

STATE OF NEW HAMPSHIRE
TICKBORNE DISEASE CURRICULUM KIT
GRADES 2-3



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New Hampshire Department of Health and Human Services

Division of Public Health Services

Table of Contents

Introduction	3
Lesson Summaries.....	4
Lesson 1 – Identifying Ticks	5
Identifying Ticks Lesson Plan.....	6
Identifying Ticks Worksheet.....	10
Lesson 2 – Let’s Go Shopping!	11
Let’s Go Shopping! Lesson Plan.....	12
Let’s Go Shopping! Worksheet.....	15
Lesson 3 – The Life Cycle of a Tick	18
The Life Cycle of a Tick Lesson Plan.....	19
The Life Cycle of a Tick Worksheet.....	22
Lesson 4 – How to Remove a Tick	23
How to Remove a Tick Lesson Plan.....	24
How to Remove a Tick Worksheet.....	27
Lesson 5 – All About Ticks – Searching for the Answers	29
All About Ticks – Searching for the Answers Lesson Plan.....	30
All About Ticks – Searching for the Answers Worksheet.....	36

Introduction

Lyme disease and other tickborne diseases are an important cause of illness in New Hampshire (NH). Over the last decade reported cases of Lyme disease have increased significantly in NH. In 2013, the Centers for Disease Control and Prevention (CDC) reported that NH had the second highest incidence rate of Lyme disease in the United States. Data also show that the annual incidence of Lyme disease is highest among the 5-14 year age group, but is high for all primary and secondary aged children.

In response to this growing epidemic, the NH Department of Health and Human Services (DHHS), Division of Public Health Services (DPHS) released its first [State of New Hampshire Tickborne Disease Prevention Plan](#) in March of 2015. The plan outlines recommended prevention measures and actions to prevent tickborne disease, including educational outreach, which will be the main method that the NH DHHS will use to address tickborne disease in NH.

In an effort to reach NH's youngest populations, the NH DHHS has developed three Tickborne Disease Prevention Curriculum Kits (grades K-1, 2-3, and 4-5), each with a primary focus on personal protective measures. Efforts have been made to adapt lessons contained within the Curriculum Kits to fit within the Common Core State Standards, the Next Generation Science Standards performance expectations, and the NH Curriculum Frameworks for science and health. Each activity addresses one or more curriculum standards, and may include standards across multiple curriculum areas. These efforts will allow school districts and teachers to utilize the materials provided by the NH DHHS to educate NH children about tickborne disease prevention without requiring significant restructuring of the established curricula.

What You Will Find in Each TBD Curriculum Kit:

- ✓ Activities that have been piloted to the specified grade levels
- ✓ Reproducible activity sheets
- ✓ Teacher's guides containing background information with underlined keywords, additional resources, and a detailed lesson plan specific to each activity

Lesson Summaries

Lesson 1

Identifying Ticks

This lesson will focus on the body parts of a tick, and the differences in appearance between tick species. Students will read the definitions of a tick's body parts, and will have to interpret the definitions in order to label the tick diagram.

Lesson 2

The Life Cycle of a Tick

This lesson was developed to teach students about life science, with a primary focus on the life cycle of a tick, and the changes in appearance and behavior exhibited by a tick as it progresses through each life stage. Students will use their writing skills to provide a description of the tick at each life stage, as well as identify one type of host that ticks feed on during each stage beginning at stage 2.

Lesson 3

Let's Go Shopping!

This lesson teaches students about tickborne disease prevention, while also developing their math skills. Students will have a specified amount of money and must 'go shopping' only for clothing items that will help prevent tick bites, but must also be sure not to exceed the amount of money they have.

Lesson 4

How to Remove a Tick

This lesson was developed to teach students the steps for proper tick removal. Students will also develop a Tick Removal Guide that shows and explains the steps for removing a tick, thus building upon students' existing writing skills.

Lesson 5

All About Ticks – Searching for the Answers

This lesson teaches students about certain characteristics of ticks, their habitat, and tickborne disease prevention, while also developing their listening and reading comprehension, and writing skills.

Lesson 1

Identifying Ticks

Background

Ticks can either be hard-bodied or soft-bodied. The blacklegged tick and the American dog tick, two of the ticks that are found in New Hampshire, are hard-bodied ticks. Hard-bodied ticks have a scutum, or shield, whereas soft-bodied ticks do not. Adult male hard-bodied ticks have a scutum that covers the entire back surface of the tick, and is not flexible, or changeable; whereas in adult female hard-bodied ticks, the scutum is smaller, covering only a small portion near the front of the tick. The abdomen is flexible and this flexibility allows for expansion, or engorgement, while the tick is feeding.

Ticks differ in color based on the type and gender of the tick. Adult female blacklegged ticks have a dark brown scutum, and a red/brown abdomen, or stomach area. Adult male blacklegged ticks have a dark brown scutum and abdomen. Adult female American dog ticks have a dark brown abdomen and a scutum with white or beige markings. Adult male American dog ticks have a mix of dark brown and white or beige colors across their entire back (scutum).

Similar to spiders, nymph and adult ticks have eight legs, or four pairs (larvae have six legs, or three pairs). The blacklegged tick has very dark brown legs, and may even appear to be black – this how it got its name! The American dog tick has red/brown legs.

Adult female blacklegged ticks have longer mouths than adult male blacklegged ticks. Both adult female and male American dog ticks have shorter mouths than female blacklegged ticks. Ticks' mouths consist of three parts that are used for touching, tasting, and attaching. Their mouths consist of curved barb-like structures, which is why it is difficult to remove a tick once it attaches.

Lesson Plan

Title: Identifying Ticks

Subject(s): Science and English Language Arts/Literacy

Grade Level: 2-3

Duration: 50 – 60 minutes

Materials Required: Identifying Ticks worksheet, writing implement, crayons or colored pencils (optional), ticks* (optional), and magnifying glass (optional)

Key Vocabulary: abdomen, engorge, flexible, scutum

Description: This lesson was developed to teach students about the body parts of a tick, and the differences in appearance between the blacklegged tick and the American dog tick.

Objectives: Students will be able to name and label four main body parts of a hard-bodied tick and describe the differences in appearance between an adult male and female tick as well as between the blacklegged tick and the American dog tick. Students will also be able to define the four key vocabulary words.

Procedure:

- 1.) Introduce the lesson with a discussion about ticks and tick species. If this is the first lesson or discussion about ticks, begin by asking students some basic questions about ticks. Some suggestions are listed below (10 – 15 minutes):
 - “Who knows what a tick is?”
 - “Has anyone ever seen a tick?”
 - “What did it look like?”
 - “Has anyone ever had a tick on them?”
 - “What did you do when you found the tick on you?”

