PBS Lesson Series

ELA: Grade 8, Lesson 13, Parasites

Lesson Focus: The focus of today's lesson will be on the informational text, "Top 10 Real-Life Body Snatchers."
Practice Focus: Students will analyze an informational text to determine the main ideas and study author's craft.
Objective: Students will use "Top 10 Real-Life Body Snatchers" to determine the main ideas with a focus on author's craft.
Academic Vocabulary: sustenance, repertoire
TN Standards: 8.RI.KID.1, 8.RI.KID.3, 8.RI.CS.4
Teacher Materials:

- The Teacher Packet for ELA, Grade 8, Lesson 13
- Chart paper (will need to have Venn diagram drawn on chart paper and ready to display)

Student Materials:

- Paper and a pencil, and a surface to write on
- The Student Packet for ELA, Grade 8, Lesson 13 that can be found on www.tn.gov/education

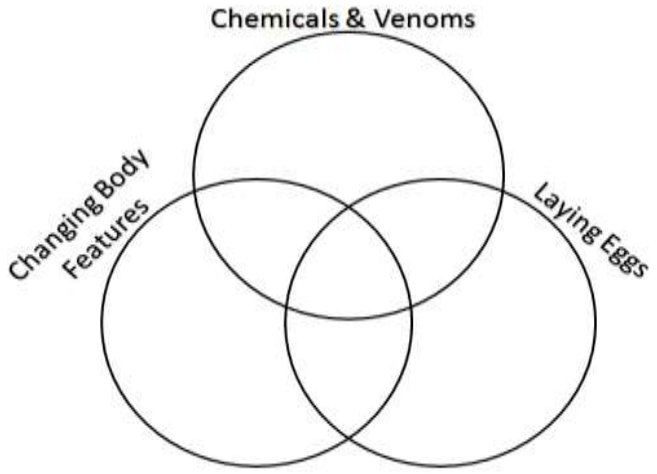
Teacher Do	Students Do
Opening (1 min) **Hello! Welcome to Tennessee's At Home Learning Series for literacy! Today's lesson is for all our 8th graders out there, though everyone is welcome to tune in. This lesson is the third in this week's series.** **My name is ____ and I'm a ____ grade teacher in Tennessee schools. I'm so excited to be your teacher for this lesson! Welcome to my virtual classroom!** **If you didn't see our previous lessons, you can find them on tn.gov/education/pbsteaching.html. You can still tune in to today's lesson if you haven't seen any of our others. But it might be more fun if you first go back and watch our other lessons, since today we'll be talking about things we learned previously.** **Today we will continue learning about real-life body snatchers! Before we get started, to participate fully in our lesson today, you will need:** • **Paper and a pencil, and a surface to write on** • **The Student Packet for ELA, Grade 8, Lesson 13 that can be found on www.tn.gov/education** **Ok, let's begin!**	Students gather materials for the lesson and prepare to engage with the lesson's content.
Intro (1 min) [Show Slide 1.] **Today our goal is to read the informational text called "Top 10 Real-Life Body Snatchers" so that we can**	Students listen to the teacher and learn an overview of the lesson.

