

# Mosquitoes and Malaria







Hello! My name is Aiiisha.

And my name is Adam.

This booklet is about malaria, and the mosquitoes living here in Africa that transmit it between people.

With our friends, we learn all kinds of information from our teacher, like where mosquitoes live, which ones transmit malaria, and how research about them may give us new control tools to use against them one day in the future.

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I am printed without harming the environment.

**IMPERIAL**



A Vector Control Research Alliance





Fatima



Aiiisha



Adam



Mary



Charles



Hassan



Hey Aiiisha and Adam!

Hello...

What's wrong?



We weren't sleeping under our bed net. It was too hot!

Mother got very angry...



WHAT?! You have to sleep under the net!

You could get malaria if you don't!

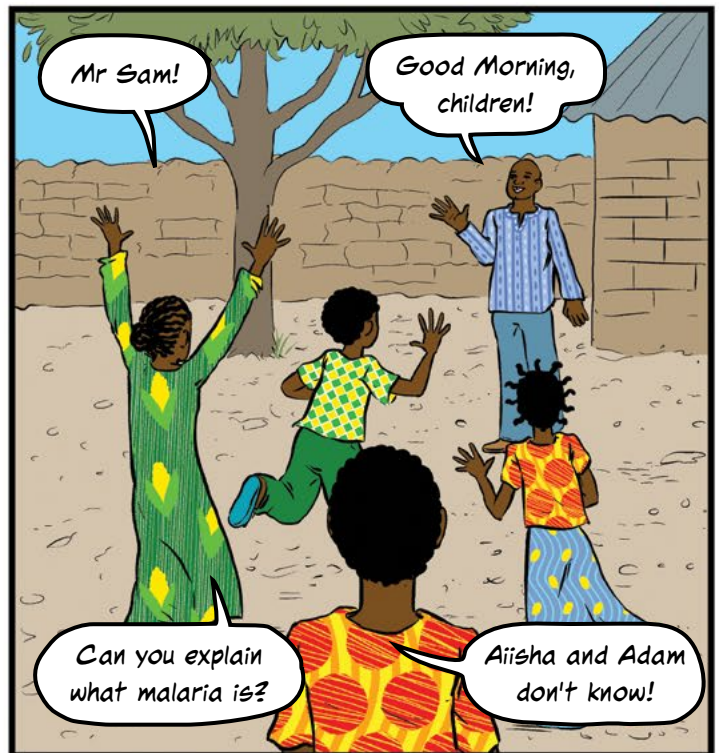


What is malaria?!



We should ask Mr Sam!

He's such a good teacher - so good at explaining things!



Mr Sam!

Good Morning, children!

Can you explain what malaria is?

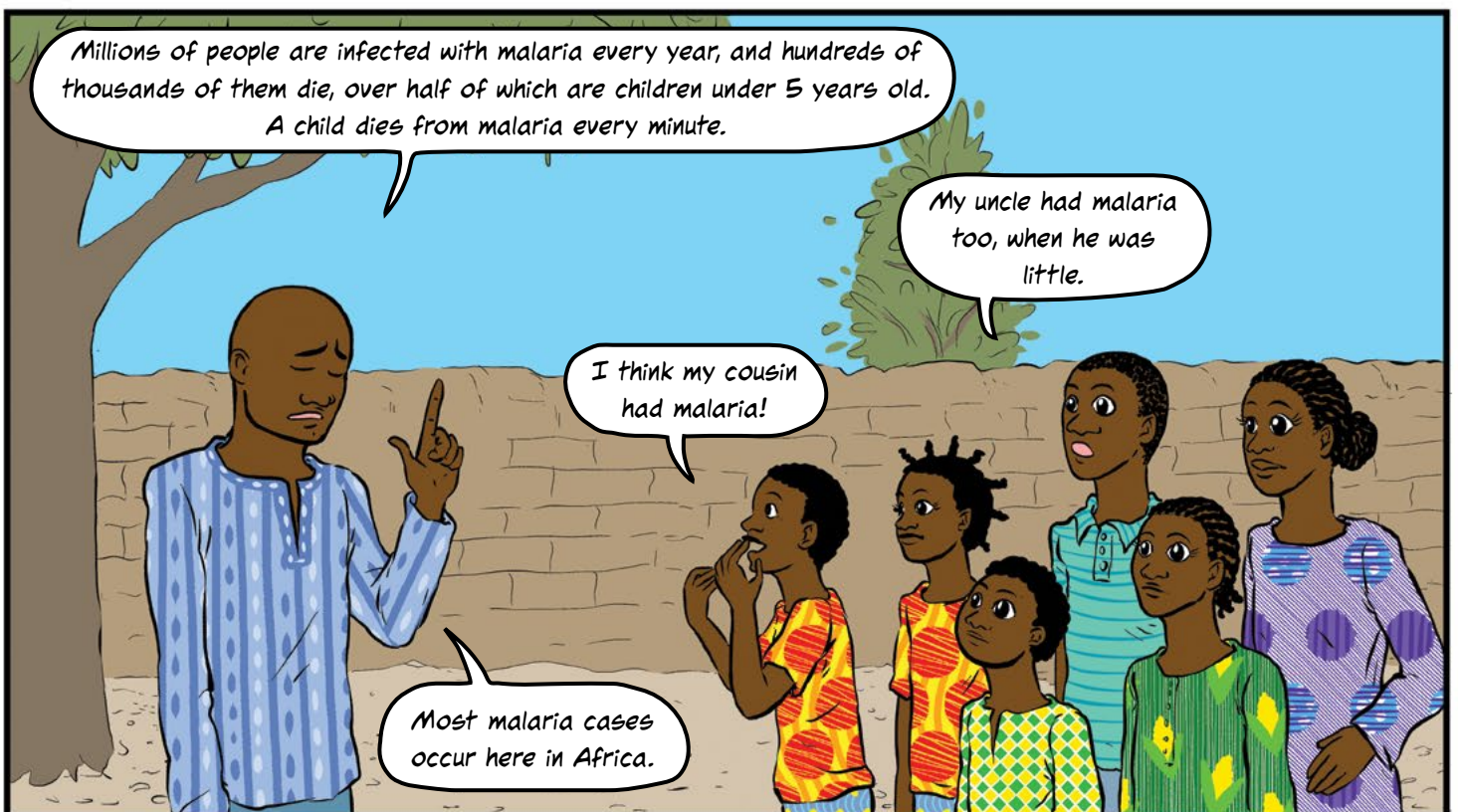
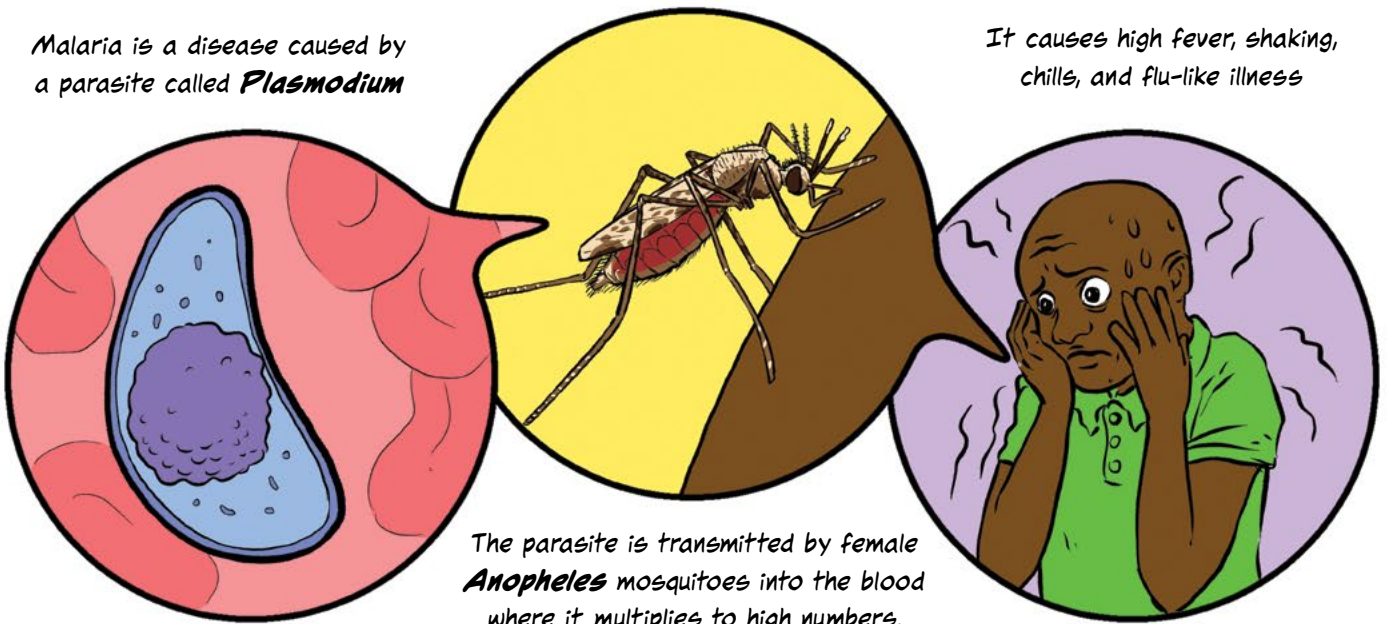
Aiiisha and Adam don't know!





