

FOREVER CHEMICALS (PFAS): READING 6TH, 7TH, 8TH GRADE



Improve students'
literacy skills

Science
Applicability

Sub Plan



Reading Buyer Comment



Extremely satisfied - Great resource to work on student reading comprehension and it tied into the topic I was teaching. My students have been struggling with reading and I've been incorporating more reading into my lessons. Thank you for the resource.



SCROLL

to take a look inside!

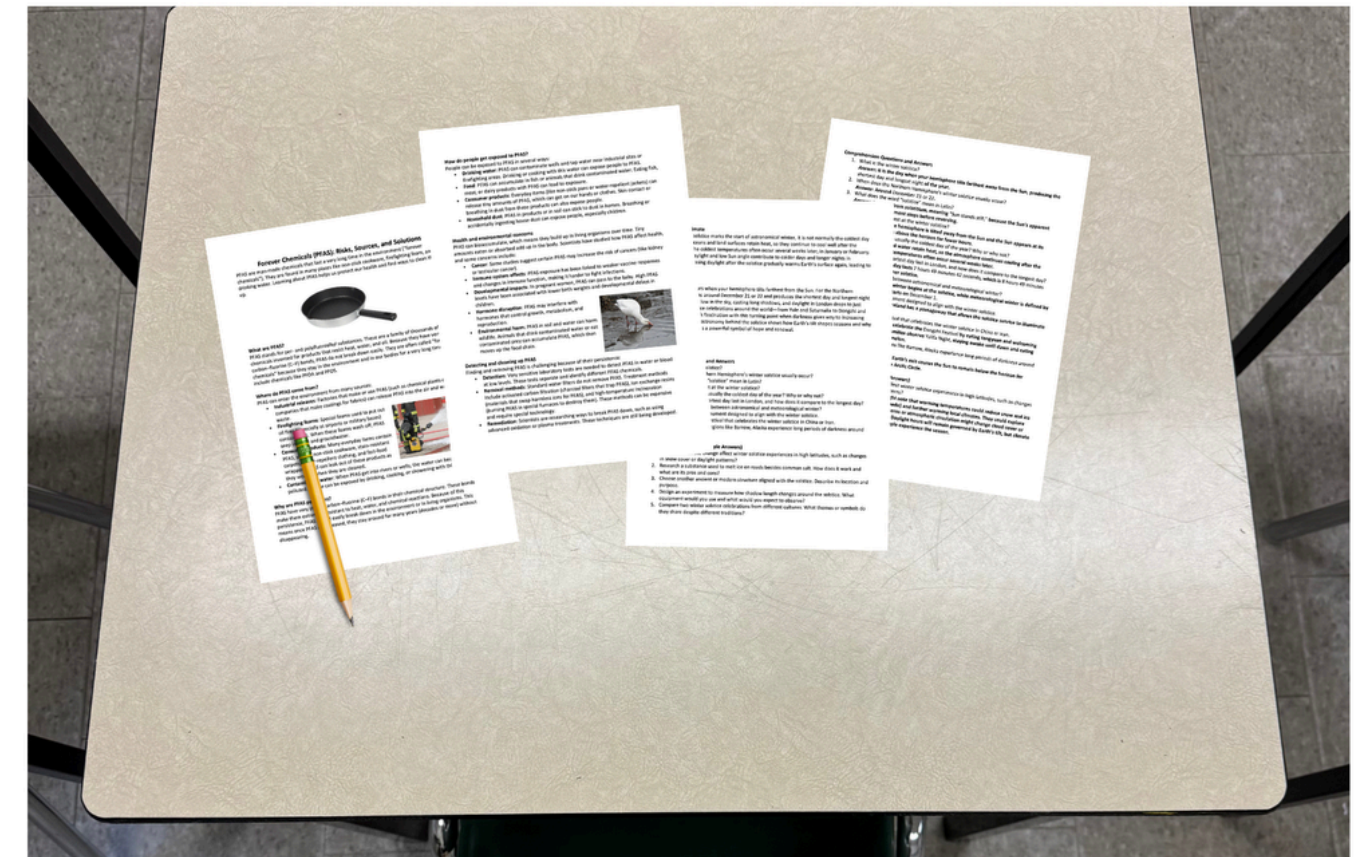


THE PROBLEMS YOU FACE

- Limited time to teach scientific literacy and strengthen students' reading and analysis skills.
- Need meaningful extension activities to engage fast-moving learners.
- Difficulty creating effective last-minute sub plans that still support student learning.

NO-PREP - PRINT/UPLOAD

- Questions and Answer Key
- **No Prep, Ready-to-Use:** Print or assign digitally with Google Docs, Microsoft Word, and PDF formats for flexible classroom use
- **Includes Varied Question Types:** Knowledge, thinking, connecting, application, and open-ended questions.



