

Skin Science

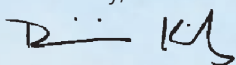
Dear Educator,

Young people interested in healthcare careers can find many opportunities in dermatology, a field that is growing in numbers, practice, and diversity.

To help raise awareness of these opportunities, the American Academy of Dermatology Association (AAD) and Young Minds Inspired have teamed up to create *Skin Science*, a free high school health and science program that invites students to examine the role of dermatologists as they explore skin care for different skin types and then test their knowledge and analytical skills with a variety of dermatological case studies.

The AAD is excited to support your students in learning more about their skin and how dermatologists help keep our skin healthy. We hope you will share this resource with other teachers at your school. And please let us know your thoughts about this program at ymiclassroom.com/feedback-skinscience. We look forward to hearing from you.

Sincerely,



Dominic Kinsley, PhD
Editor in Chief
Young Minds Inspired



Questions? Contact YMI toll-free at 1-800-859-8005 or by email at feedback@ymiclassroom.com.

About the American Academy of Dermatology Association

The AAD has a membership of more than 20,500 physicians around the world. AAD is committed to advancing the diagnosis and medical, surgical, and cosmetic treatment of the skin, hair, and nails; advocating high standards in clinical practice, education, and research in dermatology; and supporting and enhancing patient care for a lifetime of healthier skin, hair, and nails. AAD is committed to recruiting and supporting a diverse membership through its mentorship program for students who are underrepresented in medicine and interested in pursuing dermatology. See aad.org/member/career/diversity/diversity-pathways-hs-college.

Target Audience

High school health and science students

Program Components

The following resources are available at ymiclassroom.com/skinscience:

- This two-page educator's guide
- Three reproducible student activities
- A two-page reproducible *Pathway to Dermatology* career guide handout
- A reproducible summary handout
- A standards alignment chart
- A form to share your feedback

Program Objectives

- Explore the science of skin care and skin diseases
- Raise awareness that dermatologists care for various skin, hair, and nail conditions for all skin types
- Explain how skin issues impact overall health and well-being
- Introduce students to careers in dermatology and the education path to becoming a physician and dermatologist

How to Use the Program

Make photocopies of the three activity sheets for students, and have them work in small groups to complete the activities. Students will need internet access to review accurate health information from the AAD. Copy and distribute the career guide handout and make extra copies for your school's career counselor.

Activity 1 Body Armor: Our Skin

This two-page quiz provides a common foundation of knowledge for the program and allows you to assess students' familiarity with the basics of skin health and the work of dermatologists. Students will also learn about some common skin conditions and how they are treated.

Allow students to work in pairs or groups to complete the quiz. Links included on the activity sheet will help guide students to answers and additional information. Reconvene to discuss students' responses and share the information under Answers to correct any misconceptions. Additional information can be found on the *Pathway to Dermatology* career guide handout at ymiclassroom.com/skinscience.

Pathways: Inclusivity in Dermatology



IN COLLABORATION WITH:



This program, brought to you by Young Minds Inspired, is part of *Pathways: Inclusivity in Dermatology*.

Answers:

1. The epidermis is the outer layer of skin, which constantly renews itself. The epidermis protects the body from disease as part of the immune system, keeps organs safe from outside conditions, and can show signs of serious internal illnesses.
2. Health issues can show up on the skin. Examples of inflammatory skin diseases include acne, psoriasis, and eczema. Diseases such as psoriasis are a result of the immune system making too many white blood cells, leading to extra skin cells.
3. Answers may vary. Students can explore aad.org/public/diseases/a-z for examples of skin diseases and conditions, then describe each condition and sketch how it appears on the skin.
4. Melanin gives skin color. More melanin makes skin darker, less makes it lighter. Melanin also determines hair and eye color. Melanin amounts are primarily determined by the genes we inherit from our parents, but aging, diet, and sun exposure can influence melanin production as well.
5. False. Tanning beds, tanning booths, and sun lamps are not safe. Indoor tanning can increase the risk of developing the two most common types of skin cancer, increasing the risk of squamous cell carcinoma by 58% and of basal cell carcinoma by 24%. Using tanning beds before age 20 can increase chances of developing melanoma by 47%, and the risk increases with each use.
6. True. Water, snow, and sand reflect dangerous UV rays of sunlight, increasing the chance of sunburn.
7. The ABCDE's (Asymmetry, Border, Color, Diameter, Evolving) are used for checking moles to spot skin cancer or detect melanoma.

