

States of Matter

Learning Objective:

Identify and explore the properties of gases.

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What is air?

Discuss your ideas.

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Air is not a 'nothing'. Air has weight and is all around us.



This picture shows someone hang gliding. A hang glider has no engine or propellers so why does it stay in the air?

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Hang gliders use air resistance to keep them up in the air. The air pushes against the wings and prevents it from falling straight to the ground.

Being able to change the position of the wings keeps it up for even longer. If air was 'nothing' it would not keep the hang glider floating and it would fall straight to earth.

Can you think of any other examples that prove that air is not 'nothing'?



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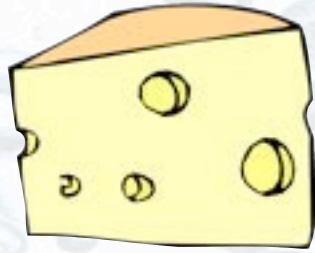
**What
are the differences
between solids, liquids
and gases?**

Discuss your ideas.

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What would happen to this solid, liquid and gas if they were poured into these open containers?



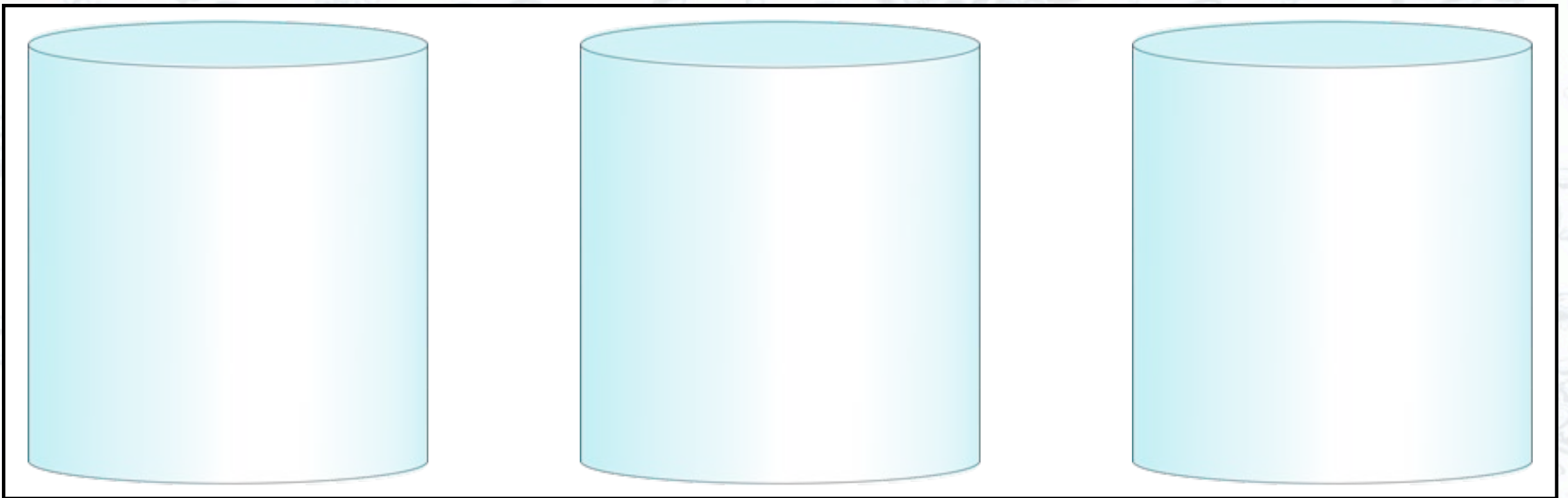
Cheese



Water



Green gas



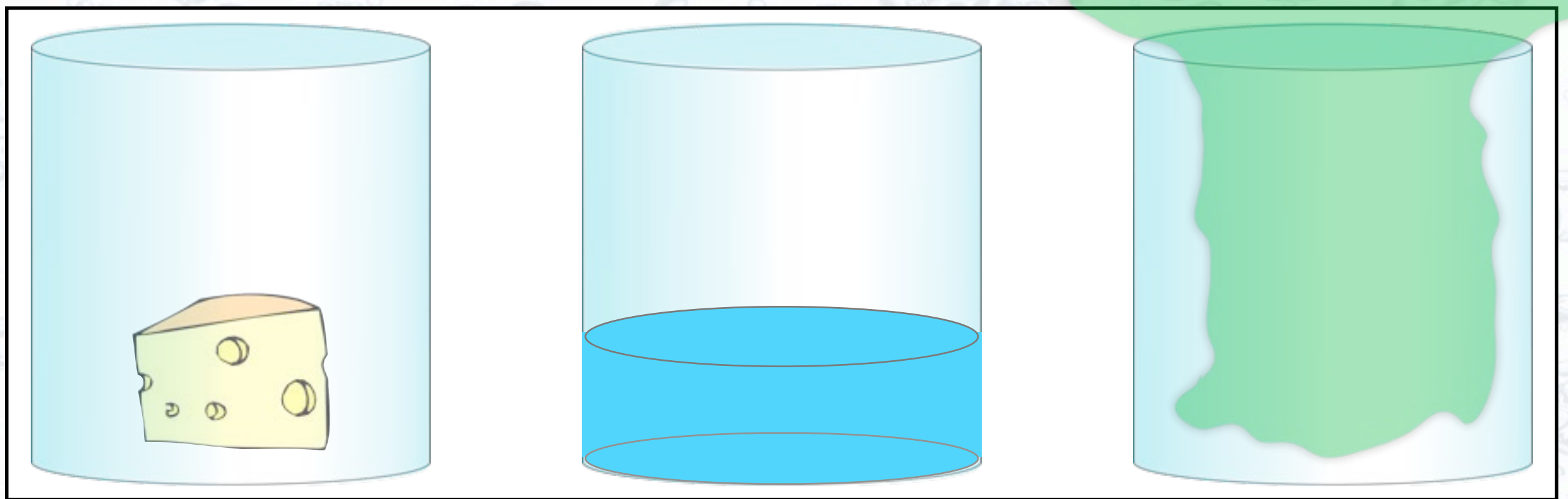
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The solid cheese would stay the same shape.

The liquid water would flow easily from the bottle and take the shape of the new container.

The green gas would pour into the container, spread out and then continue spreading into any available space.

