

Bay Area Scientists in Schools Presentation Plan

Lesson Name The Skin You're In

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Grade Level: 3rd

CA Science Standards Connections: 3rd Grade, Life Sciences

3-LS-3. Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

- a. Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Next Generation Science Standards Connections: 4th Grade, Life Sciences

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.

4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Science & Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in 3–5 builds on K–2 experiences and progresses to building and revising simple models and using models to represent events and design solutions.</p> <p>Develop a model to describe phenomena. (4-PS4-2) Use a model to test interactions concerning the functioning of a natural system. (4-LS1-2)</p>	<p>LS1.A: Structure and Function All organisms have external parts. Different animals use their body parts in different ways to see, hear, grasp objects, protect themselves, move from place to place, and seek, find, and take in food, water and air. Plants also have different parts (roots, stems, leaves, flowers, fruits) that help them survive and grow. (1-LS1-1)</p> <p>LS1.A: Structure and Function Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)</p>	<p>Systems and System Models A system can be described in terms of its components and their interactions. (5-LS2-1)</p>

Common Core Standards:

ELA/Literacy:

W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

Mathematics:

MP.2 Reason abstractly and quantitatively.

FOSS Connections:

3rd Grade Module: *Structures of Life*

Investigation 4: *Human Body*



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Teaser:

Students will enjoy magnifying their own fingerprints and determining if they have whorl, loop, or arch-type fingerprints. Students will learn the basic three layers of skin and learn skin's protective functions through a hands-on activity using latex gloves. They will also observe snakeskin, bird feathers, and horse nails, and learn that they are made of the same material as our hair and nails! From this lesson, students will be more aware of the qualities of their skin, hair, and nails, and be able to better take care of their integumentary system.

Objective: *As a result of your lesson, what will students learn? What will they be able to do?*

- Students will learn the functions, anatomy, and the proper ways of caring for their hair, skin, and nails through hands-on activities and observation of specimens.

Vocabulary/Definitions:

- 1) integument
- 2) radiation/Ultraviolet (UV)/sunblock
- 3) epidermis
- 4) dermis
- 5) hypodermis
- 6) hair follicle
- 7) keratin (hair, nail)

Maybe: Vitamin D, dehydration

Materials:

What will you bring with you?

- 1-2 ink pads, 30 balloons, 2-3 sharpies, diagram of loop/whorl/arch, 4 magnifying glasses
- For us: 3 colors of playdoh, pipe cleaner
- 30 latex gloves (small), make sure classroom has sink or bring tub or eyedropper/plastic pipette
- food coloring, tub (protection)
- animal body keratin specimen (nail, feather, scale/snakeskin), photo of horn

What should students have ready (pencils, paper, scissors)?

- their integument!

Classroom Set-up:

Class will be split into 3 groups.

It would be helpful if the classroom has a sink that's accessible.

Classroom Visit

1. Personal Introduction: _____ 5 _____ Minutes

Who are you? What do you want to share with students and why? How will you connect this with students' interests and experiences?

"Hello everyone, we are students just like you all. We have been going to school for quite a while now...and are now attending UC Berkeley. We are here today to teach you all about the largest organ in our body. Can anyone guess what that is? Yes! Our skin! Which is also part of our integumentary system. Can everyone say "Integument"? *class says integument. Integument is one of the vocabularies you will be learning today. Integument basically means *covering*, and our integuments such as our hair, skin, and nails protect our bodies in many ways. Like cushioning our bodies when we bump into things, preventing the insides of our bodies from drying and shriveling up, and also keeping our bodies warm when we are in the cold. Together, these different kinds of integuments make up our integumentary system. Instead of listening to us talk on and on for the next hour, we are going to have all of you do a bunch of fun activities and group work that can help you learn about the integumentary system. It is going to be very exciting because you get to look at animal skin and nails, examine your fingerprints, and do a lot of other fun activities. There will be 3 stations!

Topic Introduction: _____ 3 _____ Minutes

What questions will you ask to learn from students? Big Idea(s), vocabulary, assessing prior knowledge...

- Does anyone want to share anything they know about their skin, nails, and hair?
- True or False: Skin and hair are made of the same material. What about nail?

