



Thumbs Up
We were great at
the task
because...



Thumbs Sideways
We were good at
the task
because...



Thumbs Down
We were OK at the
task because...



we overcame our
frustration by...

we persevered and
concentrated on the job
by...

we modified our plans to
overcome hitches, e.g....

we modelled how the
bacteria multiplied by...

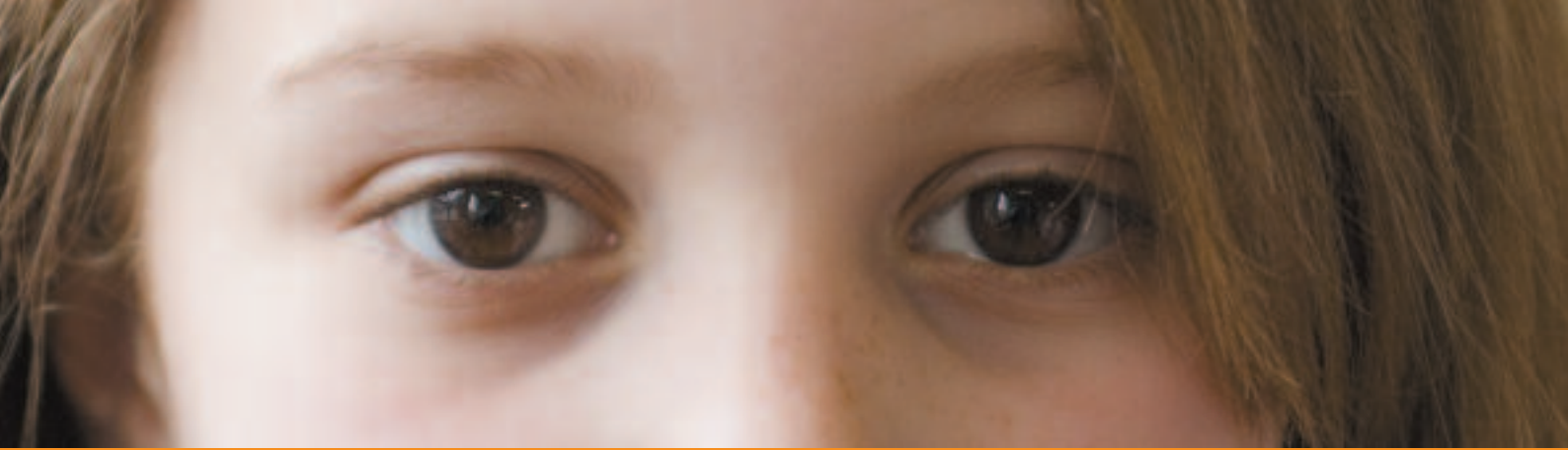
we were able to give
examples of factors that
may speed up or slow
down the multiplication
process e.g....

we...



Next time we will...





Bacteria and Custard

A white, stylized icon of a microscopic organism, possibly a bacterium or a cell, with a central dot and several radiating, teardrop-shaped protrusions.

Self Management: to avoid giving up easily

Investigative skills: to think creatively to explain how living things work



Generic task

Topple Towers



Learning Objective

Self Management: to avoid giving up easily

Introducing the task 5 minutes

Explain that it's easy to get fed up or frustrated when things are difficult. We can feel annoyed, irritated and bothered. Topple Towers challenges us to persevere and work through our frustrations on our own or with other people to help us. Lots of things in life make us want to give up, but to be successful we must overcome difficult feelings. Be prepared for it to challenge your patience!

Running the task 25 minutes

You need: a pack of cards, a clock.

- 1 Organise the children into teams of three or four.
- 2 Give each team a pack of cards and ask them to build a card tower. Tell them they have 5 minutes to experiment with the best way to build it.
- 3 After the first 5 minutes of experimenting, ask the children how they are feeling - whether they are frustrated, confident, excited, anxious etc. Ask them what they will need to do to be successful. Drawing on their comments, reinforce that they should:
 - avoid giving up easily
 - persevere if things don't go to plan
 - try alternative methods
 - concentrate and focus on the strategies that work
 - plan how to go about it
 - ask for help if they really need it
 - work through frustrations.
- 4 Now, challenge them to build the largest and most elaborate card tower that they can in 10 minutes.

