

Appendix 4:

MINERAL IDENTIFICATION KEY

- MINERALCHECK

STEP 1: Does the mineral have a metallic or semi-metallic lustre?

YES: Go to step 2

NO: Go to step 4

STEP 2: Does the mineral leave streak on the paper? (Hardness less than 2.5)

YES: Table 1A

NO: Go to step 3

STEP 3: Does the pocket knife leave a scratch on the mineral? (Hardness less than 5.5)

YES: Table 1B

NO: Table 1C

STEP 4: Does the mineral leave streak on the ceramic plate?

YES: Table 2A

NO: Go to step 5

STEP 5: Can you scratch the mineral with your fingernail? (Hardness less than 2,5)

YES: Go to step 6

NO: Go to step 7

STEP 6: Does the mineral exhibit cleavage?

YES: Table 2B-I

NO: Table 2B-II

STEP 7: Can mineral be scratch with copper coin? (Hardness less than 3,5)

YES: Go to step 8

NO: Go to step 9

STEP 8: Does the mineral exhibit cleavage?

YES: Table 2C-I

NO: Table 2C-II

STEP 9: Does the pocket knife leave a scratch on the mineral? (Hardness less than 5.5)

YES: Go to step 10

NO: Go to step 11

STEP 10: Does the mineral exhibit cleavage?

YES: Table 2D-I

NO: Table 2D-II

STEP 11: Can the mineral be scratched with quartz? (Hardness less than 7)

YES: Go to step 12

NO: Go to step 13

STEP 12 Does the mineral exhibit cleavage?

YES: Table 3A-I

NO: Table 3A-II

STEP 13: Does the mineral exhibit cleavage?

YES: Table 3B-I

NO: Table 3B-II

MineralCheck - Table 1A:

Task 1: Determine the streak colour!

Task 2: Measure and calculate the specific gravity and compare it with lower table! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
GRAFITE	C	Native minerals	No crystal shape	Semi-metallic	Gray	Gray, black	Opaque	Perfect	1 - 2	2 - 2,23	No	No	Greasy
HEMATITE	Fe ₂ O ₃	Metallic minerals	Rarely visible crystals	Metallic, semi-metallic	Gray, black, red	Red brown	Translucent, opaque	Absent	(1+) 5 - 6	5,26 - 5,3	No	Yes	Cold feel
GALENITE	PbS	Metallic minerals	Cube	Metallic	Grey	Gray	Opaque	Perfect	2½	7.57 – 7.6	No	Yes	Heavy
CINABARITE	HgS	Metallic minerals	Rarely visible crystals, elongated rectangle	Non-metallic, metallic	Red	Red brown	Transparent, translucent	Perfect	2-2½	8.17-8.19	No	No	Heavy
BAUXITE **	Mixture of various minerals	Metallic minerals	No crystal shape	Non-metallic	Red brown, yellow, white	Red	Translucent, opaque	Absent	(1+) 3 - 3½	3 – 3.1	No	No	Sticks to tongue

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 1B:

Task 1: Determine the streak colour!

Task 2: Measure and calculate the specific gravity and compare it with lower table! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
CINABARITE	HgS	Metallic minerals	Rarely visible crystals, elongated rectangle	Non-metallic, metallic	Red	Red brown	Transparent, translucent	Perfect	2-2½	8.17-8.19	No	No	Heavy
SPHALERITE	ZnS	Metallic minerals	Rhombus, common in strips	Non-metallic	Yellow, brown	Brown	Translucent, opaque	Perfect	3½-4	3.9 - 4.1	No	Yes	Cold feel, heavy
HEMATITE	Fe ₂ O ₃	Metallic minerals	Rarely visible crystals	Metallic, semi-metallic	Gray, black, red	Red brown	Translucent, opaque	Absent	5 - 6	5,26 - 5,3	No	Yes	Cold feel, heavy
GALENITE	PbS	Metallic minerals	Cube	Metallic	Gray	Gray	Opaque	Perfect	2½	7.57 – 7.6	No	Yes	Heavy

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 1C:

Task 1: Does the mineral attract the magnet?

Task 2: Determine the streak colour!

