Common Polyatomic Ions Worksheet (includes answers)

Resources:
www.youtube.com/
www.somethingcalled.science.com/common-polyatomic-ions

Section 1: Multiple Choice

1. What is a polyatomic ion?

   A) An ion composed of a single atom

   B) An ion composed of two or more atoms that carry a net electric charge

   C) An ion that does not carry a charge

   D) An ion that is always negatively charged

2. Which of the following polyatomic ions carries a charge of -2?

   A) Nitrate (NO_3^-)

   B) Ammonium (NH_4^+)

   C) Sulfate (SO_4^{2-})

   D) Phosphate (PO_4^{3-})

Section 2: Fill in the Blanks

3. The sulfate ion consists of one _____ atom bonded to four _____ atoms.
4. The nitrate ion is essential for _____ growth and is a major component of fertilizers.

Section 3: Short Answer

5. Describe the role of phosphate in biological processes.
6. Explain how carbonate ions are used in the construction industry.

Section 4: Matching

Match the polyatomic ion with its correct formula:

POLYATOMIC ION	FORMULA
A) Ammonium	1) NH_4^+
B) Nitrate	2) SO_4^{2-}
C) Sulfate	3) NO_3^-
D) Phosphate	4) PO_4^{3-}

Section 5: True or False

7. _____ The ammonium ion carries a negative charge.
8. _____ Carbonate ions help regulate pH levels in water.

Section 6: Application

9. Write the formula for the following polyatomic ions:

   a) Sulfate: _____

   b) Phosphate: _____

Common Polyatomic Ions Worksheet Answers

Section 1: Multiple Choice

1. **B)** An ion composed of two or more atoms that carry a net electric charge
2. **C)** Sulfate (SO_4^{2-})

Section 2: Fill in the Blanks

3. The sulfate ion consists of one **sulfur** atom bonded to four **oxygen** atoms.
4. The nitrate ion is essential for **plant** growth and is a major component of fertilizers.

Section 3: Short Answer

5. Phosphate is vital for biological processes as it is a key component of DNA and RNA, and also of ATP (adenosine triphosphate), which provides energy for cellular functions.
6. Carbonate ions are used in the construction industry as a building material and in the production of cement. They help regulate pH levels in water, making them useful in water treatment processes.

Section 4: Matching

POLYATOMIC ION	FORMULA
A) Ammonium	2) NH_4^+
B) Nitrate	3) NO_3^-
C) Sulfate	1) SO_4^{2-}
D) Phosphate	4) PO_4^{3-}

Section 5: True or False

7. **False** - The ammonium ion carries a positive charge (+1).
8. **True** - Carbonate ions help regulate pH levels in water.

Section 6: Application

9. Write the formula for the following polyatomic ions:

a) Sulfate: $\mathbf{SO_4^{2-}}$

b) Phosphate: $\mathbf{PO_4^{3-}}$