BACTERIA BATTLE CARDS

Tip:
Where you see the **µm** symbol, say *micrometre* (that's one millionth of a metre).

How to play:

1. Cut out the 12 cards on pages 17 and 19.
2. Deal the cards equally between two players.
3. The youngest player starts by picking the card from the top of their pile, choosing a category and then reading aloud the number next to that category. The idea is to choose the category you think is most likely to beat your opponent's card.
4. The second player picks the top card from their pile and reads the same category aloud.
5. The player with the highest number wins the round, takes both cards and adds them to the bottom of their pile. If the numbers are the same, the first player chooses another category from the same card.
6. Players take it in turns to start a round.
7. The ultimate winner is the first to claim all of the cards!

CAULOBACTER CRESCENTUS

AKA: Sticky beast

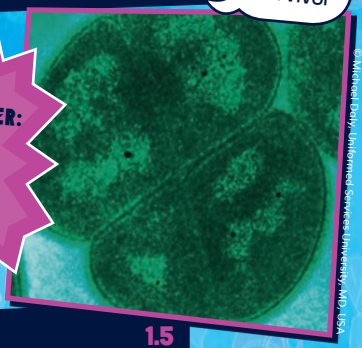
SUPERPOWER: Mega-stickiness

SIZE in µm:	3
GROWTH RATE:	5
USE TO HUMANS:	3
Useful for studying bacterial development and cell division.	
DANGER TO HUMANS:	2
Infection is rare.	

It divides into two types: one with a variable stalk and another that creates an incredibly strong 'glue'!

DEINOCOCCUS RADIODURANS

AKA: Ultimate Survivor



SUPERPOWER: Extremely tough

SIZE in µm:	1.5
GROWTH RATE:	3
USE TO HUMANS:	5
It could be helpful in cleaning up nuclear waste.	
DANGER TO HUMANS:	0
None known.	

It can survive droughts, a lack of nutrients and huge doses of radiation. If damaged, it can repair itself perfectly!

SHEWANELLA ONEIDENSIS

AKA: Metal Breath

SUPERPOWER: Conducting electricity. Shocking!

SIZE in µm:	2.5
GROWTH RATE:	1
USE TO HUMANS:	7
Shewanella could be used to clear nuclear waste, purify water and create batteries!	
DANGER TO HUMANS:	2
Human infections are rare.	

These bacteria love cool, salty marine sediment and can join together to create electrical circuits!

EXTREMOPHILE MATCH

Some bacteria thrive in the toughest of places. Can you match the extremophile type with the environments they prefer? The first one has been done for you.
Check your answers on page 34.