As an exit ticket, have students write two things they have learned and one question they would like to research about dermatology on notecards or in their science journals. For students who seem especially interested in a dermatology career, point them to aad.org/member/career/diversity/diversity-pathways-hs-college for mentorship opportunities.

Activity 2 What About My Skin?

Skin is the body's largest organ. It covers the entire body, making it something that we should all care for. Dermatologists focus on learning how to care for all skin, hair, and nail types at all ages, which is crucial in keeping skin and individuals healthy.

In this research and presentation activity, students dive into dermatology and create fact sheets or mini posters with skin care tips for different ages and skin tones. Begin by reminding students that we all have the same skin despite any differences in skin tone and color (which are a result of the overall activity of skin cells that produce melanin). Then have students use the information on the activity sheet and work in groups based on interest. For example, different groups might research shaving tips for darker skin, healthy skin cleaning tips for adolescents, sun care for different skin types, care tips for different hair types, or any other topics featured on aad.org/public. Have students use the links on the activity sheet to get started.

After they complete their research, students will produce a fact sheet or mini-poster and evaluate their work using a rubric on the activity sheet. Students can then present their research to the class and display their fact sheets or mini-posters.

Activity 3 Dermatology Detectives

In this activity, students test their aptitude for dermatology by analyzing different skin conditions. Have students work in groups to read each case study on the activity sheet, examine the images, and explore the AAD Diseases and Conditions links to identify the conditions profiled. Each case study has more than one possible answer to demonstrate the training and rigor required to be

a dermatologist. Tell students this is a hypothetical activity, not actual medical advice or diagnosis – all skin conditions need to be checked out by a certified dermatologist.

As an extension, students can research one of the skin conditions listed on the activity in depth to identify the causes, symptoms, and treatment of the skin disease or disorder they choose.

Answers: Part 1

Patient A may have hives. Hives are not contagious. They usually appear suddenly and can be very itchy and have large patches of raised skin. Hives can be caused by illness or allergies. Hives can also cause swelling in the mouth or throat, which can impair breathing and can be life-threatening. Get immediate medical care or go to the emergency room if this happens.

Source: aad.org/public/diseases/a-z/hives-overview

Patient B may have skin cancer. Skin cancer can appear on the skin as a scaly patch by an ear. Many skin cancers are caused by sun damage.

Source: aad.org/public/diseases/skin-cancer/types/common/bcc/symptoms

Patient C may have psoriasis. Psoriasis often appears on knees, elbows, lower back, and scalp, rather than in the crook of the elbow or behind the knee, which is often the site of eczema. Eczema itching is commonly intense, while psoriasis itching is usually mild. These conditions sound similar, but a dermatologist is skilled in telling the difference when they observe the skin.

Source: aad.org/public/diseases/eczema/childhood/child-have/difference-psoriasis and aad.org/public/diseases/psoriasis/what/overview

Patient D may have rosacea. Rosacea has pimple-like breakouts but no blackheads. In rosacea, broken blood vessels may be visible. The redness on the skin is usually in the center of the face and can come and go.

Source: aad.org/public/diseases/acne/really-acne/acne-rosacea

Answers: Part 2

Suggest that your students go to aad.org/public/darker-skin/diseases to find out how diseases vary depending on skin tone. Some skin conditions affect people with darker skin tones, either more frequently or more severely. Some of these conditions include:

Rosacea: Rosacea is a common condition that affects the skin on the face and sometimes the eyes. Studies show that when people with darker skin tones develop rosacea, the early signs, such as flushing, can be missed or mistaken for another condition.

Skin cancer: People of all colors, including those with brown and black skin, get skin cancer. When skin cancer develops in people of color, it's often in a late stage when diagnosed.

