K– 5th GRADE LESSON PLAN

Is dog poop bad for the environment?

Objective:

- Students will understand that dog feces can damage the health of humans and the environment.
- Students will be able to explain what they can do to keep dog poop from having a harmful effect on humans and the environment.

Venue:

Large playing field/

Classroom

Time:

Total: 30–45 minutes

Materials:

For classroom lesson:

- Picture of your watershed
- Pictures of parasites that dog feces can carry (included with this lesson plan)
- Projector for digital images included in this packet and, if desired, online images of the parasites carried in dog poop, or large prints of these images
- Printouts of illustrations and worksheets

For scavenger hunt:

- Fake dog feces (can use small potatoes)
- Illness flags
- Native species flags
- Boundary flags/rope

Content Preview and Background Information:

How can dog poop affect human health?

Dog poop is a common carrier of the following diseases and parasites:

- Whipworms (can live in soil for 5 years)
- Hookworms (can live in soil for 3–4 weeks)
- Roundworms (can live in soil for several years)
- Tapeworms (eggs can stay dormant in soil for years)
- Corona
- Giardiasis
- Salmonellosis
- Cryptosporidiosis
- Campylobacteriosis

A lot of these parasites can cause fever, muscle aches, headache, vomiting, and diarrhea. These parasites and bacteria can be easily introduced to people when dog poop is left on the ground in their gardens or used as fertilizer. If the dog poop is infected with parasite eggs, those eggs can easily transfer to yard and garden plants. When people eat produce from the garden or touch the plants before touching their eyes, mouth, or nose, they can ingest the eggs and become infected with the parasite. Children who don't wash their hands properly after playing outside in an area where dog poop has been left on the ground can easily get infected by a parasite. The parasites can stay in the soil long after the dog poop has decomposed, making it hard for kids and adults to avoid areas that can be infected. Dog poop also contains bacteria like *E. coli* and *enterococci*. Like parasite eggs, these bacteria can transfer to plants and survive in water, potentially making people sick.

Additionally, some scientists say that rats are attracted to dog poop because it contains fat, protein, and carbohydrates that they need. This can lead to rats eating dog poop, and hanging around homes and urban areas in order to be close to this food source. Other scientists contest this theory. However, if it is true, it is cause for concern because rats and other rodents carry many other diseases, like bubonic plague, hantavirus, and typhus, all of which can cause serious health issues for people.

How can dog poop affect the health of the environment?

When dog poop is left out, it can easily wash into our waterways, polluting nearby creeks, rivers, and our ocean. This makes it unsafe for people to go into the water because they can get sick if they are exposed to bacteria or parasites from the poop. Certain animals can also be affected by dog poop and potentially become sick.

Another problem is that dog feces has a high level of nitrogen, which is a nutrient that plants need to grow. Unfortunately, when too much nitrogen is introduced to a body of water, it can cause an algae bloom. Algae takes a lot of oxygen from the water, which can result in the suffocation of fish and other aquatic species that are oxygen dependent. It can also crowd out other aquatic plants, making it so that they can't get the nutrients and sunlight they need to survive.

Introduction (15 minutes):

- Introduce the idea that dog poop negatively affects people and the environment.
- Assess their prior knowledge on the subject with a KWL chart.
    1. Make a KWL chart (make three columns, each letter being a heading)
        1. K=What we do KNOW
        2. W= What do we WANT to learn
        3. L= LEARNED
    2. Begin by asking what the students already know about dog poop. Place this information in the column under K.

3. Ask them what they would like to know. Write down their questions under W. Make suggestions like:
    - Does it affect our heath?
    - Does it affect wild life?
    - Can it affect other dogs?
4. Do your best to incorporate humor and poop puns! We find that kids remember more when humor is added to the lesson.

Main content (15–30 minutes):

1. Begin telling the story of Kai and Pepe
    a. The story and illustrations that include Kai and Pepe part can be used in multiple ways, according to your students' age, needs, and preferences.
        i. Use the versions that include the illustrations and the written story and have students read the story popcorn style.
        ii. Use the illustrations without the written story and write the story together, as a class, or in small groups.
        iii. Use the illustrations without the written story and have students create their own narratives using keywords that you provide during the lesson.
2. In preparation for any of the activities above, begin by asking the students what they see in every illustrated scenario.
    a. Questions to ask after seeing the before and after images:
        i. What do they notice in the illustrations?
        ii. How are the before and after images different?
        iii. Why do they think it looks that way? For example:
            1. Why is there a lot of algae in one image and not in the other?
            2. Why doesn't Kai's garden flourish when she uses dog poop as fertilizer?
3. After finishing the story, share more details about the effects of dog poop as explained at the beginning of this packet.
4. Explain that it takes an average of nine weeks for dog feces to break down, and that dog feces can remain intact for as long as a year.
5. Explain that dog poop has two times the amount of bacteria found in human poop.
6. Considering the story of Pepe and Kai, as well as the dog poop facts you have introduced, ask students why they think it is important to pick up dog poop.
7. Explain that a watershed is an area of land that drains to one body of water, and that everyone lives in a watershed. Ask students to think about the waterways closest to them. This might be a creek, a river, a harbor, a lake, a seasonal stream, a below-ground water table, or another water body. If possible share a map or satellite image of your area, pointing out the waterways in your local watershed.
8. Share an image of your watershed and ask students to imagine a pile of poop left near the school, or quickly draw a watershed that includes an image of dog feces near a water source.
    a. Ask the students what they think will happen to the poop if it starts raining.
        i. Write down their answers
        ii. Discuss their ideas

