

Why don't
people
slosh?

Why Does Water Ever Slosh?

1. Take three bottles.
2. Fill one completely with water.
3. Half fill the second bottle.
4. Quarter fill the third bottle.
5. Make sure that all the lids are tightly fastened.
6. Shake the bottles.

Which one makes the loudest sloshing sound? _____

Does the full bottle slosh at all? _____

In order for a sound to be made, something has to move. When the bottle is completely full of water, the water cannot move enough to hit the sides, so there is no sloshing sound.

When Do People Slosh?

Usually, people don't slosh about.

But, sometimes the liquid in our stomachs makes a sloshing sound, or a gurgling sound.

That's because our stomachs are quite loose bags, with space for air. If you combine liquid and air in your stomach, it might slosh as your stomach digests.

Stomach Booklet

- Cut out the 'Stomach Wall' and cut along the dashed lines to make a flap.
- Cut out the 'Stomach Gland' and stick the tabs on the back of the 'Stomach Wall'.
- Cut out the 'Slanted Muscles' and lay them on top of the 'Stomach Wall'.
- Cut out the 'Circular Muscles' and lay them on top of the 'Slanted Muscles'.
- Cut out the 'Long Muscles' and lay them on top of the 'Circular Muscles'.
- Cut out the 'Outer Covering' and lay it on top of the 'Long Muscles'.
- Staple the booklet together.

As you can see, the stomach has several layers of muscles around it. These muscles move the stomach, helping to break food down.

Sometimes this makes a gurgling or sloshing sound.

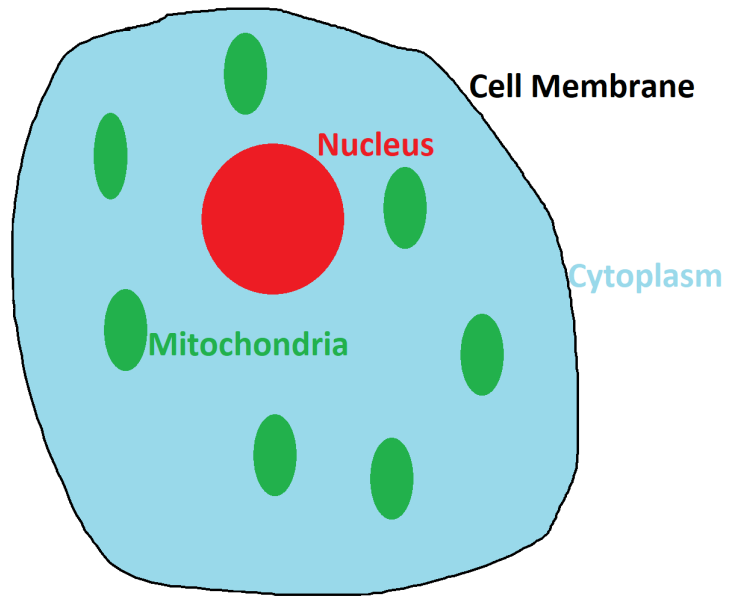
Urine doesn't slosh around inside our bladders because it is under too much pressure. Our bladders grow when they fill up with urine (like balloons), but shrink back down again, after we empty them. There's no space for sloshing.

Where is all the water in people?

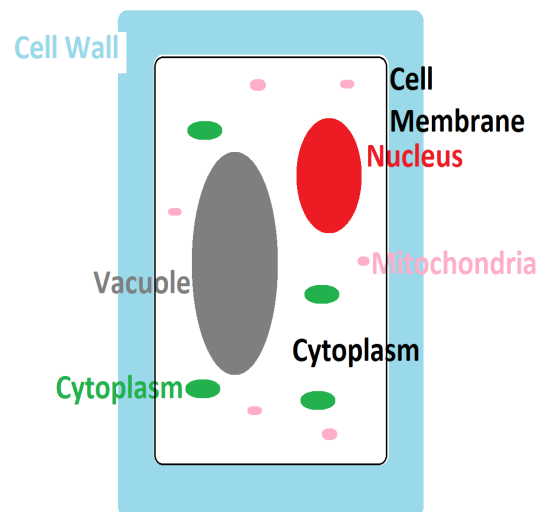
Most of the water in people (about $\frac{2}{3}$) is contained inside people's cells.

Our bodies contain a variety of cells, but all animal cells follow the same basic pattern:

Most of the cytoplasm is made up of water.



For comparison, do you remember the plant cell model that we made a little while ago?



Why doesn't the water in our cells slosh about?

- There isn't enough air in the cell.
- The membrane contains the liquid.

Getting Water Out of Fruits

Oranges are about $\frac{4}{5}$ (80%) water. Do they slosh when we shake them?

Why not? _____

1. Weigh an orange.
2. Squeeze out as much juice as you can.
3. Weigh the amount of juice that you extracted.
4. Weigh what's left of your orange.
5. Divide the weight of the juice by the weight of the whole orange, and multiply by 100 to work out the percentage of liquid extracted.

Weight of Whole Orange	Weight of Juice	Weight of Orange Remainder	Percentage of Liquid we Extracted

Did we manage to extract 80% of juice? _____

How Much Water Is Extracted from Dried Fruit?

1. Weigh ten fresh blueberries.
2. Weigh ten dried blueberries.
3. Take away the weight of the dried blueberries from the weight of the fresh blueberries to work out the difference.
4. Divide the difference by the weight of the fresh blueberries, then multiply that by 100.

Weight of 10 Fresh Blueberries	Weight of 10 Dried Blueberries	Difference Between the Weights	Percentage of Water Removed

Did the drying process remove more or less water than our juicing process?

Extracellular Fluid

The fluid inside cells is called Intracellular Fluid.

All the fluid outside of our cells is called Extracellular Fluid.

Most of the Extracellular fluid (roughly $\frac{1}{4}$) in our bodies is a fluid called Interstitial Fluid.

This is a fluid that contains salts and nutrients and signalling molecules that travel between cells.

Can you match these words and prefixes to their definitions?

Cellular

A Place

Extra-

Inside

Intra-

Outside

Stitial

To do with cells

Why doesn't the water around our cells slosh about?

The water is contained inside our tissues, and doesn't have enough space to move.

Plasma

A little under $\frac{1}{10}$ of the water in our body is in our blood as plasma.

Plasma is a yellowish colour (because of various dissolved proteins and salts), but it is mainly water. It carries blood cells around the body.

Why doesn't the blood in our bodies slosh around?

1. Suck some water up into a straw and use one finger to tightly block off the top. If you do it right, the water should stay in the straw.
2. Keeping your finger tightly over the top hole, shake the straw.

Does the water slosh around? _____

The water in our blood is contained inside veins and arteries - just like the sides of a straw. It can't slosh around.