analyze the information in the text to determine its meaning. We will begin with me reading a portion of the text and then we will reread it and pause along the way for deeper understanding. At the end of the lesson, I will assign you independent work that you can complete after the video ends. **Speaking of which: if you tuned in to the previous lesson, you may have completed the independent work assigned at the end of that one. Remember? We asked you to write a summary of what we read about the hairworm and the cricket, and to use these words in your summary: parasitizes, hijack, ingests, exposed, and subsides.** **What did you write?** [Pause.] **I wrote:** **"When a cricket *ingests* a hairworm, or takes it into its body, the hairworm *parasitizes* the cricket by *hijacking* its central nervous system so that it can control the cricket's behavior. The hairworm makes the cricket go to *exposed* water, out in the open. Once the hairworm comes out of the cricket into the water, either the cricket dies or its strange behavior *subsides* and it goes back to normal."** **Was your response something like that? It may have been different, but I hope you got those words in there and remembered some of those crazy details about how the hairworm takes advantage of the cricket!**	
<u>**Teacher Model/Read-Aloud**</u> (20 min) [Show Slide 2.] **Now, let's dig in to the informational text we will be studying today, which is another section of the article about real-life "body snatchers." As a reminder, historically, people who were called "body-snatchers" were people who stole dead bodies from graves in order to study or sell them. But these aren't the type of body-snatchers we'll be reading about. We're going to read about certain types** [Show Slide 3.] **of parasites, or living things that survive by using or hurting other living things, which we call their hosts. As a reminder, we will be hearing a lot of scientific names in this text, like *Paragordius tricuspidatus*** [Show Slide 4.] **from the previous lesson. Don't worry about understanding or remembering them; just know they're names scientists use to refer to different species. I'll be clear about what we are referring to.** **Yesterday, we looked at the introduction and certain words and phrases that will help us understand the text. This text has 10 sections total in it - one section on each real-life body-snatcher, or parasite.** [Show Slide 5.] **Today, we will study in-**	Students understand the meanings of body-snatcher, parasite, and host, activating prior knowledge of parasites and hosts in preparation for learning more about those topics. Students recall the structure of a Venn diagram, review how to use one, and understand how the week's lessons will help them complete one about parasites and their similarities and differences.

depth the second and third sections. As a reminder from yesterday, we will use the information we learn today to complete the Venn Diagram on the article. Here is what the diagram looks like. [Point to Slide 5.] **This Venn diagram shows some of the things parasites do when they infect their hosts. Some change body features, some use chemicals and venoms, some lay eggs in their hosts, and many do a combination of two or even all three of these things.** **As we read about different parasites this week, we're going to be sorting them into the various sections of this Venn diagram. For example, if we read about a parasite that uses venom and changes body features but does not lay eggs, we'll put it in this upper left section where the circles overlap** [Point.] **to show that it is in the "chemicals and venoms" and "changing body features" circles but not in the "laying eggs" circle. If we read about a parasite that changes body features, uses chemicals or venoms, *and* lays eggs, we'd write its name in the very center. Don't worry about this just yet, though, as we will complete this exercise toward the end of the lesson.** **So let's begin the text! I will begin by reading a section of the text about parasites and their hosts. We will then reread the section and analyze it on a deeper level. As I read the text, please take notes on your paper. Try to focus on the relationship between each parasite and its host and write down key details about them. Let's begin:** [Show Slide 6.] "***Hymenoepimecis argyraphaga*** **One of the most complex manipulations, or changes, of a host by a parasite happens in Costa Rica. A female parasitic wasp of the species *Hymenoepimecis argyraphaga* stings the spider *Plesiometa argyra* and paralyzes it."** [Show Slide 7.] **Wow, that is a strong sting! Notice that it is a female wasp that stings the spider. That will be important later. Let's keep reading.** [Show Slide 8.] **"In the 10 to 15 minutes that the spider is immobilized, or not moving, the wasp lays an egg and affixes it to the spider's abdomen, or stomach. For a week or two, the spider proceeds living as normal."** [Show Slide 9.] **So it's only a temporary paralysis, meaning the spider is only paralyzed for 10 to 15 minutes. While the**	

spider is down, the wasp lays an egg (remember it was female) and sticks it to the spider's stomach. The spider just carries on like normal for a week or two. [Show Slide 10.] **"Then, the egg hatches. The larva, or young wasp, pierces the spider's tough skin and sucks its blood for sustenance."** **So now the egg hatches and the young wasp emerges. Instead of leaving, the wasp stays and sucks the spider's blood. But why? The sentence says that it the wasp larvae "sucks (the spider's) blood for sustenance." Based on the context of the passage, what do you think the word "sustenance" means? Take a moment and write your answer on your paper.** [Pause.] **Based on the passage, it sounds to me like the larva is consuming the spider's blood to stay alive—kind of like we eat food to stay alive. For humans, sustenance is things like bread and vegetables rather than spider blood! Let's see what happens next.** [Show Slide 11.] **On the night it plans to kill its host, the wasp larva injects a chemical into the spider that drugs it into spinning a web unlike any it would normally make. Basically, the spider repeats one stitch in its web-constructing repertoire over and over."** **So let's look at a challenging word in this section before we discuss what it means. Listen to these 2 sentences again: "On the night it plans to kill its host, the wasp larva injects a chemical into the spider that drugs it into spinning a web unlike any it would normally make. Basically, the spider repeats one stitch in its web-constructing repertoire over and over." Based on the context clues, what do you think the word "repertoire" means in this context? Take a moment and write your answer on your paper.** [Pause.] **The key detail I noted in these sentences is the phrase "spinning a web unlike any it would normally make." Then the passage says that instead of doing what it would normally do, it "repeats one stitch in its web-constructing repertoire over and over." It sounds to me like the spider has a whole toolkit of web-making strategies it normally uses but in this case it only repeats one stitch over and over.** [Show Slide 12.] **Therefore, a "repertoire" is a set of skills that a person or thing uses often. If you play a musical instrument, your repertoire might be all the different songs**	

