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Modeling Assignment Outline

Big Blind Busted Brain

Purpose:
To demonstrate the relationship between the brain and vision using interactive models of the visual field, the visual pathway, and the major brain regions important in visual processing.

Materials:
White sheet, colored painter's tape, Velcro, cardboard, stand, wood framing material, screws, various colors of paint, newspaper, water, flour, plastic tubing, food coloring, two buckets

Procedure:
First, we will construct a large model of a brain using cardboard and paper mache. The brain will be attached to a color coded visual field. We will use tubing to represent the visual pathway that will begin in the visual field, run through the brain, and end in the occipital lobes. We will construct the model so that colored water may run through the tubes to demonstrate how visual stimuli may travel through the visual pathway. The water will drain out of the occipital lobes into the buckets.

Next we will map a large visual field onto the white sheet using painter's tape and paint. Each subunit of the visual field will be color coded to match that of the paper mache brain and further distinguish the parameters of the visual field. A piece of Velcro will be attached to the center of each of the four subunits so that pictures may be placed on the sheet in the appropriate locations.

Finally, we will build a box-like visual apparatus out of wood. The apparatus will include a head stabilizer and several modes that may be adjusted to block the viewer from seeing different subunits of the large visual field mapped onto the sheet. We will scale the apparatus so that it will be affective with roughly 10 feet between it and the sheet.

Issues:
Our project does not discuss the anatomy of the eye or how a visual message triggers a bioelectric response. It ignores some regions of the brain that are involved in the visual pathway. Many technical terms will be left out of the discussion for clarity purposes.

Lesson Plan:
We will first introduce the kids to the visual field and visual pathway through the brain using the large paper mache brain model. Next we will run through different brain damage scenarios to engage the kids

in the scientific process. During each scenario, one child will look through the visual apparatus while the others attach pictures to the visual field sheet. The child will be asked what pictures he can see to asses his degree of blindness. We will refer to the large brain model to help the kids determine the location of brain damage along the visual track. The kids will rotate so that each gets a chance to look through the apparatus. The scenarios will start out very simple and get increasingly more difficult with each rotation. We will be flexible through the demonstration and adjust the difficulty levels according to how the kids catch on. Our final scenario will be the most difficult and one in which we ask the kids for their hypotheses. We will have them test their hypotheses and ask them questions about their reasoning through the process.