Understanding Infections and Vaccines (level 1)

Description	Understand what an infection is and how vaccines play a role in reducing infection rate.
Leading Question	Can you help your community understand the importance of vaccines?
Subjects	Science, literacy
Total Time Required	1 hour a day for 5 days
Supplies Required	A4 paper, regular pencils, colored pencils, large poster paper, glue and tape
Learning Outcomes	• Identify at least one microorganism that can cause disease. • Understand why certain common practices help prevent disease. • Understand that a vaccine prevents disease and know what a vaccine contains. • Know that our bodies produce fighters against disease when we get sick. • Learn how to communicate scientific information and ask scientific questions. • Learn to think critically
Previous Learning	None

Day 1

Today you will be introduced to the organisms that make us sick.

Suggested Duration	Activity and Description
10 Minutes	**Discussion:** Have a conversation with the learners to understand how they think disease is caused. Here are a few questions that you can ask: • Can you name examples of living organisms and non-living organisms? What makes something living vs non-living? (Answer: living organisms eat, breathe, grow, move, and respond/adapt to their environment) • In times when you have been sick, what happened and what do you think caused it? (Hint: think about what you were doing, where you were, how the weather was etc.)
25 minutes	**Introduction to disease causing microorganisms:**

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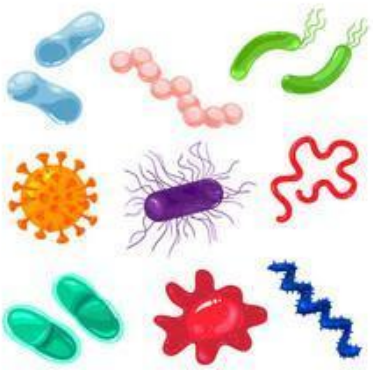
- Diseases are caused by small living things that enter our body – they are so small that we cannot see them with our eyes! Can you draw an image of what you think they look like?
- Based on the discussion you just had, ask the learner to list places where they think these disease-causing living things can be found. For example, in water, in other living things, in food that we eat, on dirty surfaces like remotes and door handles etc.
- Also ask the learner to list *from where* they think these small living things can enter our body. For example, through our nose, our mouth, through a small or large cut in the skin, through our eyes etc.

There are two types of small living things that cause disease:

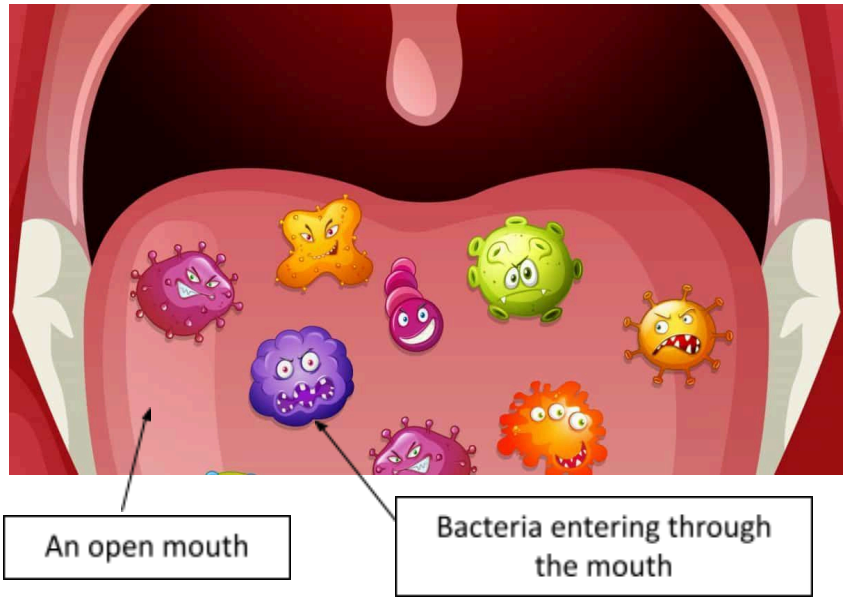
1. Bacteria - there are bacteria that help us digest food better (good bacteria) and those that make us sick (bad bacteria)
2. Viruses (there are only bad viruses)

These small living things come in many shapes and each one causes a different disease:



- Ask the learner to describe, in their own words, some features of these living things. What do you see in the picture? What similarities and differences do you see compared to how you imagined it?