2. Learning Experience(s): _____ 35 _____ Minutes

What will you do, what will kids do? Demonstrations, hands-on activities, images, games, discussion, writing, measuring... Describe in order, including instructions to kids.

We will have three stations:

Station #1: Fingerprint Identification

An activity on fingerprints. Students will first observe their fingertips with magnifying glasses and be able to locate their fingerprints. Student will then press an inkpad with their fingertips and imprint them on balloons. After blowing up the balloon, students observe enlarged print on balloon and determine whether they have arch, whorl, loop type fingerprints. The fingerprints on skin provide us a way to identify individuals since fingerprints are unique to everyone.

Materials:

- magnifying glasses
- balloons

- inkpads
- tissues/paper towels

1. Students form pairs. Each pair gets a magnifying glass.
2. Pairs observe fingertips with magnifying glasses. "What do you see?"
3. Each student gets a balloon.
4. Students take turns pressing one fingertip on inkpad.
5. Students imprint fingerprint on balloon and write name on balloon with sharpie.
6. Students blow up balloons and tie knot. (Ivy helps if necessary.)
7. Compare fingerprint with partner and with diagram. "Do your fingerprints look the same?"
8. Discuss identifying feature of fingerprints, how they are used in investigations, and maybe something about oils and friction, maybe callouses.

Station #2: Playdoh Skin Model & Latex gloves activity

Present the basic structures of the skin such as the epidermis, dermis, hypodermis, hair follicles, and sweat glands using a model made with playdoh. To emphasize that the skin has multiple layers that provide protection from abrasion and sweat glands that help regulate body temperature. Explain why we get callouses from excessive abrasion. The latex glove activity demonstrates that, like gloves, our skin is able to withstand stretching in different directions and can prevent various potentially harmful substances from entering our bodies.

Materials:

- pre-made playdoh skin model
- latex gloves
- pipette
- food coloring
- tub for catching liquids
- water

1. Explain three-layer skin model. (Epidermis, dermis, hypodermis, and hair follicle.) Maybe talk about goosebumps.
2. Hand out gloves.
3. Explain stretchiness.
4. Waterproof demo with plastic pipette, and note how water doesn't penetrate the glove! The skin protects the insides and organs the same way.
5. Explain hypodermis and how your skin also keeps you warm.
6. Skin care: dehydration (drink water!), wounds (keep them clean), radiation and sun block but you still need vitamin D.

Station #3: Comparative Anatomy

We will show that other animals have their own versions of skin, hair, and nails. Students will observe animal specimens and pictures to identify the type of animals these specimens have come from. This activity demonstrates that integument provides similar functions in both humans and other animals and is mostly made of the same material, keratin.

Materials:

-Animal specimens (horse nail, feathers, snakeskin, pictures of rhino horns)

1. Question about keratin? "Does anyone know what hair, skin, nail is made out of?"
2. Ask students to guess animal by showing them specimen one by one. Discuss each specimen, discuss keratin and how it's prevalent in many animals.
3. Function of hair and nails, and maybe how to take care of them.
4. Let kids look at specimens.

3. Wrap-up: Sharing Experiences

_____ 5 _____ Minutes

Putting the pieces together – how will students share learning, interpret experience, build vocabulary?

All students will gather together and will be asked about what they learned from the lesson. We will also ask questions to test students on the materials that were presented in the stations.

- Why do we get goosebumps?
- What are the different layers of the skin?
- What are hair, skin, and nails made out of?
- Name a few ways we can protect our skin.
- What are callouses and why are they actually a good thing?

4. Connections & Close:

_____ 5 _____ Minutes

What else might kids relate this to from their real-life experience? How can they learn more?

In conclusion, we will stress the importance of maintaining the health of the integumentary system for its provides many protective functions for our bodies and it would be in our best interest to keep it functioning properly for as long as we can. We will give advice on hygienic practices and proper habits to maintain skin, hair, and nail health.

- drink plenty of water, keep hydrated
- apply moisturizers
- wash hair thoroughly
- apply sunblock when outdoors
- get enough exposure to sun for vitamin D

Thanks and good-bye! Clean-up.

Total 50 – 60 Minutes

Follow-up – After Presentation

Suggest students write a letter explaining “How we learned about the Integumentary System?”



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