Helpful Hints

It's easier to build card towers with new cards rather than older ones!



Science embedded task Bacteria and Custard



Learning Objectives

National Curriculum Sc1: 1a, Sc2: 5f

Ideas & Evidence to think creatively to explain how living things work

Life processes to be aware that micro-organisms are living organisms that are often too small to be seen and may be beneficial or harmful

Equipment

- a container e.g. a Petri dish or empty margarine tub
- dried pasta e.g. small macaroni or pasta shells or rice crispies
- felt tip pens

Success Criteria

To be successful the children will:

- overcome frustration by persevering and concentrating on the job
- modify their plans to overcome hitches or difficulties
- model the process of how micro-organisms multiply
- give examples of factors that may speed up or slow down the multiplication of micro-organisms.

Introducing the task 15 minutes

Remind the children what micro-organisms are and discuss some examples. Discuss some of the problems caused by micro-organisms, e.g. some illnesses, and some benefits, e.g. yeast in bread making and bacteria in yoghurt. Introduce the idea that, like other living things, micro-organisms can reproduce. They usually do this by splitting into two to make a copy of themselves.

Explain that in this task the children are going to show how quickly the number of micro-organisms can rise. To do this they will need to persevere and avoid giving up easily; they may

need to change their plans as they go along to overcome any difficulties they encounter. Discuss briefly how they avoided giving up easily in the generic task.

Running the task 30 minutes (plus time needed for collecting results)

- 1 Organise the children into teams of three or four.
- 2 Give each team a Splat Chart and the equipment listed above.
- 3 Read aloud Bacteria and Custard.
- 4 Tell the teams to allow their bacteria to build up over 4 minutes (this will model the multiplication over 4 hours in real time). Make sure they have all got the correct number of bacteria in their splats.

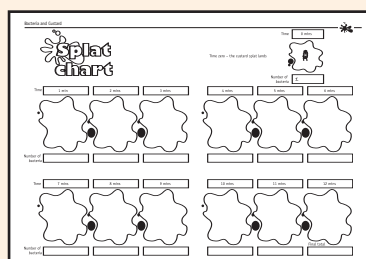
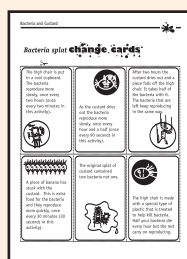
- 5 Then give out a Bacteria Splat Change Card to each team. Tell them to continue the experiment whilst taking into account the new rules on their Change Card. Ask them now to continue the activity for another 8 minutes (so that they have worked out the multiplication of bacteria for a whole 12 hour period in total).

Reviewing the task 15 minutes

Ask the teams to describe how their bacteria built up on their Splat Charts. Discuss some of the strategies they used to avoid giving up easily. Identify the factors that slowed down and sped up bacterial growth and explain the implications for hygiene and food safety. Involve the children in making an overall judgement about how well they avoided giving up easily using the assessment for learning Smart Grid (see back cover).

Time (hrs)	Bacteria
0	1
1	2
2	4
3	8
4	16

Resources





Bacteria and CUSTARD

Georgia is only one year old and a very messy eater, especially when Dad is doing the feeding! Dad is giving her a favourite dessert - bananas and custard, but a big blob of custard lands on the high chair. SPLAT!

Unfortunately, the blob contains a bacteria and Dad does not wipe the chair before he puts it away. When Georgia uses the chair again she will probably eat the blob of custard!

If it contains a lot of bacteria she might be sick!

Use the Splat Chart to work out how many bacteria the blob of custard could contain after only 12 hours. Each bacteria usually multiplies once every hour but for this activity one minute equals one hour.



Instructions

1 Organise your team:

- one person should be the timer, telling the rest of the team when every minute is reached
- one person should be working out the number of bacteria there will be in each splat and writing it on the Splat Chart
- The other people in the team will be counting out and placing the pasta in the splats each minute.

2 Use one piece of pasta or crispie to represent one bacteria. Count out the pieces and put them in the splat shapes every minute to show how the number of bacteria rises as time goes on.