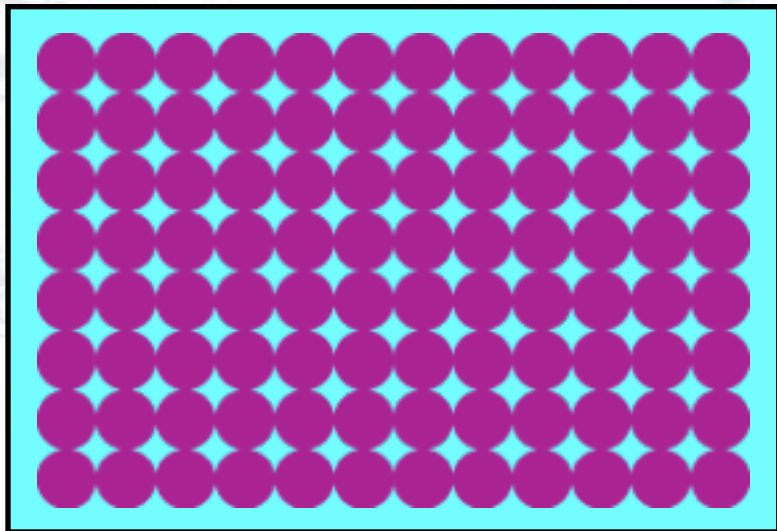


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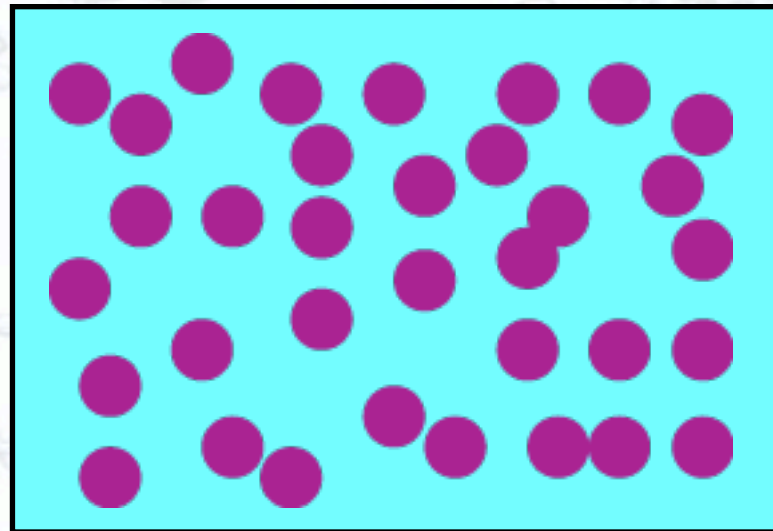
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The reason solids, liquids and gases behave differently is because the particles of each substance behave differently.

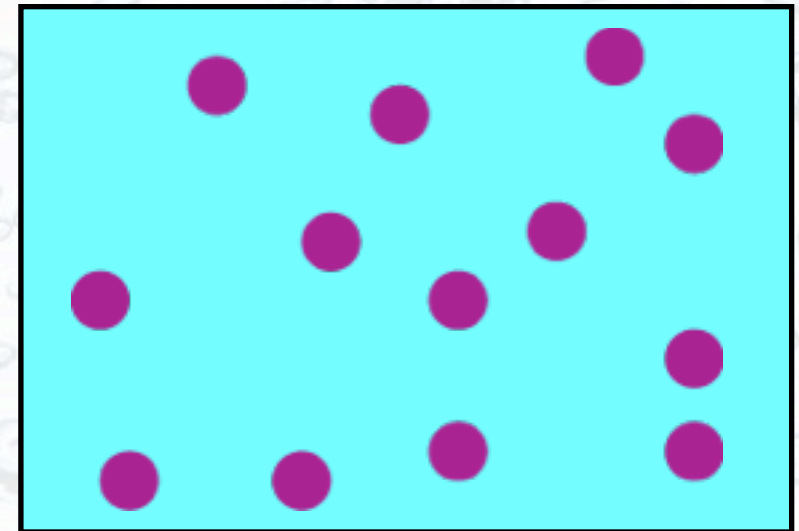
In solids, the particles are closely packed together with little space in between. This means they cannot move much.



The particles in liquids are more spaced out which means they can flow easily and change shape.