Optional step: Pass the magnifying glass and vial or container of ticks around for students to observe, and then ask students to describe various features of the ticks that they observed. (10 minutes)
- 2.) Read the background information for this lesson to the students. (5 minutes)
- 3.) Pass out one Identifying Ticks worksheet to each student.
- 4.) Read the instructions together as a class. (2 minutes)
- 5.) Encourage students to complete the worksheet independently. (15 minutes)

- 6.) Once the students have labeled all of the body parts, the teacher may decide to let the students color the tick. (10 minutes)
- 7.) Review the answers together as a class. (5 – 10 minutes)

Helpful Resources:

http://www.cdc.gov/ticks/life_cycle_and_hosts.html

http://www.tickencounter.org/tick_identification

Standards Met:

New Hampshire Curriculum Framework - Science Process Skills

SPS1– Scientific Inquiry and Critical Thinking Skills (INQ)

- S:SPS1:4:1.1 Extend the senses using simple tools. – Grades 3 and 4^E
- S:SPS1:4:1.7 Ask questions about objects, organisms and events in their local environment. – Grades 3 and 4

SPS2– Unifying Concepts of Science

- S:SPS2:2:4.1 Discover that things change in some ways and stay the same in some ways. – Grades 1 and 2

SPS3– Personal, Social, and Technological Perspectives

- S:SPS3:2:1.2 Take turns. – Grades 1 and 2^E
- S:SPS3:2:3.1 Demonstrate that all tools have a special purpose (e.g., to measure, to help in observations, to make things or to make things better). – Grades 1 and 2^E

New Hampshire Curriculum Framework - Life Science

LS1– All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

- S:LS1:4:2.1 Recognize that living organisms have certain structures and systems that perform specific functions, facilitating survival, growth and reproduction. – Grades 3 and 4

LS3– Groups of organisms show evidence of change over time (e.g. evolution, natural selection, structures, behaviors, and biochemistry).

- S:LS3:2:3.2 Recognize that there are different species of living things in various places around the world. – Grades K, 1 and 2
- S:LS3:4:3.1 Recognize that individuals of the same species differ in their characteristics; and explain that sometimes these differences give individuals an advantage in survival and reproduction. – Grades 3 and 4

LS5– The growth of scientific knowledge in Life Science has been advanced through the development of technology and is used (alone or in combination with other sciences) to identify, understand and solve local and global issues.

- S:LS5:4:2.1 Demonstrate the use of appropriate tools and simple equipment, such as thermometers, magnifiers and microscopes to gather data and extend the senses. – Grades 3 and 4^E

Next Generation Science Standards

From Molecules to Organisms: Structures and Processes

- 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction – Grade 4

New Hampshire Curriculum Framework - Written and Oral Communication

Oral Communication Strategies: W:OC:1: In oral communication, students demonstrate interactive listening by...

- W:OC:4:1.1: Following verbal instructions to perform tasks, to answer questions, or to solve problems – Grade 4^E
- W:OC:2:1.5b: Attending to speaker and waiting for appropriate turn to speak – Grades K, 1, 2, 3, and 4

New Hampshire Curriculum Framework - Reading

R:V:1: Students identify the meaning of unfamiliar vocabulary by...

- R:V:3:1.1: Using strategies to unlock meaning (e.g., knowledge of word structure, including prefixes/suffixes and base words, such as “uncovered;” or context clues; or other resources, such as dictionaries, glossaries; or prior knowledge) (State) – Grades 3, 4 and 5

R:IT:1: Demonstrate initial understanding of informational texts (expository and practical texts) by...

- R:IT:2:1.3: Locating and recording information to show understanding, when given an organizational format (e.g., T-chart or Venn diagram) (Local) – Grade 2

Common Core State Standards for English Language Arts and Literacy

Speaking and Listening Standards

- SL.1.a.1 Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion) – Grade 1

- SL.1.b.1 Build on others' talk in conversations by responding to the comments of others through multiple exchanges – Grade 1
- SL.1.c.1 Ask questions to clear up any confusion about the topics and texts under discussion – Grade 1
- SL.3.2 Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue – Grade 2
- SL.4.2 Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences – Grade 2

Language Standards

- L.4.e.2 Use glossaries and beginning dictionaries, both print and digital, to determine or clarify the meaning of words and phrases – Grade 2

*Ticks can be preserved in rubbing alcohol. Fill a small vial or container with rubbing alcohol, place the tick in the alcohol, and secure the container with a tight cover. To temporarily store a tick, place it in a sealed bag, or secure it between two pieces of masking tape.

[£] Standards met if optional step is included.

Name: _____

Identifying Ticks

Instructions: Read the definitions for each body part. Use the definitions as a guide to help you label the body parts of the blacklegged tick. Only some words will be used.

Definitions

Abdomen: Stomach area.

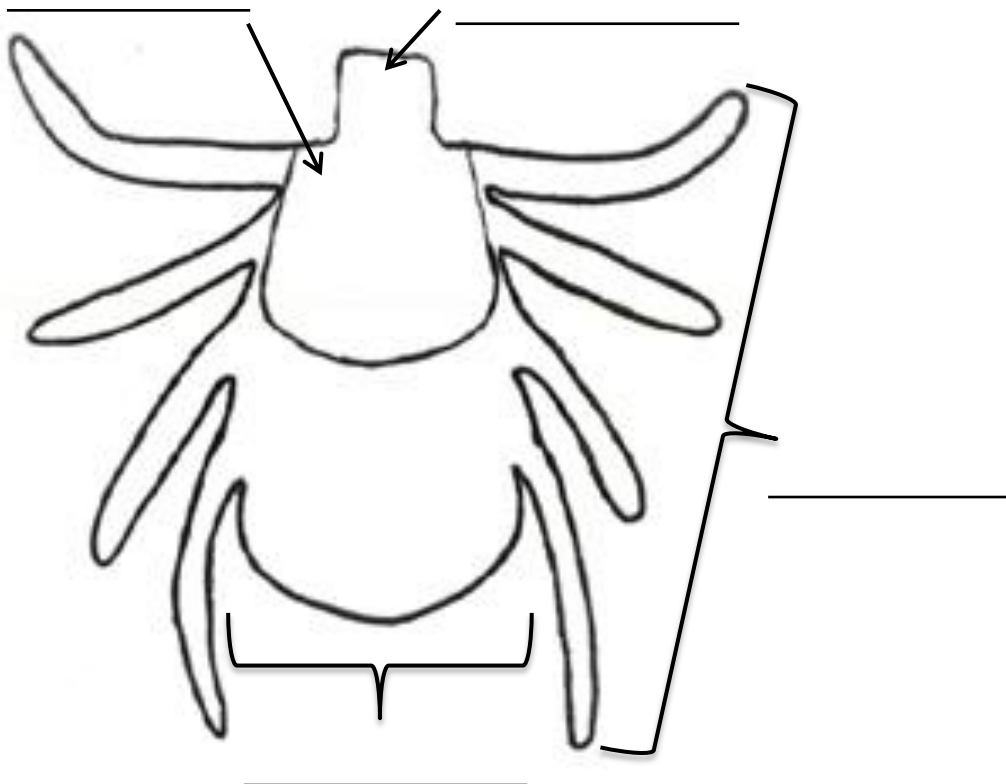
Antennae: Are most often used for smelling, and are located on an insect's head.