Malaria is a disease caused by a parasite called **Plasmodium**

It causes high fever, shaking, chills, and flu-like illness





There are 3500 mosquito species in the world and 837 of them are found in Africa. The 3 major species that transmit malaria in Africa are:



*Anopheles gambiae*



*Anopheles coluzzii*

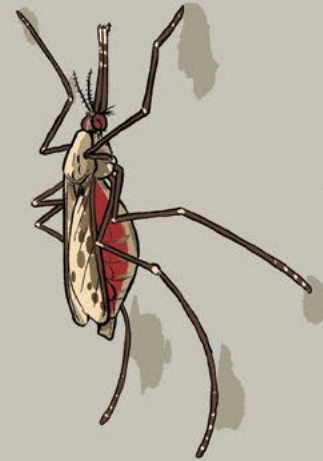
*Anopheles arabiensis*



They are widely distributed across sub-Saharan Africa.

Malaria transmission occurs via female *Anopheles* mosquitoes. When they bite infected people they pick up the parasite. They then carry the parasite and can infect new people with it when biting them for more blood meals.

Only females bite humans and transmit malaria because they need nutrients from human blood for their eggs to develop.

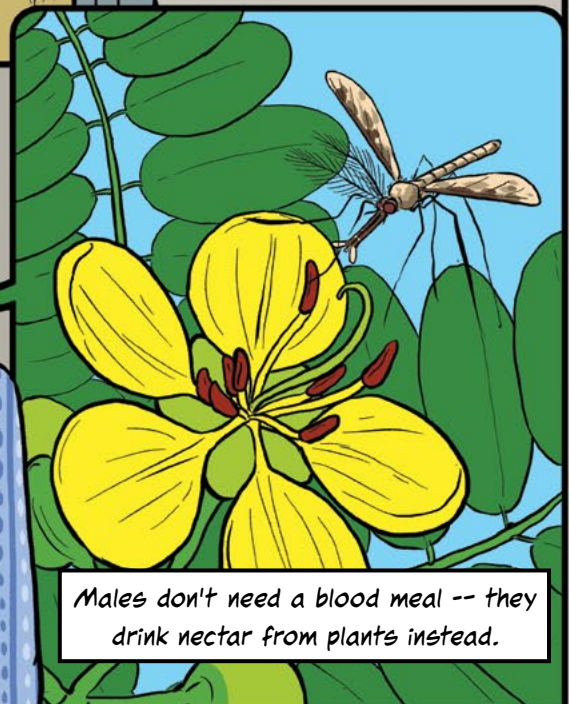


Females bite for a blood meal between sunset and sunrise, and then rest for 2-3 days until their eggs have developed.

