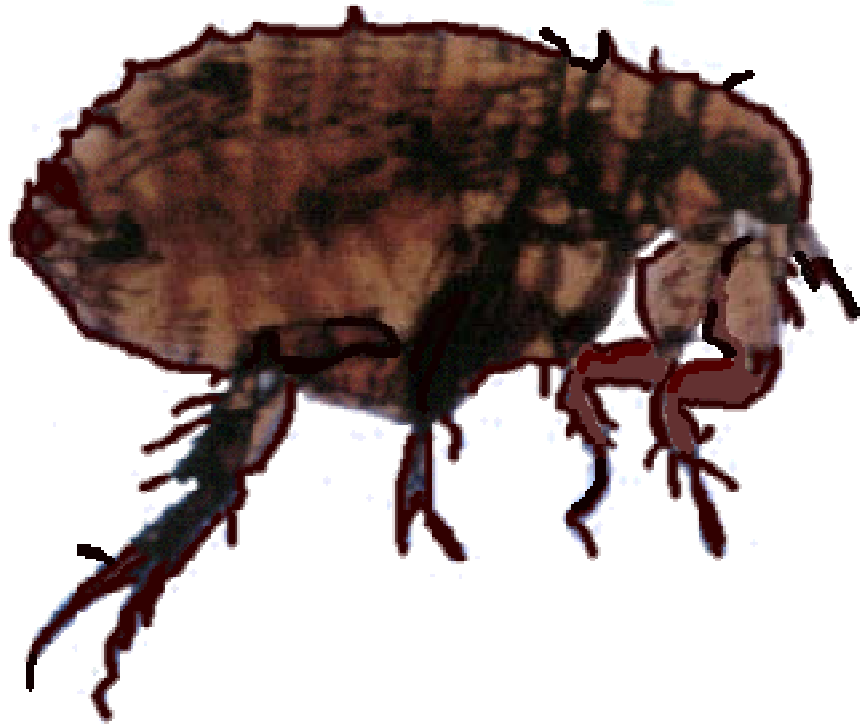


FLEAS: HEALTH AND SAFETY TIPS For YOU AND YOUR PET



Wósits'ílí yaa'
Bee ádaa'áháyá Dóó Bee Ádaaháqhasin
Biniyé Ni dóó Nilíí'

FLEAS: HEALTH AND SAFETY TIPS FOR YOU AND YOUR PET
Wótsits'ílí yaa' Bee ádaa'áháyá dóó Bee Ádaahááhasin biniiyé Ni dóó Nilíí'

*First place winner of the prestigious ASBA "Golden Bell Award"
for K-8 Curriculum.*

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A R.U.F.F. MISSION

1. Goal: That dogs and cats must be kept clean and free of any fleas or ticks.

Problem statement: Many students and adults do not realize that pets can transmit disease to humans by being a host to disease carrying fleas and ticks.

2. Measurable behavioral objectives: Student will demonstrate understanding of the concept visually, in an oral text, and written text where applicable. Age consideration.

3. Specific strategies which focus upon student needs: Leading questions that utilize the five senses. i.e. Ask students if they know what a flea is and what it looks like? Is it dangerous? Can it live on humans? Does the flea hurt our pets? Should we know how to kill fleas on our pets?

4. Awareness or readiness level: Students will respond to an appropriate question and answer at any level.

5. Specific plan: (Materials needed) Proper samples of flea-killing shampoo, powder, and spray. Information on “Black Death” bubonic plague. Having a demonstration of how to wash your pet, or how to properly apply flea powder would be beneficial. Children are visual, if they can watch something being done the chances of it remaining with them are good.

6. Student practice (student activities) Have students observe the proper bathing of a pet--either in film form or hands--on, or the proper way to put flea powder on a cat or a dog. Care should be taken to avoid the animals eyes. Flea powder is applied from back to front, lifting the hair of the pet to make sure that the powder is filtering down to the skin, thoroughly covering the animal everywhere except the eyes or inside the ears.