Legs: Are used for crawling. Nymph and adult ticks have eight legs (or four pairs), whereas larvae have six legs (or three pairs).

Mouth: Consists of three parts that ticks use to touch, attach, and feed.

Scutum: A shield. Adult female ticks have a smaller scutum than adult male ticks.

Wings: Are used for flying. Insects usually have one or two pairs.



Lesson 2

Let's Go Shopping!

Background

The best way to avoid getting sick with diseases that are caused by tick bites is by keeping ticks off your body. One important thing to know is where ticks live, or their habitat; so before you go outdoors and enter into one, you can take certain steps to keep ticks off of your body, this is called prevention.

Just like humans, ticks have homes too; however, ticks live outdoors rather than indoors. Common outdoor areas where ticks are most likely to be living include tall grass or weeds, shrubs, and leaves that you may see in woods, yards, or parks.

There are many steps or actions you can take prevent tick bites. One that many of you may have heard of is insect repellent, which should be used (with the help of a parent or guardian) before you go outdoors, and is a good way to keep ticks off of you. Did you know there is even a type of insect repellent that is made especially for clothes? It is called permethrin.

Speaking of clothes, if you know you are going to be entering into a tick habitat, it is a good idea to wear certain types of clothing that will prevent ticks from getting to your skin. These include long pants, a long sleeved shirt, socks, and shoes that cover your feet. An extra step that should be taken after you get dressed is tucking your pant legs into your socks, and your shirt into your pants.

Lesson Plan

Title: Let's Go Shopping

Subject(s): Mathematics and health

Grade Level: 2-3

Duration: 65-70 minutes

Materials Required: Let's Go Shopping worksheet packet, pencil, eraser, scissors, glue, and crayons or colored pencils (optional)

Key Vocabulary: habitat, prevention, receipt, tick

Description: This lesson teaches students about tickborne disease prevention, while also developing their math skills. Students will have a specified amount of money and must 'go shopping' only for clothing items that will help prevent tick bites, but must also be sure not to exceed the amount of money they have.

Objectives: Students will be able to identify the various clothing items that should be worn to prevent ticks from attaching to their body. Additionally, students will be able to add single- and two-digit values (in the context of money).

Procedure:

- 1.) Introduce the lesson with a discussion about preventing tick bites. Engage students by asking them questions about tick bite prevention. Some suggestions are listed below (5 – 10 minutes):
 - *“How do you think you can prevent getting bitten by a tick?”*
 - *“What types of clothing do you think are appropriate if you are going to be outside in areas where ticks live?”*
 - *“Is there anything that you or your parents already do to prevent tick bites?”*
- 2.) Read the background information for this lesson to the students. (5 minutes)
- 3.) Have a brief discussion with students about money and adding money. The teacher may want to show a few examples on the white board. (10 minutes)
- 4.) Pass out one Let's Go Shopping worksheet packet to each student as well as the required materials.
- 5.) Read the instructions together as a class. (2 minutes)
- 6.) Instruct students to complete the lesson either independently or with a partner. (30 minutes)

- 7.) Remind students to show their work when they are adding up the total cost of the items that they are buying.
- 8.) Once students have completed the worksheet, review the answers as a class, reminding students why some clothing items provide more protection from tick bites compared to other clothing items. (10 minutes)

Helpful Resources:

- http://www.cdc.gov/lyme/prev/on_people.html
- <http://www.dhhs.nh.gov/dphs/cdcs/lyme/documents/tbdpreventionplan.pdf>

Standards Met:

New Hampshire Curriculum Framework - Mathematics

Number and Operations

- M:N&O:3:4 Accurately solves problems involving addition and subtraction with regrouping; the concept of multiplication; and addition or subtraction of decimals (in the context of money) – Grade 3

Communication, Connections, and Representations

- M:CCR:2:3 Students will recognize, explore, and develop mathematical connections and be able to recognize and use mathematics in other curriculum areas (e.g., science, social studies). – Grades K-2
- M:CCR:2:3 Students will recognize, explore, and develop mathematical connections and be able to recognize and use mathematics in their daily lives (e.g., graphs, tables, or maps). – Grades K-2

Common Core State Standards for Mathematics

Number and Operations in Base Ten

- 2.NBT.5 Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction – Grade 2
- 2.NBT.6 Add up to four two-digit numbers using strategies based on place value and properties of operations – Grade 2

New Hampshire Curriculum Framework - Health

Physical Activity

- 1.6 Strategies for protection – Elementary

Personal and Consumer Health

- 2.4 Strategies to prevent parasitic infections – Elementary
- 2.6 Benefits of wearing protective clothing – Elementary

Common Core State Standards for English Language Arts and Literacy

Speaking and Listening Standards

- SL.1.a.2 Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion) – Grade 2
- SL.1.b.2 Build on others’ talk in conversations by linking their comments to the remarks of others – Grade 2
- SL.1.c.2 Ask for clarification and further explanation as needed about the topics and texts under discussion – Grade 2
- SL.3.2 Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue – Grade 2

Name: _____

Let's Go Shopping!

Your family hiking trip is coming up and you need to go shopping for new hiking clothes. Keep in mind that it is tick season, so you should buy appropriate clothes to prevent tick bites. You have \$50.00 to spend.

Instructions: Select clothing items that will help prevent tick bites. Make sure your items add up to \$40.00 - \$50.00. Once you have selected your items, place them in the shopping bag (cut and glue). Then list each item on the receipt and add up the total.