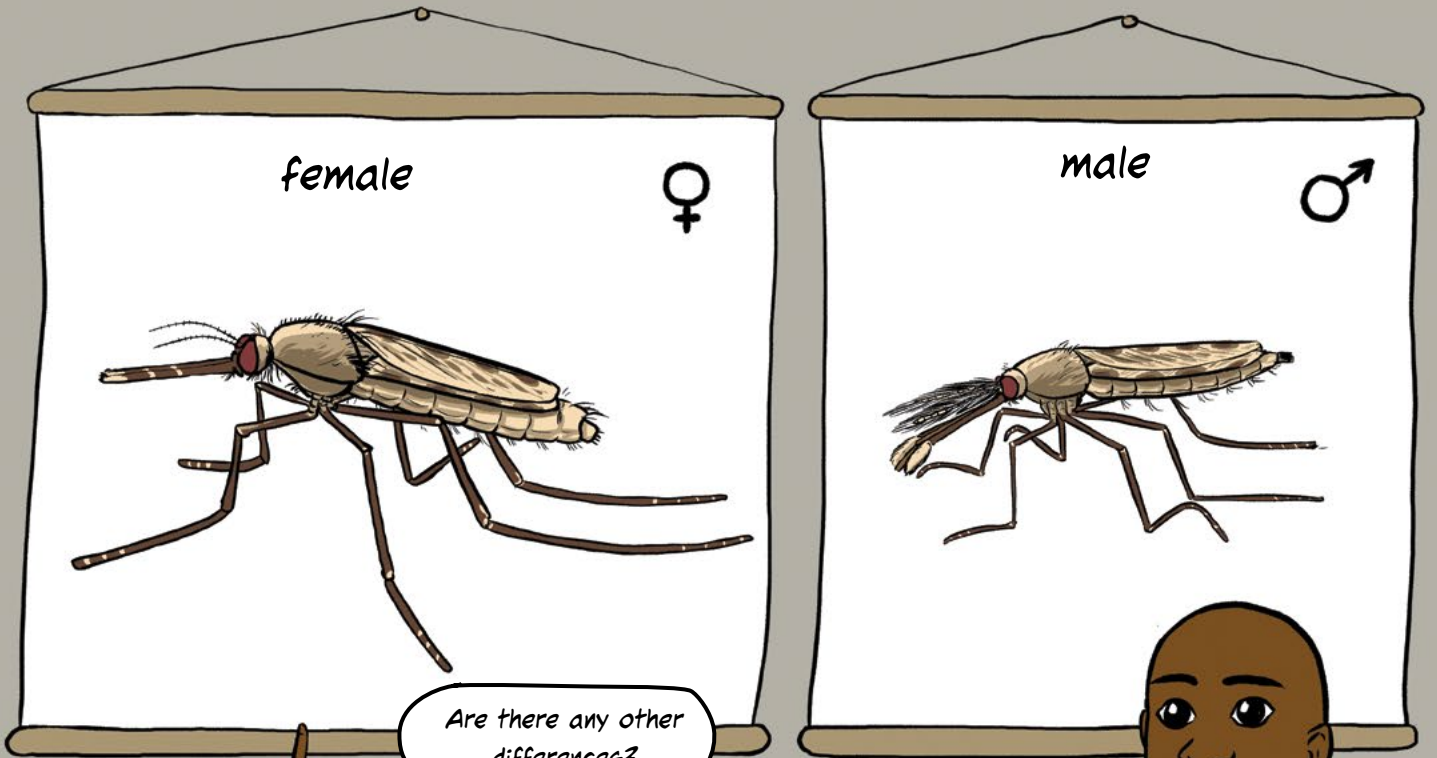
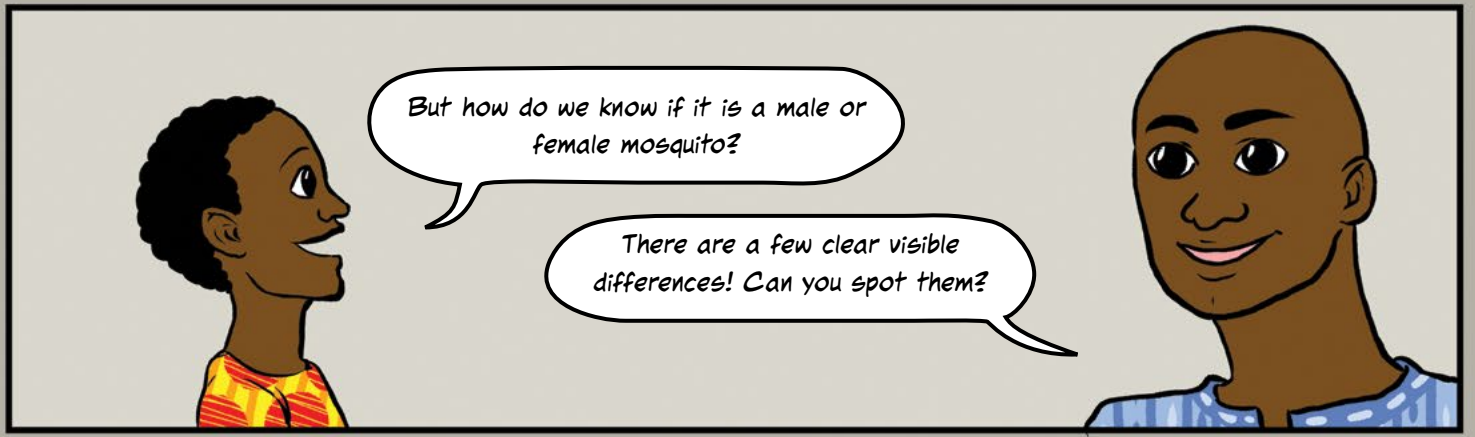
So, what do the males eat?



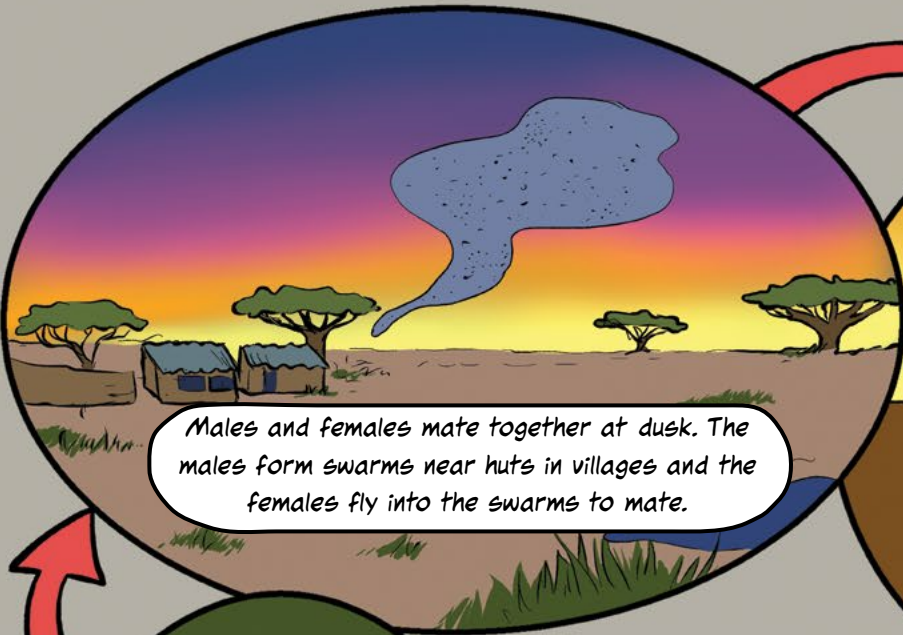
Males don't need a blood meal -- they drink nectar from plants instead.



