https://www.stevespanglerscience.com/lab/experiments/giant-bubble-experiment/

“Bubbles form because of surface tension of water that comes from atoms attracting each other. Hydrogen atoms (a negative charge) in one water molecule are attracted to oxygen atoms (a positive charge) in another water molecule. They like each other so much that they cling together and don’t want to separate. This causes “surface tension” which allows some insects to “walk” on water and paper clips to float on it. It’s just the water molecules clinging to each other electrically and providing a “surface” on the water.”

Outline:
Recap on Magnetism/Surface Tension Explanation
Activity
Bubble Shape Explanation

Key Words/Concepts:
Magnetism
Surface Tension
Volume
Sphere

Magnetism Recap:

- **Ask** the kids to recap what they learned last week:
    - Magnetism attracts opposites: positive sides to negative sides, and negative sides to positives
        - Explain that understanding how magnets work is going to help us learn more about bubbles!
- Ask for a show of hands of how many people have played with bubbles before
    - **Ask** if they know how bubbles work: how does the soap form a shape? Why are they shaped the way they are? Why do they pop?
        - Explain that this is what they’re going to be learning today!

- First: How do bubbles even form to begin with?
    - **Ask** if they know what an atom is
        - An atom is the building block for the whole universe!
        - They’re really really small
        - Everything is made out of atoms, and they can be combined to form bigger things!
            - Gold, oxygen, iron, are all atoms!
            - I H_20 is a combination of the atoms hydrogen and oxygen (SURPRISE! That’s water!)
                - By itself oxygen is something, and by itself hydrogen is something else, and when they combine they make water! Which is something totally different

- Ask if they know other examples (NaCl, CO_2)
- **Ask** the kids what bubbles are made out of (soap, water)
  - Ask them what the scientific name for water is (H_20)
    - Ask if they know what H_20 means!
      - In every molecule of water, there are two hydrogen atoms and one oxygen atom (draw on board)
      - The end with the oxygen has a slight positive charge and the end with the hydrogen has a slight negative charge (label charges)
        - This is like the magnets! They also have charges! What do we remember about magnet charges? (Opposites attract!)
      - Water molecules are the same! The positive side likes to be near the negative side
        - It's not a strong attraction- this is why we can still move through water easily
    - The attraction causes something called surface tension!
      - The positive and negative ends of the water molecules make a really thin layer on the top of the water that's a little stronger than the rest of the water
        - We humans don't notice it! But some bugs use it when they walk on the surface of water
        - You know how you can fill a cup of water a little past the top of the cup? That's due to surface tension!

Activity:

Post Activity/Surface Tension Explanation:

- Why do you think bubbles are the shape they are?
  - That's surface tension!
    - Surface tension is what forms bubbles!
      - The outside of the bubble is the thin layer made from the charges, and the reason that the soap all forms together to make a bubble is because of surface tension
        - Breaking that surface tension is what makes the bubble pop
        - This happens when something like dirt or something sharp gets in between the water molecules and causes them to separate

Review Questions:

What is an atom?
What is the chemical name for water? What atoms are those?
What are the charges on the water molecule? (bonus points if you know which side has which charge)
The charges like to attract! What is this called when it happens with water?
Why are bubbles spheres?