T-shirt - \$6.00



Hiking Boots - \$20.00



Belt - \$5.00



Tank top - \$5.00



Socks - \$3.00



Hat - \$9.00



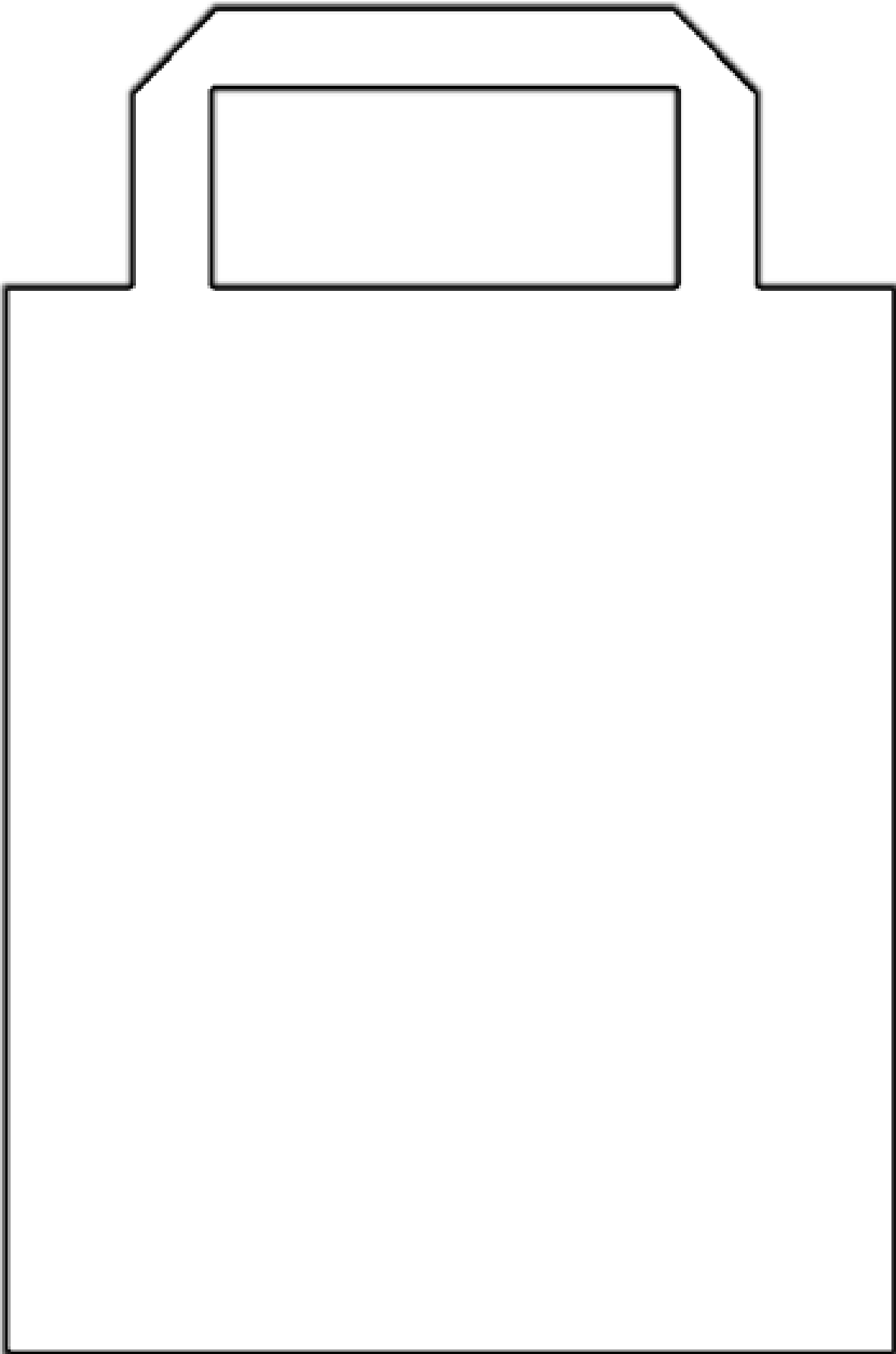
Flip flops - \$7.00



Pants - \$14.00



Long sleeve shirt - \$11.00



Receipt

Item

Cost

Total:

Lesson 3

The Life Cycle of a Tick

Background

The blacklegged tick can live for up to two years, or in other words, it has a two-year life cycle. During its life cycle, the blacklegged tick goes through four life stages; these include the egg, larva, nymph, and adult stages. At three of the four life stages, a tick will have one blood meal and increase in size from one stage to the next. The blacklegged tick gets its blood meal from another living animal, the animal that the tick feeds on is also known as a host. It is during the feeding period when a tick can become infected with a bacterium or virus that can cause tickborne disease.

The blacklegged tick starts off as an egg. Once the egg hatches, which usually occurs during the spring to summer months, the tick enters into the larval stage. Tick larvae are very small; they are about the size of the head of a pin and only have six legs. Upon entering this stage, the tick will not be infected because it has not had a blood meal yet; however, it is possible for it to become infected with a tickborne disease once it takes its first blood meal. Tick larvae usually feed on small mammals such as the white-footed mouse. If the mouse is carrying tickborne disease bacterium or virus, the tick will then become infected with the disease.

Once the tick larva has completed its meal, it will molt, or shed its skin, and grow into a nymph tick, which occurs during the following spring to early summer months. This is the third stage of a tick's life and the tick will have grown to be about the size of a poppy seed and will have eight legs. The nymph tick will take its second blood meal at this stage, usually feeding on a small to medium sized mammal, such as a mouse, bird, raccoon, and possibly a human. If the nymph tick is not already infected with a bacterium or virus that causes tickborne disease and feeds on a host that is carrying a bacterium or virus, the tick may become infected. If the tick is infected, it will pass the disease on to the host as it feeds.

The fourth and final stage of a tick's life cycle is the adult stage. A nymph tick will molt into an adult generally during the fall months. It is during this stage that the tick takes its third blood meal. The most common host for an adult tick is the white-tailed deer, but can also be other animals such as a fox, raccoon, and even a human. If the tick is infected, it will pass the disease on to the host that it takes its blood meal from. Once the tick has fed, it will lay its eggs and die. It should be noted that male ticks do not take blood meals, and therefore cannot transmit disease.

Lesson Plan

Title: The Life Cycle of a Tick

Subject(s): Science

Grade Level: 2-3

Duration: 50-60 minutes

Materials Required: The Life Cycle of a Tick worksheet, writing implement, Crayons or colored pencils (optional)

Key Vocabulary: bacteria, characteristics, host, larva, life cycle, molt, nymph, tick, virus

Description: This lesson was developed to teach students about life science, with a primary focus on the life cycle of a tick, and the changes in appearance and behavior exhibited by a tick as it progresses through each life stage.

Objectives: Students will be able to name and describe the four life stages of a tick, and will demonstrate their knowledge with drawings and writing.

Procedure:

- 1.) Introduce the lesson by talking to students about life cycles. Explain to students what a life cycle is by telling them that all living things have various life stages. (5 minutes)
- 2.) Explain the four life stages of a tick to students (it may be helpful to use images). Provide them with detailed information about the characteristics and behaviors of a tick at each life stage. (10 to 15 minutes)
- 3.) Pass out one worksheet to each student.
- 4.) Read the instructions together as a class. (2 minutes)
- 5.) Instruct the students to complete the worksheet. (25 minutes)
- 6.) Review the answers together as a class. (5-10 minutes)

Helpful Resources:

http://www.cdc.gov/ticks/life_cycle_and_hosts.html

Standards Met:

New Hampshire Curriculum Framework - Life Science

LS1 - All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species).