Sarcoidosis: This disease causes growths called granulomas, which can develop on the skin, inside the body, or both. In the United States, Black women have the highest risk of developing sarcoidosis.

Melanoma: Although rare, melanoma, a type of skin cancer, can develop under and around the fingernails and toenails. While anyone can develop melanoma on their nails, it's more common in older individuals and people with skin of color.

Acne keloidalis nuchae: This skin condition often begins with acne-like breakouts on the back of the scalp or neck. It is most common in Black males, often beginning between 14 and 25 years of age.

Resources

American Academy of Dermatology - aad.org
Skin Science - ymiclassroom.com/skinscience



Body Armor: Our Skin



Skin is the body's outer armor. Dermatologists are on the front lines to protect our skin and keep it healthy. They treat children and adults, and even perform surgery. Increase your knowledge about skin conditions and the doctors who treat them.

Visit the American Academy of Dermatology's "A to Z Diseases" under Diseases and Conditions at aad.org/public to answer the questions below.

1 Skin is your body's largest organ. What role does it play? List at least two roles and explain their importance.

2 What does the epidermis (the outermost layer of skin) tell doctors about the health of the body? Name two inflammatory diseases that can show up on the epidermis.

3 Research and describe two skin diseases or conditions. Write your notes. On the back of this sheet, sketch how they appear on the skin.

Pathways: Inclusivity in Dermatology



IN COLLABORATION WITH:



Body Armor: Our Skin

4 What is melanin? How does melanin affect the appearance of the skin? How might it affect how skin diseases appear on different skin tones?

5 **True or False:** Tanning beds protect skin from skin cancer by using artificial sunlight. Explain your reasoning.

6 **True or False:** The sun's reflection on water, snow, and sand can increase the chance of sunburn.

7 ABCDE is an acronym for asymmetry, border, color, diameter, and evolving. How do dermatologists use the ABCDE acronym?

Find out more about being a medical expert in skin, hair, and nails at aad.org.

Pathways: Inclusivity in Dermatology



IN COLLABORATION WITH:



What About My Skin?



We all have the same skin, and we all have to take care of it. But in some cases, dermatologists recommend that people with different skin tones take care of their skin in different ways.

Here's your chance to help dermatologists raise awareness about the skin care needs of people with different skin tones. Use the websites listed below to learn about some of the skin care tips dermatologists recommend depending on a person's age, skin tone, and symptoms. Focus your research on one of the suggested skin topics and design a fact sheet or mini-poster to share what you learn. Present the information in a way that will catch your classmates' attention.

Skin care topics:

- Adolescent versus adult skin
- Dry versus oily skin types
- Straight versus curly/coiled hair
- Light versus dark skin tones

Questions to explore:

- What are similarities and differences between the two groups?
- What dermatological conditions might each group be prone to?
- What recommendations will help each group best care for their skin or hair? Think about including step-by-step basics or a tip list.

Websites to help get you started:

- Everyday care: aad.org/public/everyday-care
- Darker skin tones: aad.org/public/darker-skin
- Common skin issues: aad.org/public/diseases

Find out more about being a medical expert in skin, hair, and nails at aad.org.

Before you complete your presentation, use this checklist to make sure you have included all elements in your mini-poster and presentation.

Elements	✓
Topic is clearly stated and shared	
Mini poster includes step-by-step instructions or a tip list	
Presentation is engaging	
Sources cited	

Pathways: Inclusivity in Dermatology



IN COLLABORATION WITH:



Dermatology Detectives



Skin is your body's first line of defense. Skin is an armor that protects the body from disease, protects organs, and keeps us warm and cools us off. Our skin's appearance and condition can also indicate how healthy we are inside.

Part 1

Put on your scrubs – patients are waiting! For each of the case studies below, use the web pages listed to determine which of these five skin conditions/diseases the patient may have based on the details presented.* Write your answer on the line.

