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|  | **Introduction**  Mice belong to a class called mammals: warm-blooded creatures who have hair on their bodies and feed milk to their young. More specifically, fancy mice are domesticated rodents whose genus is *Mus* and their family is *Muridae*. The average female weighs approximately 33 grams, whereas the average male weighs closer to 37 grams. A mature mouse is about 3O grams to 4 inches long (males tend to be larger) and has a tail about as long as its body. The life span of a mouse is only two to three years, with sexual maturity occurring as early as 13 days. Gestation period is about 16 to 53 days, and litter size ranges from 1 to 18 baby mice. Although mice have large eyes, they are nearsighted. Their strong sense of smell and keen hearing compensate for this disability.  Because of their rapid reproduction rate and small size, mice make especially good laboratory animals. Laboratory mice have played an integral part in our medical and technological advancements over the years, ranging from testing antibiotics to reaction times in a maze. According to the basic assumption in behavioral psychology, animals may be studied and tested, and the results generalized to predict the behavior of humans. Maze experimentation is ideally suited for our hypothesis because it provides a method to test hearing and memory of our mice. Our mice have been exposed to three different music groups: classical, jazz, and hard rock.  **Classical music**, such as Baroque music (1700-1750), produces exactly the right frequency and sounds to harmonize the functioning of the brain and produces a state of calm, relaxed alertness. That is why accelerated learning techniques introduce music into the learning process. Music can also strengthen or weaken individuals. Classical music has been shown to have either a neutral or strengthening effect.  **Hard rock** music has repeatedly been proven in experiments to have a detrimental effect. David Herrel, a 16 year old at Nansemond River High School, conducted an experiment that sharpened his theory that hard rock taints the brain. Using 72 male lab mice, he separated the mice into 3 groups of 24: a control, classical, and a hard rock group. After weeks of putting them through the same maze at an original average time of 10 minutes, the control group shaved 5 minutes from the beginning time, the classical group knocked 8 minutes off, but the hard rock averaged 30 minute completion time, a considerable difference. The fact that 72 mice were tested makes his results more valid because of the larger sample size. Most noticeably, the hard rock mice did not sniff the air to find the trails of others that came before them. In addition, Herrel's first experiment failed because the mice were not put in separate containers, and the hard rock mice killed each other.  **Jazz** is a type of music is mainly improvised and therefore it does not have the regularity found in classical or rock music (classical with the style and form, and rock music with rhythm). Performers create their own rhythm by constant syncopation-accents in unexpected places- and also by swing, a sensation of momentum achieved when the melody is heard with, then at a slight variance with, the expected beat. Although this sounds as if it will just be random music, there is a constant in the equation. There is a basic form found in jazz that is a backbone for improvisation to occur. Jazz is closely related to classical music, as some of the efforts of composers attempted to fuse jazz and light classical together. Modern jazz is now a combination of the classic improvisation of jazz and the light tones of classical music. As this is the case we expect the classical group's and the jazz group's data to be similar.  A clinical neuroscientist Richard Frackowiak of the Institute of Neurology in London says that there is no one area of the brain that individually reacts to sound or music. His research strongly suggests that many different parts of the brain are activated. His experiments were done on 16 healthy men, and his results were intriguing. When the men listened to well know pieces the most metabolically active part of the brain was the Broca's area, which deals with speech, and this suggest that this area is responsible for the recognition of all sounds, not just words. When they focused on timbre (the quality of sound) the right hemisphere was activated. When pitch was the experiment a portion of the brain known as the precuneus, a region believed to deal with visual imagery was activated. This suggests that "as you look for changes in pitch, you may see them in your mind's eye as shifts up and down a mental stave" (Discover, September 1997 v18 n9 p28).  The human brain is so much more complex than any other sophisticated human invention. Scientists still have much to learn about the billions of neurons in the brain, and the billions upon billions of interconnections between them. Memory is a complicated aspect of the brain, and there is so little known about something that defines us. Without memory we would not know faces, names, emotions, or skills. We would survive on a learning basis everyday, and no doubt, without memory the human race would be extinct. All creatures survive on previous knowledge; this is how they gather food, avoid predators, and learn how to hunt.  Brain scans that chart memories by showing the increased and decreased levels of oxygen show that they are not localized. There are certain regions of the brain that are specialized for certain things, for example the definition between an object's color versus the object's use, but memory is different. A single memory triggers many different parts of the brain simultaneously, flooding chemical messengers through the brain. When the same input is repeated the chemical connections are reinforced and the same signals are recognized as something these cells have experienced before.  Daniel Alkon, a brain researcher at the National Institute of Health, says that a stored memory exists as a series of "chemical alterations that have marked an ensemble of neurons" (US News and World Report, August 18, 1997 v123 n7 p71). This is why a small fragment of a memory, such as a smell or a sound, can trigger the entire memory. This research is backed by several experiments that have been done by Dr. Alkon and a Harvard memory researcher, Daniel Schacter. They changed the supply of proteins to the brain that are important in nerve transmission and memory changes. A rat given doses of a brain protein called CREB learns to stay away from an area where it receives a shock after the very first time. A rat deprived of this protein, or another called BDNF, is virtually unable to form memories that last.  Although we will be unable to perform such an intricate experiment test as this, after having done some research on memory we decided that is would be interesting to do some more research on this enormous topic.  So the big question is: **Does music have an effect on memory?** Fifty years ago a Hungarian composer, Zoltan Kodaly recognized the academic power of music. He designed a music program for schools that taught children nursery rhymes, classical music, and folk songs. Combined with hand signals and special melodic sequences the "Kodaly method" can teach any child to read, understand, and make music. Research has shown that musical instruction increases speech fluency, folk songs improve a student's general knowledge of history and geography, rhythm training helps the development of math skills, and the learning of new melodies builds memory.  In conclusion, the focal point of our experiment was based on the idea that music has a direct impact on memory. |

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