What Will Your Students Learn?

READING COMPREHENSION ARTICLE & QUESTIONS

- What are Forever Chemicals (PFAS)?
- How PFAS Are Used in Everyday Products
- Persistence and Bioaccumulation
- Water Quality and Contamination
- The Role of Scientists and Engineers in Clean-Up
- Environmental Health & Public Policy
- Solutions and Ways to Reduce Risk

Article with
Comprehension
Questions

6th, 7th, 8th Grade

Print & Digital

Comprehension Questions

1. What does the term PFAS stand for?
2. Why are PFAS often called "forever chemicals"?
3. Name two common sources of PFAS in the environment.
4. How can drinking water become contaminated with PFAS?
5. What is bioaccumulation?
6. Give two health risks linked to PFAS exposure.
7. Why is it important to know about PFAS?
8. What is the role of scientists and engineers in clean-up?
9. How can we reduce the risk of PFAS exposure?
10. Why are PFAS called "forever chemicals"?

Extension Research

1. Research the history of PFAS.
2. Find a factory that produces PFAS.
3. Investigate the health effects of PFAS.
4. Look up the latest research on PFAS.
5. Learn about the role of scientists and engineers in clean-up.

Forever Chemicals (PFAS): Risks, Sources, and Solutions

PFAS are man-made chemicals that last a very long time in the environment ("forever chemicals"). They are found in many places like non-stick cookware, firefighting foam, and even drinking water. Learning about PFAS helps us protect our health and find ways to clean them up.



What are PFAS?

PFAS stands for per- and polyfluoroalkyl substances. These are a family of thousands of chemicals invented for products that resist heat, water, and oil. Because they have very strong carbon-fluorine (C-F) bonds, PFAS do not break down easily. They are often called "forever chemicals" because they stay in the environment and in our bodies for a very long time. PFAS include chemicals like PFOA and PFOS.

Where do PFAS come from?

PFAS can enter the environment from many sources:

- **Industrial releases:** Factories that make or use PFAS (such as chemical plants or companies that make coatings for fabrics) can release PFAS into the air and water as waste.

- **Firefighting foams:** Special foams used to put out oil fires (especially at airports or military bases) contain PFAS. When these foams wash off, PFAS seep into soil and groundwater.

- **Consumer products:** Many everyday items contain PFAS, such as non-stick cookware, stain-resistant carpets, water-repellent clothing, and fast-food wrappers. PFAS can leak out of these products as they wear or when they are cleaned.

- **Contaminated water:** When PFAS get into rivers or wells, the water can become polluted. People can be exposed by drinking, cooking, or showering with this water.



Why are PFAS persistent?

PFAS are persistent because of their strong carbon-fluorine (C-F) bonds. These bonds are very stable and do not break down easily in the environment. Because of this, PFAS can stay in the environment for decades or even longer.

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Your Reading

Forever Chemicals (PFAS): Risks, Sources, and Solutions

PFAS are man-made chemicals that last a very long time in the environment (they are called “forever chemicals”). They are found in many places like non-stick cookware, firefighting foams, and contaminated water. Learning about PFAS helps us protect our health and the environment.



What are PFAS?

PFAS stands for per- and polyfluoroalkyl substances. These chemicals are invented for products that resist heat, water, and stains. Because of their strong carbon-fluorine (C-F) bonds, PFAS do not break down easily in the environment and in our bodies. They are called “forever chemicals” because they stay in the environment and in our bodies for a very long time. Examples include industrial releases (factories) and firefighting foams. PFAS can get into water if factories or sites with firefighting foam pollute groundwater, and if contaminated rivers supply drinking water. Bioaccumulation means PFAS build up in living organisms over time, because small amounts keep adding up in the body. Health concerns include increased risk of cancer, weaker immune responses, developmental problems in babies, and hormone disruption. Because PFAS are very stable chemicals; they do not get removed by normal filters or natural processes. Activated carbon filters or ion exchange systems can be used to capture PFAS from water.

Where do PFAS come from?

PFAS can enter the environment from many sources:

- **Industrial releases:** Factories that make or use PFAS (like companies that make coatings for fabrics) can release PFAS into the air, soil, and water.
- **Firefighting foams:** Special foams used to put out oil fires (especially at airports or military bases) contain PFAS. When these foams wash off, PFAS seep into soil and groundwater.
- **Consumer products:** Many everyday items contain PFAS, such as non-stick cookware, stain-resistant carpets, water-repellent clothing, and fast-food wrappers. PFAS can leak out of these products as they wear or when they are cleaned.
- **Contaminated water:** When PFAS get into rivers or are polluted. People can be exposed by drinking, cooking, or using this water.

Why are PFAS persistent?