- S:LS1:4:3.2 Recognize that living organisms have life cycles, which include birth, growth and development, reproduction, and death; and explain how these life cycles vary for different organisms. – Grades 3 and 4
- S:LS1:4-3.4 Predict, sequence, or compare the life stages of organisms (plants and animals): e.g., put images of life stages of an organism in order, predict the next stage in sequence, and compare two organisms. – Grades 3 and 4

Next Generation Science Standards

From Molecules to Organisms: Structures and Processes

- 3-LS1-1 Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death – Grade 3

New Hampshire Curriculum Framework - Written and Oral Communication

W:SL:1: Students demonstrate command of the structures of sentences, paragraphs, and text by...

- W:SL:2:1.1: Writing short sentences (Local) – Grade 2

W:IW:3: In informational writing(reports or procedures only), students demonstrate use of a range of elaboration strategies by:

- W:IW:2:3.1: Including details/information relevant to topic and/or focus (Local) – Grade 2

W:C:1: In independent writing, students demonstrate command of appropriate English conventions by...

- W:C:2:1.2: Using capital letters for the beginning of sentences and names (Local) – Grade 2
- W:C:2:1.4: Using correct *end* punctuation in simple sentences (e.g., period) (Local) – Grade 2
- W:C:2:1.5a: Correctly spelling grade-appropriate, high-frequency words (Local) – Grade 2
- W:C:2:1.5b: Correctly spelling most words with regularly spelled patterns (e.g., consonant-vowel consonant, CVC with silent e, one syllable words with blends) (Local) – Grade 2

Common Core State Standards for English Language Arts and Literacy

Writing Standards

- W.4.3 With guidance and support from adults, produce writing in which the development and organization are appropriate to task and purpose – Grade 3
- W.10.3 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences – Grade 3

Speaking and Listening Standards

- SL.1.a.2 Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion) – Grade 2
- SL.1.b.2 Build on others' talk in conversations by linking their comments to the remarks of others – Grade 2
- SL.1.c.2 Ask for clarification and further explanation as needed about the topics and texts under discussion – Grade 2
- SL.3.2 Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue – Grade 2

Language Standards

- L.1.2-3 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking – Grades 2 and 3
- L.2.2-3 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing – Grades 2 and 3

Name: _____

The Life Cycle of a Tick

Instructions: (a) Label each box with the correct tick life stage. (b) In each box, draw the tick life stage. (c) Below each box, write one sentence describing the tick life stage and what a tick feeds on at each stage (except at stage 1).

Stage 1: _____

Stage 2: _____

Feeds on:

Stage 3: _____

Feeds on:

Stage 4: _____

Feeds on:

Lesson 4

How to Remove a Tick

Background

One important step that can be taken to prevent getting sick from the bite of a tick is to do daily tick checks. This means checking all areas of your body when you go indoors after spending time outdoors in locations where ticks may be living, including wooded, brushy or grassy areas. You should always ask a parent or guardian to help you do a tick check, because some ticks are very small and can be difficult or hard to see. Also, there are areas of your body, such as your back, that you may not be able to check easily.

If while doing our daily tick check, you find a tick that is attached to your body, it is very important to remove it immediately, or right away. If a tick is removed before 24 hours, or one full day of it being attached to your body, there is a very low chance that you will become sick with Lyme disease because ticks need longer than 24 hours to transmit or pass on germs that cause Lyme disease. There are a few different types of tools that can be used to remove a tick. One of the more common tools that you may have heard of is tweezers. Another type of tick removal tool looks like a small spoon with a v-shaped slit or opening in it.

When removing a tick, it is important to grasp or grip the tick at its head. If the tick is attached, its head will be the closest body part to your skin, and it may even look like the tick is doing a headstand on your skin! Be careful not to grasp the tick at its body or belly area, because this is where the tick's bad germs are held, and you may end up squeezing the bad germs into your body. Once the tick has been grasped at its head, pull on the tick in a straight up motion. It is important to pull the tick straight up so that the tick's mouthparts do not detach or break off from its body. If the tick's mouthparts detach, try to remove them with tweezers. If you are unable to easily remove them, leave it alone and let the area heal; the mouthparts alone cannot transmit germs that cause tickborne disease.

Once the tick has been removed, make sure to clean the area where the tick was attached. You can clean the area using soap and warm water, or another product such as rubbing alcohol or iodine scrub. You can then dispose or get rid of the tick by placing in a plastic bag that seals or closes, wrapping it in tape, or by flushing the tick down the toilet. You should never light a tick on fire, crush it, or pour other products such as nail polish remover or gasoline on it.

Lesson Plan

Title: How to Remove a Tick

Subject(s): Health, Science, English/Language Arts

Grade Level: 2-3

Duration: 55-70 minutes

Materials Required: “How to Remove a Tick” worksheet, pencil, scissors, glue

Key Vocabulary: detach, difficult, dispose, grasp, immediately, remove, slit, transmit, tweezers

Description: This lesson was developed to teach students the steps for proper tick removal. Students will also develop a Tick Removal Guide that shows and explains the steps for removing a tick, thus building upon students’ existing writing skills.

Objectives: Students will be able to put the steps for tick removal in order, as well as describe each step by writing short sentences.

Procedure:

- 7.) Introduce the lesson by talking to the students about ticks. Some suggestions are listed below. (10-15 minutes)
 - *Ask students if they have ever seen a tick.*
 - *Show students a picture of a tick.*
 - *Ask students if they check for ticks after playing outdoors.*
 - *Ask students if they know what to do if they find a tick on their body.*
- 8.) Read the background information for this lesson to the students. (5 minutes)
- 9.) Demonstrate how to remove a tick (optional). (5 minutes)
- 10.) Hand out one How to Remove a Tick worksheet, as well as the additional required materials to each student.
- 11.) Read the instructions together as a class. (3 minutes)
- 12.) Instruct the students to complete the activity independently. (25-30 minutes)
- 13.) Review the answers together as a class. (5-10 minutes)

Helpful Resources:

<http://www.dhhs.nh.gov/dphs/cdcs/lyme/documents/tbdpreventionplan.pdf>
http://www.cdc.gov/ticks/removing_a_tick.html

Standards Met:

New Hampshire Curriculum Framework - Health

Injury Prevention

- 3.1 How to get help - Elementary

New Hampshire Curriculum Framework – Reading

R:V:2: Shows breadth of vocabulary knowledge, demonstrating understanding of word meanings or relationships by...