3 Remember the Change Cards! These change how quickly the bacteria grow.

4 If you have no more room on your splat for pieces of pasta take a 2 minute time-out break. Try to work out another way of showing how many bacteria there are. Perhaps some pasta shapes or crispies could be worth ten bacteria? Or a hundred?

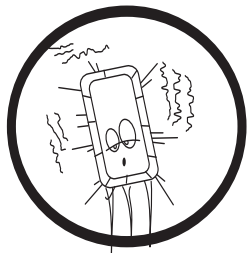




Bacteria splat **change cards**

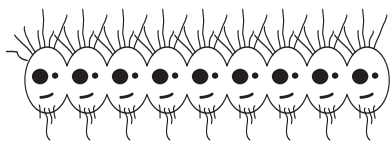
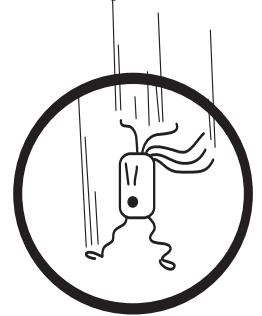


The high chair is put in a cool cupboard. The bacteria reproduce more slowly, once every two hours (once every two minutes in this activity).



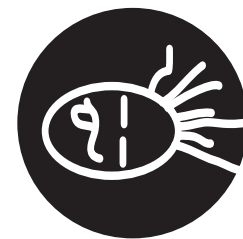
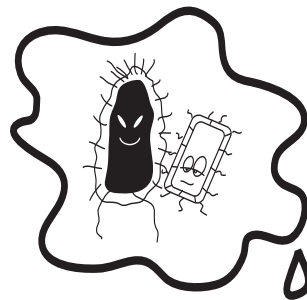
As the custard dries out the bacteria reproduce more slowly, once every hour and a half (once every 90 seconds in this activity).

After two hours the custard dries out and a piece falls off the high chair. It takes half of the bacteria with it. The bacteria that are left keep reproducing in the same way.



A piece of banana has stuck with the custard. This is extra food for the bacteria and they reproduce more quickly, once every 30 minutes (30 seconds in this activity).

The original splat of custard contained two bacteria not one.



The high chair is made with a special type of plastic that is treated to help kill bacteria. Half your bacteria die every hour but the rest carry on reproducing.

