Name _____ Class _____ Date _____

Investigating Bilharzia—A Major Health Problem

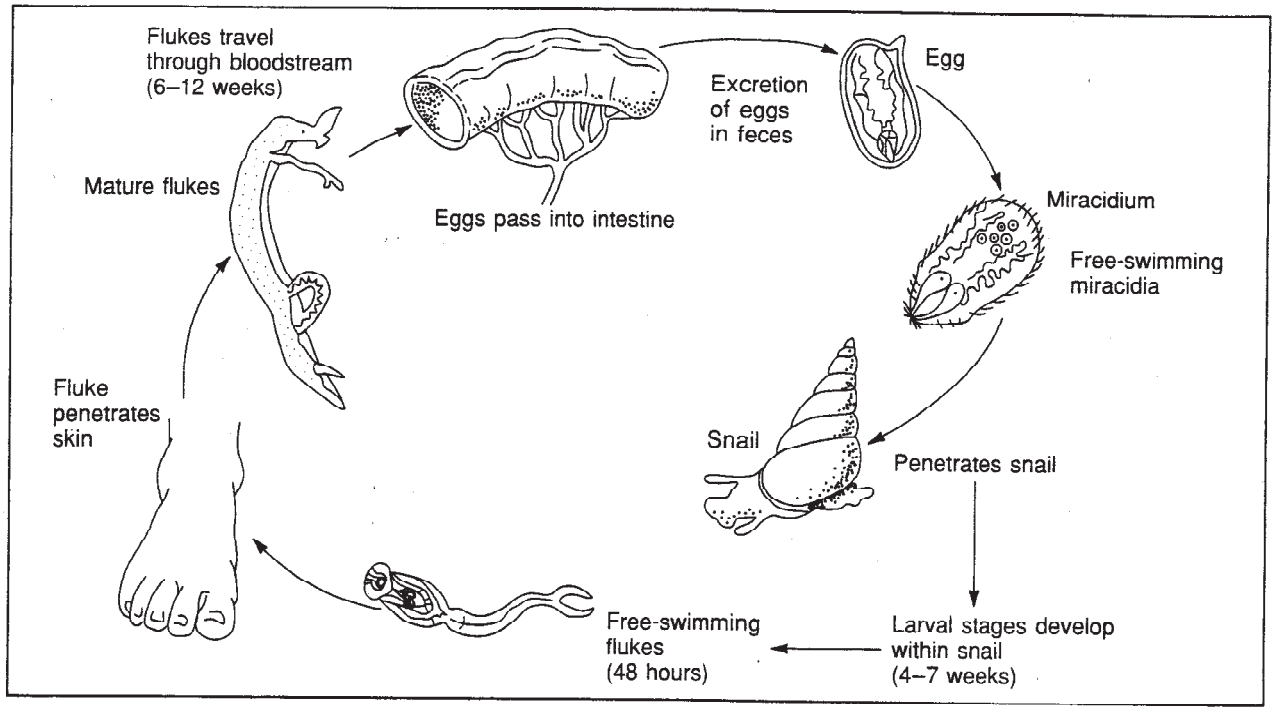
Most diseases that are caused by parasites have become less severe health problems during the last fifty years. The disease bilharzia, caused by blood flukes, has shown every sign of going against this trend. The World Health Organization has designated bilharzia as one of the world's major health problems. Because the species lives only in the tropics, however, most people in the United States know nothing about it. In this activity, you will relate the life cycle of the blood fluke that causes bilharzia to the effectiveness of control measures.

When blood flukes first infect a human host, the victim feels very weak. In later stages of the disease, the victim suffers from severe anemia and weight loss. The liver becomes inflamed and causes the abdomen to swell. Left untreated, bilharzia can lead to death.

In order to develop successful control programs, it is necessary to learn as much as possible about the blood fluke, including the stages of its life cycle. As you read the following statements, follow the stages of the life cycle shown in Figure 1 on the following page.

1. Eggs pass out of the human host in feces.
2. If the eggs reach water, they hatch into free-swimming miracidia. This is the first larval stage of the blood fluke. The miracidia have less than 24 hours to find a suitable snail host.
3. Once the larvae find a snail of the correct species, they burrow inside it and digest its tissues.
4. Inside the snail host, the flukes reproduce asexually. The resulting new worms, the final larval stage, break out of the snail and swim around in the water.
5. These free-swimming worms have 48 hours of life in which to find a human host.
6. The larval worms can penetrate any exposed human skin and eat their way to the blood vessels.
7. When they reach a vein, they swim with the flow of the blood stream to the heart and lungs and eventually to the liver. During this time they gradually change into their adult reproductive forms. After spending 3 weeks in the liver, they swim to the veins that surround the large intestine. Here they lay the eggs that eventually enter the large intestine.

Figure 1



Effective control measures would have to disrupt the life cycle of the blood fluke at any point. On the lines provided, explain how each control measure would be effective.

1. Drying out the irrigation ditches completely when the growing season is over _____

2. Filling in water canals that run through villages and replacing them with underground pipes _____

3. Digging wells to provide a supply of safe water for drinking and washing _____

4. Treating people who have been infected _____

5. Improving sanitation in villages by building sanitation facilities _____

6. Using chemicals that kill snails in infected canals and ditches _____

7. Encouraging people to raise ducks that feed on snails in areas that are infected _____

8. Equipping farmers who work in infected areas with boots _____