Task 3: Measure and calculate the specific gravity and compare it with lower table! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
PIRITE	FeS ₂	Metallic minerals	Cube	Metallic	Golden	Gray, green, black	Opaque	Poor	6 - 6½	4,8 - 5	No	No	Without
HEMATITE	Fe ₂ O ₃	Metallic minerals	Rarely visible crystals	Metallic, semi-metallic	Gray, brown, red	Brown red	Translucent, opaque	Absent	5 - 6	5,26 - 5,3	No	Yes	Cold feel
MAGNETITE	Fe ₃ O ₄ (Fe ₂ +Fe ₃ +2 O ₄)	Metallic minerals	Double sided pyramid	Non-metallic, metallic	Gray	Black	Opaque	Absent	5½-6½	5.17	Yes	Yes	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 2A:

Task 1: Determine the mineral hardness!

Task 2: Determine the streak colour!

Task 3: Measure and calculate the specific gravity and compare it with lower table! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
SULPHUR	S	Native minerals	Rarely visible crystals	Non-metallic,	Yellow	Yellow	Transparent, translucent	Poor	1½ - 2½	2 - 2,07	No	No	Smell of rotten eggs
HEMATITE	Fe ₂ O ₃	Metallic minerals	Rarely visible crystals	Metallic, semi-metallic	Gray, black, red	Brown red	Translucent, opaque	Absent	5 - 6	5,26 - 5,3	No	Yes	Cold feel
CINABARITE	HgS	Metallic minerals	Rarely visible crystals, elongated rectangle	Non-metallic, metallic	Red	Red, brown	Transparent, translucent	Perfect	2-2½	8.17-8.19	No	No	Heavy
SPHALERITE	ZnS	Metallic minerals	Rhombus, common in strips	Non-metallic	Yellow, brown	Brown	Transparent, opaque	Perfect	3½-4	3.9 - 4.1	No	Yes	Cold feel, heavy
TALC	Mg ₃ Si ₄ O ₁₀ (OH) ₂	Industrial minerals, Construction minerals	Rarely visible crystals	Non-metallic	White, golden	White	Transparent, translucent	Perfect	1	2,58 - 2,83	No	No	Greasy

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 2B-I:

Task 1: Describe the crystal shape of the mineral!

Task 2: Determine the colour of the mineral and its streak colour!

Task 3: Measure and calculate the specific gravity and compare it to the table below! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
TALC	$Mg_3Si_4O_{10}(OH)_2$	Industrial minerals, Construction minerals	Rarely visible crystals	Non-metallic	White, pale yellow	White	Transparent, translucent	Perfect	1	2,58 - 2,83	No	No	Greasy
SULPHUR	S	Native minerals	Rarely visible crystals	Non-metallic	Yellow	Yellow	Transparent, translucent	Poor	1½ - 2½	2 - 2,07	No	No	Smell of rotten eggs
GYPSUM	$CaSO_4 \cdot 2H_2O$	Industrial minerals, Construction minerals	Rhombus	Non-metallic	White	White	Transparent, translucent	Perfect	2	2,3	No	Yes	Without
HALITE	NaCl	Industrial minerals	Cube	Non-metallic	White	White	Transparent, translucent	Perfect	2½	2,16	No	No	Salty taste
MUSKOVITE	$KAl_2AlSi_3O_{10}(OH)_2$	Industrial minerals	Sheets	Non-metallic	White, gray	White, golden	Transparent, translucent	Perfect	2½	2,8 - 3	No	No	Without
BIOTITE*	$K(Fe,Mg)_3AlSi_3O_{10}(OH,F)_2$	Industrial minerals	Sheets	Non-metallic	Brown, green, black	Golden green, gray	Translucent, opaque	Perfect	2 - 3	2,7 - 3,4	No	No	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 2B-II:

You have successfully determined the name of your mineral!

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
SULPHUR	S	Native minerals	Rarely visible crystals	Non-metallic	Yellow	Yellow	Transparent, translucent	Poor	1½ - 2½	2 - 2,07	No	No	Smell of rotten eggs.

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 2C-I:

Task 1: Does the mineral dissolve in water? Check the taste of the mineral.