- R:V:K:2.2: Demonstrating knowledge of basic concepts (i.e., common words that describe position in space and time, such as: over, between, after, behind) – Grade K
- R:V:1:2.2: Selecting appropriate words to use in context – Grade 1

New Hampshire Curriculum Framework – Science Process Skills

SPS1– Scientific Inquiry and Critical Thinking Skills (INQ)

- S:SPS1:2:1.5 Sort and classify object materials and events based on one or more attributes; and explain the methods used for sorting – Grades K, 1 and 2

New Hampshire Curriculum Framework – Written and Oral Communication

W:SL:1: Students demonstrate command of the structures of sentences, paragraphs, and text by...

- W:SL:2:1.1: Writing short sentences – Grade 2
- W:SL:1:1.6: Applying directionality as appropriate to text (e.g., left to right, top to bottom) – Grade 1

W:IW:1: In informational writing (reports or procedures), students organize ideas/concepts by...

- W:IW:1:1.1: Sorting and classifying facts – Grade 1
- W:IW:1:1.3: Listing steps of a procedure in a logical order, with instructional support – Grades 1 and 2

W:C:1: In independent writing, students demonstrate command of appropriate English conventions by...

- W:C:2:1.2: Using capital letters for the beginning of sentences and names – Grade 2
- W:C:2:1.4: Using correct **end** punctuation in simple sentences – Grade 2
- W:C:2:1.5b: Correctly spelling most words with regularly spelled patterns (e.g., consonant-vowel consonant, CVC with silent e, one syllable words with blends) – Grade 2
- W:C:2:1.5c: Giving a readable and accurate phonetic spelling for words that have not been taught – Grade 2

W:OC:1: In oral communication, students demonstrate interactive listening by ...

- W:OC:2:1.1: Following multi-step verbal instructions and directions to answer questions – Grade 2
- W:OC:K:1.5b: Attending to speaker and waiting for appropriate turn to speak – Grade K

W:OC:2: In oral communication, students make oral presentations by...

- W:OC:K:2.1: Speaking clearly and distinctly, orally sharing information and experiences – Grade K

Common Core State Standards for English Language Arts and Literacy

Speaking and Listening Standards

- SL.1.a.2 Follow agreed-upon rules for discussions (e.g., gaining the floor in respectful ways, listening to others with care, speaking one at a time about the topics and texts under discussion) – Grade 2
- SL.1.b.2 Build on others' talk in conversations by linking their comments to the remarks of others – Grade 2
- SL.4.2 Tell a story or recount an experience with appropriate facts and relevant, descriptive details, speaking audibly in coherent sentences – Grade 2

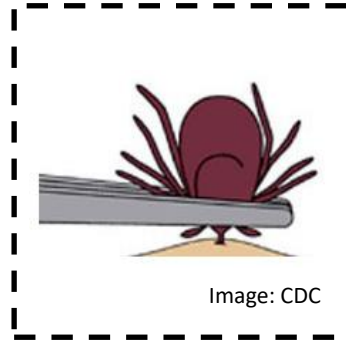
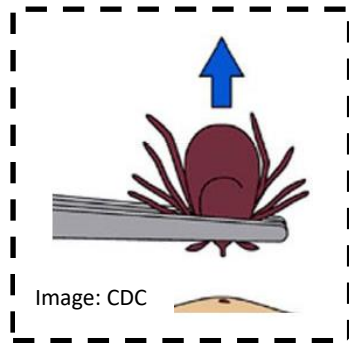
Language Standards

- L.1.i.1 Use frequently occurring prepositions (e.g., *during, beyond, toward*) – Grade 1
- L.2.a.K Capitalize the first word in a sentence and the pronoun I – Grade K
- L.2.b.1 Use end punctuation for sentences – Grade 1
- L.2.d.1 Use conventional spelling for words with common spelling patterns and for frequently occurring irregular words – Grade 1
- L.2.e.2 Consult reference materials, including beginning dictionaries, as needed to check and correct spellings – Grade 2

Name: _____

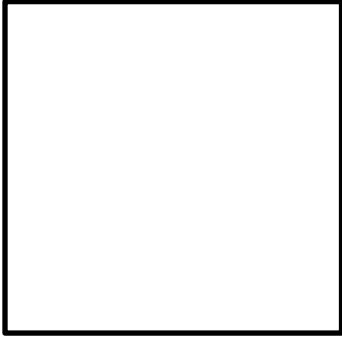
How to Remove a Tick

Instructions: Cut out the pictures showing the steps for how to properly remove and dispose a tick. Rearrange the pictures to show the correct order for removing a tick. Glue the pictures to the blank squares on your worksheet. For each step, write one sentence describing the correct action. Bring this home and hang it on your refrigerator as a reminder for how to properly remove and dispose a tick in case someone in your household finds an attached tick on his or her body.

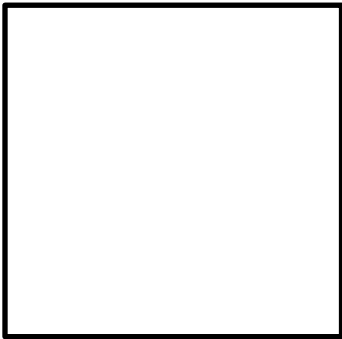


How to Remove a Tick

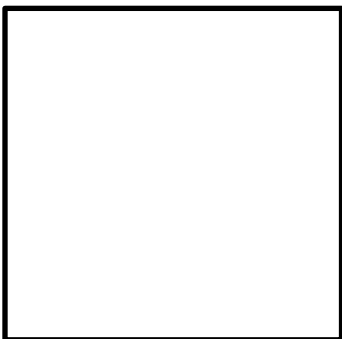
Step 1:



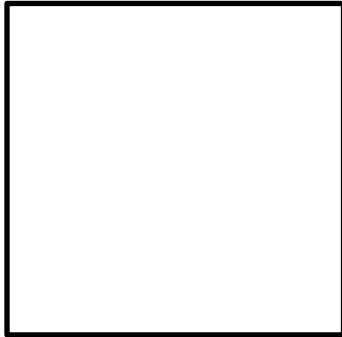
Step 2:



Step 3:



Step 4:



Lesson 5

All About Ticks – Searching for the Answers

Background

There are many species or types of ticks in the world, but there are only seven in the United States that bite humans and could make them sick. In New Hampshire, there are two kinds of ticks that we often see, the American dog tick, which has a brown body and white patterned scutum, or hard shiny shield, and the blacklegged tick, which used to be called the deer tick and has a red/brown body and black scutum. The American dog ticks that have been found in NH have not made any one sick, however, every year over 1,000 people living in NH get sick with an illness called Lyme disease, which is caused by the bite of an (infected) blacklegged tick.

If you want to prevent ticks from attaching to your skin and biting you, two things that are important to know about are where ticks commonly live, or their habitat, and the four stages of a tick's life, also known as its life cycle. Knowing this information will help you and your parents or guardian make the best decisions on which steps to take to avoid being bitten by a tick next time you go outdoors.