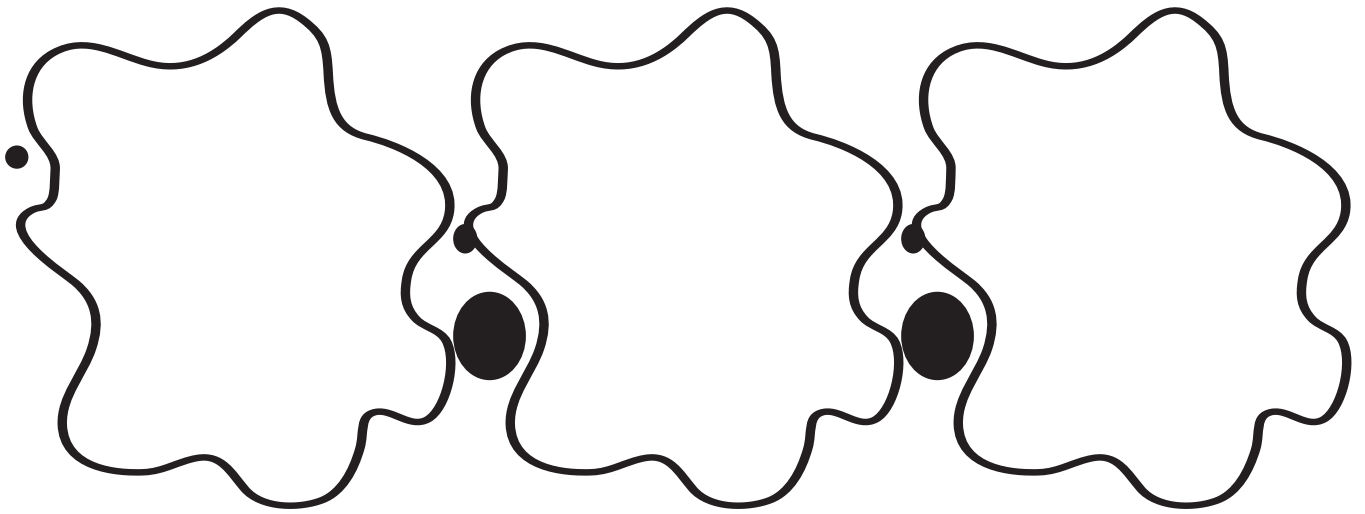
Splat chart

Time

1 min

2 mins

3 mins



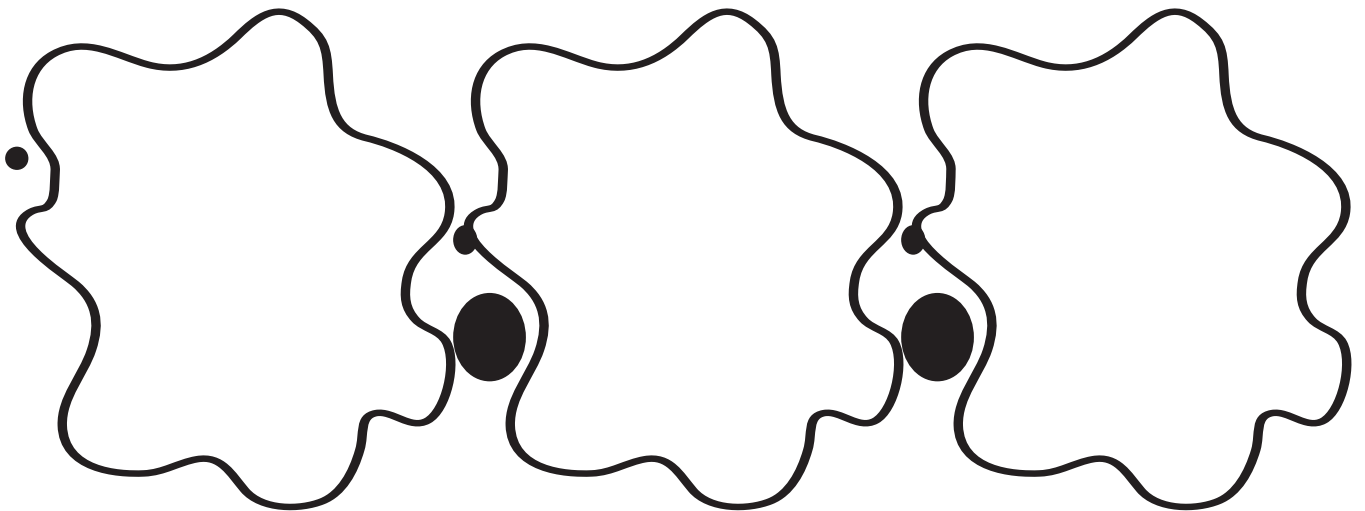
Number of
bacteria

Time

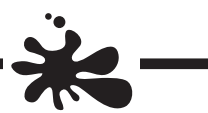
7 mins

8 mins

9 mins

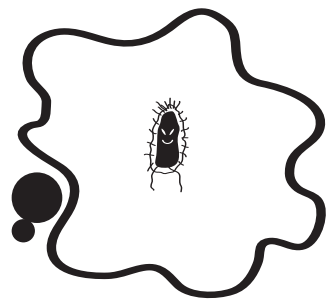


Number of
bacteria

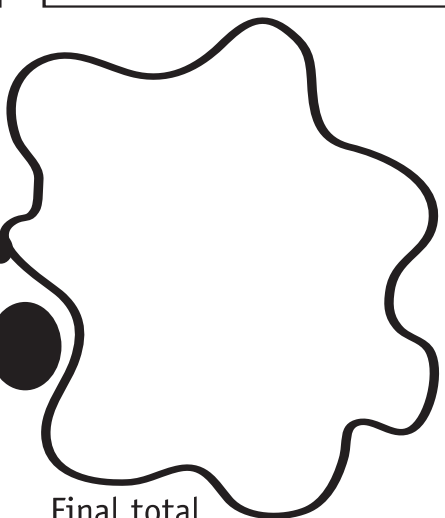
