

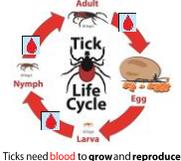
## Tick Biology and Safety Tips Lesson Plan (3<sup>rd</sup> Grade and up)

Marin/Sonoma Mosquito & Vector Control District

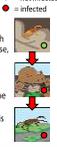
The following lesson plan can be used to introduce the tick-related materials that you received with your classroom tick packet. If you haven't already done so, download the Tick Biology and Safety Tips Presentation from our website at [bitly.com/tickschool](http://bitly.com/tickschool)

Talking points and sample questions for students are provided for each slide, but please don't feel like you need to read them like a script! Some slides have animations, and the comments are presented chronologically (click 1, click 2, etc.) as you click to advance through each slide. You might consider printing this lesson plan and working through the PowerPoint Show to prepare for the lesson. If you need the presentation in another format or have any questions regarding your classroom tick packet, please contact Eric Engh at [erice@msmosquito.com](mailto:erice@msmosquito.com)

### Tick Biology and Safety Tips (Presentation)

<p style="text-align: center;"><b>Slide 1: Introduction:</b></p> 	<ul style="list-style-type: none"> <li>• Today we will be talking about ticks. The last two pages of your Tick Activity Journal are blank so that you can take notes during the presentation.</li> <li>• By the end of this presentation, each of you will be able to identify places where ticks might be found and all four stages of the tick life cycle. We will also talk about the problems ticks cause and what you can do to protect yourself from ticks.</li> <li>• <b>Question:</b> Where would ticks most likely be in the habitat in this picture?             <ul style="list-style-type: none"> <li>○ Answer: students will probably recognize that adult ticks may be found in the grass alongside the trail, but may not realize that tick eggs and larvae are often in the leaf litter, and the nymphs are often found on rocks, logs, tree trunks and also in the leaf litter</li> </ul> </li> </ul>
<p style="text-align: center;"><b>Slide 2: Tick Life Cycle</b></p> 	<ul style="list-style-type: none"> <li>• <b>Intro:</b> Ticks are parasitic arachnids (not insects). They have a four stage life cycle (egg, larva, nymph, and adult). There are many different species (kinds) of ticks in the world, and the one in this picture is a western black-legged tick. We will focus on this species of tick because it is common in California and is known to spread certain diseases such as Lyme disease.</li> <li>• <b>Click 1:</b> All ticks require blood to grow and reproduce. Ticks bite many different animals (including people), and the animal they bite is called the host.</li> <li>• <b>Click 2:</b> A tiny, 6-legged larva needs blood from an animal in order to grow into a nymph. Tick larvae typically do not bite people. After the larva bites an animal, it drops off the host, and molts into a nymph. The 8-legged nymph is larger than a larva, but it is still very small (about the size of a poppy seed) and can be difficult to find if it has attached itself to you. Nymphs will bite people and can spread diseases. After the nymph gets the blood it needs, it drops off the host and can molt into an adult. Eight-legged adult ticks are much larger than nymphs. Adult western black-</li> </ul>

	<p>legged males are smaller than the females, but this is not always the case in all species. Both males and females feed on blood, and females take in a large amount of blood which is used to nourish eggs (sometimes over 1,000!). The female drops off the host, and will deposit her eggs on the ground.</p> <ul style="list-style-type: none"> <li>• <b>Question:</b> How many times would a female western black-legged tick need to bite an animal during its lifetime? <ul style="list-style-type: none"> <li>○ Answer: 3 times— once as a larva, once as a nymph, and once as an adult.</li> </ul> </li> </ul>
<p><b>Slide 3: Tick Habitat &amp; Hosts</b></p> 	<ul style="list-style-type: none"> <li>• <b>Intro:</b> Ticks are often found in natural places where people hike, play, work or live. Not all tick habitat looks like this picture, but the picture shows some places where ticks can easily be found. The different life stages of ticks are often found in slightly different places within the habitat, and often bite certain animals.</li> <li>• <b>Click 1:</b> Eggs &amp; larvae are often found near the ground, especially in leaf litter.</li> <li>• <b>Click 2:</b> A larva waits to bite a small animal such as a rodent or bird that also spends time on the ground.</li> <li>• <b>Click 3:</b> Nymphs may also be found in leaf litter, but often climb up onto a mossy rock, log, or tree trunk to wait for a host.</li> <li>• <b>Click 4:</b> Nymphs often find animals such as lizards or rodents that also use these places for shelter or to sun themselves. Remember, nymphs will also bite people, so try not to climb or sit on these places when you are in tick habitat!</li> <li>• <b>Click 5:</b> Adults climb up grass or other plants, often alongside a trail.</li> <li>• <b>Click 6:</b> Adult ticks wait on vegetation to bite a large animal that passes by, especially deer, but also people, dogs, horses, etc.</li> </ul>
<p><b>Slide 4: Tick Safety Tips</b></p> 	<ul style="list-style-type: none"> <li>• <b>Intro:</b> If you plan on visiting tick habitat, there are things you can do before, during and after your visit to protect yourself from ticks.</li> <li>• <b>Click 1 (Before your visit to tick habitat):</b> Put on light colored clothing. If a tick crawls onto your clothes it will be much easier to spot the tick. Long sleeves and pants provide more protection than shorts and short sleeves.</li> <li>• <b>Click 2 (Before your visit to tick habitat):</b> Talk to your parents about using a tick repellent. Many people realize that repellents can be used against mosquitoes, but there are also repellents available that are effective against ticks. Make sure that you (and your parents) carefully read the label before using any repellent.</li> <li>• <b>Click 3 (During your visit to tick habitat):</b> If you are hiking, stay in the center of the trail whenever possible! If you walk along the sides of the trail, you are more likely to brush up against vegetation where ticks are waiting. <ul style="list-style-type: none"> <li>○ <b>Question:</b> What tick life stage is most likely in tall grass alongside the trail? (adults)</li> <li>○ <b>Question:</b> What tick life stage is most likely on rocks, logs, or tree trunks? (nymphs)</li> </ul> </li> <li>• <b>Click 4 (During your visit to tick habitat):</b> Check yourself and the people you are with for ticks often. It is a good idea to “buddy up” and take turns</li> </ul>