PFAS have very strong carbon-fluorine (C-F) bonds in their molecules that make them extremely resistant to heat, water, and chemical breakdown. Because of this persistence, PFAS do not easily break down in the environment. Once PFAS are released, they stay around for many years, sometimes forever.

How do people get exposed to PFAS?

People can be exposed to PFAS in several ways:

- **Drinking water:** PFAS can contaminate wells and tap water near industrial sites or firefighting areas. Drinking or cooking with this water can expose people to PFAS.
- **Food:** PFAS can accumulate in fish or animals that drink contaminated water. Eating meat, or dairy products with PFAS can lead to exposure.
- **Consumer products:** Everyday items (like non-stick pans or water-repellent jackets) release tiny amounts of PFAS, which can get on our hands or clothes. Skin contact or breathing in dust from these products can also expose people.
- **Household dust:** PFAS in products or in soil can stick to dust in homes. Breathing or accidentally ingesting house dust can expose people, especially children.

Health and environmental concerns

PFAS can bioaccumulate, which means they build up in living organisms over time. Tiny amounts eaten or absorbed add up in the body. Scientists have studied how PFAS affect health and the environment, and some concerns include:

- **Cancer:** Some studies suggest certain PFAS may increase the risk of cancers (like liver or testicular cancer).
- **Immune system effects:** PFAS exposure has been linked to weaker vaccine responses and changes in immune function, making it harder to fight infections.
- **Developmental impacts:** In pregnant women, PFAS can pass to the baby. High levels have been associated with lower birth weights and developmental delays in children.
- **Hormone disruption:** PFAS may interfere with hormones that control growth, metabolism, and reproduction.
- **Environmental harm:** PFAS in soil and water can harm wildlife. Animals that drink contaminated water or eat contaminated prey can accumulate PFAS, which then moves up the food chain.



Detecting and cleaning up PFAS

Finding and removing PFAS is challenging because of their persistence:

- **Detection:** Very sensitive laboratory tests are needed to detect PFAS in water at low levels. These tests separate and identify different PFAS chemicals.
- **Removal methods:** Standard water filters do not remove PFAS. Treatment methods include activated carbon filtration (charcoal filters that trap PFAS), ion exchange (materials that swap harmless ions for PFAS), and high-temperature incineration (burning PFAS in special furnaces to destroy them). These methods can be expensive and require special technology.
- **Remediation:** Scientists are researching ways to break PFAS down, such as using advanced oxidation or plasma treatments. These techniques are still being developed.

Solutions and ways to reduce risk

- **Regulation:** Governments are setting rules to limit PFAS use and clean up contaminated sites. For example, agencies set safe levels of PFAS in drinking water.
- **Safer alternatives:** Many companies are replacing PFAS with safer chemicals in their products. Using “PFAS-free” cookware, clothes, and cosmetics can reduce exposure.
- **Water treatment:** Home water filters with activated carbon can reduce PFAS. City water treatment plants use special processes to remove PFAS from public water supplies.
- **Consumer choices:** Avoiding products with PFAS (like certain stain-resistant sprays) can lower personal exposure. Checking labels and choosing products made without PFAS helps protect health.
- **Community action:** Local groups can test water for PFAS, press for cleanup, and educate neighbors. Some communities have successfully banned PFAS-containing firefighting foams or passed laws to test and filter tap water.

Understanding PFAS and taking action helps protect human health and the environment. By reducing PFAS use and cleaning up contamination, we work toward a safer, cleaner future.

PFAS Source	Examples	Associated Risks
Industrial sites	Chemical plants, factories	Contaminated groundwater and air
Firefighting foams	Airport or military foams	Soil and water pollution near sites
Consumer products	Non-stick pans, stain-resistant fabrics	Household dust and food contamination
Contaminated water	Polluted wells/rivers	Drinking water exposure

Comprehension Questions

1. What does the term PFAS stand for?
2. Why are PFAS often called “forever chemicals”?
3. Name two common sources of PFAS in the environment.
4. How can drinking water become contaminated with PFAS?
5. What is bioaccumulation?
6. Give two health concerns linked to PFAS exposure.
7. Why is it hard to remove PFAS from water?
8. What is one method used to filter PFAS from water?
9. How can consumers reduce their exposure to PFAS at home?
10. Why are safer alternatives to PFAS important?

Extension Research Questions

1. Research a case where a community's water was contaminated by PFAS (for example, near a factory or military base). What cleanup actions were taken?
2. Find a study or news article about PFAS in food (like fish or dairy products). What were the findings?
3. Investigate a product labeled “PFAS-free” (such as a cookware or cosmetic). What material does it use instead of PFAS, and how effective is it?
4. Look up regulations on PFAS in your country or state. What limits are set for PFAS in drinking water?
5. Learn about remediation technologies for PFAS (like activated carbon or ion exchange). How do they work, and what are their limitations?

