

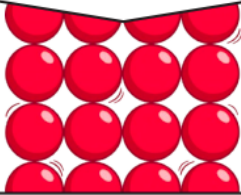
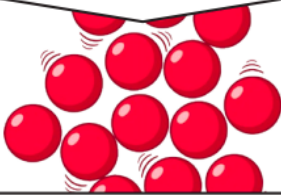
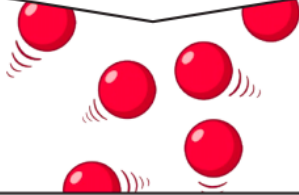
## Year 4 Science Project States of Matter

In our science project this week we want you to explore the different states of matter by doing some of your own research and carrying out investigations at home. Each day you will be given a different theme and ideas for investigations. You **do not** have to complete all of the activities. These are ideas of what you could do to find out more, explain what you know or to just have fun exploring science!

You can present your work however you want - the more creative the better! You can take photographs, videos, produce artwork, write poetry, draw graphs, make a book (to name just a few). We would love to see your hard work so please send us an email on the class accounts [4G@ashdeneschool.net](mailto:4G@ashdeneschool.net) or [4C@ashdeneschool.net](mailto:4C@ashdeneschool.net) or post on the school twitter account.

### Useful information

Materials can be one of three states: solids, liquids or gasses. Some materials can change from one state to another and back again.

Solid	Liquid	Gas
		
<p>Particles in a <b>solid</b> are close together and cannot move. They can only vibrate.</p>	<p>Particles in a <b>liquid</b> are close together but can move around each other easily.</p>	<p>Particles in a <b>gas</b> are spread out and can move around very quickly in all directions.</p>

### Websites to visit

- <https://www.theschoolrun.com/what-are-states-of-matter>
- <https://www.bbc.co.uk/bitesize/topics/zkgg87h>
- <https://www.coolkidfacts.com/states-of-matter-for-kids/>
- [https://www.ducksters.com/science/solids\\_liquids\\_gases.php](https://www.ducksters.com/science/solids_liquids_gases.php)
- <https://www.dkfindout.com/uk/science/solids-liquids-and-gases/states-matter/>



## Monday - Solids, liquids and gases

- 1) Today we want you to explore different materials you have at home and observe what happens when:
  - a) You pour them - what happens to the shape of the object?
  - b) You try and move through them - can you? What happens to the shape? Does it return to the original shape?

You could draw a table to record your results.

As well as the items you choose to look at, if you have any of the items below they are worth exploring. They might take a little extra thought!

- Sand
- Shaving foam
- Jelly
- Salt
- Ice
- An orange
- Honey

- 2) Once you've explored, watch this video to find out about solids, liquids and gases <https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zsgwwxs>.

- 3) Can you group/classify the items you looked at into solids, liquids, gases?

## Activity ideas

Can you explain what solids, liquids and gases are?		
Make your own 3D particle model using items from around the home.	Make your own science video to explain what solids liquids and gases are.	Write your own song about solids liquids and gases.
Just for fun!		
Try this walking on water experiment <a href="https://funlearningforkids.com/rainbow-walking-water-science-experiment-kids">https://funlearningforkids.com/rainbow-walking-water-science-experiment-kids</a>	Make your own bubble snakes <a href="https://onelittleproject.com/bubble-snakes/">https://onelittleproject.com/bubble-snakes/</a>	Make your own solid, liquid and gas using orange juice. <a href="https://learninglabresources.com/2015/02/teach-states-of-matter-using-orange-juice-and-baking-soda-tastes-like-orange-soda.html">https://learninglabresources.com/2015/02/teach-states-of-matter-using-orange-juice-and-baking-soda-tastes-like-orange-soda.html</a>



## Tuesday - Solids liquids and gases continued

- 1) Today we want to explore the three states of matter in a little more detail. A good way to start would be to fill three balloons.
  - a) Fill one with water
  - b) Fill one with water and freeze
  - c) Fill one with air (blow into it)
 Use the balloon to compare the three different states of matter you found out about yesterday.

### 2) Investigating gas

#### Activity ideas

How do gases behave?		
<p>Have a lie down!</p> <p>If you have an air bed (or another inflatable) try lying on it without any air in and at different points during blowing it up. How does it change? Let the air out. What happens to it? Where does it go?</p>	<p>Smell hunt</p> <p>Spray some perfume on a tissue and ask someone to hide it (don't make it too hard though!) Can you track it down using your sense of smell? What happens as you are closer/further away? What happens to the strength of the smell? Can you explain what happens linked to the gas particles?</p>	<p>Blow up a balloon (but not with your mouth or a pump!)</p> <p><a href="https://lifestyle.howstuffworks.com/crafts/science-projects/science-projects-for-kids-states-of-matter4.htm">https://lifestyle.howstuffworks.com/crafts/science-projects/science-projects-for-kids-states-of-matter4.htm</a></p>
Just for fun!		
<p>Make a film canister rocket</p> <p><a href="https://sciencebob.com/build-a-film-canister-rocket/">https://sciencebob.com/build-a-film-canister-rocket/</a></p> <p>The little bottles you get probiotic drinks in do work instead of film canisters.</p>	<p>Make your own lava lamp</p> <p><a href="https://funlearningforkids.com/super-cool-lava-lamp-experiment/">https://funlearningforkids.com/super-cool-lava-lamp-experiment/</a></p>	<p>Dancing raisins</p> <p><a href="http://www.scifun.org/HomeExpts/dancingraisins.htm">http://www.scifun.org/HomeExpts/dancingraisins.htm</a></p>

- 3) Play some online games to test your understanding of solids, liquids and gases.