9. Explain to the students that even if the poop isn't located near to a water source, the bacteria and parasites contained in it can wash into local waterways when it rains. It is also possible that rats, which carry many more diseases, might see the dog poop as food and eat it. Rats carry many more diseases that can harm people.
10. After learning these facts, ask students whether or not they think people should use their dog's waste for garden fertilizer or leave it on the ground.
    a. Write down their answers
    b. Discuss their ideas
    c. Takeaway messages to share: Not only does the poop make our water dirty and potentially endanger our health, it can cause algae blooms that harm wildlife and plants. Algae can suck out oxygen from the water and block sunlight, making it harder for aquatic creatures and plants to survive.

Want to go further with your students? Here is more information you can add to the lesson:

Dog poop has a lot of nitrogen, which fuels massive algae growth

i. Explain that a lot of aquatic creatures need clear, clean, and cold water with lot of oxygen to be able to survive.

Explain that diseases/ parasites can stay in the soil for a long time

a. Whipworms (can live in soil for 5 years)
b. Hookworms (can live in soil for 3–4 weeks)
c. Roundworms (can live in soil for several years)
d. Tapeworms (eggs can stay dormant in soil for years)

Conclusion:

Have the students re-establish what they just learned by doing a quick activity like:

1. Pair share (where a student will turn to a neighbor and tell them something new they learned today)
2. Exit ticket (students will be given a piece paper and each student will write out something new that they learned)
3. Ask students to share the most interesting fact they learned that day
4. Have students think about and explain what they will do the next time they see someone leave dog poop on the ground.

FAQ:

1. **Why isn't poop from other animals like deer and rabbits bad for the environment?**

   Answer: The theory is that herbivores' poop has less bacteria in comparison to omnivores and carnivores because meat is harder to break down than plant matter. However, more research must be done on the topic to establish this as a fact. Another possible explanation is that there are a lot more dogs than deer or wild rabbits. On average, dogs produce about 3.5 pound of poop per week, which can add up to a lot of poop and bacteria. This is especially problematic if the poop is left out to decompose and goes into the environment. Also, while deer and wild rabbits are a natural part of the ecosystem, dogs are domesticated and are not. Because of this, the ecosystem is not set up to break down their poop.

Get your students moving!

Poop scavenger hunt (15 minutes):

Materials:

- Fake poop (can be bought online or at some retail locations that sell joke gifts), print out the poop flags included at the end of this packet, or use small potatoes.
- Dog poop bags (empty)
- Trash bins or buckets
- Timer
- Rope or caution tape for boundaries

Instructions:

1. Prior to students' arrival, set up boundaries for the playing field (the size of the playing field should vary depending on the number of students in the class)
2. Explain the goals and rules for the scavenger hunt (see below) before going outside, so that you retain their full attention.
3. Explain to students that this is a class effort! The whole class either wins or loses; only if they find all of the fake poop will they win the game.
4. Give them a time limit to encourage them to work together and to make the game more competitive. We suggest no more than three minutes, but this should vary depending on your hiding locations and the size of your playing field.
5. In the end, this is game, so let the kids have fun and enjoy it!

Goal:

- Work together to pick up all of the dog poop and put it in the trashcan, where it belongs!

Rules:

1. Anyone who steps out of the boundaries is automatically out!
2. Students must grab the fake poop and/or poop flags with a doggy bag, or they will be infected with a disease! If they don't use a doggy bag, they have to sit down since they are "ill." When they sit down, they must place any poop and/or flags they have gathered beside them on the ground. Only another student with a doggy bag can pick it up to put it in the bin.
3. The students will have three minutes to find the fake poop (or poop flags) after time runs out they have to freeze
4. Scout out the area to see how they did! If there are any students with "poop" in their hand, that doesn't count as collected. For the class to win all the "poop" must me found and placed in the bin.

Review questions:
Why is it important to pick up after your dog?
Why?
What is a parasite?

Pooptastic facts with Pepe and Kai:

- An average-size dog dropping produces nearly two times as much bacteria as human waste.
- Dog poop can take up to a whole year to break down, and can continue producing bacteria during that time.
- An average dog creates 3.5 pounds of poop every week. San Luis Obispo County is home to more than 62,000 dogs. That's more than 217,000 pounds of dog poop each week! In Los Angeles County, there are 1,008,014 dogs. That's more than 3,528,049 pounds of dog poop each week! That is a lot of poop.

FAQ activity:

- Print out these facts or write them on poster paper and place them around the classroom. Have students walk around and write their reactions to each fact.
- Make a guessing game out of these facts by asking questions like: "How long does it take for dog poop to break down?" or "How much poop does an average dog produce each week in pounds?"

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