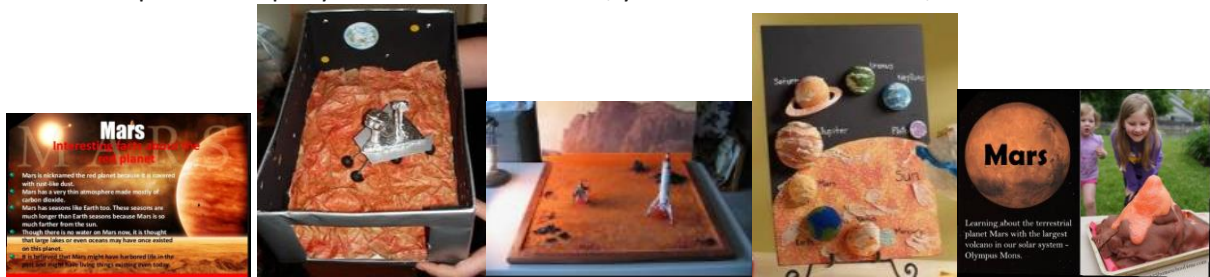


## Year Six Home Learning Pack Spring Four Part 4

If you have seen any of the news recently you would have heard a lot about Mars and our exploration of this planet. There have been three major research projects that have either landed or are orbiting Mars now. The reason for that is that Mars is orbiting closer to Earth than it normally does. NASA has landed a probe that is collecting rocks to bring back to Earth,

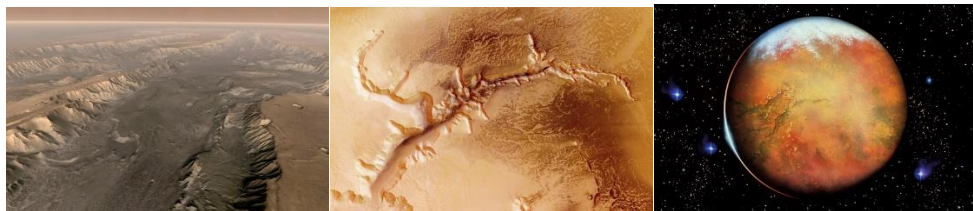
NASA's [Perseverance](#) rover, China's [Tianwen-1](#) orbiter and rover, and the United Arab Emirates' [Hope](#) orbiter all arrived at Mars this February.

I would like you base your project work from this pack on Mars. Here are a few facts to get you going. You can present your project in any way you like. You could make your planet out of cake and put the facts around the plate, make, draw, paint the red planet and put your facts on Mars itself, you could make a fact file, write and record a news report.



### Facts about Mars

- 1) Named after the **Roman God of war**, Mars is the **fourth planet** from the sun in our **solar system**.
- 2) Mars is also known as the '**Red Planet**' because, well, it's red! This signature colour comes from the large amount of a chemical called **iron oxide** (or 'rust' as you might know it) in its rocks and soil.



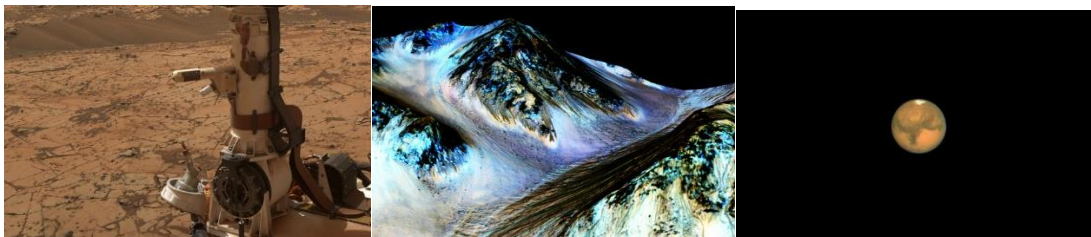
- 3) Mars is the second smallest planet in the solar system after **Mercury**. With a diameter (distance through the middle) of **6,791 kilometres**, it's roughly **half the size of Earth**.
- 4) It can get pretty cold on Mars — much **colder than our own planet**, since it's further away from the sun. At the equator, temperatures can reach **20°C**, but at its poles they can plummet to as low as **-140°C**. *Brr!*
- 5) Mars is home to the **highest mountain in our solar system** — a volcano called **Olympus Mons**. Standing a whopping **24 kilometres high**, it's about three times the height of Mount Everest!