	<p>checking each other.</p> <ul style="list-style-type: none"> <li>● <b>Click 5 (After your visit to tick habitat):</b> Dry out those ticks! Ticks could be hiding in clothing and you don't want to bring them inside. It is a good idea to dry your clothes on high heat in the dryer. The hot air will dry out and kill any ticks hiding in your clothes.</li> <li>● <b>Click 6 (After your visit to tick habitat):</b> Take a shower! Showering is a good way to check your entire body for any unwanted 8-legged "hitch hikers".</li> </ul>
<p><b>Slide 5: Removing a Tick</b></p> <p>Removing a Tick</p> <ol style="list-style-type: none"> <li>1. Get an adult as soon as possible!</li> <li>2. Make sure they follow directions from a reliable source.</li> <li>3. Do not squish, burn, smother or twist ticks!</li> </ol> 	<ul style="list-style-type: none"> <li>● Even if you are careful when you visit tick habitat, there is a chance that you may be bitten by a tick. If this happens, don't panic, but find an adult as soon as possible. There are detailed directions for removing a tick in the tick brochure that you will be taking home.</li> <li>● There are many myths about interesting ways to remove ticks, but many of these methods can actually make the problem worse. The picture shows someone using tweezers to grasp the tick as close to the skin as possible and carefully pulling straight up.</li> </ul>
<p><b>Slide 6: Ticks and Diseases</b></p> <p>Ticks and Diseases</p> <ul style="list-style-type: none"> <li>• Ticks are known to spread several diseases in California.</li> <li>• Certain kinds (species) of ticks spread certain diseases (not every single tick is carrying a disease).</li> <li>• The most common disease ticks spread to people in California is called Lyme disease.</li> <li>• If you get bitten by a tick, tell an adult right away so that it can be properly removed as soon as possible.</li> </ul>	<ul style="list-style-type: none"> <li>● The purpose of this presentation is not to scare you, but there are diseases that ticks can spread to people (you can just read and discuss the bullet points on the slide).</li> <li>● Prompt removal of a tick is very important.</li> </ul>
<p><b>Slide 7: Example: Lyme disease</b></p> <p>Example: Lyme Disease</p> <ul style="list-style-type: none"> <li>• A western black-legged tick larva searches for a host.</li> <li>• If it bites an animal that is infected with the bacterium that causes Lyme disease, the tick can become infected.</li> <li>• After feeding, the infected larva molts into an infected nymph.</li> <li>• If an infected nymph bites a person, the person may become sick.</li> <li>• Infected adult ticks can also spread this disease to people.</li> </ul> 	<ul style="list-style-type: none"> <li>● As you click through, simply read the bullet points.</li> <li>● It should also be mentioned that not all species of ticks are known to spread this disease, and not all western black-legged ticks are infected with the bacterium that causes this disease.</li> </ul>
<p><b>Slide 8: Your Classroom Tick Packet</b></p> <p>Your Classroom Tick Packet</p> 	<ul style="list-style-type: none"> <li>● Your packet includes a tick magnifier, a tick ID card, a life cycle puzzle, and an activity journal.</li> <li>● Use the magnifier to help find ticks that may have hitched a ride on your (or your dog) on a hiking trip.</li> <li>● Use the tick ID card to identify any ticks that you find. On the back, it also has instructions about how to safely remove a tick.</li> <li>● The puzzle is for your class to share. Use a Ziploc bag to store the pieces.</li> </ul>
<p><b>Slide 9: Your Activity Journal</b></p> <p>Your Activity Journal...</p> <ul style="list-style-type: none"> <li>• Pages 1-4 review what you learned in this presentation</li> <li>• Pages 5-8 are activities for you to complete</li> <li>• If you have questions, have your teacher email Eric Engh at <a href="mailto:eric@msmosquito.com">eric@msmosquito.com</a></li> <li>• Remember what you learned when you visit tick habitat!</li> </ul> 	<ul style="list-style-type: none"> <li>● This would be a good time to answer questions from the lesson, and if there are any that you are not sure about, do not hesitate to contact Eric Engh at <a href="mailto:eric@msmosquito.com">eric@msmosquito.com</a>.</li> <li>● The maze on the right is in the Activity Journal. Students guide a tick through the four stages of its life cycle, in the habitat where each life stage is found.</li> <li>● If your class will be visiting tick habitat together (hiking, outdoor school, etc.), please remind them at that time to discuss what they learned in this presentation.</li> </ul>