

Growing Creatures

A Science Activity for K-3 on polymers (Lesson)

Prof. Chris Ober

Part One - Introduction Activity (Prof. Ober) 30 minutes

Tell them this is a science lesson about polymers But before we discuss polymers we need to back up and talk about what a molecule is.

1. What is a molecule? - think about bricks in a house, it takes many bricks to build a house
 - molecules are like bricks, except they are very small and are in everything (people, objects like the table)
2. What is a polymer? - many molecules bonded together
 - see necklace (each bead is a molecule, the string is the bond that connects them together)
3. We are going to look at 3 examples of polymers
 - **Rubber**
 - **Nylon**
 - **Superabsorbers**

Rubber

- tell them you are starting with rubber because it is one of the oldest polymers and something we all know
- ask them where we see rubber (running shoe soles, tires, balls)
- ask a child to help you make rubber (pour the ingredients together and stir)
- ask them what the solution smells like
- tip glass over and remove rubber – give to child to form into a shape and keep
- Show them Bug Balls, Silly Putty, Icy Poo (all rubber toys)
- Show them the Happy and Unhappy balls – also rubber but because the molecules are structured differently, they behave differently

Nylon

- ask a child to help you make nylon (pour the ingredients together, stir, and pull out strands)
- ask where they see nylon (jackets, something mom wears when she is dressed up)
- show them a nylon and let them stretch it



Superabsorbers

- ask a child to help you with the supersponge experiment
- Show students a diaper containing a superabsorber
- Ask students if they have any brothers or sisters who are wearing diapers. Tell them that a diaper is a product that was designed for a certain purpose or job to do. Ask them to list the things a diaper must be able to do. Get them to say that it must absorb (perhaps a new word for them)
- Pour a cup of tap water onto the diaper and show students the water has been absorbed. Have students guess how many cups of water the diaper will absorb
- Cut open the wet diaper to show the students the beads of gel that have formed - Cut open a dry diaper and compare
- Tell students that the polymer can absorb over 800 times its weight under certain conditions - Tell them a diaper is known as a superabsorber
- Ask them to think about the most effective conditions for absorbing water
- Add salt from a salt shaker to the saturated diaper - Ask the students to describe to you what is happening (the gel will break down and some of the water will run out of the diaper)
- Show the student a grow creature - Ask students to identify the item - Ask students to tell you what happens when you add water to it - Ask them if they would consider a grow creature to be a superabsorber
- Tell them that grow creatures are made from a superabsorber as well as another polymer that enables the creature to keep its shape as it absorbs water
- Tell them that they are going to do an experiment at their tables with Grow Creatures and the purpose of this lab is to use the toys to see the effects of salt on superabsorbers

Part Two - Lab Activity (Graduate Students) 25 minutes

Each family should receive the following supplies:

- 4 grow creatures at various stages of growth (0, 12 h, 24 h, 36h)
- each group will have grow creatures that grew in a different solution (tap water, distilled water, saltwater)
- balance, ruler, calculator, pencil, lab book

Procedure:

- measure the length, width, thickness, and mass of the zero growth grow creature as a group (get children to be active – not a demo)
- tell them to measure the length, width, thickness, and mass of the other three grow creature (12h, 24h, 36h)
- Record information on the Data Recording Sheet



Part Three – Results (Prof. Ober) 15 minutes

- Ask each group to share their results with you
- Graph the results by size
- Ask each child to bring up their 12 hour creatures
- Line up their grow creatures beside one another. Mark height on graphs
- Ask each child to bring up their 24 hour creatures
- Line up their grow creatures beside one another. Mark height on graphs
- Ask each child to bring up their 36 hour creatures
- Line up their grow creatures beside one another. Mark height on graphs

Discussion

- Ask families to come up with two concluding statements about the results
- Ask them to write down why they think the growth is different in different solutions
- Ask them to come up with two other future experiments that a scientist could collect results for
- Challenge families to take a grow creature home and shrink it

Part Four – Silly Putty (Graduate Students) 20 minutes

- Families make silly putty
- Gina has the students act out being a molecule in the silly putty