**Did you know...? There are bits of Mars here on Earth! In the past, asteroids hit the Red Planet, sending debris into space. Some of this debris landed on our planet as meteorites.**

- 6) You could **jump around three times higher on Mars** than you can on Earth. *Boing!* This is because the planet's **gravity** – the force that keeps us on the ground – is much weaker.
- 7) Do you like to look at the **moon** at night? Well, check this out — **Mars has two moons!** One is called **Phobos** and the other **Deimos**.
- 8) A day on Mars is **24 hours and 37 minutes** — only a little bit longer than a day on our own planet. A year on Mars, however, is almost twice as long, lasting **687 Earth days!** This is because it takes a lot longer than Earth to complete its orbit around the Sun.
- 9) Until recently, scientists believed that there was no liquid water on the surface of Mars — only rocks, soil dust and ice. But... News flash! In 2018, they found **evidence of a lake** under the planet's south polar ice cap. Exciting stuff!

**Did you know that we have a FREE downloadable Mars primary resource?**

- 10) Humans have not yet been to Mars, but scientists have sent spacecraft there to help them research this fascinating planet. The first spacecraft to land on Mars were the **Viking Landers**, which touched down on the surface in **1976**.



**National  
Science  
Week  
5 – 14  
March**

**Remember:  
You can go  
onto zoom  
200% to  
clearly  
read these  
slides .**



[CREST Awards Library Home](#)

To follow on from National Science Week there is a home learning pack from Crest awards. There are 11 topics to choose from and each has an activity card, learning objective, how to carry out the investigation and recording results All f these activities can be done at home.

Listed here are two of the activities you might like to try.

There is an Early Learning and 5-7 one also available giving you a host of ideas for everyone in the family.

Have fun

## Task 1



CREST  
AWARDS

SUPERSTAR

# Super Spinners

## Organiser's Card



### About the activity

This activity is designed to get the children thinking about helicopter blades, and how different blade sizes change the way a paper spinner falls.

Mr Sycamore arrived for work in a helicopter, amazing the students. He's testing which helicopter is best. Can the students help to find out if a longer blade design will make a difference?

Through this activity you will support your group to:

- Think about what makes paper fall in different ways
- Test whether a paper spinner falls in different ways with different blade sizes
- Share their ideas with the group

### Kit list

To make the spinners they will need:

- A4 Paper
- 30 cm ruler
- Metre ruler
- Paperclips or Blu-Tack
- Scissors
- One ready-made spinner to show the children how they work
- Large and small templates for spinners (if you think children will need them) - see following page
- Stopwatches
- Other types of paper and card



## What to do

1. Read the ACTIVITY CARD to familiarise yourself with the activity.
2. Check the Kit list, including preparing a spinner and templates if you think that they might be needed.
3. Set the scene by discussing the news story and show the children a spinner falling.
4. Give children time to explore flat and screwed up paper and to think about what might be making a difference to the way that they fall.
5. Encourage the children to make their own large and small spinners. It is important to let them explore their ideas on their own. Have templates available if children need them. Some may need help to work out how to cut and fold the spinners.
6. Now let children try the spinners to see what happens.
7. Remind them about safety, particularly about not climbing to drop the spinners
8. Give children some time to talk about their observations and ideas. You could show children other spinners with different blade lengths and ask them to predict how they will fall.
9. Children can share their 'best' spinner or they can create a display by sticking their spinners onto paper with advice for Mr Sycamore. Avoid too much writing by composing text message replies.
10. There are extra challenges on the ACTIVITY CARD. These can be used if there is any spare time or if the children want to try out more ideas and earn a bonus sticker.

## Things to think about

Encourage children to drop their spinners from the same height. This should be as high as possible so that the spinners can twirl before they hit the ground.

Very large spinners require a long drop to see any effect. You may need to drop them.