7. Checking for understanding: (outcome based) Questions are included at the end of this text. Have the children form a group to help one another find the answers. Discuss results.

8. Specific affective and cognitive areas addressed: Students will be able to describe and put into action what can be done to prevent plague.

9. Specific teaching strategies which include student involvement: Students will

study fleas and demonstrate how to kill fleas on pets, and will know which animals carry bubonic plague from contact with the flea.

10. Other: (as applicable): Applicable to classes 3rd grade and up.

FLEAS: HEALTH AND SAFETY TIPS FOR YOU AND YOUR PET Wósits'íli yaa' Bee ádaa'áháyá dóó Bee Ádaahááhasin biniiyé Ni dóó nilíí'

If you ask the average person if they know what bubonic plague, ch'osh bits'áádóó naañiihígíí, is, your answer most likely would be “never heard of it,” or “didn't that disappear hundreds of years ago?” In September of 1995, the Coconino County Department of Public Health in Arizona was issuing a warning that fleas, wósits'íli yaa', found northeast of Flagstaff were carriers of bubonic plague. David Engelthaler of the Arizona Department of Health Services, which monitors insect-spread diseases said, “It is relatively rare to see these diseases, but the potential is there.”

Wósits'íli yaa' taken from Sacred Mountain, 12 miles northeast of Flagstaff on Arizona 89, tested positive for ch'osh bits'áádóó naañiihígíí in 1995. Earlier that summer, a wildlife biologist studying prairie dogs, dlóó', near the Petrified Forest contracted the plague. The 31-year-old woman was treated with antibiotics and recovered. Bubonic plague, ch'osh bits'áádóó naañiihígíí, has occurred in other northern Arizona communities in past years. In 1994, five cases were reported. As carriers of the plague, wósits'íli yaa' have killed more people than all the wars ever fought.

Engelthaler said people living in or visiting northern Arizona should stay

away from small wild animals, such as dlóó'. Dogs, lééchaa'i, should not be allowed to roam and should be treated with flea powder, yaa beenaatseedí, once a week, along with other flea protection, he advised.

What is a flea?



Wósits'íli yaa' are jumping, dah niljǫ́h insects, with long legs and greatly enlarged coxae, ch'osh yee dah náníljǫ́hígíí (the leg segment closest to the body).



The flea, wósits'íli yaa', (any of various small, wingless, blood-sucking insects of the order Siphonaptera that have legs adapted for jumping and are parasitic on warm-blooded animals), is unique in that it is laterally flattened. It has piercing, sucking mouth parts equipped with three piercing stylets, yee ałt'o'ígíí (a small, slender, pointed part).

The antennae are short and lie in grooves in the head. The head, thoracic, and abdominal segments, and the legs of wósits'íli yaa' are covered with rows of backwards-pointing spines or bristles. These spines help the flea move forward in the hairs of a host, yaah déesdáhi (biology: the animal or plant on which or in which another organism lives). This

is why it is so hard to pick a **wósits'ílí yaa'** from your pet's fur.

Wósits'ílí yaa' live on mammals and birds and suck blood for food. A **wósits'ílí yaa'** has flat sides and a head much smaller than the rest of the body. The **wósits'ílí yaa'** shape and its strong spiny legs help it glide quickly and easily through the hairs or feathers of its **yaah déesdáhi**. **Wósits'ílí yaa'** puncture the skin with their beaks to get blood.

Wósits'ílí yaa' live on human beings, cats, mási, dogs, lééchaq'i, rats, lé'étsoh, birds, tsídi, horses, líí', poultry, na'ahóohai, rabbits, gah, and many wild animals. A few kinds live only on certain types of animals. Most kinds of **wósits'ílí yaa'** can jump, dah niljǐh, from animal to human beings and from animal to animal. They leave the **yaah déesdáhi** as soon as it dies because they must have blood for food.