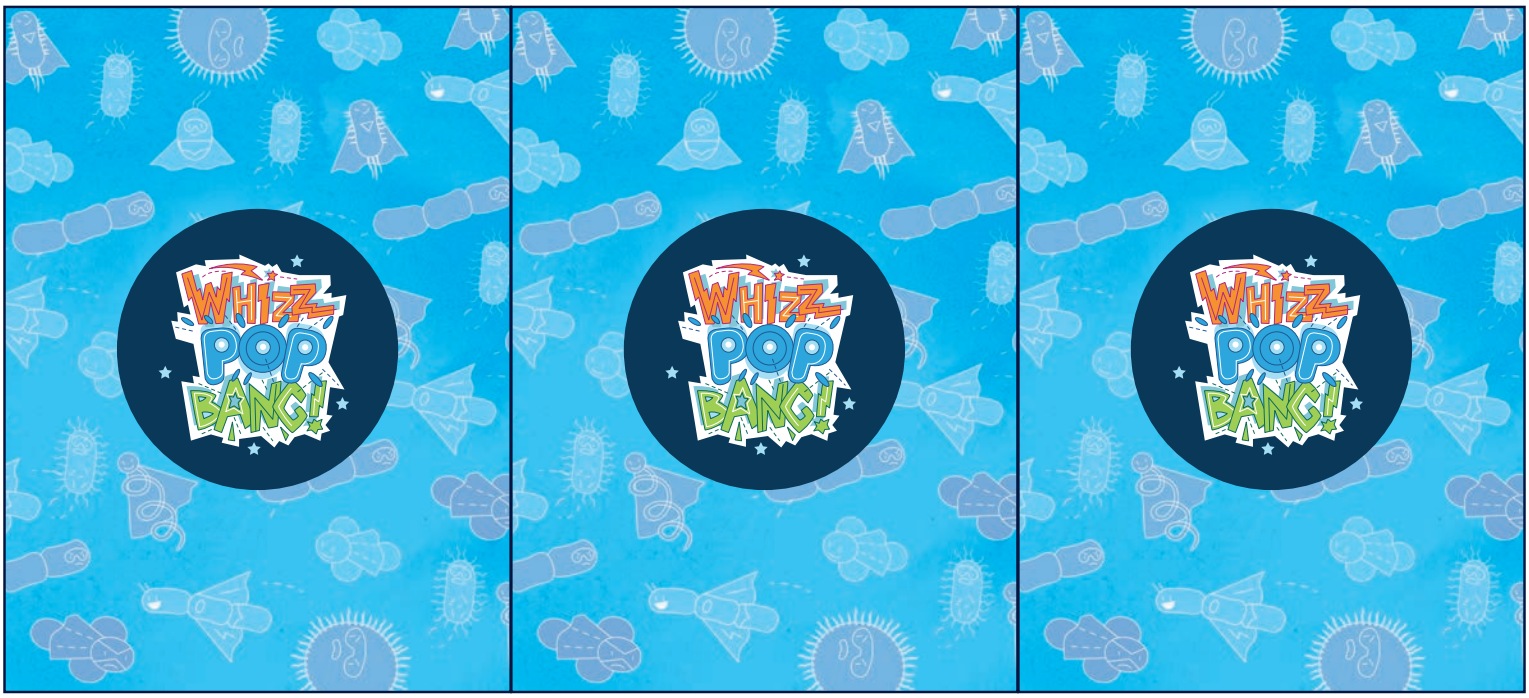
Acidophilic	Salty
Halophilic	Hot
Thermophilic	Limited water supply
Psychrophilic	Acid
Alkaliphilic	Cold
Oligotrophic	Limited nutrition supply
Xerophilic	Alkaline

Clue 1: Some people like halophilic fish and chips!

Clue 2: Your tummy might rumble in an oligotrophic place.

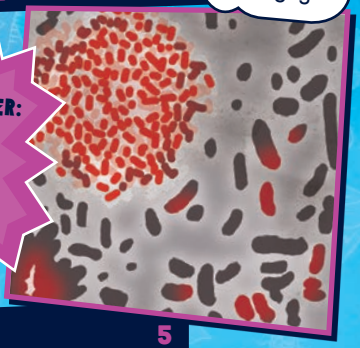
Clue 3: You'd need your water bottle in a xerophilic environment.

Clue 4: Thermo is from the Greek word thermos, meaning heat.



PHOTORHABDUS LUMINESCENS

AKA: The glow guy



SUPERPOWER: It glows!

SIZE in µm: 5

GROWTH RATE: 8

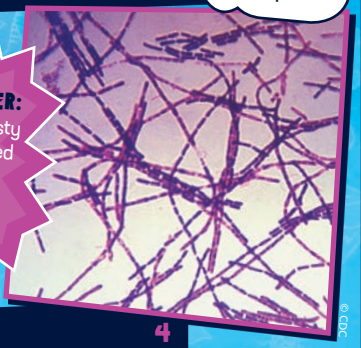
USE TO HUMANS: 6
They help wounds to heal by slowing the growth of other, more damaging, microbes.

DANGER TO HUMANS: 1
Human infections are rare and harmless.

These bacteria live in the guts of nematodes worms. They work together to infect and kill insects. Lethal!

BACILLUS ANTHRACIS

AKA: Super Spore



SUPERPOWER: Causes a nasty disease called anthrax.