- Based on what you see, can you think of why we get sick when these enter our body? (Answer: our body is able to recognize when a bad bacteria or virus enters and tries to fight it. During this fight, we feel sick, get fever and feel tired. We feel better once our body has fought it off).

	• COVID-19 is a virus. When this virus enters our body we get sick. Some ways that we think it spreads is through: o Water droplets – if you are infected, sneezing and coughing close to others can make others sick too. o Contacting contaminated surfaces
20 minutes	**Create a visual depiction of how bacteria and viruses can enter our body.** On the last day of this project the learner will present what they know about infections and vaccines. This activity is in preparation for the final presentation. • Based on what the learner learnt today, ask them to **illustrate and label** a diagram showing how a bacteria or virus can enter our body. Here is an example of bacteria entering through the mouth:  • Other options include someone sneezing whilst sitting next to another person and spreading disease. • Someone touching a dirty item
5 minutes	**Show and tell:** • In pairs, show your drawings to each other and explain what your diagram shows.

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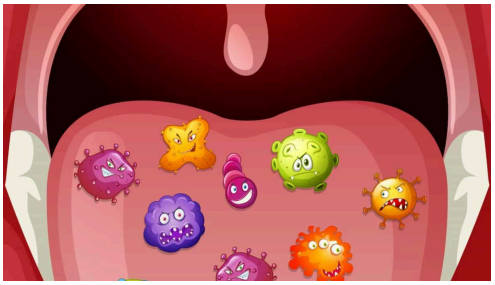
	• Learners can be given the opportunity to ask each other questions about their drawing.

DAY 2

Today you will learn how we can prevent infection.

Suggested Duration	Activity and Description
10 minutes	**Discussion:** Have a conversation with the learners to understand how much they know about good hygiene practices and ways to remain disease-free. Here are some questions you can ask: 1. What are some ways we can avoid being sick? (Some answers might include eating healthy, washing hands, staying active etc.) 2. During the COVID-19 pandemic we all have to wear masks, why do you think we do this? (Answer: to avoid spreading COVID-19 virus through sneezes and coughs.)
10 minutes	**Why do disease prevention mechanisms work?** For each of the prevention mechanisms listed below, ask the learners why they think it prevents disease: 1. Cooking food that has bacteria at high temperatures 2. Washing dirty hands with soap and water 3. Covering our nose and mouth when sneezing or coughing 4. Cleaning open wounds 5. Covering open wounds with a Band-Aid (Answers): 1. Bacteria on meat and vegetables die at high temperatures. 2. Using soap kills bacteria. 3. It stops the spread of any bacteria that is in the water droplets of your cough and/or sneeze. 4. Bacteria or viruses can enter through open wounds so disinfecting the area kills any microorganisms. 5. Bacteria or viruses can enter through open wounds, so keeping the cut covered can reduce chances of microorganisms entering.

	Conduct a simple demonstration to show how bacteria is killed off through hand washing: 1. Sprinkle black pepper on the learners' hand to represent bacteria 2. Hold it under running water and use soap to clean off the "bacteria"
30 minutes	**How our body fights disease:** ● **Stage 1:** Once a bacteria or virus enters our body, (refer to the image you drew yesterday),  ● **Stage 2:** Our body tries to fight the bacteria or virus off. **Draw** the scene of our body fighting an infection in the way that you think it happens using small fighters. An example is shown below:  ● During the fight our body gets sick. Ask the learner to name these "fighters". Some names they might come up with could include, soldiers, policemen, good guys etc. Role play the fight between the our body and the bad bacteria. ● **Stage 3:** Once the fighters have defeated the bacteria or virus, we feel better. **Draw** the scene of the bad bacteria defeated and the fighters having won.

