

BACKGROUND INFORMATION

Bacteria come in lots of shapes and sizes. When we identify bacteria in the laboratory we often name them by their shape or where they are found. Round ones are called cocci, rod shaped ones are called bacilli, gently curved ones vibrio, and spiral ones are called spirilla or spirochetes. Bacteria that live in very hot conditions are named thermophiles and those found in extreme cold are named psychrophiles. Some bacteria can appear to be different colours, e.g. cyano-bacteria are blue/green while rhodo-bacteria are red.

Some bacteria can move around. Tail-like structures called flagella allow some bacteria to move around their environment.

The aim of this activity is to raise the awareness of the diversity of bacteria shapes and sizes. It also introduces how bacteria can cause disease.

MATERIALS TO RUN THE ACTIVITY

- Balloon Bugs bacteria presentation
- Balloons of different shapes and sizes, in particular round, sausage and squiggly shapes
- Balloon pump(s)
- Balloon Bugs Instruction cards
- Lengths of wool (to represent flagella)
- Double-sided sticky tape
- Marker pens or felt tip pens
- Tags for labeling the bacteria*
- String
- Rubber bands
- Scissors (to cut around the tags)
- Hole punch

*If you do not wish the children to use scissors provide pre-cut and hole-punched tags.

SAFETY NOTES

Before running the activity, check whether any of the students have latex allergies. If there are any students with latex allergies provide alternative craft materials such as cotton wool balls, large polystyrene balls, or toilet rolls and craft paper.

Make sure that students use balloon pumps to inflate the balloons and not their mouths.

ACTIVITY PREPARATION

1. Room set up (prior to students arriving)

It is recommended that you set up craft tables (one for each bacteria) with all the necessary materials to make a balloon bug before the start of the session.

Alternatively, prepare several boxes (one box per bacteria) with all the necessary materials to make the balloon bug. Using this method you can split the class into several groups where the students choose a box and follow the instructions inside to create a balloon bug.

2. Make your own *Balloon Bugs*

To provide guidance for the students we recommend you make some example models before the session, ideally one of each bacteria.

RUNNING THE ACTIVITY

Below are some guidelines for running the activity:

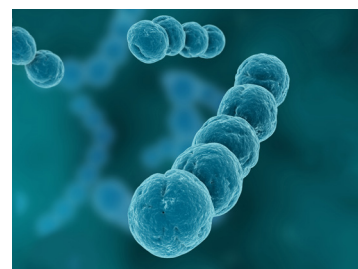
1. Introduce the topic of bacteria using the Balloon Bugs presentation. This will allow students to see that bacteria come in lots of different shapes and sizes, as well as introduce the activity and the five different bacteria they can choose to make.
2. Get the students making their own balloon bacteria.

GUIDELINES FOR MAKING THE *BALLOON BUGS*

Below are instructions for making three different *Balloon Bugs*.

How to make a *Streptococcus pneumoniae*

1. Using a hand pump, blow up five small round balloons and tie off the ends. Try to make each balloon the same size as the next. Use small pieces of double-sided tape to stick the balloons end to end; OR
Blow up one long modelling balloon and leave a little room in the end. Twist the balloon in regular intervals and hold in place with a rubber band.



Streptococcus pneumoniae.
Shutterstock.

BALLOON BUGS

Teacher's notes

2. If you have time, draw markings on the side of the balloons as in the picture.
3. Complete and attach a name tag.

How to make a *Salmonella typhimurium*

1. Using a hand pump, blow up one long balloon and tie it off.
2. Use the tape to stick lengths of wool to the balloon like flagella.
3. If you have time, draw markings on the side of the balloons.
4. Complete and attach a name tag.



Salmonella typhimurium.
David Goulding, Wellcome Trust Sanger Institute.

How to make a *Campylobacter jejuni*

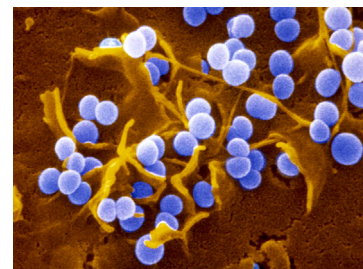
1. Using a hand pump, blow up one squiggly balloon and tie it off.
2. Stick a long piece of wool to each end.
3. Complete and attach a name tag.



Campylobacter jejuni.
B. Wren, London School of Hygiene & Tropical Medicine.

How to make an MRSA

1. Using a hand pump, blow up one round balloon and tie it off.
2. Using a soft pen, draw small dots and squiggles on the balloon
3. Complete and attach a name tag.



Staphylococcus aureus.
Sharon Peacock, Oxford University.

How to make a *Clostridium difficile*

1. Using a hand pump, blow up a long model-makers balloon, leaving a little room at the end, and tie it off.
2. Pinch and twist the balloon into four even-sized sausages.
3. Bundle the four sausages together and tie the two ends of the balloon together.
4. Complete and attach a name tag.



Clostridium difficile.
David Goulding, Wellcome Trust Sanger Institute.

FURTHER INFORMATION

Additional sources of information on the web for teachers and students to increase their knowledge of pathogens include:

Wellcome Trust Big Picture: Epidemics

These are online articles on issues surrounding disease epidemics looking at:

- How individuals and governments should respond to the possibility of new outbreaks
- The role pharmaceutical companies have to play in disease control
- Who should be priority for vaccines when there is not enough medicine to go around.

www.bigpictureeducation.com/epidemics

The website also has an online picture gallery of a range of different infectious microbes including fungi, bacteria and viruses.

ONLINE RESOURCES

Additional resources and activities for the classroom that help support this activity:

E-bug

E-bug is an online antibiotic and hygiene teaching resource aimed at Key Stage 2 and Key Stage 3 students. Created by the Health Protection Agency (HPA), it involves a consortium of 18 partner European Union countries. It has a range of games, interactive quizzes, disease fact sheets and much more.

www.e-bug.eu/

BBC broadband classroom clips

This website offers video clips to support the teaching of bacteria in the classroom. Some recommended clips to support this activity are listed below:

- Understanding the size of the bacteria: www.bbc.co.uk/education/clips/zkptsbk
- Seeing the bacteria carried on hands: www.bbc.co.uk/education/clips/zwrs34j
- The bacteria that lives on the skin: www.bbc.co.uk/education/clips/ztvfb9q