Task 2: Drizzle one drop of HCl on the mineral. Do you see a reaction? Compare the properties with the table below! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICAT-ION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
HALITE	NaCl	Industrial minerals	Cube	Non-metallic	White	White	Transparent, translucent	Perfect	2½	2,16	No	No	Salty taste
CALCITE	CaCO ₃	Industrial minerals, Construction minerals	Rhombus	Non-metallic	Different	White	Transparent, translucent	Perfect	3	2,6 -2,8	No	Yes	Without
DOLOMITE	CaMg(CO ₃) ₂	Industrial minerals, Construction minerals	Rhombus	Non-metallic	Different	White	Transparent, translucent	Perfect	3½ - 4	2,72 - 2,86	No	Yes – in warm HCl	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 2C-II:

You have successfully determined the name of your mineral!

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
SERPENTINE *	$(\text{Mg,Fe})_3\text{Si}_2\text{O}_5(\text{OH})_4$	Industrial minerals	Rarely visible crystals	Non-metallic	Green, black	Gray green, white	Transparent, translucent	Good	2½-4	2,5-2,6	No	No	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 2D-I:

Task 1: Describe the crystal shape of a mineral!

Task 2: Measure and calculate the specific gravity!

Task 3: Determine the streak colour!

Task 4: Drizzle one drop of HCl on the mineral. Do you see a reaction?

Task 5: Determine the mineral hardness and compare it with the table below! Determine the name of your mineral!

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
KYANITE	$Al[6]Al[6]OSiO_4$	Precious and semi-precious minerals	Elongated rectangle	Non-metallic	Blue, green	White	Transparent, translucent	Perfect	5½ - 7	3,53 - 3,67	No	No	Without
AMPHIBOLE *	A0-1B2C5T8O22(OH,F,Cl) ₂ , (general formula)	Industrial minerals	Elongated rectangle	Non-metallic	Green, black	Gray, green, brown	Translucent, opaque	Perfect	5 - 6	3 - 3,4	No	No	Without
PIROKSENE *	M ₂ M ₁ T ₂ O ₆ M2 – Mg, Fe, Mn, Li, Ca, Na M1 – Al, Cr, Fe ³⁺ , Mn, Mg, Zn, Ti, V, Zr, Sc	Industrial minerals	Elongated rectangle	Non-metallic	Green, brown, black	Green, gray, brown	Translucent, opaque	Good	5½ - 6	3,19 - 3,56	No	No	Without
CALCITE	CaCO ₃	Industrial minerals, Construction minerals	Rhombus	Non-metallic	Different	White	Transparent, translucent	Perfect	3	2,6 - 2,8	No	Yes	Without
DOLOMITE	CaMg(CO ₃) ₂	Industrial minerals, Construction minerals	Rhombus	Non-metallic	Different	White	Transparent, translucent	Perfect	3½ - 4	2,72 - 2,86	No	Yes – in warm HCl	Without
FLORITE	CaF ₂	Industrial minerals	Cube	Non-metallic	Different	White	Transparent, translucent	Perfect	4	3,17 - 3,56	No	No	Without
SPHALERITE	ZnS	Metallic minerals	Rhombus	Non-metallic	Yellow, brown	Brown	Translucent, opaque	Perfect	3½-4	3.9 - 4.1	No	Yes	Cold feel, heavy

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 2D-II:

Task 1: Drizzle one drop of HCl on the mineral. Do you see a reaction?

Task 2: Measure and calculate the specific gravity and compare it to the table below! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
WULFENITE	PbMoO ₄	Metallic minerals	Elongated Rectangle	Non-metallic	Yellow, brown, orange	White	Transparent, translucent	Good	2½-3	6.5 - 7.5	No	No	Heavy
CALCITE	CaCO ₃	Industrial minerals, Construction minerals	Rhombus	Non-metallic	Different	White	Transparent, translucent	Perfect	3	2,6 -2,8	No	Yes	Without
DOLOMITE	CaMg(CO ₃) ₂	Industrial minerals, Construction minerals	Rhombus	Non-metallic	Different	White	Transparent, translucent	Perfect	3½ - 4	2,72 - 2,86	No	Yes – in warm HCl	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 3A-I:

Task 1: Measure and calculate the specific gravity and compare it to the table below! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
KYANITE	$Al[6]Al[6]OSiO_4$	Precious and semi-precious minerals	Elongated rectangle	Non-metallic	Blue, green	White	Transparent, translucent	Perfect	5½ - 7	3,53 - 3,67	No	No	Without
ORTOCLASE (K-Na) *	$(K,Na)AlSi_3O_8$ $KAlSi_3O_8$	Industrial minerals, Construction minerals	Elongated rectangle	Non-metallic	White, pink	White	Transparent, translucent	Perfect	6 - 6½	2,54 - 2,63	No	No	Without
PLAGIOCLASE (Na-Ca) *	$NaAlSi_3O_8$ $CaAl_2Si_2O_8$	Industrial minerals, Construction minerals	Elongated rectangle	Non-metallic	White, gray, blue	White	Transparent, translucent	Perfect	6 - 6½	2,6 - 2,76	No	No	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 3A-II:

Task 1: Describe the crystal shape of the mineral!

