COMMUNITY GROUPS RESOURCE PACK

KITCHEN ACTIVITIES

BRITISH SCIENCE ASSOCIATION

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This resource pack contains a selection of activities that have been designed for any audience interested in exploring science. Whether you are new to science, a regular pro, or just looking for something to try on the weekend, these activities can be completed as a family, with a group of friends or as individuals. You can do them at community events, clubs, and even from the comfort of your own home.

If you want to try these activities out on members of your community, take a look at our diverse range of volunteering opportunities. You don't have to be a scientist to volunteer with us, to find out more visit:
http://bsa.sc/volunteer-BSA

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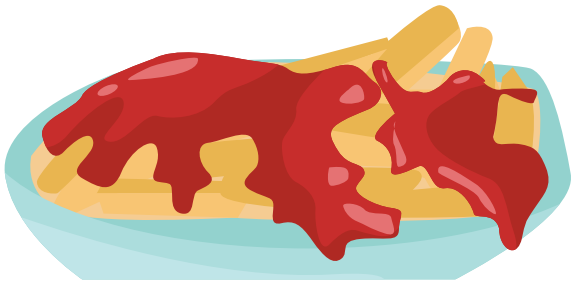

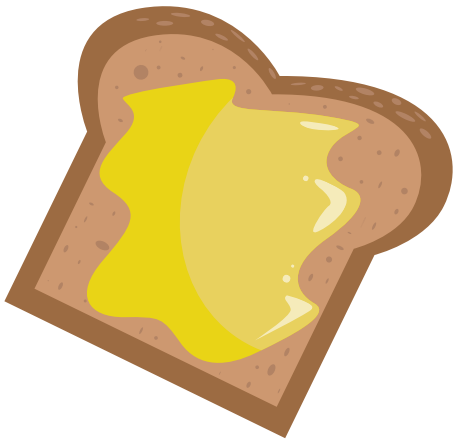

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Cheesy challenge

TIME - up to half a day

ABOUT THIS ACTIVITY

Isn't it amazing that you can turn a white runny liquid into cheese? In this activity, you will do a bit of kitchen chemistry to make your own cheese. Follow the method and once you understand the process, create a recipe for your own personalised cheese.

WHAT YOU NEED

- A cup of semi skimmed or skimmed milk
- Lemon juice
- A spoon
- A bowl (for heating in the microwave) or a small pan (for heating on the cooker)
- A sieve
- A bowl and a piece of clean, thin cloth to strain the milk
- Salt and other flavourings (optional)
- Samples of cheese (optional)

WHAT TO DO

Before you start, examine some cheese and other milk products and discuss what you already know about where they come from and how they are made. Try some cheese samples from the fridge and note their taste and texture. Now, check you have all the ingredients and equipment necessary to make your own cheese.

1. Pour 1 cup of milk into a bowl or small pan. Heat it in the microwave or on the cooker until the milk just begins to boil. If it's on the cooker, keep stirring to stop it burning.
2. Remove from the heat. Add lemon juice a few drops at a time and keep stirring gently.
3. Keep adding lemon juice until the milk starts to go lumpy (this is called curdling). Let it cool.
4. Put a sieve on top of a bowl and put a cloth in the sieve.
5. Pour the milk into the sieve and let all the liquid (whey) run through into the bowl. The lumps (curds) will stay in the cloth. Lift up the cloth and gently squeeze out more of the liquid. You have now made your own cheese! Add a little salt and any other flavours you like.

Skimmed milk works well because the fat, which is used to make other milk products such as cream, is not needed to make cheese. If you leave the cheese for a while to let more of the liquid drain out, you will get a slightly firmer cheese.

GET EVERYONE INVOLVED

YOUNGER ONES Discuss what you know about cheese. How many types of cheese can you name? Describe your favourite. Help gather and clean the equipment. Remember about safety when cheese making and tidy as you go. You can help with the recipe and of course, the taste testing.

OLDER CHILDREN You can keep a record of the cheese making process. Include notes, observations and photographs about your samples of cheese. What kind of cheese have you made? Does it look like any that you buy in the shops? Add testing notes to your record so you can improve your technique for next time.

ADULTS Gather resources and supervise heating the milk. Remind everyone to keep hands, tables and equipment clean so that the cheese can be eaten. If enough milk is used, everyone can make their own cheese and compare samples at the end. Get everyone to help wash up at the end.

HEALTH AND SAFETY

Take care! You need to use hot milk. Younger children will need supervision if heating the milk. Wash your hands with soap and warm water. Make sure equipment and tables are clean. Cover the table with a fresh paper cloth. The cheese can be eaten if everything has been kept clean.