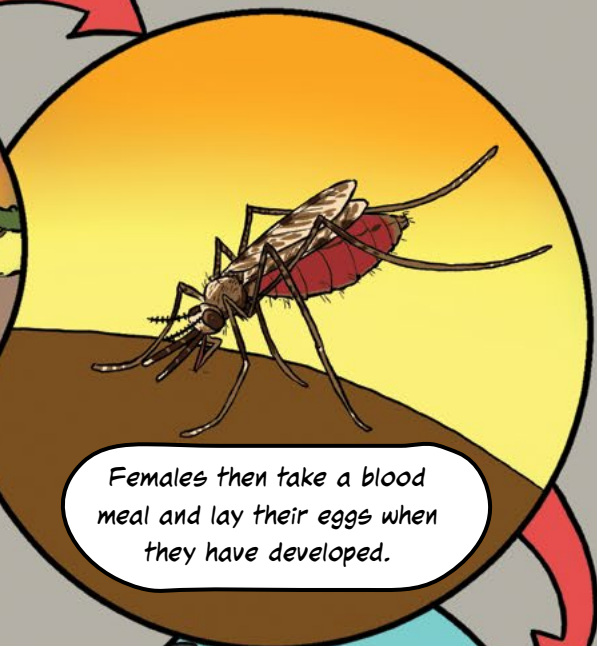




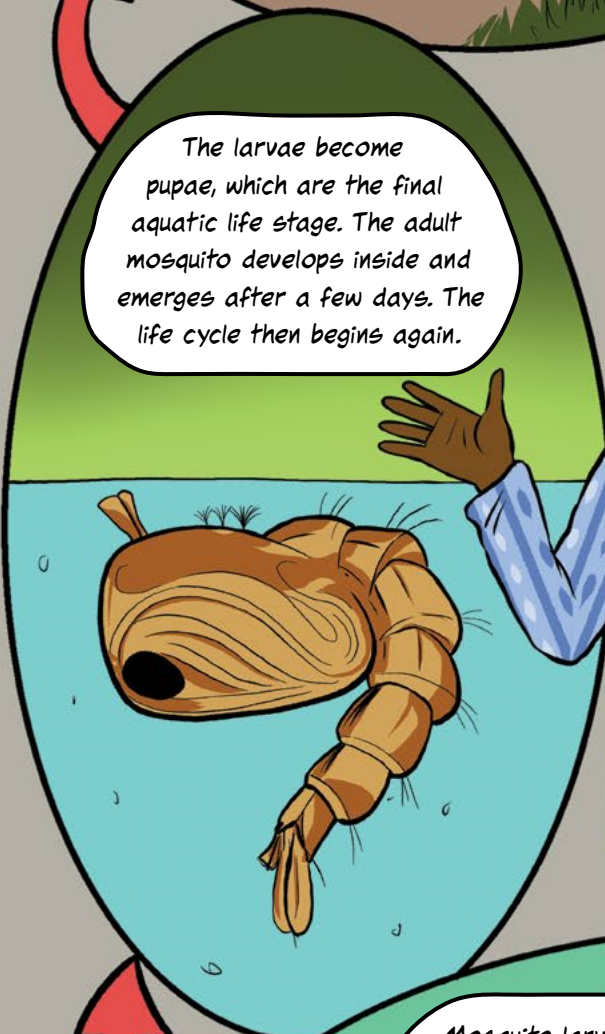




Males and females mate together at dusk. The males form swarms near huts in villages and the females fly into the swarms to mate.



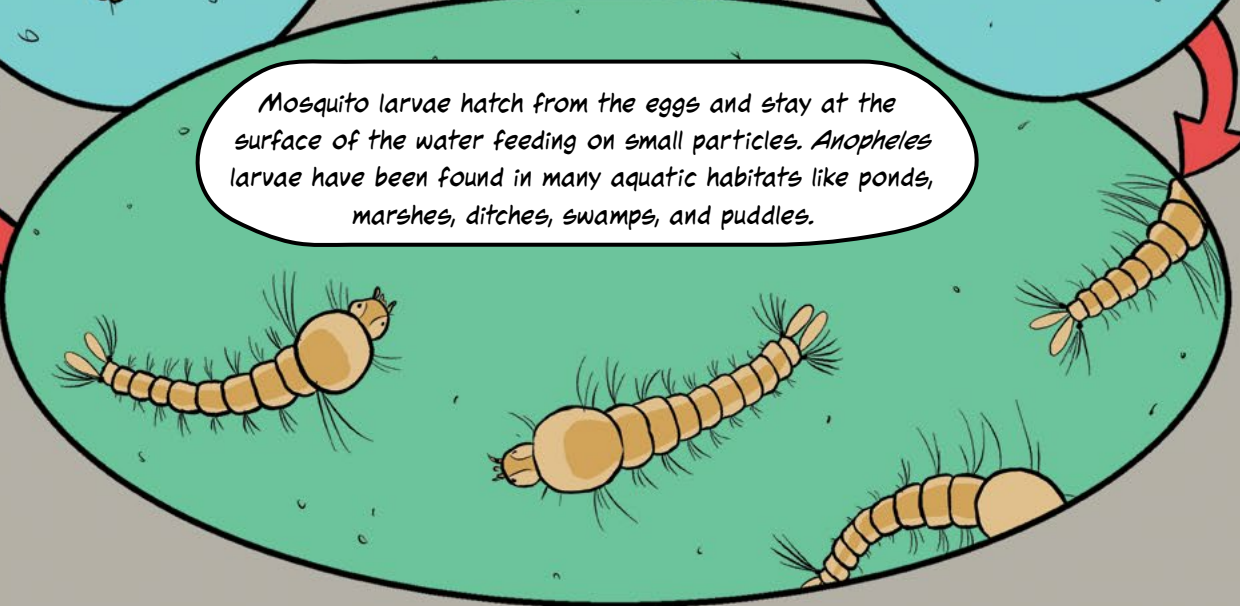
Females then take a blood meal and lay their eggs when they have developed.