you can play. If you like to cook, your repertoire might be the different dishes you can make. For the spider, its repertoire is different types of webs it can make. **So why did the spider not use its whole toolkit, or repertoire, of web-making strategies? Because it was drugged! Before the wasp larva kills the spider, it drugs it so it will only make one stitch over and over. It's all part of the wasp's plan! I wonder why the wasp made the spider make a web by repeating one stitch over and over. Let's see.** [Show Slide 13.] **"The wasp larva then kills and eats the spider, spins the cocoon from the sturdy web, and a week and a half later, transforms into a wasp."** **Ok, so the wasp clearly needed a sturdy web and had the spider repeat a stitch over and over so it was thick and strong. Once the web is in place, the wasp larva kills the spider, eats it, and then a week and a half later, transforms into a wasp. There is nothing kind about this situation!** **Now, let's reread this section one more time and make sure we got all of the details in our notes. Be sure to add to your notes along the way.** [Show Slide 14.] ***"Hymenoepimecis argyraphaga*** **One of the most complex manipulations, or changes, of a host by a parasite happens in Costa Rica. A female parasitic wasp of the species *Hymenoepimecis argyraphaga* stings the spider *Plesiometa argyra* and paralyzes it. In the 10 to 15 minutes that the spider is immobilized, or not moving, the wasp lays an egg and affixes it to the spider's abdomen, or stomach. For a week or two, the spider proceeds living as normal. Then, the egg hatches. The larva pierces the spider's tough skin and sucks its blood for sustenance. On the night it plans to kill its host, the wasp larva injects a chemical into the spider that drugs it into spinning a web unlike any it would normally make. Basically, the spider repeats one stitch in its web-constructing repertoire over and over. The wasp larva then kills and eats the spider, spins the cocoon from the sturdy web, and a week and a half later, transforms into a wasp."** [Show Slide 15.] **Ok, let's take a step back and go through the details again. A wasp paralyzes a spider and lays an egg on it. The spider carries around the egg until it hatches, at which point the larva that comes out of the egg stabs through the spider's skin and starts sucking its blood for sustenance.**	

Then when it's ready to kill the spider, what does the parasite wasp larva do? [Pause.] **Yes, it injects a chemical into the spider. Now what does this make the spider do?** [Pause.] **Right, it drugs the spider into spinning a certain kind of web so the wasp can use it to make the cocoon it needs to transform into an adult—kind of like a caterpillar transforms into a butterfly.** **Can you picture all this?** [Pause.] **It's pretty crazy, isn't it? Poor spider!** **Do you have key details in your notes about the parasite wasp and its spider host? Take a moment now to make sure.** [Pause.] **I wrote in my notes that the wasp lays an egg on the spider, the larva that comes out of the egg injects a chemical into the spider, and that makes the spider spin a cocoon for the larva. In addition to all this, the wasp larva sucks the spider's blood and eventually eats it. Pretty good deal for the wasp, I'd say—though not so much for the spider!** [Show Slide 16.] **Now, let's add our notes to the Venn Diagram we have been working with this week. Go ahead and take out your copy of the Venn Diagram you drew yesterday. If you were not able to draw it yesterday, go ahead and draw a fresh copy.** [Display the Venn diagram on chart paper.]  	

