. Aligned NGSS are noted in parentheses.

Example #1: (Beginning of Unit 1)

{Contributes to the Objective: Identify the basic needs of human beings}

Activity: As students examine the needs of human beings (Unit 1), animals (Unit 2), and plants (Unit 3), keep a chart of your students’ ideas and examples for each group/unit. These charts can be used as evidence during later discussions. During Units 2 and 3, ask your students to identify patterns across the three domains providing appropriate support and scaffolding (e.g., all animals—including humans—eat food, some animals eat plants, some animals eat other animals, some animals eat both plants and other animals, etc.). Students will use the patterns culled from this “data” to describe what human beings, animals, and plants need to survive. (K-LS1-1)

Example #2: (Beginning of Unit 1)

{Contributes to the Objective: Describe habits that keep our bodies healthy}

T—Which of our basic needs (healthy food, water, shelter, air, clothing, rest, cleanliness, and exercise) are related to our health? Direct students to take a few moments to think, then pair students up to discuss their ideas with a partner.

After students have had sixty to ninety seconds to talk, ask several pairs to share their ideas with the group. As the partners debrief, encourage all students to think about the responses and whether or not they agree, including their rationales (e.g., eating healthy foods keeps our bodies healthy).

T—If many of our basic needs are connected to keeping our bodies healthy, what does that tell us? Students should draw the conclusion that health is very important since it is closely connected to

almost every basic need. If student responses are off base, use targeted questions to guide them to this idea.

T—Today we are going to focus on how we can keep our bodies healthy. What do you do to stay healthy? As students share ideas, record the responses on the board or chart paper.

After a few minutes, draw students' attention to the board or chart paper, and model how to group similar ideas together (e.g., "You shared: Brushing my teeth, flossing, and washing my hands. How are we keeping our bodies healthy through these routines or habits? → These are examples of how we keep our bodies clean."). The goal is to identify examples for the following categories: eating healthy foods, exercising, getting rest, and keeping our bodies clean.

T—Let's take a closer look at each of these healthy habits, starting with exercising.

[Note: The activity below could be completed in the classroom or outdoors if your students need more space.]

Model how to locate your pulse on your wrist and/or neck. Ask students to place their finger on their pulse. Explain that this allows them to feel their blood circulating through their bodies.

T—I want you feel your pulse for thirty seconds. When your time is up, I will ask you to tell me what you noticed. When time is called, ask students questions that draw their attention to the pace of their pulse. Explain that they took their pulse in a resting state.

Explain to students that you will give them some time to "exercise" so they can compare their pulse after exercise to their pulse in its resting state. Ask the students to stand up and run in place (or around the playground) for one to two minutes.

T—Now I want you to sit down and feel your pulse for thirty seconds. After thirty seconds, ask the students to stop and tell you what they noticed compared to the first time they took their pulse. Students should identify that their pulse was faster after exercising.

T—Why do you think that happened? Through questioning, guide students with making the connection between the heart pumping faster and how exercise keeps the heart and body healthy.

Example #3: (Beginning of Unit 1)

{Contributes to the Objective: Describe how we can keep our bodies safe from germs}

Advance Preparation: At the start of this activity, students should be sitting on the carpet. If not, make sure there is at least one empty table/desk in the room, asking students who normally sit there to move. Make sure that you place several pencils, crayons, or other writing tools; a bag of glitter; and paper on this table/desk.

Hold up the bag of glitter.

T—We have been learning about how to keep our bodies healthy. Today we are going to learn about how germs can spread and how we can protect our bodies from germs.

We are going to pretend that this glitter represents germs. (Ask students to share some of the different ways germs can spread.) **Using this glitter, I am going to demonstrate how germs can spread by coughing.**

Walk up to the table/desk where no one is sitting. Pretending to cough, blow glitter on the table. Direct students to stand up and form a circle around the table.

T—What just happened here? (Possible student responses may include, “Your cough spread germs onto the table.”) Through questioning, guide students to see that the “germs” not only spread onto the table, but also onto all objects sitting on the table.

Ask students to return to their seats (including the children who sit at the table with the glitter).

T—I want you to make a prediction about what is going to happen, if [names of students sitting at the table] work at their table. Encourage students to pause for several seconds to think, and then instruct them to tell a partner what they think will happen.

T—Using pencils/crayons and paper, write/draw your prediction. During this activity, you may prompt students, who are sitting at different tables, to ask to borrow writing instruments and paper from the table with the glitter.

After students have finished and have had an opportunity share their predictions, ask the students who are sitting at the table with the glitter to share where they see the glitter now. Through questioning, guide these students to discover that the “germs” are covering a larger area of the table, and also cover parts of their hands and paper. If students from different tables borrowed writing instruments or paper with “germs,” the “germs” are now at their tables as well.

T—All of these germs spread through just one cough. How can we keep our bodies safe from germs? Through questioning, continue the discussion to meet the lesson objective.

Websites & Media

The Society for Neuroscience—BrainFacts.org:

<http://www.brainfacts.org/sensing-thinking-behaving/senses-and-perception/>

Enhance your knowledge about the brain and your senses with interesting facts, stories, and vibrant visuals from this website. Questions such as, “[Why does stepping on a Lego hurt so bad?](#)” just might kick-start your thinking about how you can engage your students to think about sensation.

