

Parasites

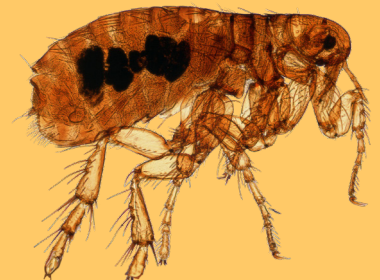


Parasites

**Do you need an idea for a scientific study?
Try out one of our ideas or make one of your own.**

Start learning right now about how parasites impact your life. Take the following brief quiz to see how much you already know about these blood-sucking creatures. See the bottom of page 4 to check your answers.

1. The number of tick-related diseases doubled between the years 2004 and 2017.
 - a. true
 - b. false
2. All of the following organisms are in the class Arachnida *except*:
 - a. mites.
 - b. ticks.
 - c. spiders.
 - d. fleas.
3. The typhus disease is primarily transmitted by:
 - a. spiders.
 - b. fleas.
 - c. lice.
 - d. ticks.
4. Fleas have the ability to jump a maximum of about how many times their body length?
 - a. 10
 - b. 25
 - c. 50
 - d. 75
5. For some unknown reasons, cattle cannot become infested with lice.
 - a. true
 - b. false



The Model Parasite

Models in science are used to represent things, ideas, and processes in a logical manner. All models attempt to connect reality to the model in a simple way. The goal of all model builders is to make the representation help viewers of the model better understand whatever the model represents. For instance, viewing the entire Earth by a person standing on the surface is not feasible and in fact, may lead to erroneous inferences regarding the shape of Earth, such as the earth is flat. However, the model of Earth, commonly called the globe provides a better understanding of Earth's actual shape. A major problem with models is that they always contain inaccuracies or limitations. For instance, the globe effectively gives the general shape of Earth as being spherical; however, most globes fail to show Earth as an oblate spheroid. The size scale of Earth presented as the globe could also lead those uninformed to underestimate the true size of Earth.

Materials Required

- 15 pipe cleaners
- small container Play-Doh™ or clay
- ruler

Procedure

1. Investigate the body structures of ticks, fleas, and lice.
2. Using the clay and pipe cleaners, build a model of a tick. Sketch your tick below.
3. Using the clay and pipe cleaners, build a model of a flea. Sketch your flea below.
4. Using the clay and pipe cleaners, build a model of a louse. Sketch your louse below.
5. Investigate the average size of ticks, fleas, and lice.

Tick	Flea	Louse

Questions

1. Using the three models you built, the ruler, and your results from procedure 5 above, create a scale for your model. For instance, 1 cm model = 1 mm life size.
2. List and describe two limitations of the three models you created.

Parasites

Flee Fleas!

One type of typhus, called murine typhus is caused by the *Rickettsia typhi* bacteria, which are transmitted through flea bites and flea fecal matter that enter the human body through open wounds. Fleas carrying these bacteria are common on rats, cats, and opossums. Typhus is a disease that results in a high fever, rash, body aches, nausea, loss of appetite, vomiting, stomach pain, cough, and headaches. Murine typhus is rarely fatal and most people recover without any treatment. However, some cases result in severe health issues and damage to vital organs. The application of the *doxycycline* antibiotic is the current prescribed treatment of murine typhus. No vaccine currently exists that prevents murine typhus. Symptoms usually appear within two weeks of exposure to the infected flea and immediate treatment with antibiotics is most effective.

The number of cases of typhus in the United States has increased in recent years, especially in areas with large homeless populations, such as Los Angeles. The lack of proper sanitation, overcrowding, increased exposure to untreated and wild animals, and the high costs associated with lengthy treatments used to cure typhus are often characteristics of many of these at-risk populations who exhibit a disproportionate number of cases of typhus as compared to the general population.



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Answers: Page 2 Answers: (1) a, (2) d, (3) c, (4) c, (5) b. Page 3 Answer: (1) Answers will vary; however, the models are much larger than the actual organisms. (2) Answers will vary; however, inaccurate size and mass, and other things, such as a lack of details in the model can be listed as limitations.

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