The larvae become pupae, which are the final aquatic life stage. The adult mosquito develops inside and emerges after a few days. The life cycle then begins again.



The eggs are laid in water or they will dry out -- they have air sacs to keep them afloat.

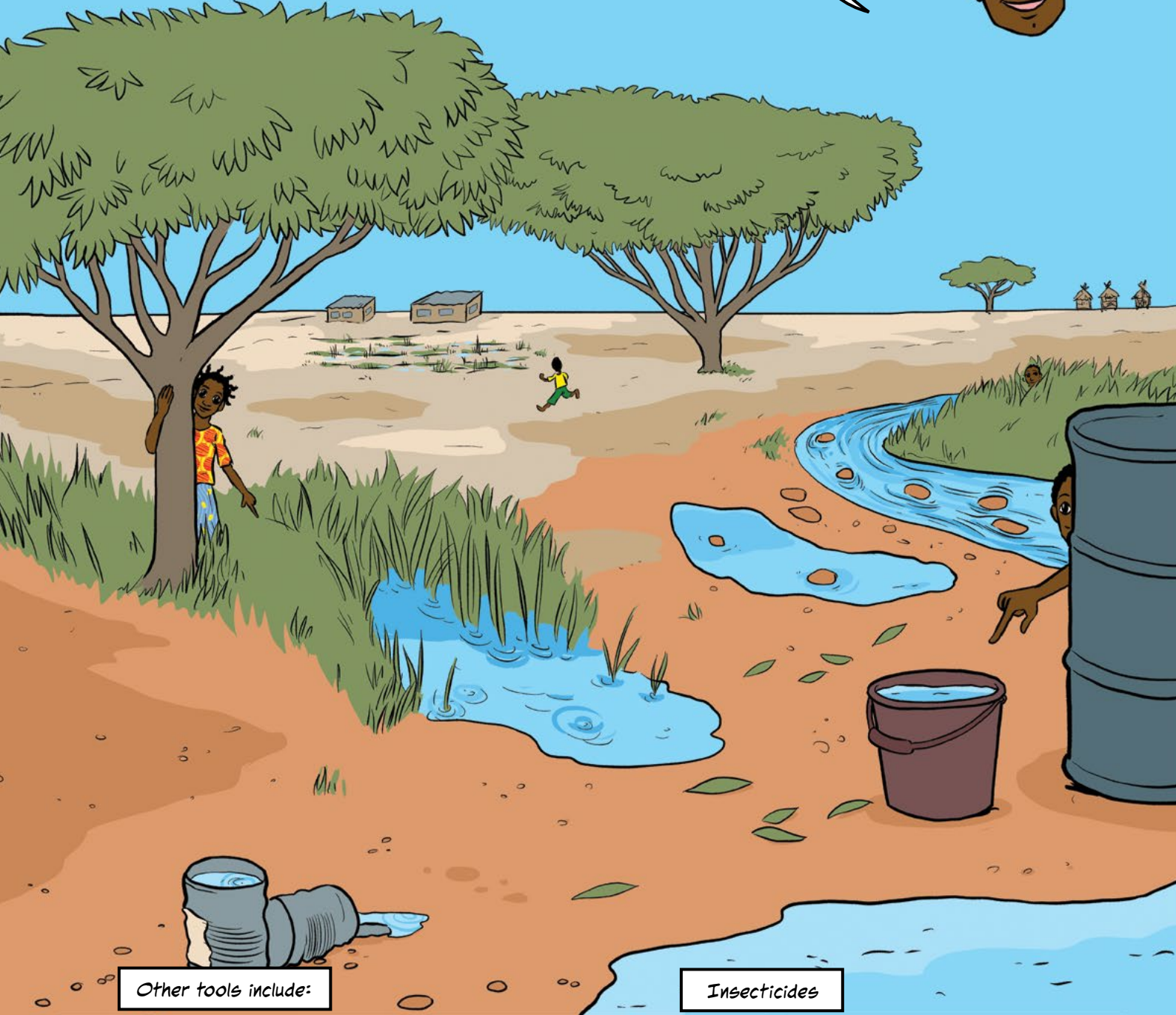


Mosquito larvae hatch from the eggs and stay at the surface of the water feeding on small particles. *Anopheles* larvae have been found in many aquatic habitats like ponds, marshes, ditches, swamps, and puddles.



Because *Anopheles* mosquitoes depend on water to complete their lifecycle, one way to combat malaria is to remove their aquatic breeding grounds.

Can you spot all the watery mosquito breeding grounds?



Other tools include:

Insecticides



Antimalarial drugs



Indoor residual spraying



Insecticide-treated bed nets



But malaria is still a big problem because:



The mosquitoes have developed some insecticide resistance...

...and the malaria parasite is developing resistance to various antimalarial drugs.



Excuse me, Mr Sam, but how do you know all this?

I went to a meeting with the Target Malaria Stakeholder Engagement team!

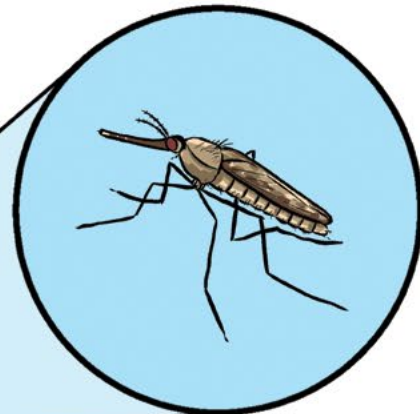
What is Target Malaria?

**Target Malaria** is a group of researchers that works across the world in Burkina Faso, Uganda, Ghana, UK, Italy, and USA.