Ticks have a four-stage life cycle that spans, or is spread out over, a two year period. This means that ticks can survive for up to two years. The first stage of a tick's life is the egg stage, followed by the larval stage. Tick larvae have six legs and are so small that they are similar to the size of a pinhead. Then, once tick larvae have one blood meal, which they take from a small animal such as a mouse or chipmunk, they grow and become a nymph, which usually happens any time from May to late June. Nymph ticks grow two additional legs, or one more pair, but are still very small. Nymphs usually bite small to medium sized animals such as foxes, but may also bite humans. The fourth and final stage of a tick's life is the adult stage. Adult ticks are bigger than nymph ticks and prefer to take their blood meal from white-tailed deer, but like nymphs, may also feed on humans.

Ticks primarily live outdoors and may be in bushes, on tall grass or weeds, or in leaf cover. It is important to know that ticks do not live in trees and do not jump, so they will not fall out of a tree and land on you. Similar to all living things, ticks have senses that serve special functions or allow ticks to do special things. When a tick is hungry, it will quest, or rest on a blade of grass and hold out its front two legs waiting for an animal or person to walk by. Ticks' legs have special features that help them sense nearby animals and humans. Those special features function similar to your nose, allowing a tick to smell the animal or person that may be walking by.

Lesson Plan

Title: All About Ticks – Searching for the Answers

Subject(s): Science, Health, Writing, and Reading

Grade Level: 2-3

Duration: 50 – 70 minutes

Materials Required: “All About Ticks – Searching for the Answers” worksheet packet, *All About Ticks* reading passage, pencil

Key Vocabulary: habitat, larva, life cycle, nymph, prevention, quest, scutum, span

Description: This lesson teaches students about certain characteristics of ticks, their habitat, and tickborne disease prevention, while also developing their listening and reading comprehension, and writing skills.

Objectives: Students will develop reading and listening skills through comprehension of background information provided to them, as well as additional related classroom discussion. Students will also be able to explain the meaning of words related to tickborne disease prevention by writing sentences that provide suggestions for how tickborne diseases can be prevented.

Procedure:

- 14.) Provide a brief introduction to the lesson. (1-2 minutes)
- 15.) Pass out one *All About Ticks* background information sheet to each student.
- 16.) Instruct the students to read the information sheet on their own. (10-15 minutes)
- 17.) Have a short discussion with the students about the background information and have a brief discussion about tickborne disease prevention. Some suggested discussion points are listed below (5 – 10 minutes):
 - a. “How do you think you can prevent getting bitten by a tick?”
 - b. “Is there anything that you or your parents already do to prevent tick bites?”
- 18.) Pass out one All About Ticks – Searching for the Answers worksheet packet to each student.
- 19.) Read the instructions together as a class. (1 minute)
- 20.) Instruct students to complete the packet independently. (30 minutes)
- 21.) Review the answers together as a class. (5-10 minutes)

Helpful Resources:

<http://www.dhhs.nh.gov/dphs/cdcs/lyme/documents/tbdpreventionplan.pdf>

http://www.cdc.gov/ticks/life_cycle_and_hosts.html#find

http://www.cdc.gov/lyme/prev/on_people.html

http://www.cdc.gov/ticks/removing_a_tick.html

Standards Met:

New Hampshire Curriculum Framework - Health

Personal and Consumer Health

- 2.4 Strategies to prevent parasitic infections – Elementary
- 2.6 Benefits of wearing protective clothing – Elementary

New Hampshire Curriculum Framework - Life Science

LS1– All living organisms have identifiable structures and characteristics that allow for survival (organisms, populations, & species)

- S:LS1:4:2.1 Recognize that living organisms have certain structures and systems that perform specific functions, facilitating survival, growth and reproduction – Grades 3 and 4
- S:LS1:4:2.3 Identify and explain how the physical structures of an organism (plants or animals) allow it to survive in its habitat/environment (e.g., roots for water; nose to smell fire) – Grades 3 and 4
- S:LS1:4:3.2 Recognize that living organisms have life cycles, which include birth, growth and development, reproduction, and death; and explain how these life cycles vary for different organisms – Grades 3 and 4

LS2-Energy flows and matter recycles through an ecosystem

- S:LS2:2:1.2 Recognize that animals, including humans, interact with their surroundings using their senses; and that different senses provide different kinds of information – Grades K-2
- S:LS2:2:1.3 Recognize that some plants and animals go through changes in appearance when the seasons change – Grades K-2
- S:LS2:4:1.2 Describe the interaction of living organisms with nonliving things – Grades 3 and 4
- S:LS2:4:2.2 Recognize that energy is needed for all organisms to stay alive and grow or identify where a plant or animal gets its energy – Grades 3 and 4
- S:LS2:4:3.2 Describe ways plants and animals depend on each other (e.g., shelter, nesting, food) – Grades 3 and 4

LS3– Groups of organisms show evidence of change over time (e.g. evolution, natural selection, structures, behaviors, and biochemistry)

- S:LS3:2:3.2 Recognize that there are different species of living things in various places around the world – Grades K-2

New Hampshire Curriculum Framework – Reading

R:V:2: Shows breadth of vocabulary knowledge, demonstrating understanding of word meanings or relationships by...

- R:V:2:2.2: Selecting appropriate words to use in context, including words specific to the content of the text – Grade 2

R:IT:2:2: Analyze and interpret informational text, citing evidence as appropriate by...

- R:IT:2:2.1: Connecting information *within* a text – Grades 2 and 3
- R:IT:2:2.4: Identifying facts presented in text – Grade 2
- R:IT:4:2.3: Drawing inferences about text, including author’s purpose (e.g., to inform, explain, entertain) or message – Grades 4 and 5

R:RS:2:1: Demonstrates ability to monitor comprehension for different types of texts and purposes by...

- R:RS:2:1.1: Using a range of self-monitoring and self-correction approaches (e.g., predicting upcoming text, monitoring, adjusting and confirming, through use of print, syntax/ language structure, semantics/ meaning, or other context cues[e.g., pictures], etc.) – Grade 2

R:RS:2: Uses comprehension strategies (with flexibility and as needed)...

- R:RS:2:2.1: Using strategies while reading or listening to literary and informational text. (Local) EXAMPLES of reading comprehension strategies might include: using prior knowledge; predicting and making text- based inferences; determining importance; generating literal and clarifying questions; constructing sensory images (e.g., making pictures in one’s mind); making connections (text to self, text to text, and text to world); or locating and using text features (e.g. headings, parts of the book) – Grade 2

R:F&A: Reads grade-level appropriate material with...

- R:F&A:5:1.2: Fluency: reading with appropriate silent and oral reading fluency rates as determined by text demands and purpose for reading – Grade 5

R:WID: Applies word identification/ decoding strategies by ...