Optical Illusions: <http://www.sciencekids.co.nz/pictures/illusions.html>

Illusions can amaze your students as they wonder how an illusion works and why their brains “trick” them into seeing something that their eyes don’t actually see.

Guide Dogs: <http://www.slideshare.net/guestb1e4b60/freedom-guide-dogs-for-kids>

This student-friendly presentation can help you to introduce how guide dogs assist those with visual impairments.

Unite for Sight—Annie’s Website for Kids: <http://www.uniteforsight.org/kids/about.php>

This organization supports efforts around the world to teach children about the eye and to provide vision screenings. Unite for Sight’s mascot, Annie, can help you to plan kid-friendly lessons about eyeglasses, eye safety, and more.

PBS Kids—Arthur’s Sign Design: <http://pbskids.org/arthur/print/signdesign/index.html>

This website can help you to introduce sign language to your students. Using the “Practice Signing” section, Arthur will help you and your students practice signing your names, ask questions, or even make statements using sign language.

PBS Kids—Sid the Science Kid’s “I Sense” Game: <http://pbskids.org/sid/isense.html>

You might use this interactive game with your students to apply their knowledge of the senses. Select the common object that matches Sid’s prompts about smell, touch, sight, and more.

Supplemental Trade Books

- Eating Well, by Liz Gogerly (Crabtree Publishing Company, 2009) ISBN 0778741176
- Eyes (Human Body), by Robert James (Rourke Publishing, 1995) ISBN 1571031049
- First Delights: A Book About the Five Senses, by Tasha Tudor (Price, Stern, Sloan, 1988) ISBN 0448093278
- Fuel the Body: Eating Well, by Amanda Doering Tourville (Picture Window Books, 2008) ISBN 1404848142
- Get Up and Go!, by Nancy Carlson (Penguin Group, 2008) ISBN 0142410640
- Go Wash Up: Keeping Clean, by Amanda Doering Tourville (Coughlan Publishing, 2008) ISBN 1404848088
- Happy Birthday Moon, by Frank Asch (Aladdin, 2000) ISBN 0689835442
- Hearing Things, by Allan Fowler (Children's Press, Inc., 1991) ISBN 0516449095
- It Looked Like Spilt Milk, by Charles Shaw (HarperTrophy, 1988) ISBN 0064431592
- Look! A Book About Sight, by Dana Meachen Rau (Picture Window Books, 2005) ISBN 1404810196
- Mice Squeak, We Speak, by Arnold L. Shapiro and illustrated by Tomie DePaola (Putnam Juvenile, 1997) ISBN 0399232028
- My Amazing Body: A First Look at Health and Fitness, by Pat Thomas (Barron's Educational Series, Inc., 2002) ISBN 0764121197
- My Five Senses, by Aliki (HarperTrophy, 1989) ISBN 006445083X
- My Senses Help Me, by Bobbie Kalman (Crabtree Publishing Company, 2010) ISBN 9780778794721
- No One Saw: Ordinary Things Through the Eyes of an Artist, by Bob Raczka (Millbrook Press, 2001) ISBN 0761323708
- Oh, the Things You Can Do that Are Good for You!: All About Staying Healthy, by Tish Rabe (Random House, Inc. 2001) ISBN 0375810986

- Polar Bear Polar Bear, by Bill Martin Jr. (Henry Holt and Co., 1992) ISBN 0805023461
- Seven Blind Mice, by Ed Young (Puffin Books, 2002) ISBN 0698118952
- Shhhh . . . A Book About Hearing, by Dana Meachen Rau (Picture Window Books, 2005) ISBN 1404810188
- Sleep Is for Everyone (Let's-Read-and-Find-out Science Book), by Paul Showers (HarperCollins Publishers, 1997) ISBN 0064451410
- The Five Senses (It's Science), by Sally Hewitt (BT Bound, 2003) ISBN 061337343X
- The Five Senses: Hearing, by Maria Ruis (Barron's Educational Series, Inc., 1985) ISBN 0812035631
- The Five Senses: Sight, by Maria Ruis (Barron's Educational Series, Inc., 1985) ISBN 081203564X
- The Five Senses: Smell, by Maria Ruis (Barron's Educational Series, Inc., 1985) ISBN 0812035658
- The Five Senses: Taste, by Maria Ruis (Barron's Educational Series, Inc., 1985) ISBN 0812035666
- The Five Senses: Touch, by Maria Ruis (Barron's Educational Series, Inc., 1985) ISBN 0812035674
- The Listening Walk, by Paul Showers and Alike (HarperTrophy, February 1993) ISBN 0064433226
- Touching and Feeling, by Katie Dicker (Cherrytree Books, 2009) ISBN 1842345788
- What is Taste?, by Jennifer Boothroyd (Lightning Bolt Books, 2010) ISBN 0761350170
- You Can't Smell a Flower with Your Ear! All About Your 5 Senses, by Joanna Cole (Grosset & Dunlap, 1994) ISBN 0448404699
- You Can't Taste a Pickle with Your Ear: A Book About Your 5 Senses, by Harriet Ziefert and illustrated by Amanda Haley (Handprint Books, 2002) ISBN 1929766688
- Your Five Senses, by Melvin and Gilda Berger (Scholastic, 2003) ISBN 0439566886
- Helen Keller, by Pamela Walker (Scholastic, 2001) ISBN 9780516235882
- Sensing Light and Sound, by Jennifer Boothroyd (Lerner Publishing Group, 2014) ISBN 9781467745062