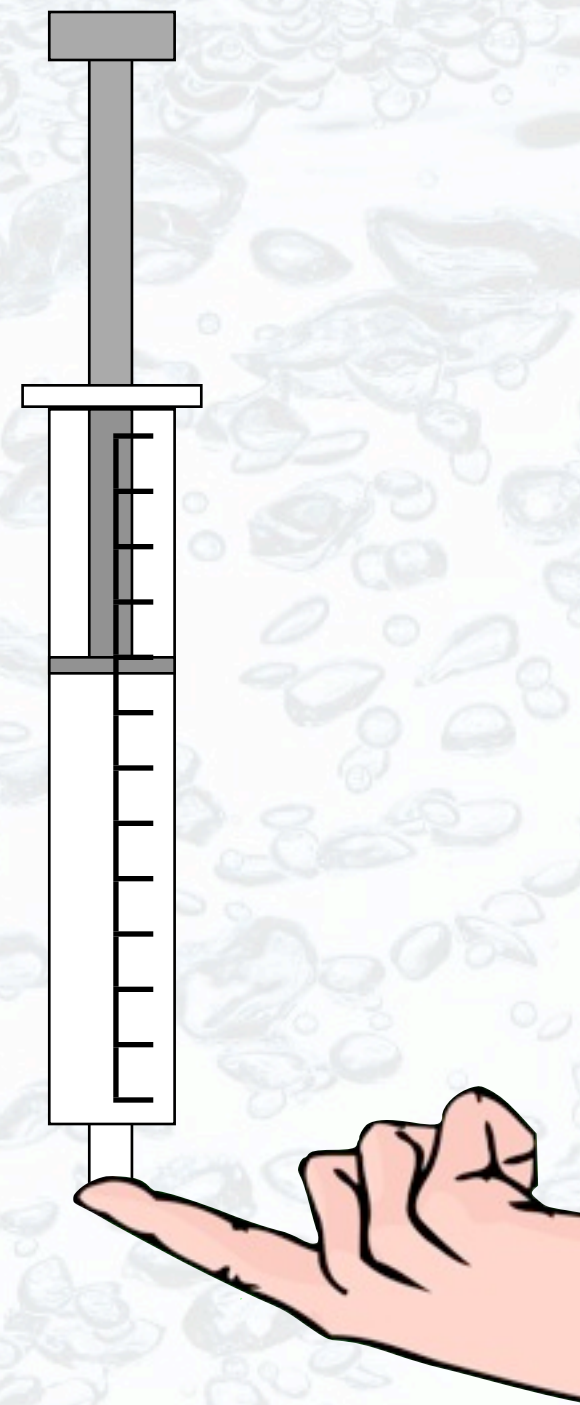
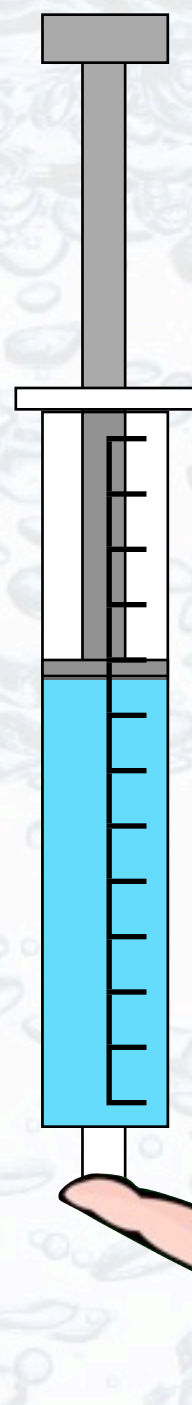
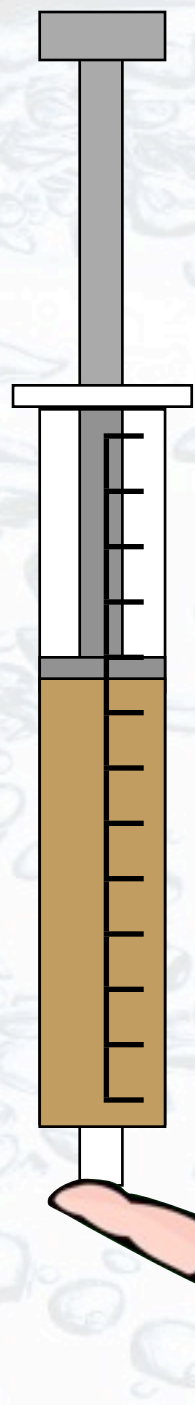


In a gas, the particles are even further spaced out so they can move more easily and spread into any available space.