Discussion Questions - Answer Key

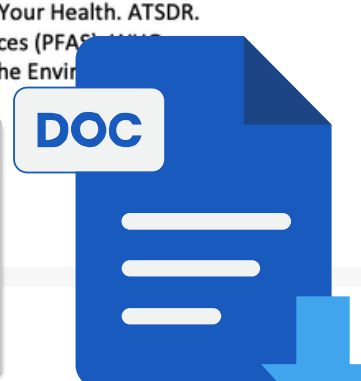
PFAS stands for per- and polyfluoroalkyl substances, which are a group of man-made chemicals. Because PFAS have very strong chemical bonds and do not break down easily, so they persist in the environment and in our bodies for a very long time. Examples include industrial releases (factories) and firefighting foams. (Also correct: firefighting foams like non-stick cookware or contaminated water sources.) PFAS can get into water if factories or sites with firefighting foam pollute groundwater, or if contaminated rivers supply drinking water. Bioaccumulation means PFAS build up in living organisms over time, because small amounts keep adding up in the body. Health concerns include increased risk of cancer, weaker immune responses, developmental problems in babies, and hormone disruption. Because PFAS are very stable chemicals; they do not get removed by normal filters or natural processes. Activated carbon filters or ion exchange systems can be used to capture PFAS from water.

Answer Key Included Office, Google, and PDF Versions

Answers vary. Example: “Activated carbon filters work like sponges to trap PFAS molecules; ion exchange resins use charged beads to attract PFAS. Both require replacing or regenerating the filter material once it’s full.”

Answer Key (APA)

U.S. Environmental Protection Agency. (2022). What are PFAS?. EPA. [Toxic Substances and Disease Registry. \(2021\). PFAS and Your Health. ATSDR. \(2020\). PFAS in the Environment. EPA. \(2020\). PFAS in the Environment. EPA.](#)

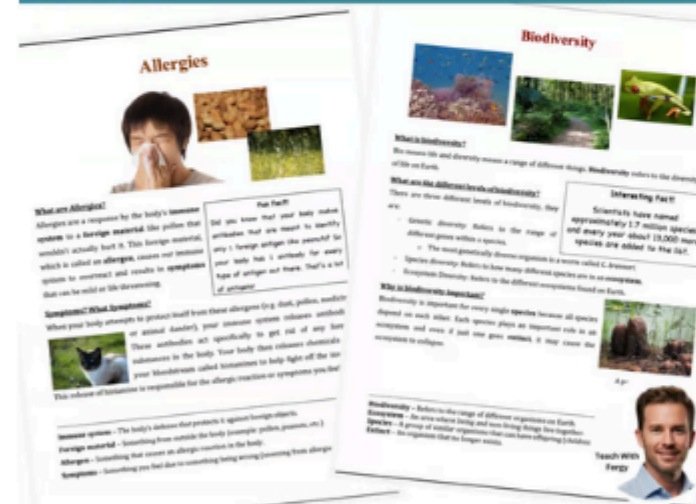


Comprehension and Extension Questions

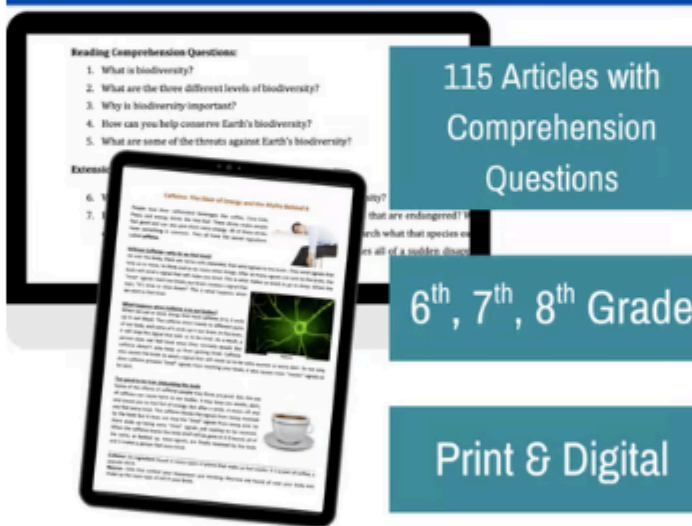
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115 Articles with
Comprehension
Questions

6th, 7th, 8th Grade

Print & Digital



★★★★★ Extremely satisfied - So many comprehensive readings for all science fields. PDF and DOCX versions included so they can be edited if needed. Each one includes short answer questions at the end, the first set are easy to find the answers to in the readings, the second set require a bit more critical thinking. Includes an answer key. Great to use to fill in time or for sub plans.

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