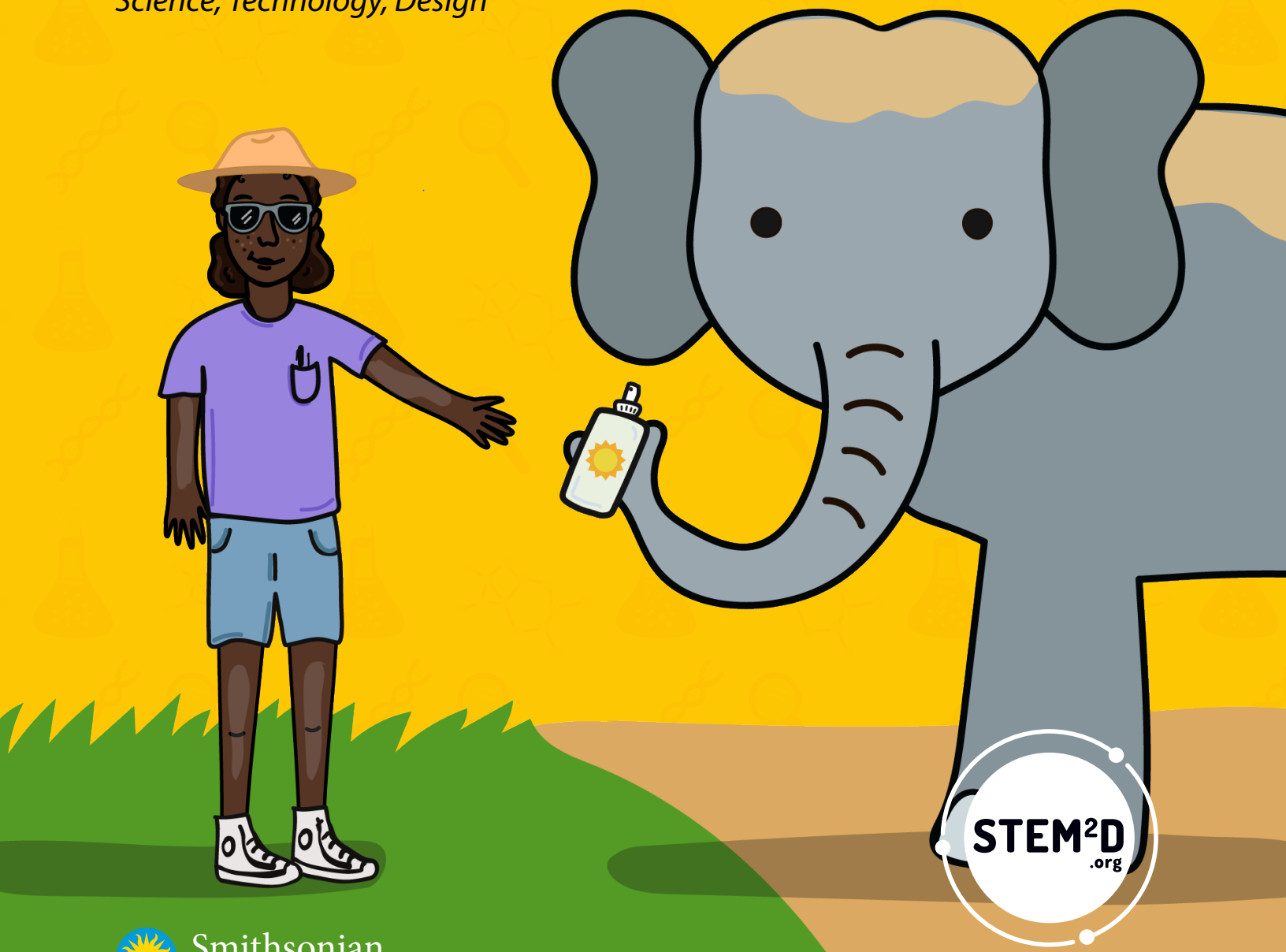
STYLING SUN SAFETY

Target Audience:
Students, ages 5-8

STEM²D Topics:
Science, Technology, Design



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Styling Sun Safety is part of the STEM2D Student Activity Series. The content and layout were developed by the Smithsonian Science Education Center as part of Johnson & Johnson's WiSTEM²D initiative (Women in Science, Technology, Engineering, Mathematics, Manufacturing, and Design), using a template provided by FHI 360 and JA Worldwide. This series includes a suite of interactive and fun, hands-on activities for girls (and boys), ages 5–18, globally.

Credits:
Design and cover: Sofia Elian, Smithsonian Science Education Center

Styling Sun Safety

Challenge

Develop Sun safety strategies for people by modeling animal Sun safety adaptations.

Target Population

Students, ages 5–8

Activity Description

In this activity students will design and engineer solutions to protect people from harmful UV rays, based on strategies found in nature. Students will learn about how animals use a variety of adaptations to protect themselves from getting too much Sun. Students will make connections between those adaptations and the strategies people use to keep themselves safe from the Sun. Using design-thinking strategies, students will create an outfit for a Sun safety fashion show, connecting to the ideas they learned from Sun safety techniques used by animals and people.

