Name: _____ **Date:** _____

Chemistry *~ Ms. Hart* **Class:** Anions or Cations

5.13 Oil Spills

Directions *– Read and annotate using our class's annotation strategies.*

How Soap Works

Dirt and grease together make grime. Grease or fats, nonpolar molecules, are made up of chains of carbon and hydrogen bonds. Because grime contains many nonpolar components, it is difficult to remove from hands or clothing using just water.

Stop and check: what is a nonpolar molecule? Give at least one example.

To remove most grime, we can use a nonpolar solvent (solution) such as turpentine. Turpentine is the solvent used to "dry clean" clothes – a process whereby dirty clothes are churned in a container full of this nonpolar solvent, which removes the toughest nonpolar stains without the use of water.

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Rather than washing our hands with nonpolar solvents, we have a more pleasant alternative – soap and water. Soap works because soap molecules have both nonpolar and polar properties. A typical soap molecule has two parts: a long nonpolar tail of carbon and hydrogen atoms and a polar head containing at least one ionic bond.

Stop and Draw: what do you think the soap molecule looks like?

Because most of a soap molecule is nonpolar, it attracts grime molecules via intermolecular forces. Grime finds itself surrounded in three dimensions by the nonpolar tails of soap molecules. This attraction is usually enough to lift the grime away from the surface being cleaned. With the nonpolar tails facing inward toward the grime, the polar heads are directed outward, where they are attracted to the water molecules by strong forces. If the water is flowing, the whole conglomeration of grime and soap molecules flows away and down the drain.

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