NO PREP

Zombie Science

Parasites and the Undead

Includes: Student reading, case study, differentiated questions, teacher key

Name: Period: Date:

Zombie Science: Parasites and the Undead

The Fascination with Zombies

Zombies are a major part of Halloween culture, appearing in movies, TV shows, and haunted houses. The idea of the undead—bodies that rise and walk after death—has fascinated people for centuries. While no real organism comes back to life after death, the natural world does offer some eerie parallels. In biology, certain parasites and pathogens can control the behavior of their hosts in ways that seem almost "zombie-like." These examples show how science can sometimes be just as strange as fiction. One of the most famous real-world comparisons is the Cordyceps fungus, which infects insects. Once inside, the fungus takes over the insect's body and brain, forcing it to climb to a high place before killing it. The fungus then grows out of the insect's body and releases spores to infect others. To humans, this seems like a real-life version of zombie possession, though it only affects insects. Studying these organisms helps scientists understand disease, control pests, and explore the limits of biology.

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Parasites That Control Behavior

Parasites are organisms that live in or on a host, often harming it. Some have evolved strategies to manipulate the host's behavior for their own survival. For example, the parasite Toxoplasma gondii, which can live in cats, alters the behavior of rodents. Infected rodents lose their natural fear of cats, making them easier prey. This benefits the parasite because it needs to be inside cats to reproduce. Another example is the Lancet liver fluke, a parasite that affects ants. It forces infected ants to climb grass stalks and clamp down, increasing the chance that grazing animals will eat them. Once inside a larger animal, the fluke continues its life cycle. These biological tricks may not create movie-like zombies, but they do show how organisms can be "controlled" in ways that appear unnatural and spooky.

Zombies: Fiction vs. Biology

Zombie stories may never come true the way movies show them, but parasites demonstrate how living organisms can influence one another in eerie ways. The connection between horror fiction and biology gives students a unique way to explore science. By learning about parasites, students can better appreciate both the creativity of human imagination and the strange realities of nature.

Key Information: Table: Real "Zombie" Parasites

Parasite/Pathogen	Effect on Host
Cordyceps fungus	Forces insects to climb before killing them
Toxoplasma gondii	Removes rodents' fear of cats
Lancet liver fluke	Makes ants cling to grass for grazing animals to eat
Rabies virus	Causes aggression and biting behavior
Horsehair worm	Drives insects to jump into water, where worm emerges

Case Study: Cordyceps and Zombie Ants

In tropical rainforests, scientists have observed the strange effects of the Cordyceps fungus on ants. When an ant becomes infected, the fungus grows inside its body, releasing chemicals that affect the ant's nervous system. The ant leaves its colony, climbs up vegetation, and bites down tightly on a leaf or stem. Within days, the ant dies, and the fungus grows a stalk out of its head. This stalk releases spores that fall to the ground, where other ants may come into contact with them. Entire colonies can be threatened if infections spread widely. The sight of an ant frozen in place with a fungus sprouting from its body is unsettling, and it has inspired stories of real-life zombies. While Cordyceps cannot infect humans, the fungus shows how powerful parasites can be. It also provides scientists with valuable insight into parasitic control of behavior, making it an important subject of study in biology. The case of the zombie ant reminds us that nature can sometimes be just as frightening—and fascinating—as horror fiction.

1. How does the Cordyceps fungus control the behavior of ants?

_____

_____

2. Why do scientists study parasites like Cordyceps?

_____

_____

Multiple Choice

1. Which parasite removes rodents' fear of cats?
    a) Rabies virus
    b) Toxoplasma gondii
    c) Cordyceps fungus
    d) Lancet liver fluke

2. What does the Cordyceps fungus force ants to do before killing them?
    a) Return to their nest
    b) Attack other ants in the colony
    c) Climb vegetation and bite down
    d) Jump into water

3. Why is the idea of "zombie science" connected to Halloween?
    a) It shows creepy real-life parallels to horror stories
    b) Parasites literally raise the dead in the same way as movie zombies
    c) Scientists created zombies in labs
    d) It explains how vampires live

Matching

Write the letter of the correct definition on the line next to each term.

Term	Definition
1. ___ Rabies virus	A) Infected rodents lose fear of predators
2. ___ Cordyceps fungus	B) Ants cling to grass for grazing animals to eat
3. ___ Lancet liver fluke	C) Causes biting and aggression
4. ___ Horsehair worm	D) Forces insects to climb and clamp vegetation
5. ___ Toxoplasma gondii	E) Drives insects into water to release parasite

Fill-in-the-Blank

1. The _____ fungus infects ants and causes them to die clamped to vegetation.

2. The parasite _____ changes rodent behavior so they are more likely to be eaten by cats.

3. _____ is a virus that causes aggression and biting in animals and sometimes humans.

Short Answer

Answer each question in 2-4 complete sentences.

1. How do parasites show that real-life biology can sometimes seem like horror fiction?

_____

_____

_____

2. Why might parasites evolve strategies to change the behavior of their hosts?

3. How can studying parasites like Cordyceps help scientists better understand biology?