Materials for Each Student:

- Student Sheet 1
- Paper plates
- Construction paper
- String
- Scissors (shared)
- Crayons and/or markers (shared)
- Tape or glue (shared)

Safety

When using scissors, cut in a direction away from your body.

Background Information

Have you ever had to squint your eyes because the Sun made it hard to see? Have you ever worn sunscreen to protect your skin or used a hat for shade? These are ways you protect yourself from the Sun. Too much Sun can cause sunburn. Animals have special adaptations and behaviors that help them stay safe in the Sun. Elephants use dirt as protection from the Sun. They throw dirt on their backs to cover their skin, so they don't get sunburn. Sea urchins cover themselves with algae from the seafloor to keep the Sun from hitting them from above the water. Meerkats and cheetahs have black markings around their eyes. These black areas protect their eyes from the glare of the Sun. Some animals have coats that protect their skin. Dogs have fur and sheep have wool that protects them from the Sun. Tortoises have protection from the Sun too. They have shells. The shell can create a shadow for the tortoise's head and legs, or the tortoise can pull its head into the shell to avoid the Sun.

Both animals and people must avoid getting too much Sun. One way people stay safe is by using sunscreen. Sunscreen is especially important to a person's health because it blocks the Sun's rays from hitting and damaging the skin. Too much Sun causes sunburn, which can be very painful. Using sunscreen is a good idea whenever you plan on going outside for a long time. Even on cloudy days when the Sun does not seem very strong, sunscreen can protect your skin from damage.

Johnson & Johnson sunscreen products

Meet Sun Care Scientist Diyana Sudarsono*

*Younger students may need an adult's help reading this section.

How did you get started in your career as a scientist?

When I was younger, I knew I wanted to create shampoo, but just wasn't sure what the job was called. I asked my parents, teachers and they told me to "just study Science". I chose the path of Science and it eventually led me to pursue my studies in Chemical Process Technology, where I specialised in Industrial Chemistry. This was when it opened opportunities in Research and Development, and allowed me to pursue my childhood dream.

Can you provide a description of your work in sun protection?

I spent 11 years in Product Design, where we take a look into the chemistry that goes into working with raw materials to build formulas. Especially with sunscreens, we need to understand how the Sun filters work, and find a balance between achieving a good SPF value and a pleasant sensory experience.

What is the best part of working as a scientist?

The best part for me was to see the products that I have formulated on shelves! I remember the first time I saw my product on the shelves in a beauty store, I was overwhelmed with a sense of achievement!

How do you test that a sunscreen works?

If you notice your skin is burning, regardless of however you applied the cream, the sunscreen is not working for you and you should get out of the Sun.

What is your favorite fact about Sun safety?

We can still have fun out in the Sun with proper protection! One of my favorite facts is on reapplication of sunscreen. Most of us think that we are protected from Sun's UV just with one application of sunscreen, before we head out for our outdoor activity and then wonder why we still get sunburn. Sunscreen will need to be reapplied every 2 hours, even more if we are doing swimming or activity that make as sweat a lot.

Explaining the Problem Conversation Starters

- Has anyone ever had sunburn?
- Did you know animals can get sunburn too?
- Do you know what a model is?
- Did you know humans are animals? We can model animal strategies to keep ourselves protected from the Sun.

Step-by-Step Instructions

- Have students pull out their Student Sheet 1 and a pencil or pen.
- Work through Student Sheet 1 together with students. Describe the Sun safety approaches of animals as students draw a line matching the animal to the comparable human Sun safety technique. Revisit the Background Information section to clear up any student confusion.
- Example: "Let's look at the baby elephant. It likes to throw dirt and mud onto its back to protect itself from the Sun. What can we do that is like the baby elephant? That's right, use sunscreen!"
- Completed Student Sheet 1

  Matches
  - Elephant—Sunscreen
  - Sea urchin—Hat
  - Cheetah—Sunglasses
  - Sheep—Shirt/Clothes
  - Tortoise—Umbrella
- After completing Student Sheet 1, divide students into groups.
- Assign each group a challenge to design a Sun safety outfit for people that matches the adaptations of three of the animals found on Student Sheet 1.

- You can either assign the three animal adaptions to each group or allow the groups to choose.
- Example: One group may choose to model the adaptations of the cheetah, tortoise, and sea urchin by designing sunglasses, an umbrella, and a hat.

Examples of items students might design for their Sun Safety fashion show: sunglasses, hat and sunscreen bottle.

- Students design and construct a Sun safety outfit using arts and craft supplies such as paper plates, construction paper, string, etc.
- Students present their Sun safety outfit to the class after completion.
- As each student group presents, ask the class: "Which three animal adaptations match up with this outfit?"

