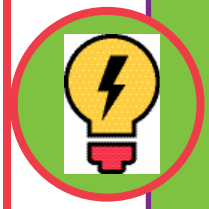
DO IT!

Good Wrinkles!

Humans have evolved to be able to think about very complex concepts. This has helped us build tools, learn new things, and create a complex society. How do our brains store so much information? In this activity, we will learn how the human brain's wrinkles help it become so powerful, and why the wrinkles are an important part of what separates our brains from those of the animal species around us.



You'll Need

1) Large sheet of newspaper (at least 20 in. x 20 in.)
2) Metric ruler
3) Pair of scissors
4) Roll of tape (clear or masking)
5) Sheet of construction paper
6) Pictures of mammalian brains (at end of instructions)

1. **Spilt into Groups.** Divide youth into groups of two or three. Give each group a piece of construction paper and ask them to cut it into a 9 in X 9 in square. Optional: Ask students to calculate the surface area of the sheet (9 X 9 = 81 square inches).

2. **Distribute Newspaper**. Give each group of students a newspaper. Ask them to cut it into a 19.2 in X 19.2 in square. Optional: ask students to calculate the surface area of the sheet (approximately 369 in).

3. **Differentiate Sheets.** Either ask students to find the difference between the two areas of the sheets (369 – 81 = 288 square in) or ask them to describe the differences between the two sheets (the newspaper is much larger than the construction paper.

4. **Begin Challenge.** Have students find a way to make the newspaper fit evenly over the construction paper without cutting or wrapping the paper. You should be able to read all the newsprint from some angle. Taping the edges of the newsprint to the construction paper is allowed.

5. **Share Data.** Once all groups have finished, have youth share out their solutions. How did they arrive at their conclusions? Why do their newspaper creations have the shape that they do?

6. **Explain Wrinkles.** Tell youth that the construction paper has about the same surface area as

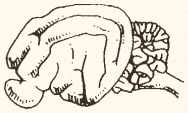
the helmet-shaped part of an average human skull and that the sheet of newspaper has about the same surface area as an average human cerebrum. By wrinkling their newspaper they were able to fit a large amount of information into a small space. As mammals evolved and needed more cerebral tissue (the thinking part of the brain, the tissue formed wrinkles, so that more and more tissue would fit into the space in our heads!

7. **Compare.** Look at the pictures of different animal brains. What differences do youth see? What do these differences tell us about the intelligence of each species?

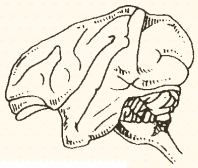
Mammalian Brains

Opossum brain

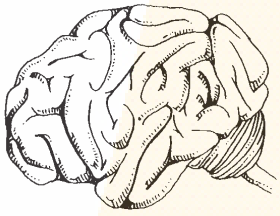
Rabbit brain



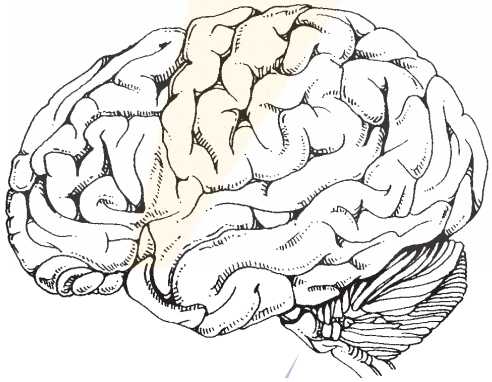
Cat brain



Monkey brain



Chimpanzee brain



Human brain