- R:WID:4:1.4: Reading grade-appropriate words (including irregularly spelled words) – Grade 4

R:IT:1: Demonstrate initial understanding of informational texts (expository and practical texts) by...

- R:IT:3:1.2: Using information from the text to answer questions related to explicitly stated main/central ideas or details – Grades 3-5

New Hampshire Curriculum Framework – Written and Oral Communication

W:SL:1: Students demonstrate command of the structures of sentences, paragraphs, and text by...

- W:SL:3:1.1: Writing a variety of complete simple sentences (Local) EXAMPLES: declarative, exclamatory, and interrogative – Grade 3

W:RC:2: In response to literary or informational text read aloud, students make and support analytical judgments about text by...

- W:RC:3:2.3: Using details or references to text to support focus (Note: support may include prior knowledge) – Grade 3

W:C:1: In independent writing, students demonstrate command of appropriate English conventions by...

- W:C:4:1.2: Applying basic capitalization rules EXAMPLES: names, beginning sentences, proper nouns, titles – Grade 4
- W:C:3:1.4: Using *end* punctuation correctly in simple sentences (i.e., period, question mark, exclamation point) – Grade 3
- W:C:4:1.5: Correctly spelling grade-appropriate, high-frequency words and recognizing syllables and affix patterns/rules that are characteristic of the English spelling system EXAMPLES: consonant doubling, change y to i, drop silent e, spelling rules for affixes – Grade 4
- W:C:5:1.4: Using punctuation to clarify meaning EXAMPLES: commas, apostrophes, quotation marks – Grade 5

Common Core State Standards for English Language Arts and Literacy

Key Ideas and Details

- RI.1.3 Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for the answers – Grade 3
- RI.2.3 Determine the main idea of a text; recount the key details and explain how they support the main idea – Grade 3

Craft and Structure

- RI.6.2 Identify the main purpose of a text, including what the author wants to answer, explain, or describe – Grade 2
- RI.4.3 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area – Grade 3

Range of Reading and Level of Text Complexity

- RI.10.3 By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2–3 text complexity band independently and proficiently – Grade 3

Phonics and Word Recognition

- RF.3.a.4 Know and apply grade-level phonics and word analysis skills in decoding words. Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context – Grade 4

Fluency

- RF.4.a.3 Read with sufficient accuracy and fluency to support comprehension. Read grade-level text with purpose and understanding – Grade 3

Research to Build and Present Knowledge

- W.8.2 Recall information from experiences or gather information from provided sources to answer a question – Grade 2

Conventions of Standard English

- L.1.d.3 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. Form and use regular and irregular verbs – Grade 3
- L.1.i.3 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking Produce simple, compound, and complex sentences – Grade 3
- L.2.a.4 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. Use correct capitalization – Grade 4
- L.2.c.4 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. Use a comma before a coordinating conjunction in a compound sentence. – Grade 4
- L.2.g.3 Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing. Consult reference materials, including beginning dictionaries, as needed to check and correct spellings – Grade 3

Knowledge of Language

- L.3.a.4 Use knowledge of language and its conventions when writing, speaking, reading, or listening. Choose words and phrases to convey ideas precisely – Grade 4

Vocabulary Acquisition and Use

- L.4.a.4 Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on *grade 4 reading and content*, choosing flexibly from a range of

strategies. Use context (e.g., definitions, examples, or restatements in text) as a clue to the meaning of a word or phrase – Grade 4

Next Generation Science Standards

From Molecules to Organisms: Structures and Processes

- K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive – Kindergarten
- 4-LS1-1 Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction – Grade 4
- 4-LS1-2 Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways – Grade 4

Name: _____

All About Ticks
Searching for the Answers

Part I

Instructions: Read each sentence and fill in the blanks with the correct word. Then find the word in the word search puzzle.

- 1.) The most common illness spread by blacklegged ticks is called _____ disease.
- 2.) A tick's _____, may be in the woods, yards, and parks, and may include shrubs, tall grass and leaves.
- 3.) Tick eggs hatch into _____, which are very small - about the size of a pinhead.
- 4.) Ticks use their _____ to detect an animal or person that may be close by.
- 5.) The third stage in a tick's life cycle is called the _____ stage.
- 6.) Adult blacklegged ticks may bite humans, but prefer to feed on white-tailed _____.
- 7.) Nymph and adult ticks have _____ legs, or four pairs.
- 8.) When a tick is hungry, it will rest on bushes or a tall piece of grass and hold out its first pair of legs waiting for an animal or person to walk by, this is also known as _____.
- 9.) Two types of ticks that are found in New Hampshire are the American dog tick and the _____ tick.
- 10.) The shiny part of a tick's back is its _____, or shield.

Part II

Instructions: There are five additional illness prevention words hidden in the puzzle. Find the words and write them in the blank spaces below. Use at least three of these words and write three sentences that provide instructions on how to prevent getting sick from a tick bite.

Here are some ways to prevent getting sick from a tick bite:

1.)

2.)

3.)

Word Search Puzzle

H	Q	J	D	L	U	C	H	H	G	B	U	V	O	P	V	R	P	F
A	U	E	W	G	M	R	E	J	L	O	B	N	F	D	O	B	F	H
E	E	G	A	K	H	H	I	M	H	J	I	F	N	I	D	J	O	P
R	N	F	L	O	N	G	P	A	N	T	S	L	P	B	E	N	U	M
G	O	T	A	I	J	T	M	O	N	B	O	T	Y	K	G	O	V	Y
S	O	B	R	A	B	H	Q	Y	S	W	V	S	O	M	G	O	K	N
A	C	O	V	P	Y	G	A	P	Q	T	B	T	I	V	E	A	C	M
S	M	D	A	K	A	I	R	F	Y	G	S	D	F	C	L	P	E	P
R	J	S	E	N	S	E	S	H	M	I	E	R	E	F	K	N	H	Y
T	I	O	D	F	K	I	M	S	C	U	T	U	M	X	C	F	C	H
Y	A	H	D	P	O	V	N	L	A	A	I	A	B	F	A	Z	K	L
P	Z	I	C	D	D	K	J	I	A	N	K	U	E	K	L	F	C	G
C	L	H	A	B	I	T	A	T	D	O	C	H	I	Y	B	I	I	G
V	F	B	I	J	E	X	G	N	P	V	K	R	F	J	Z	S	T	E
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Q	U	E	S	T	I	N	G	L	D	O	L	D	E	E	B	T	O	F
S	H	O	J	E	G	V	I	E	M	M	D	W	Z	K	X	M	L	A
O	W	V	Y	K	C	S	Q	P	I	B	O	E	B	F	Y	G	D	H
I	Q	U	S	D	M	Y	A	E	W	L	R	K	R	H	M	I	L	U
T	R	A	I	L	T	B	S	R	Y	S	U	O	W	I	T	M	F	T