If they are too flimsy they will not spin.

Very tiny spinners can spin extremely quickly.

It is difficult timing the spinners if they fall quickly. However, if children want to try timing, you should let them have a go to see if works.

Adding paperclips or Blu-Tack can increase spin speed.



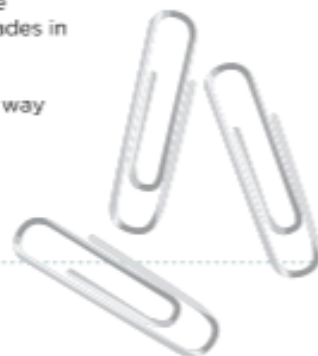
## Take it further

In this situation, gravity pulls an object towards the Earth, but air pushes against it. Flat paper falls slower than screwed up paper because there is more air resistance.

Gravity pulls the spinners down. The air resists the movement and pushes on each blade causing the spinners to spin.

Spinners with longer blades will normally spin more slowly. This is because there is more surface area for the air to push against. The material on large spinners needs to be stiff enough to hold the blades in place to allow it to spin.

Sycamore seeds are sometimes called helicopters because of the way they spin as they fall.



## Keywords

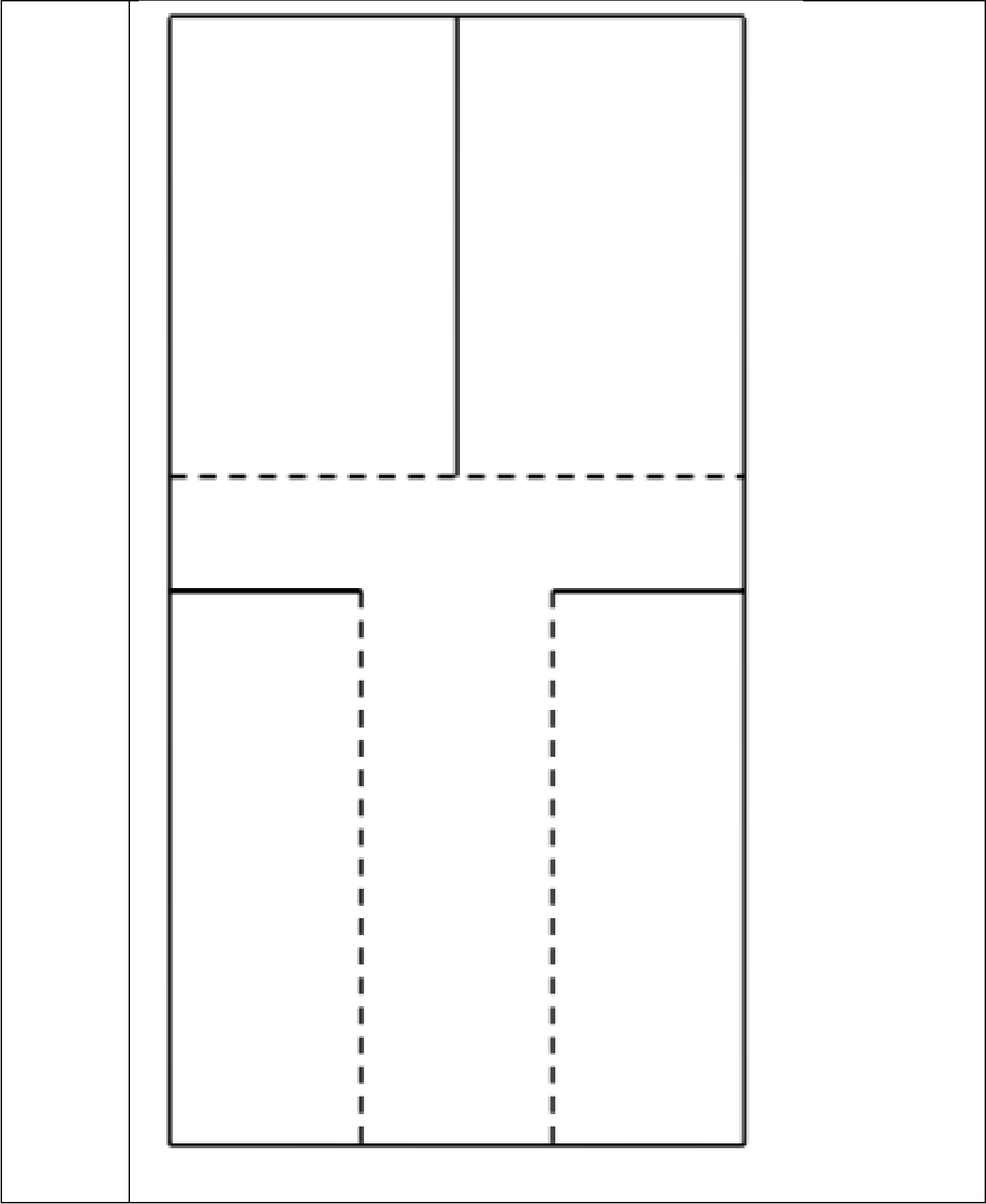
- Flight
- Shape
- Size
- Aerodynamics

## Watch out!

It can be useful to drop the spinners from a height greater than a child's height. However, children should not stand on chairs or tables to launch their spinners unless very closely supervised. A library stool or kitchen steps are better.

Children need to handle and carry scissors in a safe manner.









CREST  
AWARDS

SUPERSTAR

# Super Spinners

Activity Card



Mr Sycamore, class 5 teacher at Startown Primary School, amazed pupils and staff when he arrived for work in a helicopter!

"It's a bit of a hobby really," said Mr Sycamore, "I'm flying a different one every day and then I'll buy the one I like the best. This helicopter has a short blade design, I wonder if the size of blade makes a difference? I'll need some Super Spinner test pilots to help me decide!"

## Your challenge

Can you help Mr Sycamore decide if the size of the blades makes a difference?

Building full size helicopters is difficult but you can have fun making paper helicopter blades and watching how they fall.

## Discuss

What happens if you drop flat and scrunched up paper?

What do you notice about the way that they fall?

What might be making a difference to the way that they fall?



## Getting started

You can make paper spinners to use as a model. You will need to put a paper clip on the bottom to help them to fall properly. What sizes will you make them? How big will you make the blades? How many clips will you add?