Mated females may lay their small (0.5mm) light-colored eggs loosely among the hair of the **yaah déesdáhi** or in its nest or bedding. Within 2-21 days, the eggs hatch into tiny wormlike larvae, **yaa'ashch'osh**, (the newly hatched, wingless, often wormlike form of many insects before metamorphosis) which in homes develop in crevices in flooring, along loose boards, under the edges of rugs, and in crevices of upholstered furniture. Larval food consists of almost any animal organic matter including dead skin, hair, feathers, food particles,

dead insects and insect feces, especially that of adult fleas.



After feeding from 1-2 weeks, the **yaa'ashch'osh** construct tiny silken debris-covered cocoons, **ch'osh dit'ooí bizis** (a protective case of silk or similar fibrous material spun by the larvae of moths and other insects that serves as a covering for their pupal stage).



Inside its **ch'osh dit'ooí bizis** the **yaa'ashch'osh** molts to form a pupa, **niyé** (the nonfeeding stage between the larva and adult in the metamorphosis of insects, during which the larva typically undergoes complete transformation within a protective cocoon or hardened case). After about a week, the adult flea emerges from the **ch'osh dit'ooí bizis** ready to begin the life cycle **iiná ahééhát'ééh** (the interval of time between birth and death and the sequence of changes through which an organism passes), again.

Mating may take place on or off the **yaah déesdáhi** but a blood meal is required for females to produce eggs. Adult fleas are long-lived (over a year) and they are able to survive weeks without a feeding.



Absence of the preferred **yaah déesdáhi** (i.e.dog or cat) will cause **wósits'ílí yaa'** to attack humans more readily.



Wósits'ílí yaa' are strong and have

great leaping ability for their size. They accomplish their leaps by a sudden release of energy stored in a rubberlike protein located at the site of what would be the wing-hinge ligament in flying insects. A **wósits'íli yaa'** can **dah niljǫh** 150 times their own length, vertically or horizontally. This is equivalent to a man jumping one thousand feet or the length of two football fields!

Wósits'íli yaa' bodies can withstand tremendous pressure, their secret to surviving the scratches and bites of the flea-ridden host.

WHAT HAPPENS WHEN A FLEA, BITES YOU?



Wósits'íli yaa' inject a **hemorrhagic**, **ayi'déé' dił** (**excessive discharge of blood from the blood vessels; profuse bleeding**) , **saliva**, **azhé'é**, (**the watery mixture of secretions from the salivary and oral mucous glands that lubricates chewed food, moistens the oral walls, and contains ptyalin, an enzyme contained in the saliva of human beings and of certain other animals that possesses the property of converting starch into dextrin and maltose and aids in digestion**) , into their **yaah déesdáhí** while feeding. This can cause severe itching, and repeated bites may produce a generalized rash. A small red spot usually appears where the **wósits'íli yaa'** mandibles have penetrated the skin. Bites are felt immediately, but become increasingly

irritating and can be sore for up to a week.



WARNING: although domestic cats, dogs, and human flea bites are in no way life-threatening, the fleas of wild rodents (mice, rats, squirrels, and prairie dogs), in parts of northern Arizona (above the Mogollon Rim) are capable of transmitting the plague bacteria, from rodents to humans. Plague is a life-threatening disease if not promptly treated with antibiotics.

Kinds of Fleas



Three different kinds of **wósits'íli yaa'** species may be characterized as domestic. They live in the folds of clothing and drop eggs about the house instead of attaching them to clothing.

The **ch'osh biyázhi** look like **maggots**, **yaa'ashch'osh** (**the legless, soft-bodied, wormlike larva of any of various flies of the order Diptera, often found in decaying matter**). When they become adults, they seek a **yaah déesdáhí**.

The main **wósits'íli yaa'** affecting the dog and cat is the cat flea. *Clenocephalides felis*. There is a dog flea also that is occasionally responsible for flea infestation, but the majority of the time, *C. felis* is the **wósits'íli yaa'** found on dogs and cats.

