BUILD A BACTERIA!

Teachers' notes

BACKGROUND TO ACTIVITY

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. Some bacteria create a chain of multiple bacterial cells. Some bacteria can move around: tail-like structures called flagella allow some bacteria to move around their environment. Bacteria have different surface proteins which can effect whether they can cause illness in humans.

Estimated duration: 30 minutes

To run function finders you will require:
- Introductory slides
- Printed student worksheets
- Printed Gene Cards (with optional lamination and blue tac/velcro)
- Pots or tubs for storing Gene Cards
- Coloured paper or card stock
- Pencils
- Scissors
- Coloured pens/pencils: green, blue, red, purple, yellow
- String or coloured yarn
- Glue or tape

ACTIVITY PREPARATION

1. Activity printing and set up

Print out the student worksheets - enough for 1 per student. It is recommended that sheets are laminated to prevent damage and to be easily re-used, however this is not essential.

Print and fold the Gene Cards - the Gene Card printable document has instructions on how many to print based on a class of 32 students.

Cut up the string or yarn into lengths of approximately 5cm.

Sitting in groups of 4-6 students, each group will need:
- 1 student worksheet per student
- 5 pots, each containing one type of Gene Card (4-6 of each)
- Coloured paper
- Pencils
- Scissors
- String
- Coloured pens: green, blue, red, purple, yellow
- Glue or tape

We recommend that students work individually to make one bacteria each, however, this activity would also work as one-between-two, especially for younger groups.

2. Make your own bacteria

To provide guidance for the students we recommend you make some example models before the session.

RUNNING THE ACTIVITY

1. Introduce the topic of bacteria using the Build a Bacteria! 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 bacteria, using the slides at the end of the presentation as guidance

Each student uses their worksheet and the Gene Card to randomly chose the following features of their bacteria:

- Bacterium shape (round or oval)
- Type of bacterium cell wall (gram positive or negative)
- Number of bacterium (2, 3 or 4)
- Flagella location (one side, two sides, all over)
- Special features (2 out of: immunity response trigger; immunity response evader; pili; toxin release; cell wall support)

FURTHER INFORMATION

Bacterium shape

Students will select either a 'round' or 'oval' bacterium shape Gene Card. They should add this Gene Card to their worksheet, and then select some coloured paper or card and draw either a round or oval shape. They should not cut their bacterium out yet.

Bacterium cell wall

Students will select either 'gram positive' or 'gram negative' Gene Cards which they should add to their worksheet. If they have picked a 'gram positive' Gene Card, they should add a border around their shape in a purple pen. If they have picked a 'gram negative' Gene Card, they do not add a border. All students should then cut out their bacterium shape.

How many bacterium?

Students will select either 'two', 'three', or 'four' Gene Cards, which they should add to their worksheet. Students then replicate the last two steps (shape and border) the appropriate number of times. Students then use glue or tape to stick their two/three/four bacteria shapes together in a line.

Flagella Location

Students will select either 'at one end', 'at two ends' or 'all around' Gene Cards, which they should add to their worksheet. Students then use string to add flagella to their bacteria string using their Gene Card to identity where on the bacteria to add the string.

Special Features

Students will select two special feature Gene Cards (out of immunity response trigger; immunity response evader; pili; toxin release; cell wall support) and add those to their worksheet. Each special feature has a related colour on the Gene Card, students will use the corresponding coloured pen or pencil to add dots to the surface of their bacteria.

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/

Guardians of the Gut

Guardians of the Gut is an online microbiome teaching resource website aimed at primary students. It requires registering your school for free, and has three separate activities supported by quizzes: The Human Body, Microbiome, and Antibiotics.

https://guardiansofthegut.org/

Science For Everyone Career Profiles and Classroom Resources

Science for Everyone is a new initiative targeted at primary school teachers to raise awareness of Unconscious Bias and its potential to influence students' science capital and attitudes towards science. Developed by Wellcome Connecting Science and funded by the Royal Society of Chemistry and the Wellcome Sanger Institute, it includes classroom resources around STEM skills and careers.

https://www.science4everyone.org/classroom-resources/