## Test your ideas

Watch the spinners carefully as they fall.  
Can you make them go faster and slower?  
You could try landing them on a target and score points for where they land.  
Remember to change only one thing at a time.



## Share your ideas

You could make a display for Mr Sycamore using your spinners to show him what happened.



## Extra things to do

Does the spinner act differently if you change its shape?  
What if you make spinners from different kinds of paper?  
What else could you change?  
Can you make a bar chart to show your results?





# Yummy Yoghurt Makers

## Organiser's Card



### About the activity

This activity is designed to get children thinking about reversible and irreversible reactions.

The children have been sent an email by Mita Gabbar on behalf of Practical Action, who help farmers turn milk into yoghurt in rural Bangladesh in order to make the most money. Can the students help to find the most delicious flavour?

Through this activity you will support your group to:

- Make different varieties of yoghurt
- Conduct a taste test scientifically
- Record and present their results to the group
- Think about the lives of those living in a developing country



### Kit list

- Different types of milk (full fat cow's milk, skimmed and/or semi-skimmed cow's milk, goat's milk, sheep's milk, soya milk, almond milk, etc).
- Flasks
- Saucepans
- Cooker, hot plate or some other source of heat
- Large spoons for stirring
- Small spoons for tasting
- Yoghurt (make sure it is 'live' yoghurt)
- Dried milk powder (if using)
- Ready-made yoghurt samples, prepared the day before
- Blindfolds made from pieces of fabric
- Thermometer
- Selection of finely chopped or pureed fruit

### What to do

1. Prepare a selection of yoghurt samples the day before this activity so that children can test them. Remember to use a variety of milks.
2. Introduce the activity using the email from Mita. Children may be surprised that in other countries children don't always go to school. Tell them how people around the world are trying to change this as one of the Global Goals. For information go to <https://www.globalgoals.org/4-quality-education/>
3. Give out activity cards and equipment to the children.
4. Encourage children to discuss their ideas and how they will use the resources to carry out their investigations.
5. Encourage the children to predict the type of yoghurt the different milks will make. Will the yoghurt be thick, runny, sweet or sour?