GO FURTHER

Find out more about cheese making and how to make cheeses with different textures.

https://www.cheesemaking.co.uk

Design new recipes for different textures and flavours for your next cheesy project. Biotechnology is the science of using microorganisms, such as bacteria, to make useful products. Find out about other biotechnology projects you can do at home.

https://www.sciencebuddies.org/science-fair-projects/Intro-Biotechnology.shtml

DID YOU KNOW?

The liquid (whey), which is left over after making the cheese, can be used in recipes to make food such as bread, soup and cakes.

A 1,400-year-old piece of cheese was unearthed in a Tipperary bog in Ireland in 1987. It was still edible.

King Henry II declared cheddar to be the best cheese in Britain.

Every spring, locals from Stilton, Peterborough race each other rolling giant wheels of stilton down a big hill.

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Tomato sauce testers

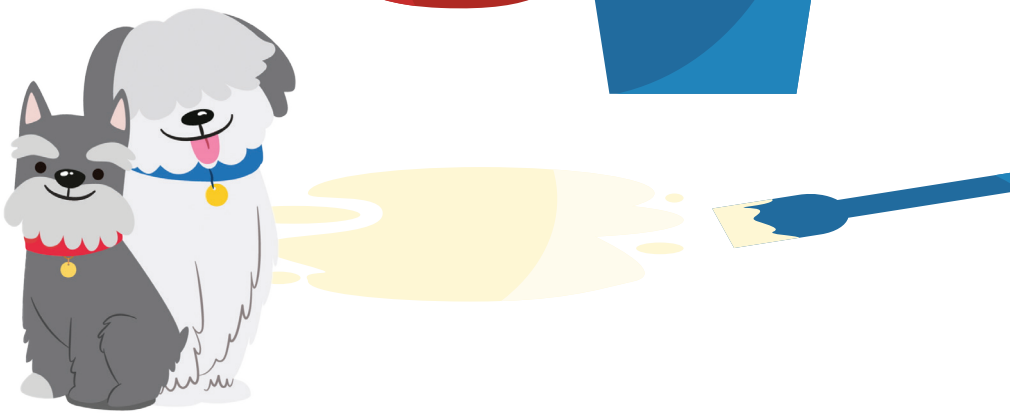
TIME - a couple of hours

ABOUT THIS ACTIVITY

Food science is an important industry. Food scientists work hard to ensure your tomato sauce contains a tasty mix of ingredients and is a good colour. To make a high-quality tomato sauce, it must also flow well. In this activity, you will design experiments to find the perfect thickness for tomato sauce - not too thick, not too thin, but perfect splats for dipping chips.

WHAT YOU NEED

- Wallpaper paste without fungicide
- Red food dye
- Disposable cups for sauce samples
- Rulers, timers
- Teaspoons
- Funnels with different sized spouts or drinks bottles cut in half
- Aprons and gloves



WHAT TO DO

1. Wear your apron to avoid getting mess on your clothes.
2. Follow the mixing instructions carefully to make thick wallpaper paste.
3. Add red food dye. This is your fake tomato sauce.
4. Add a small amount of the fake tomato sauce to your disposable cups. Measure and add different amounts of water to each, making dilutions of different thickness. These need to be mixed well to get an even mixture. You now have some samples to test.
5. Get testing:

Drip test - time and observe how well the sauce drops off a spoon. You can also see how easily it drips through different sized holes. You can use funnels or drinks bottles.

Droop test - time how long it takes your sauce to run down a slope. Decide what angle and length of slope to use.

Splat test - watch how your sauce splatters on a plate. Decide if it's too liquid or too thick.

Dip test - put it on a chip and see how easily it sticks. Remember, you cannot eat the fake sauce or chip!

You may have many results, so you will need to design a table to write down all your findings. Perhaps you could create a scoring system for each test?

GET EVERYONE INVOLVED

YOUNGER ONES You can help mix all the samples of fake sauce. Make sure the correct amount of water is added to each by measuring carefully. Decide what tests you want to do.

OLDER CHILDREN It can be fun deciding how you measure the flow for your perfect tomato sauce. You will need to discuss how thick you think your tomato sauce should be and how quickly it should pour. Some people like it to keep its shape on the plate, while others love a big splat. Record your decisions and what you observe for each sample, so you can compare.

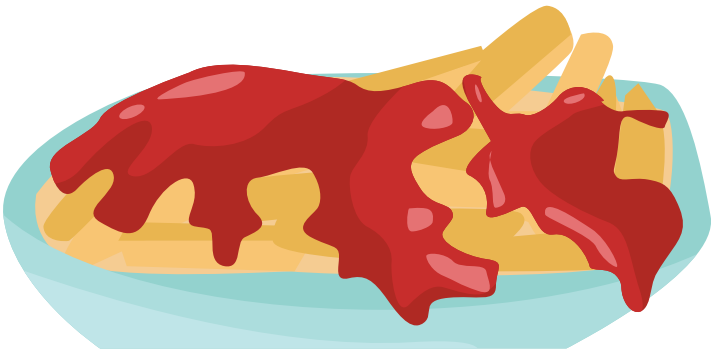
ADULTS You can help decide how many tests to do. Reinforce that the sauce should not be eaten. Give everyone time to talk about what they have found out and to demonstrate what they think is the best thickness for the sauce. Get everyone to help tidy up and clean equipment, as this is an important part of food science.

