Name	Zoya and Aamna
Grade	9
Project Title	The Cognitive Effects of Brain Exercises on Alzheimer’s Disease

Date	Information / Data / Accomplishments
Wednesday, November 21, 2025	On this date, I decided on my CYSF project titled: The Cognitive Effects of Brain Exercises on Alzheimer’s Disease by viewing an issue with this disease. We figured that since there is no cure, there must be methods to delay the effects of each stage or to improve patients' short-term memory. We wished to gather information regarding physical, mental, and cognitive activities that can be done simply and efficiently at home while providing an effective difference at the same time. Our questions require us to figure out the most effective activity cognitively and physically, plus the reason why it is successful and how it makes a difference scientifically. I specifically studied the Hippocampus and the Entriphinal Cortex
Tuesday, November 25, 2025	On this date, I started researching the basics of Alzheimer's, including what it is and who it affects, and at what age it is most common. This research was done at school, andI didn't have time to complete it on a later date. I will continue my research.
Saturday, December 6, 2025	I began researching the causes of Alzheimer's and the parts of the brain that are affected by each stage. I found
Monday, December 8, 2025	I continued filling out the document that contains my research regarding the part of the brain that is most affected by the disease, and at what stage these parts are fully infected. I needed to know the functions of each of these parts, which I found the majority of my information: clevelandclinic which provides information that explains each part in detail and the necessity of it. Additional resources aided me in categorizing and understanding the locations of the brain that are affected per stage.
Thursday, December 11, 2025	With further research done, I learned that there are 4 primary lobes that, if damaged, affect your brain's regular functions. These four lobes are the temporal, occipital, parietal, and frontal. Each contains some connection towards memory or body reflexes/movement, which is why these 4 areas are specifically degraded as the disease targets these locations, causing the patient to have weaker memory and movement over time. Three of these lobes are affected during the moderate stage, while the occipital lobe (vision control) is damaged during the severe stage.
Sunday, December 14, 2025	My next step was to break up the three major stages into smaller parts with their symptoms. After searching for a while, I noticed one particular website that explained each stage of Alzheimer's into 7 parts. I summarized its findings while including additional information that I had gathered before. You know the duration, symptoms, and behavioral changes that occur. The reason why this is so important

	is that we can know and be able to identify the stage a person has, which later on we can specify the activities that would benefit the patient the most, depending on their stage. We can diagnose and assign activities that would strengthen their memory and movement, which may prolong the duration of the stage they are in.
Monday, December 15, 2025	I finalized all the stages, including the 3 major stage parts affected. I wanted to research background information regarding mental activities and why they are so highly recommended by doctors and nurses to keep strong memories. As it turns out, activities like puzzles, reading, memory games, or learning a new skill force the brain to come up with strategies, activating its thinking process while memorizing placements and basics. With further research, I learned that mental engagement strengthens a person's neural pathways. This is why mental engagement is necessary since a person with AD has their tissues and pathways being destroyed over time by the disease, and doing cognitive activities can compensate for the damage.
Friday, December 19, 2026	I dived deeper into each activity, seeing the effects of it on the brain, why it is considered useful, and which is the most effective. Using several reliable sources, I discovered that word puzzles especially build the neural pathways in the brain for retaining knowledge. Jigsaw puzzles compel the brain to make connections between the pieces through their shape and visual image. Dice games activate 4 primary neurotransmitters like dopamine (drives motivation and pleasure), serotonin (improves mood), oxytocin (stronger bonds), and endorphins (relieves stress & pain). Board Games use logic and focus to remember rules, strategize, and track progress. Video Games are beneficial since they improve attention control, cognitive flexibility, and information processing.
Saturday, December 20, 2025	On this day, I started looking into different studies and experiments on physical exercises for individuals with Alzheimer's individuals but my research didn't take me far as I encountered numerous sites that weren't verified sources and couldn't be applicable for our project. I didn't realise this error until halfway into my research, and this blunder took me back a few steps.
Sunday, December 21, 2025	I continued finding different applicable certified sites and did not find any that talked about Alzheimer's. Until I found PubMed and Google Scholar, all verified sources used by many researchers and scientists were
Thursday, December 25, 2025	I did further research to figure out other activities that benefit those with Alzheimer's. By utilizing sources like google scholar i learned that there are 4 major activities that may help.
Friday, January 2, 2026	On this day i started investigating the experiments of physical exercises on Alzheimer's. Exhibiting the one that aligned with my research the most. With the research I did, I would make sure the intricate scientific terms were given definitions for easier comprehension. I would continue this process one or two times, but I had difficulty finding the right experiment that was thorough and detailed. If on the lucky occasion I did find one, it wouldn't be what my project was about, but rather a different aspect of Alzheimer's I was not focusing on. I found a study that focussed 300 alzheimer's parrtcipants that exercised for 45 minutes for four days under the supervision of a trainer at their local YMCA. this expiermnet