6. Help the children to make their own batches of yoghurt using different ingredients. Make sure you have a ready-made yoghurt sample for each of the types of milk the children will be using to make their own yoghurt.
7. Support children to conduct their investigation and make their own records of their results. Allow the children to do blind taste tests of the ready-made yoghurt samples. Can they guess which milk was used to make each yoghurt sample? Were their predictions right? Children

can vote for their favourite yoghurt. Can they make it even tastier by adding chopped or pureed fruit?

8. Ask the children to present their findings to the rest of the group, they can be as creative in their presentation as they want e.g. they could make a pictogram of each person's vote to show which yoghurt was the most popular. They could write to Mita to tell her what they found out about making yoghurt and to share their recipes.

## Things to think about

To make 500ml of yoghurt you will need 500ml of any milk and 3 tablespoons of fresh, live, plain yoghurt. Using 25g of dried milk powder for every 500ml of milk will help your yoghurt set. Some types of milk take longer to set.

Heat the milk in a saucepan. When the milk reaches 46°C take it off the heat and stir in the yoghurt. The temperature of the milk is important. Help the children measure the temperature of the milk carefully.

Pour the mixture into a flask and leave overnight. In the morning it should have thickened and turned into yoghurt.

Making yoghurt is an irreversible reaction. Once the bacteria have fermented the milk you cannot turn it back into milk. This activity is a good opportunity to think about which reactions they know that are reversible, for example turning water into ice.

## Keywords

- Yoghurt
- Cultures
- Fermentation
- Reactions

## Watch out!

Emphasise washing hands and keeping work spaces and equipment clean when preparing food.

Ensure adult supervision when children make the yoghurt.

Check for any food allergies.

## Find out more

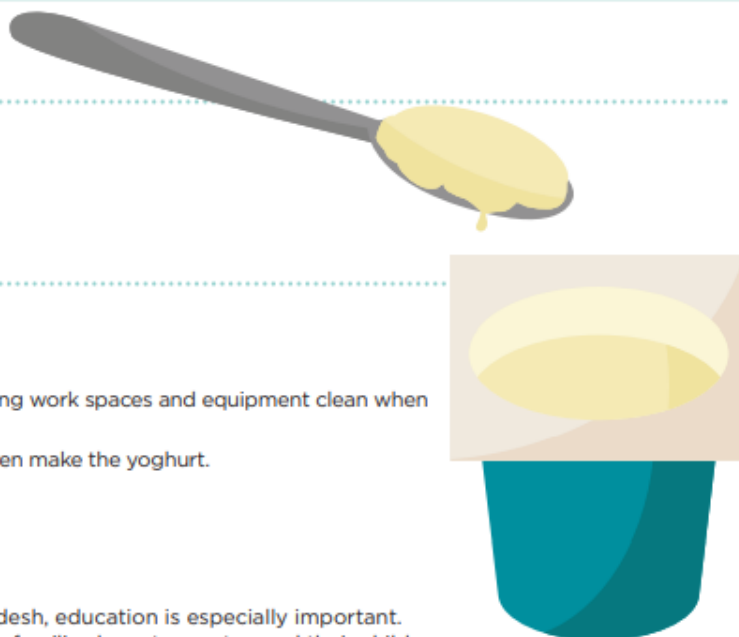
In developing countries like Bangladesh, education is especially important. However, with no national provision, families have to pay to send their children to school. Making and selling yoghurt is one way that families can generate an income for school fees.

