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You will need

- 1 Tim Tam (this is a chocolate biscuit covered in Chocolate - the experiment should also work with most Kit Kats or Penguin biscuits)
- 1 piece of bubbly chocolate (Aero)
- 1 piece of normal chocolate (Dairy Milk)
- 1 cup of milk



What to do

1. Bite off both ends of the Tim Tam and investigate the layering in the biscuit.
2. Bite off a little bit from both ends of the Bubbly chocolate and the normal chocolate - investigate the inside of the chocolate.
3. Hold one end of the Tim Tam into the glass of milk and then put the other end in your mouth. Blow as hard as you can!
4. Hold one end of the Bubbly chocolate into the glass of milk and then put the other end in your mouth. Blow as hard as you can!
5. Hold one end of the normal chocolate into the glass of milk and then put the other end in your mouth. Blow as hard as you can!



Questions

1. Draw a diagram of the biscuit with its layers. (a 2D drawing).

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2. Draw a diagram of the Bubbly Chocolate and the plain chocolate (a 2D drawing).

3. What happened when you blew through the Tim Tam and why?

4. What happened when you blew through the Bubbly Chocolate and the normal chocolate? Why?



What's happening?

If you look at the cut Tim Tam you will notice that the actual biscuit part of the Tim Tam absorbs a drop of milk. There must be very small holes (**porosity**) in the biscuit and pathways for the milk to move through (**permeability**).

Even although the Bubbly chocolate has holes (porosity) it is very hard to blow the milk through the bubbly chocolate because none of the holes are connected, there are no pathways through the chocolate for the milk – the Bubbly has lots of **porosity** but no **permeability**.

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You cannot blow the milk through the normal chocolate because it has no holes and no passageways – it has no **porosity** and no **permeability**.



Applications

When we talk about storing CO₂ in rocks, we usually are looking for two kinds of rock.

1. Rocks that have lots of tiny, connected holes to hold the CO₂
2. Rocks that have no connected holes, so that the CO₂ gets stuck in the holey rock beneath it.

Look again at the Tim Tam. The biscuit layer is like a highly **porous** and **permeable** rock that the CO₂ (or milk) can move through and bits of milk get trapped in the tiny holes. Then the chocolate layer above the biscuit, stops the liquid from moving upwards or downwards because the solid chocolate has no connected holes (it is **non-porous** and **non-permeable**).

We call these **non-porous** and **non-permeable** rocks '**cap rocks**'. Both these types of rock are usually required for CO₂ storage deep underground.