|  |  |  |
| --- | --- | --- |
|  | **Activity 1 – Skin Observations** |  |

**Teacher Instructions**

This activity will focus on the first line of bodily defense: the skin! Students will complete observations and answer questions about their own skin. They will complete an experiment to examine the absorption of certain materials on the skin.

**Objective**

After this activity, students should be able to:

* Investigate the properties of skin
* Form hypotheses prior to conducting the investigation

**Materials**

* Eye dropper
* Water
* Hand lotion
* Mineral oil
* Rubbing alcohol
* Student handout

**Safety**

Some students may be allergic to hand lotion. Instruct students who have skin allergies to omit any section that may cause them to have a reaction.

**Student or Group Name:**  **Date:**

|  |  |  |
| --- | --- | --- |
|  | **Activity 1-****Skin Observations** |  |

To learn about the chemical properties of skin, you can put various substances on the outer surface and observe what happens. Some substances just stay on the surface, while other substances disappear (dissolve) into the skin. In this experiment, you will examine how different substances are absorbed through the skin.

**Safety:** Some lotions and oils may cause skin allergies. If you have skin allergies, proceed with caution in this portion of the lab. You may need to omit that part of the procedure. Do not put any of the substances in your eyes.

**Materials:**

Eye dropper, water, hand lotion, mineral oil, rubbing alcohol, student handout

**Procedure:**

1. Make predictions/hypotheses in the table provided about what each of the substances will do once they contact skin.

2. Turn your arm so that your palm is facing up. On your forearm, put a drop of water. Next to it, put a drop of lotion on your skin. Next to that place a drop of mineral oil. Finally, place a drop of rubbing alcohol on your skin. You should have 4 different substances on your skin. Spread out each drop on your skin to increase the surface contact of the various liquids, but do not rub them in. As you do so, be sure NOT to mix the substances together.

3. Watch all four drops for 10 minutes without disturbing them. At the end of ten minutes, record your observations, including how the substances made your skin feel (oily or not, change in temperature?) and any changes to the substances.

4. Which substances were absorbed by your skin? Which substances stayed visible on your skin. Record your observations.

5. Answer follow-up questions on the Q/A response sheet using what you've learned from this experiment and also reflections from this unit.

**Investigation**

1. Make predictions/hypotheses. What will happen to the substances once they are on your skin? Will they be absorbed? Will they stay on the surface of the skin? Will they evaporate before you rub them in? Make your predictions in the area below.

**HYPOTHESES:**

|  |  |  |
| --- | --- | --- |
| **Substance** | **What will happen when in contact with skin?** | **What will happen after rubbed into skin?** |
| **Water** |  |  |
| **Hand Lotion** |  |  |
| **Mineral Oil** |  |  |
| **Rubbing Alcohol** |  |  |

2. Turn your arm so that your palm is facing up. On your forearm, put a drop of water. Next to it, put a drop of lotion on your skin. Next to that place a drop of mineral oil. Finally, place a drop of rubbing alcohol on your skin. You should have 4 different substances on your skin. Spread out each drop on your skin to increase the surface contact of the various liquids, but do not rub them in. As you do so, be sure NOT to mix the substances together.

3. Watch all four drops for 10 minutes without disturbing the drops. Record your observations below, including how the substances made your skin feel and any changes to the substances, at the end of 10 minutes.

**RESULTS AFTER 10 MINUTES WITHOUT BEING RUBBED INTO THE SKIN:**

|  |  |
| --- | --- |
| **Substance** | **What happened when in contact with skin for 10 minutes:** |
| **Water** |  |
| **Hand Lotion** |  |
| **Mineral Oil** |  |
| **Rubbing Alcohol** |  |

4. Rub each drop against your skin. As you do so, be sure NOT to mix the substances together. Which substances were absorbed by your skin? Which substances stayed visible on the skin? Record your observations in the space provided as you did above.

**RESULTS AFTER BEING RUBBED INTO THE SKIN:**

|  |  |
| --- | --- |
| **Substance** | **What happened when in contact rubbed into skin:** |
| **Water** |  |
| **Hand Lotion** |  |
| **Mineral Oil** |  |
| **Rubbing Alcohol** |  |

5. Why do you think certain substances were absorbed easier than others? What can you tell about the skin from your observations?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. If you were developing a medication to be absorbed through the skin, what types of qualities would it have to have? Which substances that you tested above would be most similar to the absorbable medicine?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |
| --- | --- | --- |
|  | **Activity 2 –** **Ready, set, infect!** |  |

**Teacher Instructions**

This activity can be found on: <https://www.scienceinschool.org/content/ready-set-infect>

“Ready, set, infect!” is a role-playing game. It allows students to experience how dynamic the human immune system must be to protect the body against infection via three lines of defense: skin; white blood cells (through inflammation); and antibodies (via the immune response).

**Objective**

In this activity, students will:

* Model and understand the structure and function of the immune system

**Materials**

* Role cards that can be downloaded from the above website materials section