Skin conditions/diseases:

- Eczema: aad.org/public/diseases/eczema/childhood/child-have/difference-psoriasis
- Hives: aad.org/public/diseases/a-z/hives-overview
- Psoriasis: aad.org/public/diseases/psoriasis/what/overview
- Rosacea: aad.org/public/diseases/acne/really-acne/acne-rosacea
- Skin cancer: aad.org/public/diseases/skin-cancer/types/common/bcc/symptoms

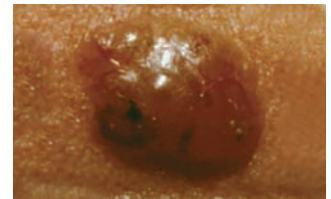
Patient A has an itchy rash on their neck and hands, which the patient says appeared suddenly. The bumps are smooth raised welts. No one close to the patient has the same rash.



What might Patient A have? Why?

Possible condition/disease:

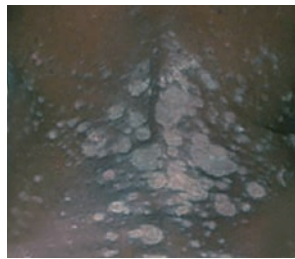
Patient B has a small round scaly patch near their ear. It does not itch but has not gone away. The patient does not have any other patches like it on their face or body.



What might Patient B have? Why?

Possible condition/disease:

Patient C has thick, red, scaly patches on their elbows and knees. They have had these patches for some time, and they come and go in various places on the skin.



Is this eczema or psoriasis? Why?

Possible condition/disease:

Patient D has red areas on their face, especially around their nose and cheeks. Small blood vessels are visible around their nose. Their skin is very sensitive to sunscreens and skin care products. The patient thinks this is acne, but you know it's not.



What is it? Why?

Possible condition/disease:

* *Disclaimer:* This activity and brief case studies are not meant as medical advice or diagnosis. If you have any questions about your skin, contact your doctor or a dermatologist as soon as possible.

Part 2

There are some skin conditions that manifest themselves differently on different skin tones. These include rosacea, skin cancer, sarcoidosis, melanoma, and acne keloidalis nuchae. Research one of these skin conditions to learn about how they impact darker skin tones. Go to aad.org/public/darker-skin/diseases to find out more information.

Find out more about being a medical expert in skin, hair, and nails at aad.org.



Pathway to Dermatology

Career Guide



What is a dermatologist?

Dermatologists are doctors who treat more than 3,000 disorders and diseases of the skin, hair, and nails, including everything from acne to hives to skin cancer. Dermatologists also perform surgery, give injections, and provide laser treatments to care for and cure various skin conditions and diseases.

Dermatologists use their training to improve a patient's quality of life and even save lives. Check out "**Diseases and Conditions: A to Z**" to learn more about the many ways dermatologists help their patients stay healthy: aad.org/public/diseases/a-z

What are some areas in the field of dermatology?

Dermatologists can work in a variety of areas. For example:

- Pediatric dermatology: work with children
- Mohs surgeons: perform skin cancer surgery
- Dermatopathology: examine biopsy skin samples and pathology reports

Everyone needs skincare. The American Academy of Dermatology Association supports Black, Latino/Hispanic, and Indigenous students with mentoring to diversify the field and support all communities. Find out more at aad.org/member/career/diversity/diversity-pathways-hs-college.

Pathways: Inclusivity in Dermatology



IN COLLABORATION WITH:

Johnson & Johnson



Pathway to Dermatology

Career Guide



What does it take to become a dermatologist?

Dermatologists are specialized medical doctors. Training includes:

- Four-year college bachelor's degree
- Four years of medical school
- Year-long internship
- Three-year residency after medical school devoted to treating patients who present with skin issues (Other medical specialties can require up to a 7-year residency after medical school.)

Does this sound like a career you'd be interested in?

If you like helping people and solving problems, if you like science or research, if you like the idea of becoming a surgeon, if you are fascinated by how the largest organ in our bodies works to protect us, dermatology might be a field for you. If you're interested in learning more about the range of opportunities in dermatology, visit aad.org/member/career/diversity/diversity-pathways-hs-college. You could become an expert in skin, hair, and nails!