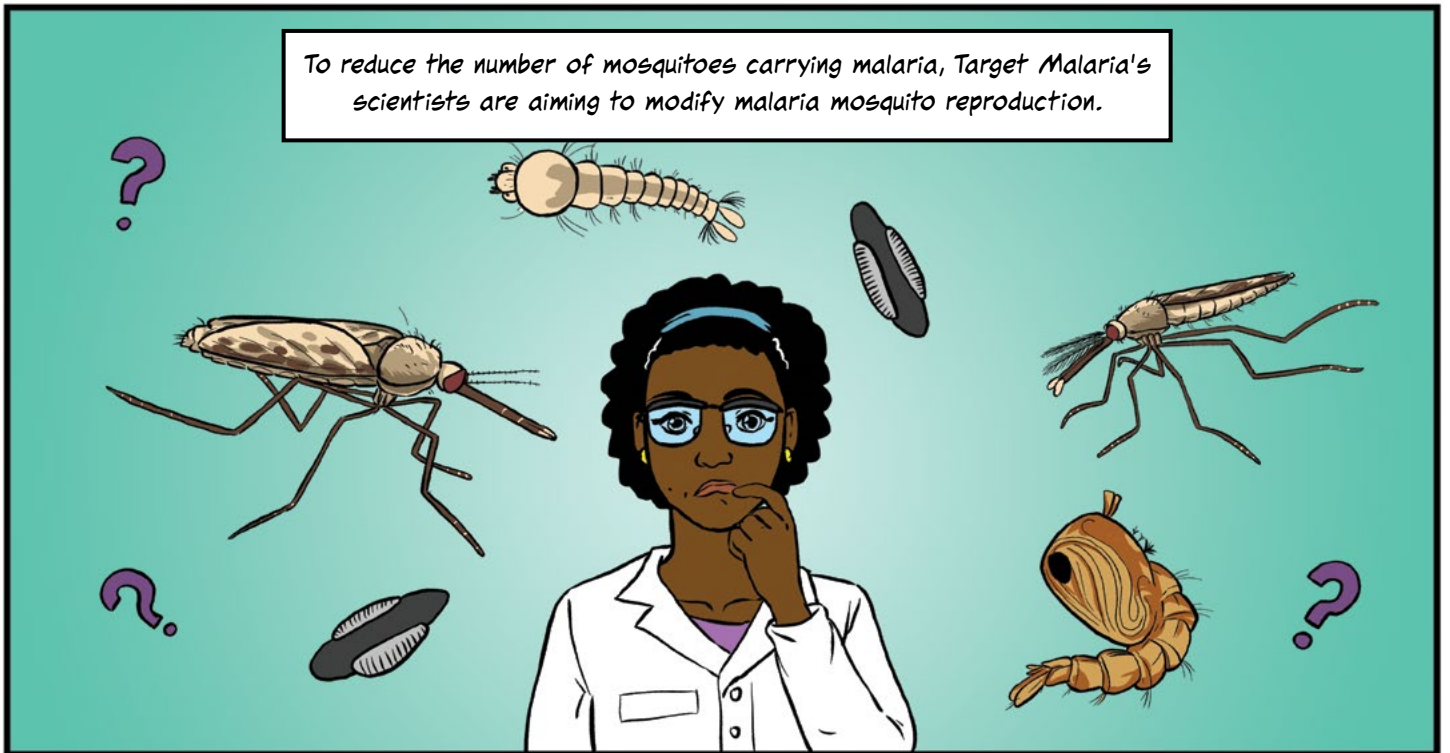
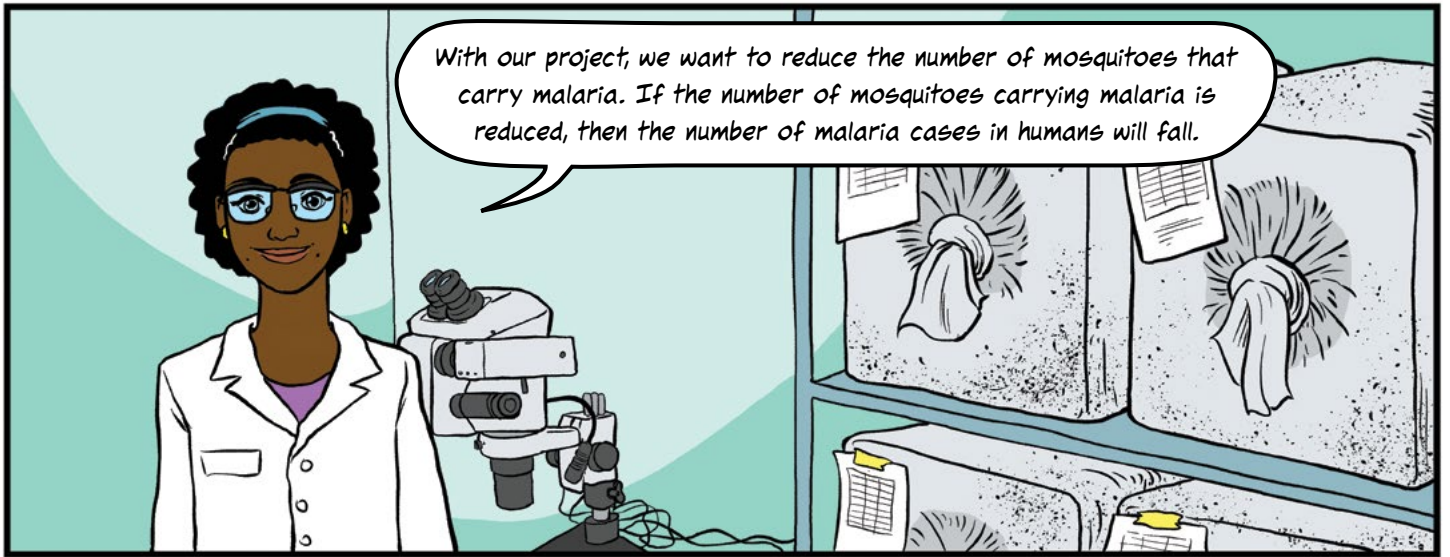
Target Malaria aims to research, develop, and share a new control tool for malaria.

In order to do this, they research and work on the 3 major malaria-carrying mosquito species that we mentioned before. Can you remember what they are?

