

Week 1

Today, we will learn:

- to define what microbes are
- to explain how we can see microbes

Activity 1 - Which words do you associate with microbes?

1. Go to the link <https://pollev.com/eliseldh997>
2. Fill in words you associate with microbes. You are encouraged to submit multiple answers

Activity 2 - How small are microbes?

2.1 - Order the following objects and organisms by size (see slide for visual help)

	Order (from big to small)	Approximative size
Human	1	
Grain of Salt		
Robin		20 cm
Microbe		
Grain of Sugar		
Ant		
Molecule		

If you have time, try to guess which molecule is the one represented on the slide and who the person is on the slide

2.2 - Self-reflection

Answer the following questions:

1. What is the smallest object that you can see with your eyes and without any technical help?
2. Can you see a microbe with the naked eye
3. If you were the size of that object, how big would a microbe be?

Activity 3 - Seeing bacteria with the naked eye

1. If a bacteria is 1 micrometer squared and we can see 1 millimeter squared, how many bacteria need to be aggregated for you to see them?

Hint: 1 millimeter = 10³ micrometer

Hint: We are looking into an area and not a length

2. Knowing that a bacteria divides into 2 within 20 minutes, how long does it take for 8 bacteria to appear?

*Hint: 4 bacteria are going to appear in 20+20= 2 * 20 = 40 minutes*

3. How long does it take for enough visible bacteria to appear?

2 ⁰	=	1
2 ¹	=	2
2 ²	=	4
2 ³	=	8
2 ⁴	=	16
2 ⁵	=	32
2 ⁶	=	64
2 ⁷	=	128
2 ⁸	=	256
2 ⁹	=	512
2 ¹⁰	=	1024
2 ¹¹	=	2048
2 ¹²	=	4096
2 ¹³	=	8192
2 ¹⁴	=	16384
2 ¹⁵	=	32768
2 ¹⁶	=	65536
2 ¹⁷	=	131072
2 ¹⁸	=	262144
2 ¹⁹	=	524288
2 ²⁰	=	1048576

Hint:

Activity 4 - Seeing microbes through their impact on their environment

How do microbes modify their environment in the sourdough starter?

Can you think about other ways microbes could change their environments?

Checklist for next week

<https://forms.gle/HQ6WwSJsoesd9MMD9>

- Mud (please collect it during the week)
 - enough to fill in the bottles
 - if the mud comes from an area where there is water nearby, try to also sample the water in another container
- Empty and washed plastic bottles (x2)
 - the bottles need to be clear
 - preferably similar-sized (a small water bottle can work) so that you can compare them
 - the taller, the more likely there is to have more layers
 - if you can cut the top so that it is easier to put the mud in under the supervision of your parents, it would be great
- 2 eggs
- some water
- 1 cup of shredded paper
- Plastic wrap or aluminum foil
- two elastic bands or tape to seal off
- Some water
- Another container where you can mix mud

If some of these items are not available to you, please put it in the feedback form by the end of today so that we can send it to you.