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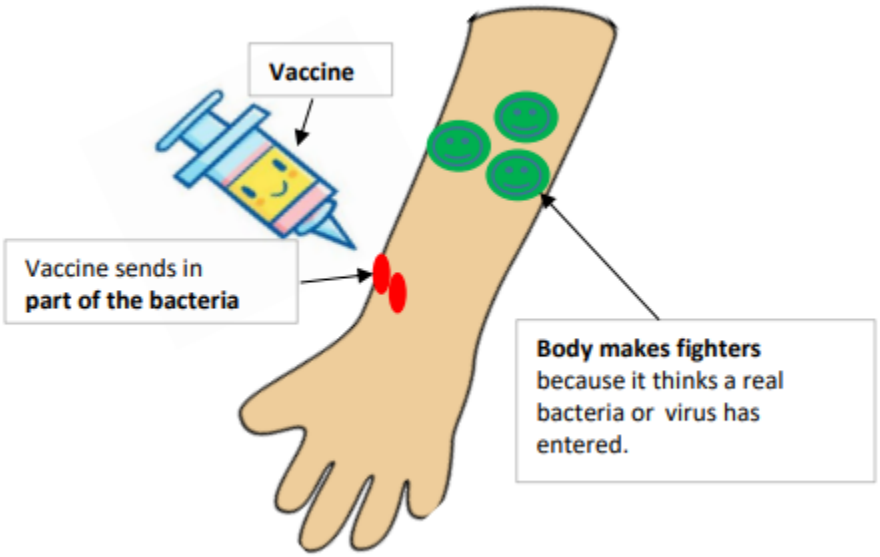
	Main takeaway: Ensure the learner is aware of how our body is feeling at each of the 3 stages.
10 minutes	**Think about it:** ● We feel sick once the bacteria has entered our body and when our body is fighting the bacteria. How long is this time period usually? Think about the last time you were sick – how long did you feel tired and weak? (Answer: ~5 days) ● How do you think we can shorten the time we are sick? (Answer: Help the fighters by taking your medicines, resting and eating healthy food.)

DAY 3

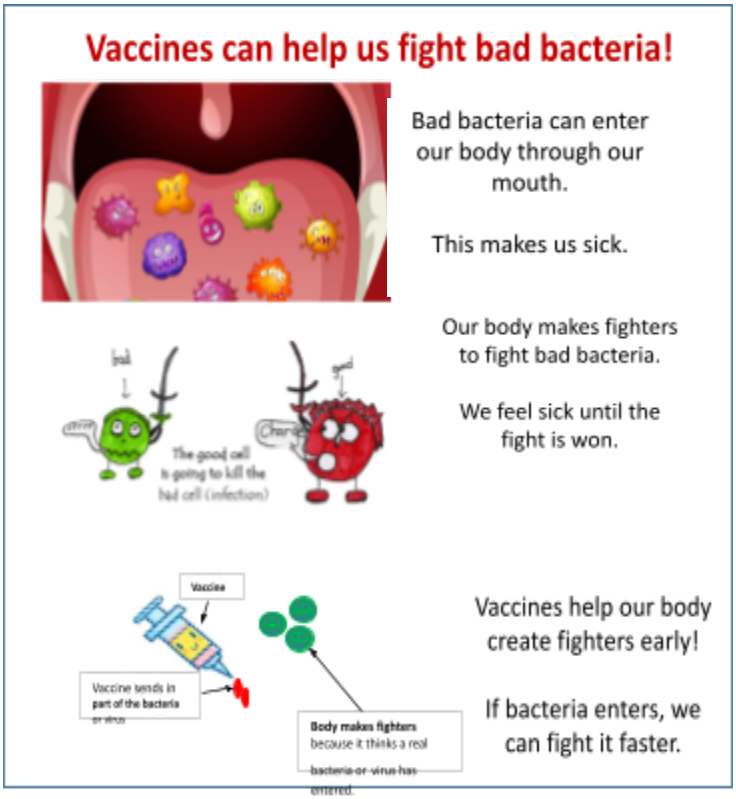
Today you will learn about the normal infection pattern or cycle.