Now, I know that you may not have the text in front of you, but I think your notes will help. Take a moment now to think about where the parasitic relationship we just read about might fit into this Venn diagram. [Pause.] **Ok, good! I'll show you where I placed this one and you can see how it matches up with your thoughts. If I include information that is not on your Venn Diagram, please add what I tell you to it.** [Write "wasp & spider" in the upper right area where the chemical and egg circles overlap. Leave room for additional answers to be added to that area.] **I placed this parasitic relationship between the wasp and the spider into the space that overlaps Chemicals & Venoms and Laying Eggs. Remember that it was the parasitic wasp who stings and paralyzes the spider, then lays an egg on the spider's abdomen; once hatched, the larvae injects the spider with a drug to make it spin a web for the larvae to use as a cocoon. The drug counts as a chemical or venom, I think, and of course we know that there's also an egg involved. So this parasite fits into both circles. Did you have this on your diagram?** [Pause.] **If not, take a moment and add it to your diagram.** [Pause.] **Ok, thank you. Now let's move on to the next example of a parasitic relationship. As I read, listen closely and take notes regarding key details.** [Show Slide 17.] ***"Glyptapanteles sp.*** **Little do caterpillars of the moth *Thyrinteina leucocerae* know, but as they feed on guava and eucalyptus trees in Brazil, the larvae of parasitic wasps of the genus *Glyptapanteles* may very well be feeding on them. The wasp deposits up to 80 eggs in the caterpillar."** **So that's kind of a crazy thought! While the caterpillars are eating trees, the larvae of parasitic wasps are eating the caterpillars! And laying eggs on them too! And there's 80 eggs! This one is starting off interesting already. Let's keep reading.** [Show Slide 18.] **"When the eggs hatch, the larvae bulk up by eating the host's inner parts. At full size, all but a few squeeze through holes in the caterpillar's skin and spin a cocoon on a nearby twig or leaf."** [Show Slide 19.] **So now all 80 of those eggs are hatching and the larvae "bulk up" by eating the host's inner parts. I know that "bulk up" means to get stronger, to get muscular, so clearly the larvae are growing and getting stronger by eating the insides of the caterpillar. Then it says that once the**	

larvae reach full size, all but a few are squeezing through the holes in the caterpillar's skin so they can spin a cocoon on a nearby twig or leaf. But what happened to the few larvae that stayed behind? Let's see. [Show Slide 20.] **"The larvae that stay behind begin to pull the puppet strings, so to speak. Within a day, the caterpillar stops eating and starts exhibiting a strange behavior–what scientists call "violent head-swings."** [Show Slide 21.] **Notice that the author says that the parasitic wasps "pull the puppet strings" of the caterpillar to make it protect the cocoon. Take a moment and write on your paper what you think the phrase "pull the puppet strings" implies about the wasps' actions.** [Pause.] **Ok, thank you. So when we're looking at the phrase "pull the puppet strings," we know the author is not using a literal phrase as that does not make sense in the context of the passage. The author is using the phrase figuratively, or in a non-literal sense. Authors often use figurative language like this so that you'll paint a picture in your mind of something. Did you pause and imagine in your head a wasp pulling the "puppet strings" of the caterpillar? What does this say about who is in control of the caterpillar's actions?** [Pause.] **That's right - the wasp is, in a certain sense, "pulling the puppet strings" by making the caterpillar do things against its will. So what is the caterpillar doing against its will?** [Pause.] **It stops eating on the trees and starts swinging its head around violently, which means really fast and aggressively.** **Let's keep reading:** [Show Slide 22.] **"Like a bouncer at a bar, it swings at any predators that approach the cocoon, either knocking them down or causing them to back away. Once the wasps emerge, the caterpillar dies, having served its purpose."** **So now we know the reason why the wasp is making the caterpillar swing its head around like a head-banger. It's trying to keep away enemies! This allows time for the all the wasps to emerge and keep living. It has a sad ending though. The caterpillar dies. Poor fella!** **Now, let's reread this section again to make sure we are recording all of the notes that we need. Add to your notes for this section as I read:**	