GO FURTHER

Look at tomato sauce bottles. How are they designed to help you get the tomato sauce out?

Find out about food science jobs, such as quality and production managers, process development scientists, nutritional therapists and laboratory technicians.

https://www.thebalance.com/cool-jobs-food-industry-2064051



HEALTH AND SAFETY

- When using fake sauce, remember it is NOT edible. Do not taste or eat it.
- Clean up any mess on the table or floor quickly with a damp cloth to avoid accidents.

DID YOU KNOW?

How well tomato sauce flows (viscosity) is tested in a machine called a Bostwick Consistometer. The sauce must flow no more that 10cm in 30 seconds at 20°C.

Because the tomato has seeds and grows from a flowering plant, botanically it is classed as a fruit, not a vegetable.

Food hygiene is extremely important. Around 70 million people suffer from food poisoning every year, with around 7 million of these cases being fatal.

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Making yoghurt

TIME - a couple of hours

ABOUT THIS ACTIVITY

Yoghurt is yummy to eat and easy to make. Not only that, it provides lots of nutrients including protein, iodine, calcium and phosphorous which all help to maintain a healthy body. In this activity, you will explore how to make the tastiest yoghurt from different types of milk. You can mix in your favourite fruit and other ingredients to create your own recipe.

WHAT YOU NEED

- Different types of milk (full fat cow's milk, skimmed cow's milk, semi-skimmed cow's milk, goat's milk, sheep's milk, soya milk, almond milk, etc)
- Flasks, saucepans
- Kitchen thermometer
- Cooker or source of heat
- Kitchen thermometer
- Large spoons for stirring, small spoons for tasting
- Fresh plain natural yoghurt from a shop
- Dried milk powder (if using)

WHAT TO DO

Preparation To make 500ml of yoghurt, you need 500ml of any milk and 3 tablespoons of fresh, plain yoghurt. Make sure you have enough for everyone.

Use 25g dried milk powder for every 500ml of milk, to help your yoghurt set. Some types of milk take longer to set. Before you start, wash your hands with soap and water.

1. Pour your milk into a saucepan and gently heat it. Use a thermometer to help you.

2. When the milk reaches 46°C take it off the heat and stir in the natural yoghurt. The temperature of the milk is important as the yoghurt you add contains live bacteria, which you want to grow in the warm milk.

3. Pour the mixture into a flask and leave overnight at room temperature. In the morning, it should have thickened and turned into yoghurt.

Testing Once your yoghurt is made, you can put it to the test. You can make your yoghurt even tastier by adding chopped or pureed fruit.

GET EVERYONE INVOLVED

YOUNGER ONES Talk together about how you think yoghurt is made. Help prepare the ingredients, make the yoghurt and tidy up afterwards. Investigate if different types of milk make different types of yoghurt. Why is the temperature of the milk so important when making yoghurt?

OLDER CHILDREN Predict the types of yoghurt that different milks will make, then test them and record the characteristics of the yoghurt made from each. Record your predictions to compare with the final results.

Yoghurts can be thick, runny, sweet or sour, so choose your fruit and flavourings carefully to enhance the flavour of your yoghurt.

ADULTS Supervise the heating of milk to the right temperature. Encourage discussion of why temperature is so important; you don't want to kill the live bacteria. You can coordinate a blind taste test of the yoghurt samples the next day. Remind everyone about keeping clean and tidying up.

GO FURTHER

Decide how to make improvements and plan your next yoghurt recipe.

You can use the yoghurt from this batch as the starter for your next food experiment.

Microorganisms are tiny life-forms. Research what other foods are made using microorganisms.

https://revisionworld.com/gcse-revision/applied-science/food-science/microorganisms-and-food

HEALTH AND SAFETY

- **You need to wash your hands with soap and warm water and keep workspaces and equipment clean when preparing food.**
- **Adult supervision is necessary if children make the yoghurt.**
- **Check for any food allergies.**

DID YOU KNOW?

Yoghurt is believed to have originated independently, thousands of years ago in Eastern Europe and Asia.

A pot of yoghurt (150g) provides important nutrients needed for a healthy balanced diet.

In developing countries like Bangladesh, making and selling yoghurt is a way families can generate an income for school fees.

Making yoghurt is an irreversible reaction. Once bacteria have changed milk, you cannot turn it back into milk. Some reactions are reversible, for example turning water into ice.

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