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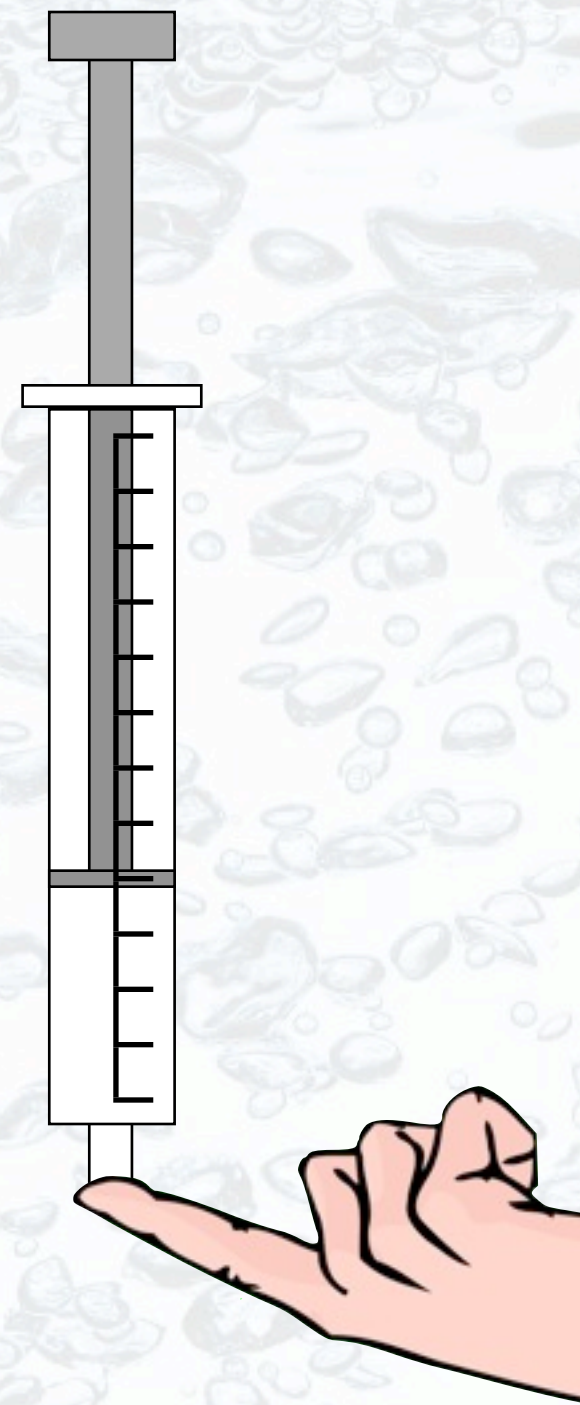
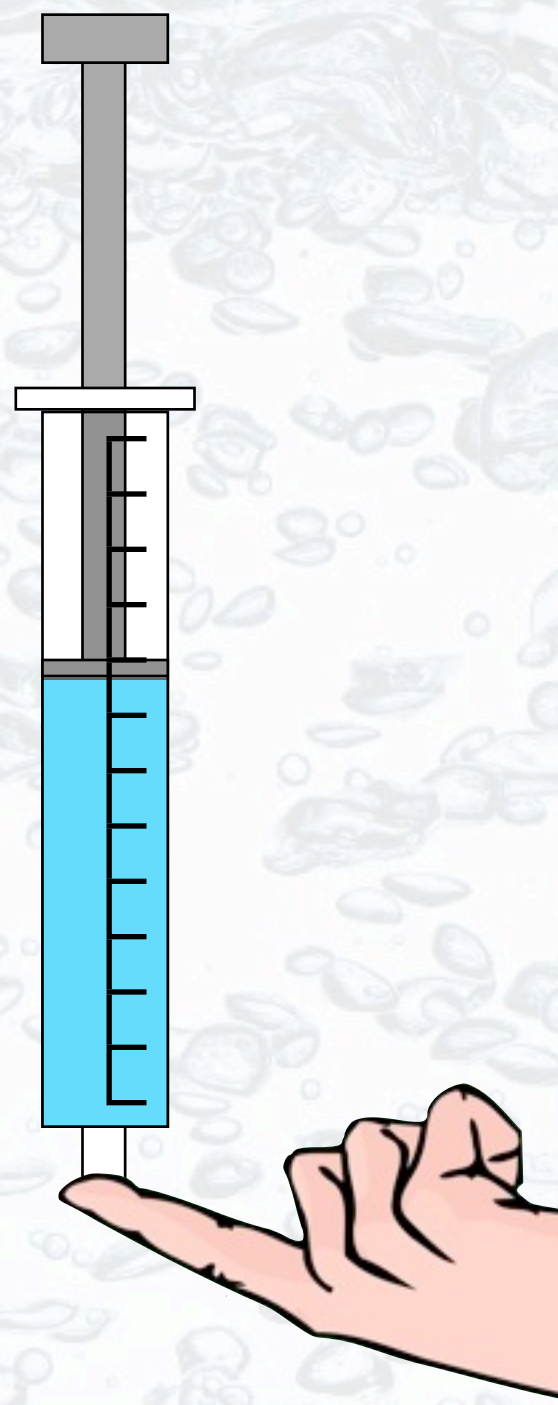
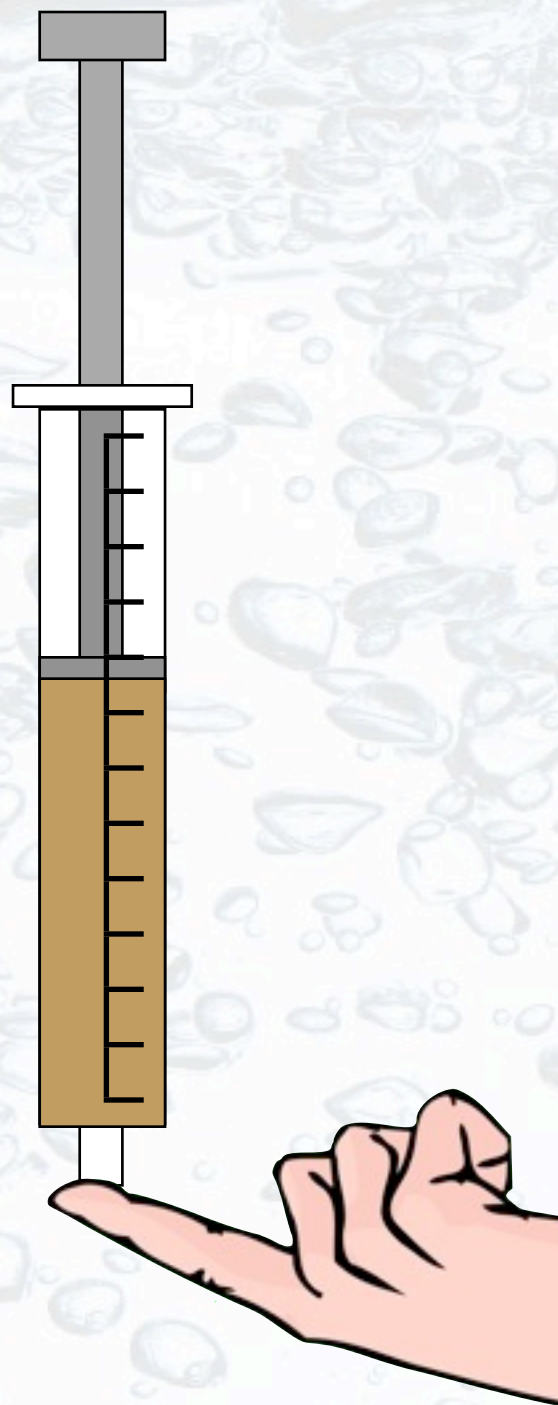
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These syringes have been filled with sand, water and air. What do you think will happen when each syringe is squashed down?

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Because the particles in solids and liquids are more tightly packed together, you cannot compress them much. Gas is easier to compress because the particles are spread out so much.

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Can you match these sentences to the correct state?

Solid

Liquid

Gas

- I change shape to fit my container.
- I keep flowing until I have used up all the space.
- I change shape to fill any space.
- I cannot flow.
- I keep the same shape.
- I flow easily.

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Solid

- I cannot flow.
- I keep the same shape.

Liquid

- I change shape to fit my container.
- I flow easily.

Gas

- I keep flowing until I have used up all the space.
- I change shape to fill any space.



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