About the American Academy of Dermatology

The American Academy of Dermatology Association (AAD) and its physician members from around the world help communities in many ways, including:

- Organizing and participating in cancer awareness activities
- Providing grants to help communities make sun-safe spaces for children to play
- Providing opportunities for children with serious skin conditions to go to camp
- Providing grants for community-based initiatives to promote safe and healthy skin
- Mentoring and supporting diverse students interested in dermatology

Pathways: Inclusivity in Dermatology



IN COLLABORATION WITH:



Skin Science

Presenter's Guide

Resources Needed

In addition to this guide, you will need a copy of the teacher's guide as well as enough copies of the student activity sheets for all students. You will also need a computer with internet access to explore examples of skin conditions and access aad.org web pages where indicated.

Getting Started

Thank you for sharing your passion for dermatology with students. As you prepare your classroom presentation, consider starting by offering the following information about your own journey so that students can better understand what it means to be a dermatologist and discover that it's an attainable career for them.

- Who are you and what do you do?
- Why did you choose dermatology?
- What steps did it take to become a dermatologist? What did you do in high school to prepare for being a doctor?
- What are some common skin conditions and diseases you treat? (Consider a digital presentation with images as appropriate.)
- What is a day in your professional life like?
- What is the American Academy of Dermatology Association (AAD)?

- How can AAD help young people interested in a medical career? (Be sure to mention the mentorship program: aad.org/member/career/diversity/diversity-pathways-hs-college)

The following activities are available for you to use as part of your presentation. The teaching kit at ymiclassroom.com/skinscience includes the associated reproducible activity sheet that you can copy and distribute to students. In addition, the notes below will help you supplement the information in the classroom teacher's guide so that you can share your expertise with students.

Activity 1 Body Armor: Our Skin

This quiz provides a common foundation of knowledge for the program and allows presenters to assess students' familiarity with the work of dermatologists, careers in dermatology, and basics of skin health. Students will also learn about some common skin conditions and how they are treated.

Allow students to work in pairs or groups to complete the quiz. Links included on the student activity sheet will help guide students to answers and more information. Review the answers provided in the teacher's guide as a group, correct any misconceptions, and use students' answers and new learning to initiate a classroom discussion about what dermatology is and some common (and uncommon) skin conditions.

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Activity 2 What About My Skin?

In this research and presentation activity, students dive into dermatology and create mini-posters with skin care tips for different ages and skin types that they will present to classmates. Have students work in groups based on interest: students may research shaving tips for individuals with darker skin tones, healthy skin cleaning for adolescents, differences in care for different hair types, or sun care for all skin types – see the activity sheet. Students should use the links on the activity sheet to get started.

Talk with students about differences in skin due to pigmentation and age and how dermatologists have to be familiar with all types of skin to be able to treat patients – everyone is unique.

Consider providing a brief presentation about how you help people with varying skin types, targeting topics that are relevant to high school students. Introduce the activity and then have the teacher oversee the research and poster development after your visit.

Activity 3 Dermatology Detectives

Introduce this activity by explaining how a dermatologist identifies skin conditions when patients come to you. Then read one of the case studies on the activity sheet to the class. The sheet includes links to pages on the AAD site that students will review to help them identify and match the symptoms for five common skin conditions. Each case study has more than one possible answer to show the amount of training and rigor required to be a dermatologist. Be sure to remind students this is a hypothetical activity, not actual medical advice or diagnosis; all skin conditions need to be checked out by a certified dermatologist.

Talk with students about the challenges in identifying common (and uncommon) skin conditions. The discussion can be extended to barriers to health care that some communities face, which can make recognizing,

identifying, and treating health care issues a challenge. Highlight the positive role dermatologists can have in preventing and curing disease and their positive impact on public health.

Encourage the teacher to complete the activity with the students if you don't have time to review all four case studies.

Get Students Involved

- Consider asking the students to turn and talk with their neighbors about the following questions, or engage students in group discussions.
 - What have you already been doing in high school that could help you become a dermatologist?
 - What else do you need to do?
 - What have you already been doing that you heard me say helped me on my way to being a dermatologist?
- What questions do students have? Stop often, and be open to taking the presentation in a new direction based on student interest.