Suggested Duration	Activity and Description
15 minutes	**An introduction to vaccines:** ● Discussion questions: Have you heard of the word 'vaccine'? What do you think a vaccine is and what do you think a vaccine does? *(Optional question: Have you been vaccinated before? If so, what disease was it against and how did you feel after it?* **Please note that medical information is private unless consent is provided to share.* ● A vaccine is injected to help us fight an infection caused by a bacteria or virus! ● The vaccine contains *a little bit* of the disease-causing bacteria or virus which tricks our body into thinking there is an invasion. But these bacteria and viruses in vaccines are not alive and cannot hurt us. ● If our body thinks it's getting invaded, what do you think it makes? (Answer: fighters)

	• But there is no infection so the fighters wait until there is a real infection and they fight off the bacteria or virus faster than usual. Since there is nothing to fight, we don't feel too sick after a vaccine.
20 minutes	**Create a labelled drawing showing how a vaccine helps create fighters in our body.** 
10 minutes	**Think about it:** • What do you think are the benefits of getting vaccinated? (Possible answers: 1. It helps prepare our body for real bacteria and viruses 2. A real infection will not last as long or will not be felt at all because fighters are already ready. 3. You reduce the chances of making others around you sick.) • Do you think one vaccine will create fighters for all diseases? Or do we need to take a different vaccine to create fighters for each disease? (Answer: Each bacteria that causes a specific disease is different so the fighters are different. Refer to images from Day 1 where bacteria and viruses are shown in different shapes and colours. Each bacteria and virus is different and affects our body in a different way. This means each disease needs its own vaccine.)

Day 4

Today you will create an informative poster about infections and vaccines.

Suggested Duration	Activity and Description
10 minutes	● Gather all the illustrations you created in the past 3 days. These include the following: o How viruses enter our body o How our body fights disease o Bad bacteria defeated by fighters o Vaccine helping to create fighters. ● Decide on the title of your poster and your main message. Some examples include: 1. The cycle of infection – why do we get sick? 2. Vaccines can help us fight bad bacteria and viruses!
50 minutes	● Create your poster by gluing in or taping in all the illustrations you made. Make sure to focus on the main message and ask for help to spell words you don't know. ● An example poster is shown below: 

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DAY 5

Today you will present your posters to your family and/or friends!

Suggested Duration	Activity and Description
15 minutes	• Prepare for the presentations by pasting all the learners' posters on the board or the wall.
3-5 minutes per learner	• Each learner presents their posters to their family (if present) and/or the other learners. They should focus on their main message and explain their drawings with logical chronological flow. • Criteria for presentation assessment: o Vocal projection: Can everyone in the room hear the presented clearly? o Content: Is the order of information logical? o Confidence and tone: Does the presenter understand the content presented? Were the questions answered correctly? o Presenting 3 stages of infection in a logical/sequenced manner o Clear presentation of how vaccines work and their benefits
1 minute per learner	• After each learner presents, the facilitator, family member or fellow learner asks the presenter **1 question** about their poster or about their experience learning about infection. Some questions you may ask include: 1. What did you find most interesting about this project? 2. How will you try to prevent you and your family from getting sick? 3. What do you think about vaccines? Are they good or bad, and why? 4. Can you clarify (a specific part) of your poster to us? What is happening in (this part) of your drawing?

Additional enrichment activities:	Students can prepare the following (literacy extension): - Imagine that you are a news presenter - Report on the latest COVID-19 vaccine released and how it is able to save many lives

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Modifications for simplification	If the learner is unable to create a drawing of how vaccines help us fight disease based on the information provided, show an example for them to replicate and walk them through the different stages.

ASSESSMENT CRITERIA

Students' participation in discussion questions throughout the 5 days.

- Assess the level of engagement, thoughtfulness and linking of new concepts learnt to experiences they have had with disease.
- Day 2 disease prevention discussion answers: Demonstration of critical thinking and application of new concepts when describing why they think disease prevention mechanisms work.
- The learner asks questions from the facilitator and other learners' during their presentation.

Observation skills

- Assess the extent to which the learners' illustrations contain detail. Have the concepts learned during the lesson been translated to their drawings?
- Assess their answers to observation-based discussion questions. Do their answers contain detail? Are accurate similarities and differences being identified?

Poster

- Assess whether the poster has a main message and focus that is consistent. A clear main message is seen and the poster is appropriately titled.
- Accuracy – the poster is scientifically accurate to the degree that the learners have been taught.

Presentation

- Communication – demonstrate confidence in the material presented including when answering questions.