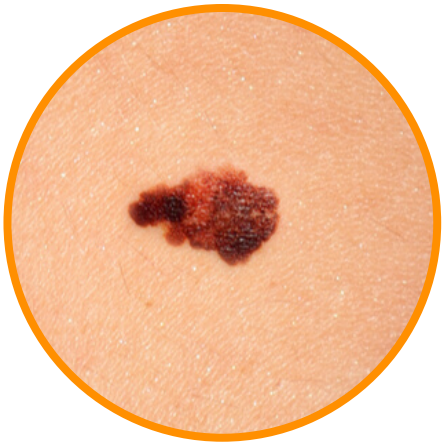
Skin Cancer

Skin cancer can occur after too much sun exposure over time! This happens because the sun's rays are made of ultraviolet, or UV, light. This is a type of very high energy light that is invisible to our eyes, but can cause damage to our skin.

When UV light causes damage, it actually penetrates the skin and makes changes to the DNA of the skin cells. Think of it like a computer virus that makes your computer crash; the UV light changes the DNA of the skin cells. This change makes them replicate and produce more and more cells. These cells create a cancerous tumor.

Take a look at these examples of skin cancer.



Sun Protection

There are many different methods for protecting the skin from UV rays. Here are some examples:

Commercial Sunscreen:

- Advantages:
  - You can buy these sunscreens at the store.
  - They are relatively inexpensive.
  - You have a variety of options of that you can buy at the store.
- Disadvantages:
  - Sunscreens contain chemicals that some people don't want to put sunscreen on their skin.
  - Some people don't like the smell of sunscreen.

Homemade Zinc Paste:

- Advantages:
  - You can mix more whenever you need it.
  - This only contains the chemicals that people put in them.
  - Some people think these mixtures are healthier for their skin.
- Disadvantages:
  - Mixtures may not be mixed properly, which might make them less effective than regular sunscreen

Clothing:

- Advantages:
  - Easy to find
  - Lots of options
- Disadvantages:
  - Lots of long sleeve clothes can get hot in the summer!
  - So much laundry!

Teacher Prep

- Depending on the amount of sun-sensitive paper you have, you can cut the sheets into halves or quarters.
- Each group will need 4 equal-sized pieces.

- Prepare homemade zinc paste for each group. To do this:
  - Mix 1/2 cup coconut oil with 2 tablespoon nano zinc powder.
  - Alternatively, you can purchase an “all natural” zinc product online.
  - Locate a sunny place outside to test the sunblock samples.

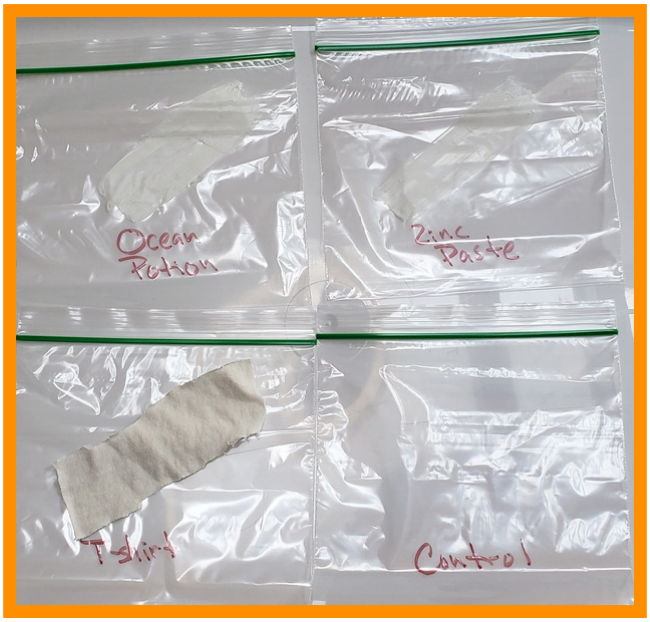
Testing Sun Protection

Follow the steps below to test your different sunblock methods.

Step One: Prepare Your Experiment

Follow the steps below to prepare your experiment.

- Label and fill baggies as follows:
  - Baggie #1
    - Label baggie with: “Commercial Sunblock”
    - Place a thick layer of regular commercial sunscreen into the baggie.
  - Baggie #2
    - Label baggie with: “Zinc Paste”
    - Place a thick layer of the homemade zinc paste into the baggie.
  - Baggie #3
    - Label baggie with “T-Shirt”
    - Place a piece of t-shirt material inside the baggie.
  - Baggie #4
    - Label baggie with “Control”
    - You won’t add anything to this bag—this is the control, meaning that you will compare how the sun shines through the other bags compared to this bag.



- Place all of your baggies on the tray provided by your teacher.
- Ask your teacher to dim the lights before working with the sun sensitive paper in the next step.
- Place one piece of sun sensitive paper inside each baggie.
  - Make sure the paper is directly below the sunblock and the piece of t-shirt.
  - This will allow the sunblock or t-shirt to stop some of the sun’s rays from reaching the sun sensitive paper.
- Place something heavy on the corner of each baggie to keep it from blowing away when you bring the tray outside.

Step Two: Perform Your Experiment

It's time to place the baggies outside and determine which method is best for blocking the Sun's rays.

- Set the tray of prepared baggies outside in the sunshine for 5-10 minutes.
  - This will cause a chemical reaction to occur between the sun and the sun sensitive paper.
  - The paper will create a white chemical in the places where it reacts with sunlight.

- Bring tray inside.

- Remove sun sensitive paper from each baggie and rinse in cold water for 60 seconds.
  - This will stop the sun sensitive paper from reacting to light.
  - The white chemical that formed on the paper will wash away and the paper will turn blue.

Step Three: Make Observations

Make observations of the results of your experiment! Your goal is to determine which method was best at blocking the sun's rays.

- How to Read Your Sun-Sensitive Paper:
  - Blue color: These are places where the sunlight reacted with the paper.
  - White color: These are places where there were no reactions on the paper.

- The paper with the most amount of white on it is the method that was best at blocking the sun's rays. Make observations in the data table.

STEM CAREER ADVENTURES

Data Table

Sunblock Method	Observations
Regular Sunscreen	
Zinc Paste	
T-Shirt	
Control (no sunblock)	

Which method was best for blocking the Sun's rays?