Wrapping Up the Presentation

- Provide students with any additional advice to get started in the field of dermatology.
- Describe your most rewarding case or what you find rewarding about your job in general.
- Discuss your work within the community.
- Allow students to ask you questions. (Be prepared for salary questions. Consider having a range that is common in your state.)
- If you are comfortable, bring business cards or some other way for students to contact you or a member of AAD if they want more information or mentorship on becoming a dermatologist.

Tips for Working with High School Students

- Speak from the heart. Students may not show their interest right away, but they know when adults are interested in them.
- Remember this can be a difficult experience for students who may have skin conditions you mention. Check with the teacher ahead of time about this topic. Be mindful and modify your presentation if you think mentioning certain conditions could lead to any bullying or singling out any student.
- It is much more productive to give students topics to discuss amongst themselves than to keep them silent. Ask engaging questions they can discuss with the students sitting around them. Walk around the room and listen to their answers or prompt more discussion in groups that may be quieter.
- Avoid bringing promotional materials.



Save Your Skin!

Skin is the largest organ of the human body! Taking care of your skin is crucial to your health. This includes knowing how to care for your skin, learning signs and symptoms of trouble, and seeing a dermatologist for check-ups and if you have questions or concerns about your skin. Dermatologists protect and treat people with all skin types and conditions.



Fast facts about your skin:

- The epidermis is the outer layer of skin, which constantly renews itself. It protects the body from disease as part of the immune system, keeps organs safe from outside conditions, and can show signs of serious internal illnesses.
- Health issues can show up on the skin. Examples of inflammatory skin diseases include acne, psoriasis, and eczema. Diseases such as psoriasis are a result of the immune system making too many white blood cells, leading to extra skin cells.
- Melanin gives skin color. More melanin makes skin darker, less makes it lighter. Melanin also determines hair and eye color. Melanin amounts are primarily determined by genes, but aging, diet, and sun exposure can influence melanin production as well.
- Tanning beds, tanning booths, and sun lamps are not safe and can increase your cancer risk.
- Sunscreen should be applied every day on skin not covered by clothing if you will be outside. The sun emits harmful UV rays year round. Even on cloudy days, up to 80% of the sun's harmful UV rays can penetrate the clouds. Water, snow, and sand reflect dangerous UV rays of sunlight, increasing the chance of sunburn.

The ABCDE skin check for melanoma can save your life.

If you notice any of these signs, see a dermatologist or your doctor to rule out melanoma, a type of skin cancer.

A is for Asymmetry

One half of the spot is unlike the other half.

B is for Border

The spot has an irregular, scalloped, or poorly defined border.

C is for Color

The spot has varying colors from one area to the next, such as shades of tan, brown or black, or areas of white, red, or blue.

D is for Diameter

While melanomas are usually greater than 6 millimeters, or about the size of a pencil eraser, when diagnosed, they can be smaller.

E is for Evolving

The spot looks different from the rest or is changing in size, shape, or color.

Signs of common skin conditions for all skin types:

- Acne - blackheads, whiteheads, and pimples that can occur at any age
- Eczema - inflamed, irritated, and often very itchy skin that can occur at any age
- Psoriasis - scaly plaques caused by the skin making skin cells too quickly
- Hives - itchy welts caused by allergies, cold or hot temperatures, or a medical condition

Need help? See a dermatologist.

Dermatologists are doctors who treat disorders and diseases of the skin, hair, and nails, including everything from hives to skin cancer that happen to people of all skin types. They also perform surgery, give injections, and provide laser treatments to care for and cure various skin conditions and diseases. Dermatologists use their training to improve a patient's quality of life and even save lives.

Check out "Diseases and Conditions: A to Z" to learn more about the many ways dermatologists help their patients stay healthy: aad.org/public/diseases/a-z. If you're interested in learning more about opportunities in dermatology, visit aad.org/member/career/diversity/diversity-pathways-hs-college.