	showd that high levels of aerobic exercise have been shown to improve brain volume and factors of cognitive decline. After much hardworkof research i found another experiment. It was a randomized controlled program where 210 indovuals with zlzheimiers with AD and their cargievers were categorized and randomized into 3 groups, There were 2 types of interventions: a home-based customized exercise program (HE) and a group- based exercise (GE), twice a week for 1 year, compared to a control group (CG) who received usual community care. Overall, regular long-term customized HE improved the executive function, but the effects were mild and were not observed in other areas of cognition.
tuesday, January 6, 2026	On this day i searched more about cognitive activities, specifically reminiscence therapy and memory games. This helps stimulate cognitive function and improve memory retrieval. I decided to expand on this by investigating mental exercises, which discuss how these exercises increase neural pathways that might otherwise weaken due to disuse.
Saturday, January 10, 2026	I started focusing my research on cognitive activities work. I went as far as looking for multiple different studies and activities that focused on cognitive exercises in individuals. In our first research activity, we had 22 induvauls which tested the hypothesis that frequent participation in cognitive stimulating activities is beneficial to brain health. Participants reported how often they engaged in cognitive activities, completed memory and thinking tets and received MRI scans. Participants who played games showed greater gray matter volume in several Alzheimer's vulnerable brain regions. Higher CAS-games were associated with better memory, speed, and cognitive flexibility. Looking at the citations of thisstudy i came across another cognitive research study, which investigated whether physical exercises and cognitive training could improve biological markers linked to people with mild cognitive impairment (MCI). The study inclduded 74 year old adults diagnosed with MCI. Participants were randomly divided into 3 groups. The overall findings suggest that regular physical activitcy particularly when paired with cognitive training, may help protect brain health and slow the biological processes associated with AD in individuals with MCI.
Wednesday, January 14, 2026	I found a couple of physical activity studies that worked and fit the expectations of our standards. Our physical research experiment. A study from the University of Wisconsin found that people over 60 who performed 30 minutes of moderate exercise 5 days a week had la ower risk of developing the disease and fewer memory and cognitive problems. Another study from the University of Kansas found that some participants with Alzheimer's were able to increase their scores onmemory test after routinely exercising and even increased the size of their brains' hippocampus. Another physical experiment was conducted for a randomized control program. Its entire objective was to examine whether regular long term exercises programs performed by individuals with Alzheimer's at home or in a group-based exercise at an adult daycare had beneficial effects on cognitive abilities.
Sunday, January 18, 2026	On the slim luck or chance we found another mental activity experiment, it included the following: a report from the Chronicle library in 2012 reviews whether mentally challengning may be beneficial for Alzheimer's patients. Scientists noticed that

	mental simulation improved scores on memory nd thinking tests. There was a six to nine-month delay in the progressive symptoms. Those who engaed in these activties hada positive effect on their well-being and quality of life overvnall. Benefits were shown in patcpaints who were in the mild to moderate stages of dementia, but those with severe demntiss did not gain any advantage from the extra stimulation
Friday, January 24, 2026	We understood the teacher's feedback and applied it to each section of our project to ensure no repetition, and clear information is presented in order. We organized our new information on Google Slides that we would later print out to utilize on our trifold. We reworded parts of our slideshow and research information to make it shorter but more understandable
Saturday, January 25, 2026	We chose the color theme(red & blue) for our trifold so each side has to correspond with a color depending on the context. For our system, we did that any mental research, data, or experiment would be in different shades of blue. Physical research, data, and experiments would be in different shades of red. Once we decided the color, font, and appropriate size, we printed each slide out. Each paper was cut into a box that had a white background and the writing was colored. We planned our trifold as one side would have all the cognitive/mental research and the other would have all the physical information. Our middle would include general information related to both sides like our problem, method, seven stages, affected areas, and our conclusion. We bought a mushroom yesterday that we intend to create a brain model out of. We used a light pink base with dark pink curved lines as the gyri and sulci. Blue veins were formed around the lines with a white-pink stem. We created the brainstem and cerebellum with clay that has a brownish pink color coated on top. We bought a leaf that we customized to say “Alzheimer” in red paint with a light brown background. We added blue and red neurons on each side of the leaf. Additionally we bought lights that were intended to go along the side of the trifold with 5 clips containing the image of a brain. On the top we put a small light as a finishing touch to add a mature yet appealing look to the trifold.