Pulex irritant, the human flea, wósits'ílí yaa'.

Ctenocephalides felis, the cat flea, másí bi yaa'.

Ctenocephalides canis, the dog flea, lééchaa'i byaa'.

PRECAUTION AND CONTROL

Knowing a thing or two about wósits'ílí yaa' habits may help you outwit them...



When in the back country, avoid extended activities in areas heavily populated by rodents, tsin deigházhígíí, (any of various mammals of the order Rodentia, such as a mouse, na'ats'qqsí, rat, lé'étsoh, squirrel, dloziłgai, or beaver, chaa', characterized by large incisors adapted for gnawing or nibbling), such as near pack rat nests and prairie dog, dlóq' towns.



In the home, you know your in trouble when:

- (1) certain areas of your carpet seem to hop.
- (2) sitting on the couch becomes an experience in acupuncture.

(3) your dog and cat act like animal contortionists in their efforts to scratch and bite six itches at once. In other words, your house has become a giant flea bag.

In order to avoid wósits'ílí yaa' bites you need to keep pets free of these parasites. Pets may be treated with an insecticidal flea powder, yaa beenaatseedí (a chemical substance used to kill insects). In any case, DO NOT TREAT NURSING PUPPIES OR KITTENS LESS THAN FOUR MONTHS OLD.



Pet shampoos containing approved insecticides may also be used, but wósits'ílí yaa' have become resistant to many of these pesticides commonly found in insect bombs and flea collars.

For the most effective control of wósits'ílí yaa' start early in the spring and continue throughout the summer and into the fall, until the first frost. A new drug has been approved and can be found at your veterinarians office that will allow you to give your pet an oral tablet once every month. This will keep the pet flea free for that month.

Flea, shampoos, especially those containing, Pyrethrum, Duratrol, Tetrachlorvinphos, Gardona, or Dichlorvos are the most effective. Adding minced fresh garlic and a sprinkling of brewer's yeast to your pet's food is also said to help repel fleas. Your veterinarian can

prescribe tablets to be taken orally once a month to keep your pet flea free.

When flea collars are used containing insecticides, they are suppose to release low concentrations of insecticides slowly into the fur around the animal's neck. Some veterinarians advise pet owners not to use flea collars on their pets. Ask your veterinarian's advise on the use and strength of flea collars.

Sanitation is important to rid an infected house of *wósits'ílí yaa'*. Vacuum rugs and upholstered furniture daily to remove fleas eggs, and larvae. *Wósits'ílí yaa'* spend most of their time away from their *yaah déesdáhí* and can survive for several weeks without feeding, so keep up the vacuuming for at least a month.

Be sure to block up any exits from the vacuum cleaner after vacuuming so the *wósits'ílí yaa'* cannot hop back out ,and then either destroy the material collected in the vacuum cleaner bag or

vacuum up a handful of moth crystals or flakes every 2-3 weeks. Pay particular attention to cracks and crevices, the edges of carpets, and along baseboards where the *wósits'ílí yaa'* may be hiding. To prevent treated pets from becoming reinfested, you should treat the premises with an approved insecticide or employ a reputable pest control operator to do the work. If your pet will allow you to vacuum them, this is a good way to help elimante *wósits'ílí yaa'*.