To help pupils find out more about the lives of children in Bangladesh take a look at some of Practical Action's other activities for Primary including the Floating Garden Challenge, an investigation into growing food in areas of Bangladesh prone to flooding. [practicalaction.org/primary](http://practicalaction.org/primary)

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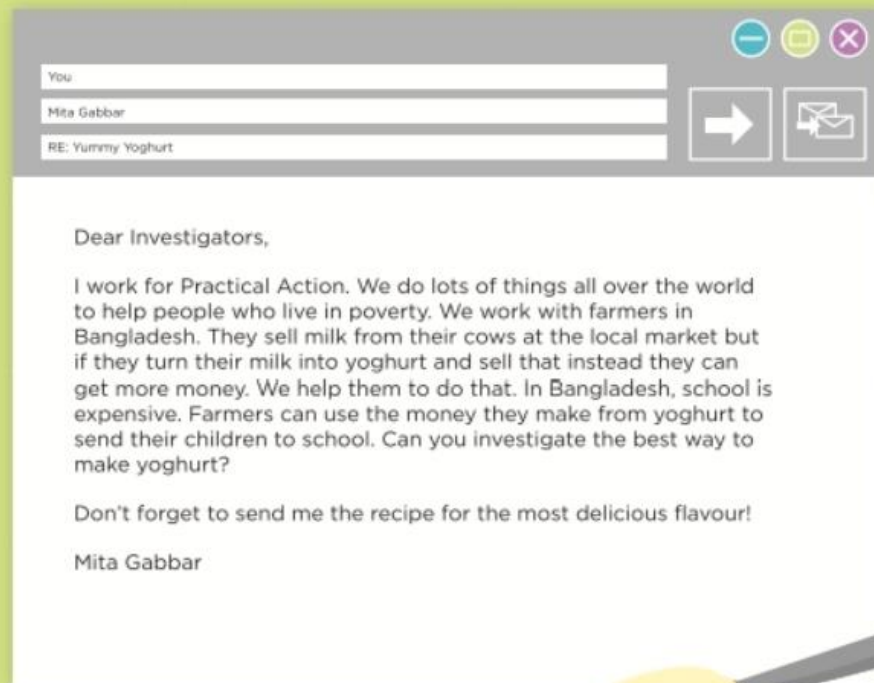
**Practical  
ACTION**

 **BRITISH  
SCIENCE  
ASSOCIATION**



# Yummy Yoghurt Makers

## Activity Card

A graphic of an email interface. At the top, there are three colored circles (blue, green, red) and two icons (a right arrow and an envelope). Below these are three input fields: 'You:', 'Mita Gabbar', and 'RE: Yummy Yoghurt'. The main body of the email contains the following text:

Dear Investigators,

I work for Practical Action. We do lots of things all over the world to help people who live in poverty. We work with farmers in Bangladesh. They sell milk from their cows at the local market but if they turn their milk into yoghurt and sell that instead they can get more money. We help them to do that. In Bangladesh, school is expensive. Farmers can use the money they make from yoghurt to send their children to school. Can you investigate the best way to make yoghurt?

Don't forget to send me the recipe for the most delicious flavour!

Mita Gabbar

### Your challenge

Investigate how to make the tastiest yoghurt from milk. Did the different types of milk make different types of yoghurt?

Which flavours work best?

### Discuss

Have you eaten yoghurt before? Which kind is your favourite?

What type of milk do you think will work best?

Why do you need to start with fresh yoghurt to make more?

How will you test the yoghurts? You could do a blind taste test.



## Getting started

**Before you start wash your hands with soap and water**

Pour your milk into a saucepan and gently heat it up.

When it is 46 degrees celcius take it off the heat. Use a thermometer to help you.

The yoghurt culture has live bacteria in it. Stir this into the warm milk.

Pour the new mixture into a flask.

In the morning the milk will have turned into yoghurt!

## Test your ideas

You might like to record your results in a table like this one. You could use a tally to keep track.

	Yoghurt 1	Yoghurt 2	Yoghurt 3
Number of votes for favourite yoghurt			

## Share your ideas

Make a pictogram of each person's vote – which yoghurt is most popular? Write to Mita to tell her what you have found out about making yoghurt.

## Extra things to do

Design a poster to sell your yoghurt at market.

Find out what else you can make from milk.

Find out more about the food people eat in Bangladesh. Draw a picture of a meal a child your age might eat in Bangladesh...and include yoghurt!



