Sci 9 **DNA Extraction Lab**  Name:

**Introduction:** DNA is found in the nucleus of all cells. It’s structure is a long molecule in the shape of a double helix and normally exists in a thin, stringy mass called chromatin. A single molecule would be too small to be seen with the naked eye. But if we gather enough of it, it can become visible without a microscope.

Although DNA can be found in all plants, strawberries are a good to use as it has 8 sets of DNA (octoploid). Bananas and kiwi also work but yield less. To extract the DNA, we must first break up the cells to free the DNA from the nucleus. Once the cells are disrupted the various cell debris such as organelles, cell wall, and other proteins must be filtered out. Extraction buffer contains a detergent that will dissolve the fats within the cell membrane. Salt within the buffer keeps the proteins in the extract layer so they aren’t precipitated with the DNA. DNA is not soluble in alcohol so it will precipitate out (come out of solution) when ethanol is added. The DNA is sticky and will clump up when it comes out of solution. The colder the ethanol the less soluble the DNA will be.

Scientists study DNA of organisms to compare their DNA of those that are resistant to disease.

**Materials:** Fruit extraction buffer

 Sandwich bag test tube

 Spoon beaker

 Ice cold ethanol wire loop/wooden stick

 Cheese cloth

**Procedure:**

1. Place one strawberry in a sandwich bag. Mash gently with your hands.
2. Using a graduated cylinder, measure 10ml extraction buffer. Pour into bag. Mix gently trying to avoid bubbles.
3. With one partner holding a double layer of cheese cloth over the mouth of a beaker, pour your berry solution onto the top of the cheese cloth. Mash gently with the back of a spoon to push through the liquid portion, leaving chunks on top.
4. Remove and compost the cheesecloth/strawberry chunks.
5. Pour berry juice/buffer solution into a test tube.
6. Gently layer `2ml ice cold ethanol ON TOP of the berry juice in the test tube. Wait a few minutes.
7. You should start to notice the DNA precipitating out of solution.
8. Using a wire loop or wooden stick, gently swirl it in the top layer. You should be able to pull a clump of DNA out.
9. Make your observations.
10. Clean up and put everything away.

Questions:

1. Describe the appearance of DNA in terms of colour and texture.
2. What was the purpose of mashing the strawberries?
3. What was the purpose of the extraction buffer?
4. Why was it necessary to filter the mashed berry?
5. A person cannot see a single cotton thread 100 feet away, but if you wound thousands of threads together into a rope, it would be visible at some distance. How is this statement an analogy to your DNA extraction?
6. If you wanted to extract DNA from a living person, what cells would you use and why?
7. List two reasons a scientist might want to study the DNA of strawberries or other organisms.