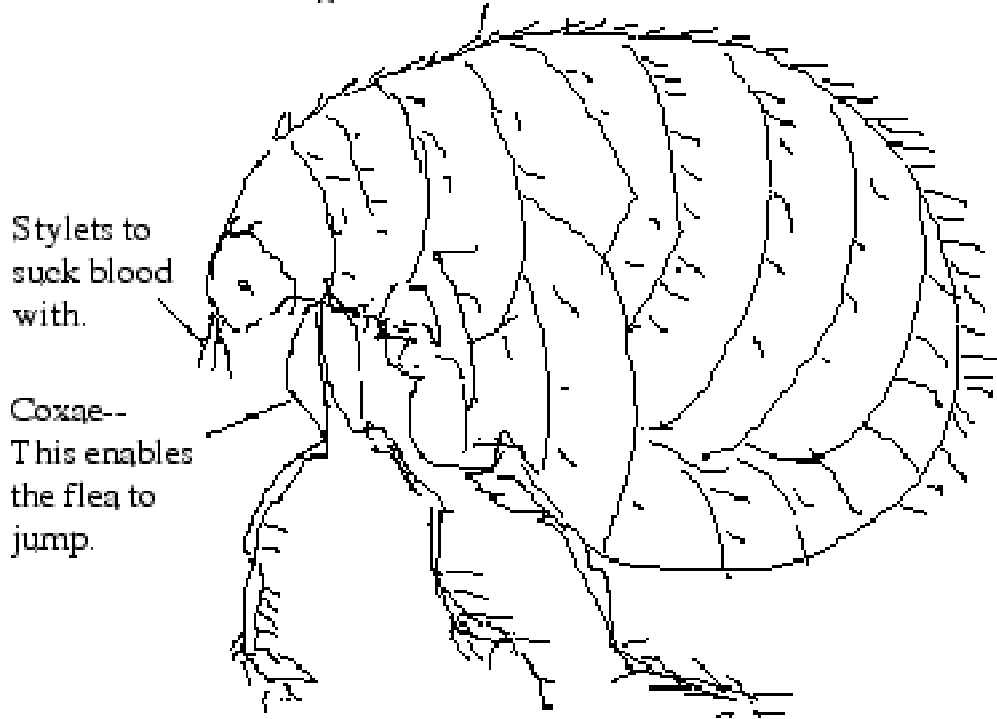
Many pets are made miserable not only by the *wósits'ílí yaa'* bites themselves but also by an allergic reaction to flea saliva, a persistent condition that is often treated with cortisone-related medications.

Never, Never handle wild animals that are easy to catch.

Never, Never handle **DEAD** or **SICK** animals, especially rodents. They could have the **plague, ch'osh bits'áádóó naaŋnihígíí.**

Body of the Flea

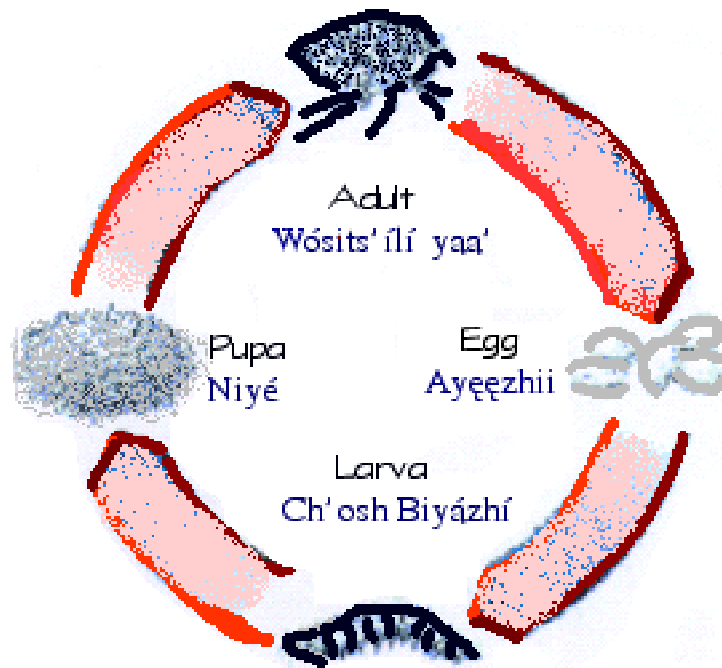
Spines or bristle hairs which enable the flea to move through the host's hair or feathers.



Stylets to suck blood with.

Coxae-- This enables the flea to jump.

Spines on the flea's legs help it to cling to the host.



