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Model Outline

## **Crazy Eyes!**

**Purpose:** To demonstrate the importance of the vestibuloocular reflex (VOR) with regard to how it allows the eyes to remain at a specific position despite movement of the head, and to explore what might occur as a result of damage to the system, due to head trauma. The vestibular system will be explored and experimented with using several different models. The most emphasized of these models will be that of the semicircular canals and their components.

**Materials:** Chair that is able to spin/rotate, camera (if possible), poster with words/pictures, 3-4 posters with pictures of pathways, “googly eyes”, clear plastic tubing, small metal balls, cow eyeball with pins, Petri dish, water with food coloring, ping pong ball, and glue, plastic model of eyeball.

**Procedure:** Select all children around display to view pathways presented on posters (brief overview). Children will view both the cow eyeball and plastic eyeball visual aids. The muscles of the eye which allow for particular movements will be acknowledged, but not stressed. Petri dish with colored water and ping pong ball will be presented and children will be allowed to manipulate/spin as inner ear components are explained. Plastic tubing with metal ball inside will be explained as a model of semicircular canals and children will be allowed to manipulate models on their own to better understand how different head movements affect the inner workings of these canals. The components of these canals and how they play a role in vestibular control will be discussed. To test how well the children understand the concept, one child will be selected to sit in chair and instructed to focus on a poster with a word and/or picture on it. Children will be asked what they believe will happen to the child’s eyes once the chair has stopped moving. The child will then be gently spun around in the chair as the other children watch. The child will be asked to tell us what the word/picture is after they have finished spinning. Once spinning is complete, the child will turn around and view the other children so they may witness the movements of the eye (a camera will be used to record this if attainable). The children will be asked why they think the eyes do this (questions about injuries, etc.) and will then be presented with “googly eyes” to manipulate and wear while spinning in the chair. More questions will then follow to assure understanding of topic (hypothetical situations) encompassing the entire VOR system.

**Issues:** Will not be going into depth regarding how fluids are secreted or how they flow in order to maintain interest. Charges of fluids will also be ignored. The mechanism of the VOR is all that will be discussed in depth. No neurotransmitters or receptors will be discussed in detail, although they will be mentioned briefly (so as to not confuse children). In depth explanations regarding tip links of stereocilia will be left out to help simplify the mechanism, however, the position changes as well as outward differences will be acknowledged.

**Lesson Plan:** Children will learn how this reflex works and why it is important. They will learn that the VOR allows for eyes to remain focused and stationary despite movements of the head and that this reflex may not truly be appreciated until there is a problem with it. The children will be asked, prior to the spinning chair experiment, what they believe will happen to the eyes once the head has stopped moving (as a result of the spinning) and why. Also, they will be asked why they think, as a result of head trauma, people might experience problems with vertigo and nausea. Children will be asked why these same problems might be experienced when they have an ear infection based on what they have learned regarding the semicircular canals and the VOR.