- <https://www.abpischools.org.uk/topic/solids-liquids-gases>
- <https://www.turacogames.com/games/states-solid-liquid-gas-science-game-for-kids/>
- <http://www.rsc.org/learn-chemistry/resources/gridlocks/puzzles/level-1/StatesOfMatter1.html>



## Wednesday - Changing state

Some materials can change their state when they are heated or cooled. Today we want you to explore these changes. There are lots of ideas below that you could try.

Please be extra careful if you are using heat. Get an adult to help keep you safe!

### Activity ideas

Investigations		
<p>What melts faster?</p> <p>Measure out the same amount of chocolate, butter and ice.</p> <p>Predict which one you think will be the first to melt.</p> <p>Leave them in the same place and time how long it takes.</p>	<p>Can you stop an ice cube from melting?</p> <p>Using different materials from around the house can you make a coat for an ice cube that will stop it/slow down the change of state?</p> <p>Leave an ice cube that is not wearing your homemade jacket next to it to compare.</p>	<p>Race for treasure</p> <p>Freeze a 5p in the middle of two ice cubes.</p> <p>Using ingredients that you can find at home (e.g. vinegar, salt, sugar, soap, washing up liquid) race to free the 5p before someone else at home.</p> <p>You are not allowed to hold the ice cube in your hands!</p>
Just for fun!		
<p>Make rice crispy cakes</p> <p>Watch what happens to the chocolate as you heat it and then cool it again during your baking.</p>	<p>Make your own ice lollies</p> <p>Use different flavoured fruit juices and see which flavour changes from a liquid to a solid the fastest.</p>	<p>Make sugar crystals on a string</p> <p><a href="https://lifestyle.howstuffworks.com/crafts/science-projects/science-projects-for-kids-states-of-matter2.htm">https://lifestyle.howstuffworks.com/crafts/science-projects/science-projects-for-kids-states-of-matter2.htm</a></p>



## Thursday - Reversible and irreversible changes

Yesterday you investigated how heating or cooling a material could (for some materials) change its state. Some of these materials can change back, this is called a reversible change. However, other materials cannot change back, this is called an irreversible change.

Today we want you to continue to investigate which materials will change state but we also want you to find out if you can change them back! Below are lots of activities you could try to investigate reversible and irreversible changes. Can you sort/group materials into those that can change back and those that cannot?

Please be extra careful if you are using heat. Get an adult to help keep you safe!

### Activity ideas

Reversible or irreversible change?		
<p>Help to make breakfast</p> <p>What happens when you apply heat to an egg?</p>	<p>Movie night</p> <p>What happens when you heat up popcorn?</p>	<p>Bake a cake</p> <p>What happens when you put the cake mix in the oven?</p>
<p>Make a cup of tea</p> <p>What happens when you boil water in a kettle?</p>	<p>Jelly</p> <p>Make a bowl of jelly. What happens when you put the mix into the fridge?</p>	<p>Ice cubes</p> <p>What happens when you put water in the freezer? Can you change it back?</p>
<p>Candles</p> <p>Light a candle and watch what happens to the wax.</p>	<p>BBQ time</p> <p>If it is nice enough to have a barbecue. Observe (from a safe distance) what happens to the coals.</p>	<p>Chocolate</p> <p>Experiment with putting a bar of chocolate in different places to see what happens. Put it in the direct sunlight, by a radiator, in the fridge/freezer.</p>



## Friday - The water cycle

Today we want you to investigate the different stages of the water cycle. These are: Evaporation, condensation, precipitation and collection. Watch this video to find out more.

<https://www.bbc.co.uk/bitesize/topics/zkgg87h/articles/z3wpp39>

Investigate the different stages of the water cycle and then prepare a creative way to explain what happens.

### Activity ideas

Evaporation		
<p>Have a water fight! Once you are nice and wet, observe what happens to the water on you/ your clothes.</p> <p>Or you could help with doing the washing and observe what happens to the washing on the washing line.</p>	<p>Investigate evaporation rates by putting the same amount of water in different locations e.g. Outside, by a radiator, in the fridge, in direct sunlight.</p> <p>Predict where you think water will evaporate the quickest/slowest and then take measurements over set intervals of time.</p>	<p>Puddles</p> <p>Use chalk to draw a round a puddle (or make a puddle if it hasn't rained). Check on it at set intervals and see what happens to the size of the puddle.</p>
Condensation/precipitation		
<p>Put a hot drink next to a window and observe what happens when the steam hits the cold window.</p>	<p>Ice on a plate</p> <p>Put a plate full of ice over the top of a glass bowl half filled with hot water and observe what happens.</p>	<p>Make a storm in a jar</p> <p><a href="http://www.sciencefun.org/kidszone/experiments/storm-in-a-glass/">http://www.sciencefun.org/kidszone/experiments/storm-in-a-glass/</a></p>

### How to make your own water cycle

- <https://www.google.com/search?client=safari&rls=en&q=how+to+make+your+own+water+cycle&ie=UTF-8&oe=UTF-8>
- <https://betterlesson.com/lesson/634593/what-s-up-with-the-water-cycle>