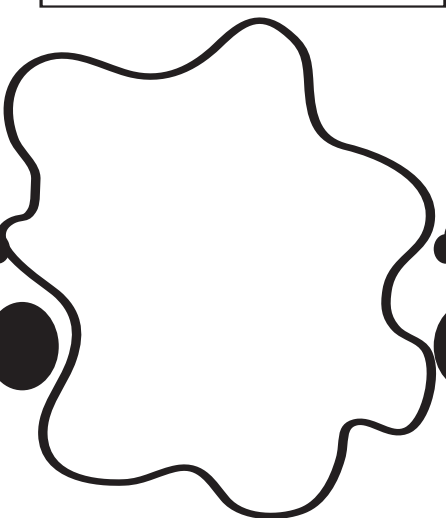
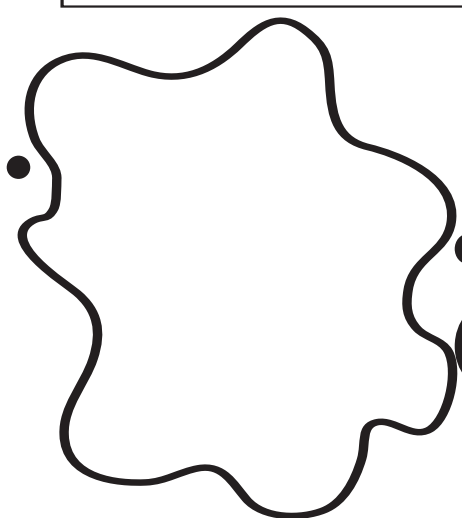
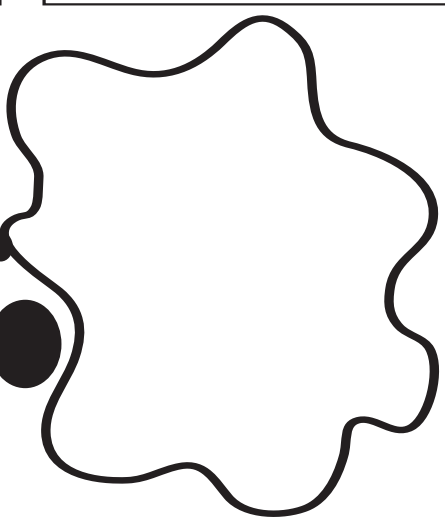
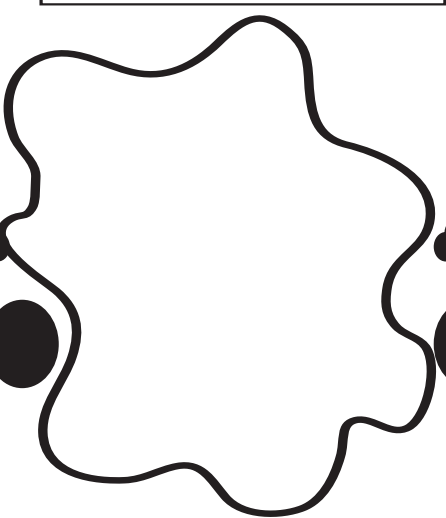
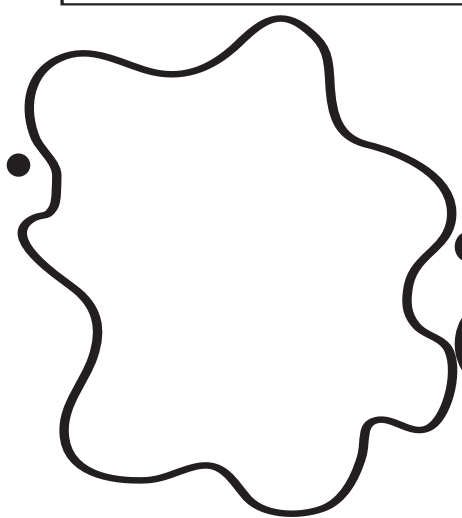


Time

Time zero – the custard splat lands



Number of bacteria



Final total