Task 2: Determine the colour of the mineral!

Task 3: Measure and calculate the specific gravity and compare it to the table below! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
OLIVINE *	(Mg,Fe) ₂ SiO ₄	Industrial minerals, Construction minerals	Rare visible crystals	Non-metallic	Golden yellow	White	Transparent, translucent	Poor to distinct	6 - 7	3,2 - 4,4	No	No	Without
GARNAT *	A ₃ B ₂ (SiO ₄) ₃ Mineral group; A3+ – Mg, Fe, Mn, Ca; B2+ - Al, Fe, Cr, Ti, Zr;	Precious and semi-precious minerals	Rhombus	Non-metallic	Red, black	White	Transparent, translucent	Absent	6½ - 7½	3,6 - 4,3	No	No	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 3B-I:

Task 1: Describe the crystal shape of the mineral!

Task 2: Determine the colour of the mineral!

Task 3: Measure and calculate the specific gravity and compare it to the table below! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
OLIVINE *	$(\text{Mg,Fe})_2\text{SiO}_4$	Industrial minerals, Construction minerals	Rare visible crystals	Non-metallic	Golden yellow	White	Transparent, translucent	Poor to distinct	6 - 7	3,2 - 4,4	No	No	Without
TURMALINE *	$\text{XY}_3\text{Z}_6(\text{BO}_3)_3\text{Si}_6\text{O}_{18}(\text{OH})_4$ X – Ca, K, Na or empty, Y – Al, Fe, Li, Mn in Z – Al, Fe ³⁺ , V ³⁺ , Ti ³⁺ , Cr ³⁺	Precious and semi-precious minerals	Elongated rectangle	Non-metallic	Different	White	Transparent, translucent, opaque	Absent	7 - 7½	2,9 - 3,3	No	No	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.

MineralCheck - Table 3B-II:

Task 1: Describe the crystal shape of the mineral!

Task 2: Determine the colour of the mineral!

Task 3: Measure and calculate the specific gravity and compare it to the table below! Determine the name of your mineral.

MIN. / PROP.	FORMULA	CLASSIFICATION	CRYST. SHAPE	LUSTRE	COLOR	STREAK COLOR	TRANSPARANCY	CLEAVAGE	HARDNESS	SPEC. G.	MAGNETISM	REACTION WITH HCL	SENSORY PROPERTIES
OLIVINE *	$(Mg,Fe)_2SiO_4$	Industrial minerals, Construction minerals	Rare visible crystals	Non-metallic	Golden yellow	White	Transparent, translucent	Poor to distinct	6 - 7	3,2 - 4,4	No	No	Without
QUARTZ	SiO_2	Industrial minerals, Construction minerals	Elongated, on top pyramid like structure.	Non-metallic	Different	White	Transparent, translucent	Absent	7	2,65 - 2,67	No	No	Without
GARNAT *	$A_3B_2(SiO_4)_3$ Mineral group; A3+ – Mg, Fe, Mn, Ca; B2+ – Al, Fe, Cr, Ti, Zr;	Precious and semi-precious minerals	Rhombus	Non-metallic	Red, black	White	Transparent, translucent	Absent	6½ - 7½	3,6 - 4,3	No	No	Without
TURMALINE *	$XY_3Z_6(BO_3)_3Si_6O_{18}(OH)_4$ X – Ca, K, Na or empty, Y – Al, Fe, Li, Mn in Z – Al, Fe3+, V3+, Ti3+, Cr3+	Precious and semi-precious minerals	Elongated rectangle	Non-metallic	Different	White	Transparent, translucent, opaque	Absent	7 - 7½	2,9 - 3,3	No	No	Without

Note: Names marked with star (*) represent a group of related minerals, names marked with two stars (**) represent a mixture of different minerals.