Fleas pass through a complete life cycle of four stages:

Egg; Larva; Pupa; Adult

Adult fleas prefer to live on the host animal, but are often dislodged by scratching. Eggs are laid on the animals, but are quite smooth and easily fall off into the environment. Larva hatch from the egg and undergo approximately three molts, progressively becoming larger. Adult fleas hatch from the cocoon when proper stimulation is present. The stimuli include: increased carbon dioxide levels, heat, and motion. The adult can emerge from the cocoon in a very short time period...less than a second...and immediately jump to find a proper host. Once on the host they feed on blood obtained by biting through the skin. An egg may develop into an adult flea within fourteen days if conditions are ideal. Each fertilized female may lay as many as 25 eggs per day...more the 800 in her lifetime. In just thirty days, 25 adult female fleas can multiply to as many as a quarter of a million fleas!

Questions for discussion:

1. Question--Are fleas dangerous?

Answer: Yes

2. Question--How are they dangerous?

Answer: Some types of them can carry disease, most specifically bubonic plague,

3. Question--What is bubonic plague?

Answer-- Bubonic Plague is caused by an organism (tiny bug) called Yersinia Pestis. The bug grows in a flea's gut. When the infected flea bites an animal, it regurgitates the organism into the animal. The organism is too small to see without a magnifying glass.

4. Question--How do people get plague?

Answer--Bubonic plague is transmitted to human beings chiefly by fleas from infected rodents. An attack of plague usually begins suddenly. The patient has chills and fever, headache, and body pains. At the same time, the lymph glands swell, especially in the groin, armpits, and neck, called buboes. Often the buboes become open sores. A deadly type of the disease, called pneumonic plague, affects the lungs.

This is how it could happen:

Your pet **lééchaq'i** will chase and sometimes catch a **dlóq'** often trying to dig into the **dlóq'** burrow, **a'áán**. Infected **wósits'ílí yaa'** live on the **dlóq'** and will **dah niljǐh** on to the **lééchaq'i**. The **lééchaq'i** comes home and the family members will pet the **lééchaq'i**, the **wósits'ílí yaa'** then **dah niljǐh** from the **lééchaq'i** to the person.

5. Question--Do dogs get plague?

Answer--Dogs do not get the plague but the infected fleas can live on them.

6. Question: How do people get cured of the plague?

Answer: The treatment involves 1-2 weeks of an antibiotic medicine taken intravenously.

7. Question--Do cats get plague?

Answer--YES!

8. Question--Can people catch plague from cats?

Answer--Yes, an even more deadly form can come from a cat. It is called *pneumonic plague*. Babies and small children, even adults can catch this type of plague from the cat. It takes 2 to 4 days from direct exposure to illness. Without prompt treatment, a person can easily die as a result of either type of plague. (Because cats can catch the plague they tend to develop abscesses and a cough. When the cat coughs, the droplets contain the virus. If a cat with the plague coughs directly into the mouth of someone they will get a form of plague that attacks the lungs. Then that person can spread the disease through coughing.)

9. Question--How can bubonic plague be prevented?

Answer--Avoid contact with rodents and cottontails, gałbáhí, when you are outdoors.

10. What if you hunt or trap?

Answer--Wear rubber gloves when cleaning or skinning wild animals. If your unprotected skin touches the flesh of the rodent or cottontail that is infected with the plague the bacteria will enter directly into your bloodstream.

11. If you have dogs and cats how can you keep them safe from fleas?

Answer--Dust them weekly with a good flea powder. Or you can bathe them with a shampoo that kills fleas. You can also spray them with a flea spray (but don't get it in their eyes, it hurts)

12. Is it O.K. to pitch tents or lay bedrolls on or near rodent nests or burrows?

Answer--Do not pitch your tent or lay your bedroll near rodent nests or a burrow because infected fleas could be present in or around the burrow.

13. Should you seal off all openings at home so rodents such as mice, rats, chipmunks, hazéits' ósii, ground squirrels, naadooboo'ínii, etc. cannot get in?