[Show Slide 23.] ***"Glyptapanteles sp.*** **Little do caterpillars of the moth *Thyrinteina leucocerae* know, but as they feed on guava and eucalyptus trees in Brazil, the larvae of parasitic wasps of the genus *Glyptapanteles* may very well be feeding on them. The wasp deposits up to 80 eggs in the caterpillar. When the eggs hatch, the larvae bulk up by eating the host's inner parts. At full size, all but a few squeeze through holes in the caterpillar's skin and spin a cocoon on a nearby twig or leaf."** **Ok, let's review again. The caterpillars of a certain moth species like to eat on certain kinds of trees in Brazil. What they don't know is that certain kinds of wasps like to eat on them while they're eating on those trees. The wasp then deposits a bunch of eggs in the caterpillar. When the eggs hatch, the larvae gets stronger by eating up the caterpillar's inner parts. Some leave the caterpillar but some stay behind. The ones that left the caterpillar are making a cocoon nearby. Let's review what happens to the ones that stay behind.** **"The larvae that stay behind begin to pull the puppet strings, so to speak. Within a day, the caterpillar stops eating and starts exhibiting a strange behavior–what scientists call "violent head-swings." Like a bouncer at a bar, it swings at any predators that approach the cocoon, either knocking them down or causing them to back away. Once the wasps emerge, the caterpillar dies, having served its purpose."** [Show Slide 24] **So the ones that stay behind make the caterpillar stop eating and start swinging its head violently to ward off anything that might eat the young wasps. They basically make it into their own personal security guard! Take a minute now to check your notes.** [Pause.] **Did you write that this wasp parasite lays eggs inside a caterpillar, and that when those eggs hatch, some of the larva leave to make a cocoon while some stay behind to use the caterpillar as a defender?** [Pause.] **So did I.** **Didn't catch that? I'll say it once more, slightly differently. Please add this to your notes if you don't have it already. The wasp parasite lays eggs inside a caterpillar, and when those eggs hatch, some of the larva leave to make a cocoon while some stay behind and make the caterpillar start swinging its head around wildly, which protects the larvae from predators.** [Pause.]	
<u>Guided Practice</u> (5 minutes)	Students copy the Venn Diagram onto their paper and complete each circle, including the overlaps.

Ok, now let's add what we learned about this parasitic relationship to our Venn Diagram. On the chart paper, you will see the Venn Diagram we have been working with. [Show Slide 25] [Display the Venn diagram on chart paper.] **Now, take a moment to think about where the parasitic relationship of the caterpillar and the wasp might fit into this Venn diagram.** [Pause.] **Thank you! I'll show you what information I identified and you can see how it matches up with your thoughts. If I include information that is not on your Venn Diagram, please add what I tell you to it.** [Write "wasp & caterpillar" in the area where the chemical and egg circles overlap.] **What I noted from this parasitic relationship between the wasp and the caterpillar goes into the same space that we wrote in earlier, the one that overlaps Chemicals & Venoms and Laying Eggs. Here is what I added: The parasitic wasp lays eggs in the caterpillar and then after the eggs hatch, some stay to "pull the strings" or to make it protect the cocoon. I put this example here as I inferred that the larvae is using some type of chemical to control the caterpillar and make it protect the cocoon. Did you have this on your diagram?** [Pause.] **If not, take a moment and add it to your diagram.** [Pause.] **Ok, that's all of the details I am adding today but I am looking forward to reading about more parasitic relationships tomorrow so I can add more details to it. Please keep your diagram handy so we can reuse it tomorrow.** **I hope that you found this exercise to be helpful. The purpose is to make sure we are categorizing the examples and ideas we have read about today as well as observing the relationships among them.**	
<u>Independent Work</u> (1 minute) [Show Slide 26.] **Let's reflect on today's lesson. Today we learned about some parasites and the creative ways that they take advantage of their hosts. For your independent work, please respond in writing to the following prompt:** **Students, please write the prompt down on your notebook paper so you will have it handy for when you are responding in writing.** **In a brief essay, compare and contrast the parasitic relationships we discussed today. What are the similarities between the wasp and the spider relationship, and the wasp**	Students will respond to a writing prompt that synthesizes their knowledge from today's lesson.

and the caterpillar relationship? What are the important differences between them? Be sure to use specific details from your notes to support your answers. **Take a moment to write down that prompt now.** [Pause.] [Show Slide 27.]	
Closing (1 min) **Thank you. I enjoyed working on the Body Snatchers informational text with you today! Thank you for inviting me into your home. I look forward to seeing you in our next lesson in Tennessee's At Home Learning Series! Bye!**	