Vocabulary

Animal: a living thing that feeds itself by eating plants or other animals

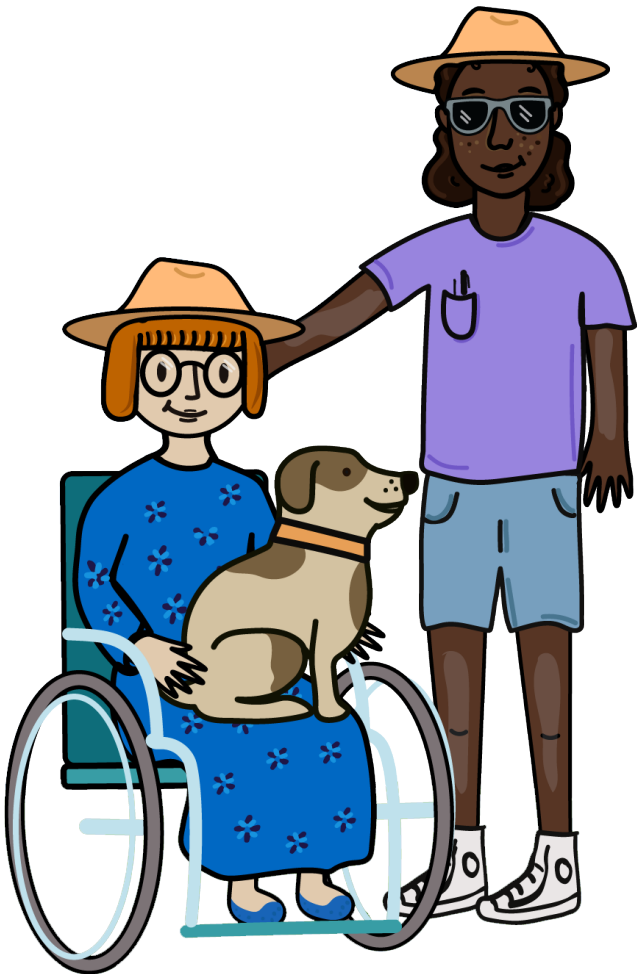
Adaptation: a special skill that helps an animal survive

Sunburn: a painful skin reaction that happens after too much exposure to sunshine

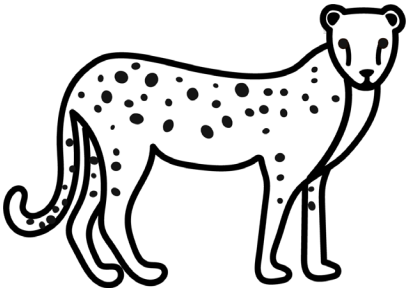
Sunscreen: lotion or spray that is applied to the skin to protect skin from the Sun

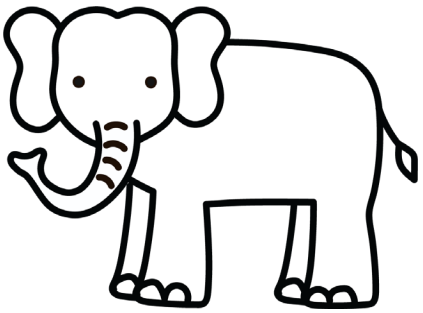
Human-made: made by people and not from nature

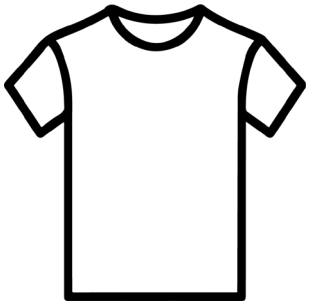
Safety: protection from danger or harm

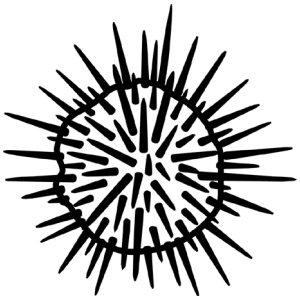


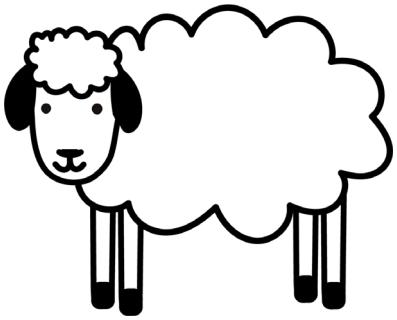
Student Sheet 1

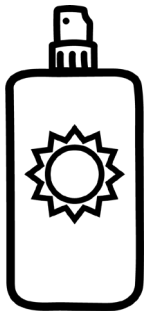


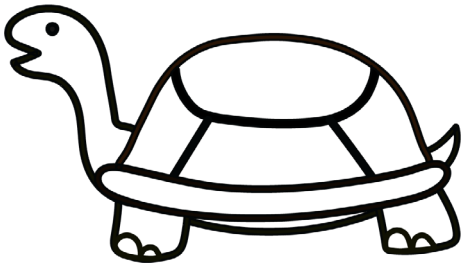


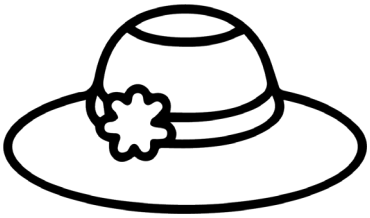












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