Answer--Yes

14. Why should you keep your home and surrounding area free of trash and junk to keep rodents away?

Answer: Because rodents will live where they can find food and nesting material. Old car bodies are really bad because they are usually home to rodents. They like to use the stuffing in the car seats for their nest.

15. Should you report any die-offs of wild rodent populations or cottontails to your tribal health officials or to the Indian Health Service Office?

Answer: Yes, they may not know that there is a plague problem.

16. Question--is bubonic plague a new disease?

Answer--No. The first record of plague in Europe tells of an epidemic, *yiłnih* (*spreading rapidly and extensively by infection and affecting many individuals in an area or a population at the same time*), in Athens in 430 B.C. One of the worst occurred in Rome in A.D. 262, and killed 5,000 persons a day. The Crusaders carried the disease to Europe. From 1334 to 1351, it swept over China, India, Persia, Russia, Italy, France, England, Germany, and Norway. In London, more than 150,000 people died of plague between 1603 and 1665. Plague almost vanished in the late 1800's but in 1894 it appeared in Hong Kong, one of the worlds great ports. From there ships carried it to the rest of the world, especially India. More than 10,000,000 people in India died from the plague during the next 20 years.



=thematically tied in with health, historical health issues, biology, reading, language, safety, and history.

More questions to ask.

1. Describe the common flea.
2. How long can a flea live?
3. How does the flea change from wormlike into a flea?
4. What is a cocoon?
5. Inside the cocoon the larva molts into what?
6. What is the black death?
7. When was the first record of an outbreak of bubonic plague?
8. Where does the plague come from?
9. What carried the plague bacteria?
10. How far can a flea jump?
11. How can we keep fleas off of our pets?
12. What happens when a flea bites you?
13. How many types of fleas are there?
14. How can bubonic plague be prevented?

Vocabulary words for Health and Safety for You and Your Pet. Please define each word and use it in a sentence. Use of the Navajo words are encouraged.

1. bubonic plague	ch'osh bits'áádóó naałniihígíí	page 5
2. fleas	wósits'íli yaa'	page 5
3. prairie dogs	dlóq'	page 5
4. dogs	łééchaa'i	page 5
5. flea powder	yaa beenaatseedí	page 5
6. jumping	dah niljǫ́h	page 5
7. coxae	ch'osh yee dah náníljǫ́hígíí	page 5
8. stylets	yee alt'o'ígíí	page 5
9. host	yaah déesdáhí	page 6
10. cats	mási	page 6
11. rats	łé'étsoh	page 6
12. birds	tsídii	page 6
13. horses	łǫ́'	page 6
14. poultry	na'ahóóhai	page 6
15. rabbits	gah	page 6
16. larvae	yaa'ashch'osh	page 6
17. cocoons	ch'osh ditł'ooí bizis	page 6
18. pupa	niyé	page 6
19. life cycle	iiná ahééhát'ééh	page 6

20. hemorrhagic	ayi'déé' dił	page 7
21. saliva	azhé'é	page 7
22. maggots	yaa'ashch'osh	page 8
23. rodents	tsin deigházhígíí	page 8
24. cottontails	gałbáhí	page 13
25. chipmunks	hazéits' ósii	page 13
26. ground squirrels	naadooboo'ínii	page 13
27. epidemic	yíłnih	page 14



Dear Parent,

We are currently working on a thematic unit dealing with The RUFF Program and are attempting to help integrate learning by providing you with discussion topics for home to school transfer.

1. Do you understand what a flea is? Do you understand that it can carry the disease bubonic plague?
2. Have you noticed any fleas on the pet animals lately?
3. If you are outside playing, do you understand that you should stay away from rodents and their nests?

Please talk about these issues with your child this week. If there are any questions please do not hesitate to call me.

Sincerely,

Your child's teacher

FOR MORE R.U.F.F. "MISSIONS"

contact:

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