SIZE in µm: 4

GROWTH RATE: 6

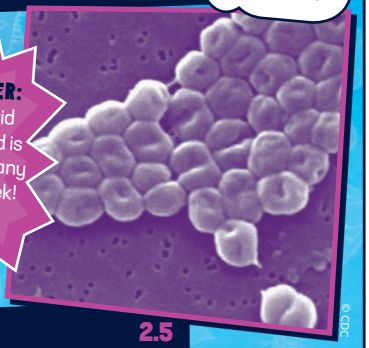
USE TO HUMANS: 0
None known.

DANGER TO HUMANS: 9
It's sneaky, hard to defeat and targets animals and humans!

This incredibly hardy bacterium can lie dormant in extreme conditions for years.

ACINETOBACTER BAUMANNII

AKA: A Sinister Bacter



SUPERPOWER: Causes horrid infections and is resistant to many antibiotics. Eek!

SIZE in µm: 2.5

GROWTH RATE: 2

USE TO HUMANS: 0
None known.

DANGER TO HUMANS: 10
This baddie makes sick people even sicker. Not cool.

Possibly the most dangerous bacteria to humans of all!

AQUIFEX PYROPHILUS

AKA: Volcanic Vagabond

SUPERPOWER: Survives at up to 95 °C.

SIZE in µm: 6

GROWTH RATE: 7

USE TO HUMANS: 5
It makes water!

DANGER TO HUMANS: 0
We're too cool to host this bacteria.

This heat-lover is found in hot springs, thermal vents and sulphur pools and creates either water or nitrogen by breathing. Wow!

BACILLUS CEREUS STRAIN F

AKA: The Ice Queen

SUPERPOWER: Survives being frozen.

SIZE in µm: 4

GROWTH RATE: 9

USE TO HUMANS: 0

DANGER TO HUMANS: 0
No known infections (but its relative, *Bacillus cereus*, can cause serious infections, like food poisoning).

Discovered in frozen soil in Russia, this bacteria survived at -3 °C for millions of years.

STAPHYLOCOCCUS AUREUS

AKA: Slime Shield

SUPERPOWER: Makes a slime layer called a biofilm which resists attacks by the immune system and antibiotics.

SIZE in µm: 0.6

GROWTH RATE: 10

USE TO HUMANS: 6
Can help prevent other infections.

DANGER TO HUMANS: 7
It's usually no problem, but when it attacks, it can make us all kinds of poorly.

Thrives on human skin, usually with no problems, but sometimes infections develop...

THERMUS AQUATICUS

AKA: Hellfire

SUPERPOWER: Can survive at up to 80 °C!

SIZE in µm: 200

GROWTH RATE: 4

USE TO HUMANS: 10
It's very important in scientific research.

DANGER TO HUMANS: 0
We're too cool to host this bacteria.

This geyser-dweller thrives in hot water and produces Taq polymerase, which is used in replicating DNA.

BACTEROIDES THETAIOTAOMICRON

AKA: Carrot Cruncher

SUPERPOWER: It's both really helpful AND really dangerous!

SIZE in µm: 6

GROWTH RATE: 6

USE TO HUMANS: 10
Lots of foods are hard to digest without it.

DANGER TO HUMANS: 8
Infections are rare, but very serious, and it's resistant to some antibiotics.

One of the most common bacteria found in the human gut, it breaks down plant food molecules.

MAGNETOSPIRILLUM MAGNETOTACTICUM

AKA: Nature's Compass

SUPERPOWER: Contains minuscule magnets!

SIZE in µm: 6

GROWTH RATE: 5

USE TO HUMANS: 4
Can be used to create drugs that target disease precisely, reducing nasty side effects.

DANGER TO HUMANS: 0
No known dangers.

It's one of a group of magnetic bacteria that align with Earth's magnetic field.

*Sizes and growth rates of bacteria can vary depending on the conditions.


WHIZZ
POP
BANG!