Skin Size

Get all wrapped up in a lesson about skin

Figure out the approximate surface area of skin on someone's body.
Figure out the approximate amount of atmospheric force pushing on someone's body.

Materials:
Newspaper
Scissors
Tape
Ruler or meter stick
Lots of open floor space

To Do and Notice:

1. Choose a person to be wrapped in newspaper.
2. Carefully wrap each body part.
3. Tape the pieces together.
4. Totally cover your subject's body…head, feet, hands…
5. Always leave a breathing hole for the mouth.

When done wrapping:

6. Remove all the paper from the person's body by carefully tearing the paper down each limb.
7. Lay all torn paper pieces on the floor.
8. Move the various body-part-papers around to form a square or rectangular shape (you may rip some of the larger pieces of paper to fit into this shape).
9. Measure the length and width of the arranged paper on the floor and calculate the total surface area.

Eric Muller - Exploratorium Teacher Institute 1998

What's going on?

The number you calculated is a reasonable approximation for the surface area of the participant's skin.

The skin is the largest organ in or on the human body. The surface area of skin of an "average" adult is ~1.8 m2 (or ~ 19.4 ft2).*

(The Earth Science/atmospheric pressure - Skin Connection)

All objects on the surface of the earth, including you, reside at the bottom of a huge layer of air - the atmosphere. The atmosphere, which is composed of colliding gas molecules, has a pressure of about 14.7-pound of pressure per square inch (psi) at sea level (or 101.35 kilopascals).

If you convert the surface area of skin into square inches and multiply it my 14.7 psi you will get an idea of how much total air pressure is pushing on your body and how much your body is pushing back on the air (area x pressure = force). An average adult's skin of ~2800 square inches has a pressure on it of 14.7psi, which makes a total of 41160 pounds of force.

References and Resources:
*From : http://ergo.human.cornell.edu/350DEAfiles/thermal/th.cond.notes.html
This activity was first seen during a UCSF/SEP project.