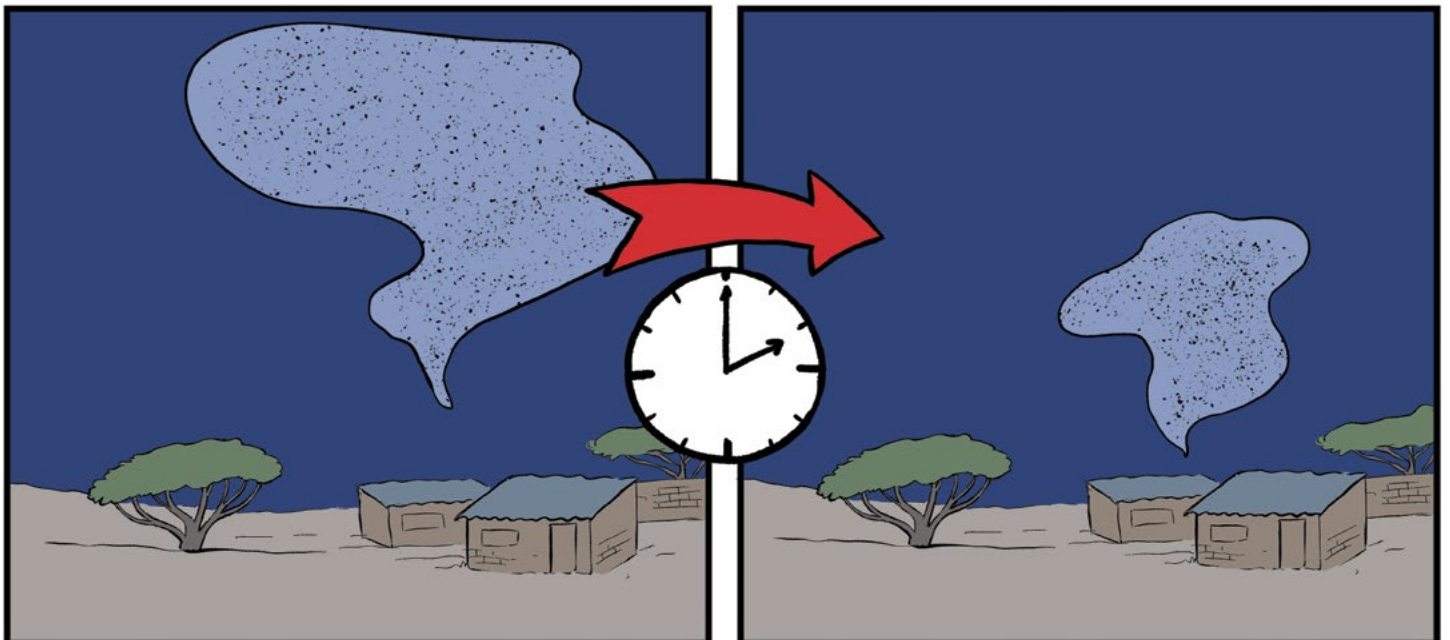


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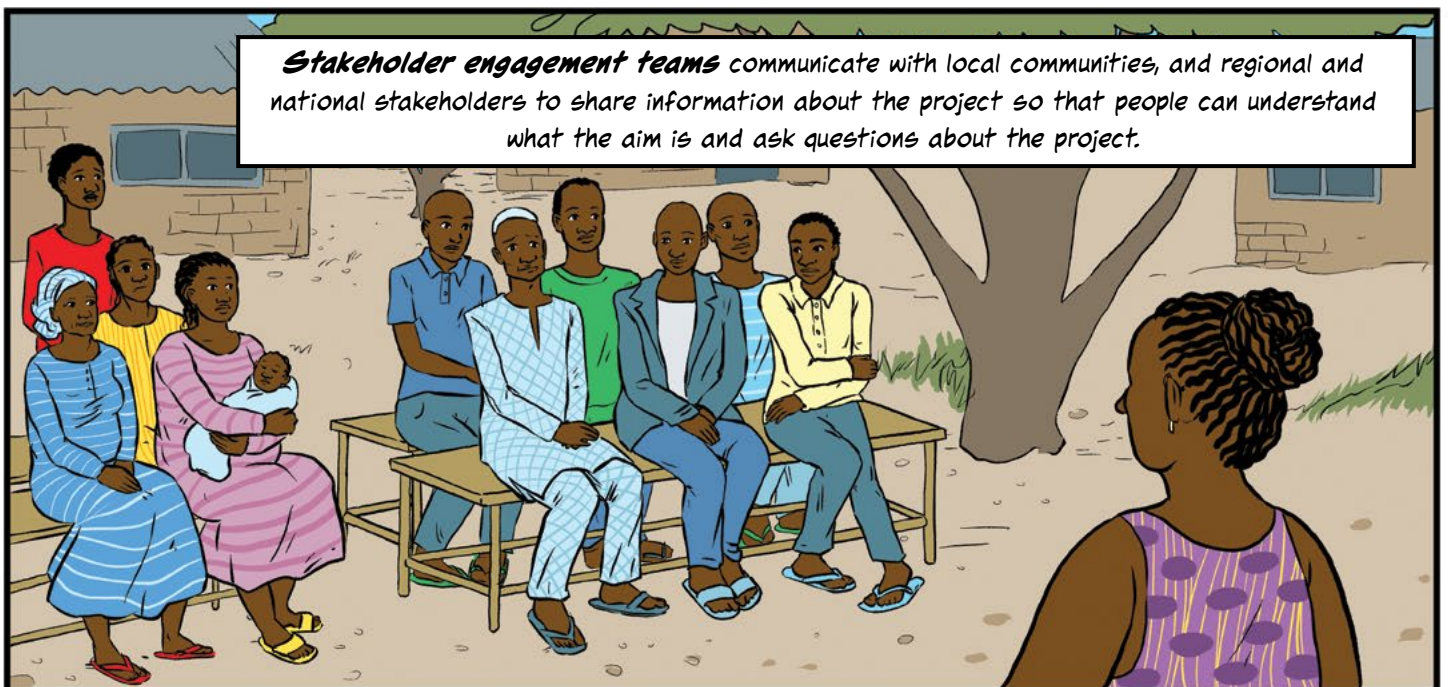
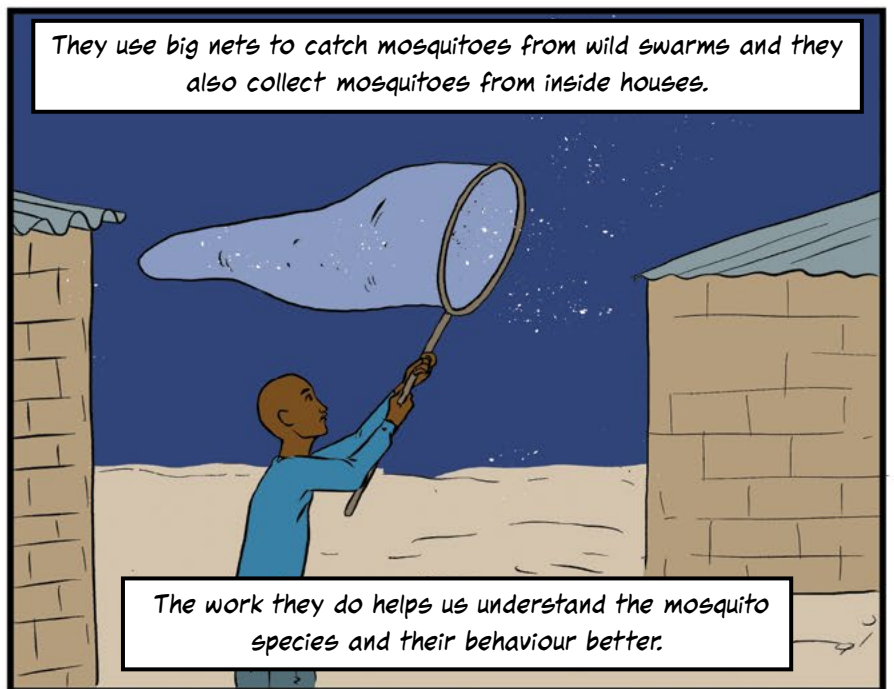
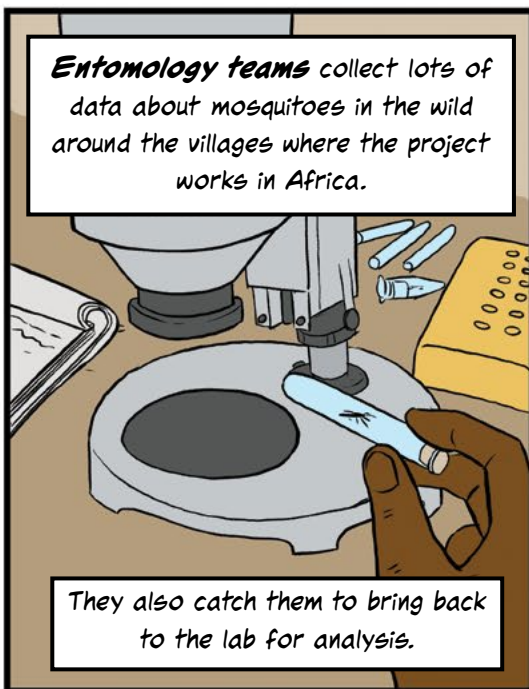
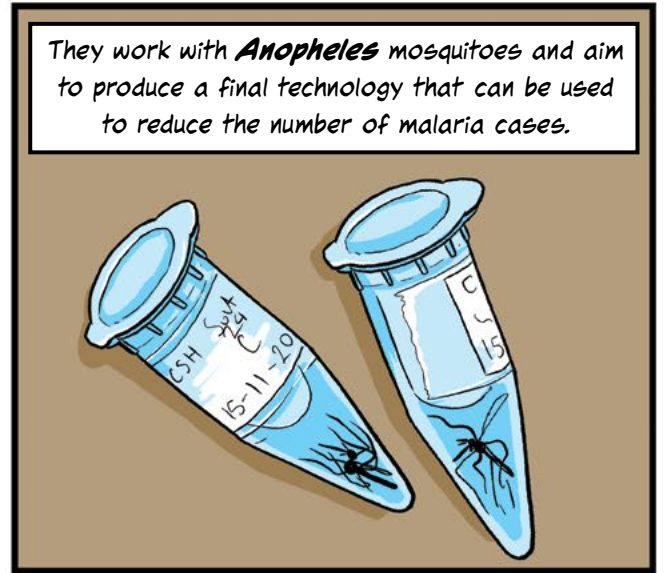
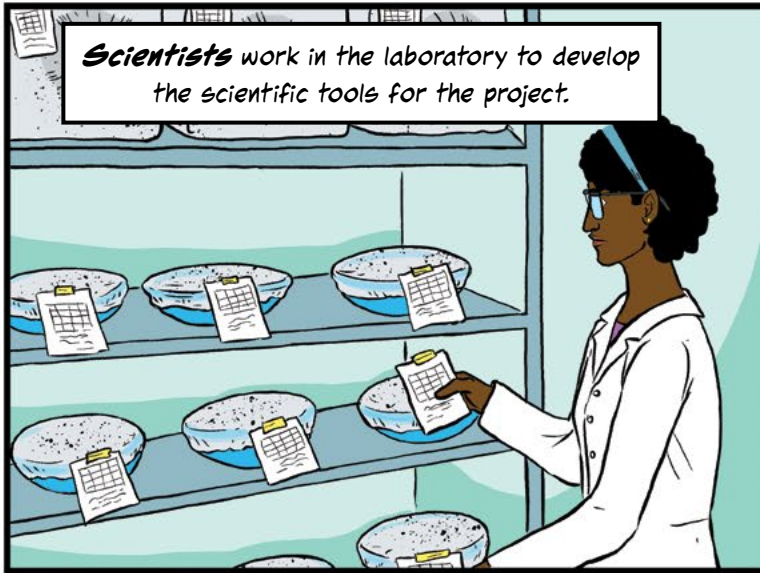


The aim is to modify reproduction in a way so that when the modified mosquitoes breed, the population reduces in size over time. This means there will be fewer mosquitoes that can carry malaria.





Everyone in the Target Malaria team helps with different aspects of the research:



This way people are informed about what the project teams are doing so that they can have a say.





Malaria continues to be a problem and a widespread disease, so remember to always continue with personal protection.

Remind your friends, family, and teachers to do the same.

