

Elemental Su Doku

Target level

Students in the 11 –16 age range, middle to high ability.

Prior knowledge needed

The numbering of groups and periods in the Periodic Table

Topics

Groups and periods in the Periodic Table

Rationale

This activity helps students gain a familiarity with the Periodic Table by getting them to continually refer to it in a problem solving activity. Students should more easily recall the elements in the same group after doing some of these problems. The logical skills developed in solving the puzzle are useful.

Use

This activity could be used at any time but is best used in conjunction with work on the Periodic Table. Three elemental Su Doku puzzles are given with answers. Students should start with puzzle 1 as this contains the most detailed explanation of how to solve it.

Further puzzles can be readily generated using the excel template.

Elemental Su Doku 1

In Elemental Su Doku you need to use logic to work out the elements in the blank squares. You will need to be able to see a Periodic Table.

Every row, column and 3x3 box contains an element from groups 1, 2, 3, 4, 5, 6, 7, 0 and a transition metal.

Each box is based on a **period** so the elements in groups 1,2,3,4,5,6,7 and 0 in a 3x3 box come from the same period apart from the transition metal. The transition metal in the box, could be any transition metal but Fe is used in the answer grid so you may find it easier to check your answers if you use Fe as well.

For example in the top right 3x3 box the group 1 element must be in the bottom row, since there is already a group 1 element (Li & Na) in the top two rows of 9. The group 1 metal clearly must go into the only space available in the bottom row of that 3x3 box. The other elements in that 3x3 box are from period 2 so the group 1 metal must be Li (not Na or K)

Good luck

Rating: Easy

Li			Ar	Al				Be
N	F				Na			
			P		Cu		O	C
Cl		Si			Ne	P	Mn	
		Al		Li		Si		
	P	Na	C			Al		S
B	O		Cl		Si			
			S				F	Ni
Ne		F		P	Mg			B

Elemental Su Doku Number 2

Elemental Su Doku Number 2

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Each box is based on a period so the elements in groups 1,2,3,4,5,6,7 and 0 in a 3x3 box come from the same period apart from the transition metal. The transition metal in the box, could be any transition metal but Fe is used in the answer grid so you may find it easier to check your answers if you use Fe as well.

Good luck

Rating: Moderate

	O	Li		B			Be	
	N				Ne	Li		F
Fe					F		B	C
		Ni			S		Cl	Ar
		Al	Mg		Ag	P		
P	Cl		Al			Co		
K	Zn		Br				Kr	
Kr		Ca	Ge				Se	
	Ge			K		Ca	As	

Elemental Su Doku Number 2

Credit: Pre-publication materials from the Royal Society of Chemistry

Elemental Su Doku Number 3

Elemental Su Doku Number 3

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Every row, column and 3x3 box contains an element from groups 1, 2, 3, 4, 5, 6, 7, 0 and a transition metal.

Each box is based on a period so the elements in groups 1,2,3,4,5,6,7 and 0 in a 3x3 box come from the same period apart from the transition metal. The transition metal in the box, could be any transition metal but Fe is used in the answer grid so you may find it easier to check your answers if you use Fe as well.

Good luck

Rating: Difficult

Be			Cl				As	
			Na	Si				Se
F					Mg	Ga		Fe
Cu			Po			Sr	Sn	
	I			Ba			Xe	
	Sr		Rn		Cs			In
Ne		C	Cr					
O			Si	Ar				
	Zn				Al			Kr

Elemental Su Doku Number 3

Credit: Pre-publication materials from the Royal Society of Chemistry

Su Doku Answers

Elementary puzzle 1. Rating: Easy

Li	C	Fe	Ar	Al	S	F	N	Be
N	F	O	Mg	Si	Na	Fe	B	Ne
Be	B	Ne	P	Cl	Cu	Li	O	C
Cl	Mg	Si	B	O	Ne	P	Mn	Na
S	Ar	Al	Fe	Li	N	Si	Mg	Cl
Fe	P	Na	C	Be	F	Al	Ar	S
B	O	Be	Cl	Fe	Si	Ne	Li	N
C	Li	N	S	Ar	Al	Be	F	Ni
Ne	Fe	F	Na	P	Mg	O	C	B

Su Doku Answers

Elementary puzzle 2. Rating: Moderate

F	O	Li	Fe	B	C	Ne	Be	N
B	N	C	O	Be	Ne	Li	Fe	F
Fe	Be	Ne	Li	N	F	O	B	C
Mg	Na	Ni	P	Si	S	Al	Cl	Ar
Si	Ar	Al	Mg	Cl	Ag	P	Na	S
P	Cl	S	Al	Ar	Na	Co	Si	Mg
K	Zn	As	Br	Se	Ca	Ge	Kr	Ga
Kr	Ga	Ca	Ge	Fe	As	Br	Se	K
Se	Ge	Br	Kr	K	Ga	Ca	As	Fe

Su Doku Answers

Elementary puzzle 3. Rating: Difficult

Be	O	Li	Cl	Al	Fe	Kr	As	Ge
B	N	Fe	Na	Si	Ar	Br	Ca	Se
F	C	Ne	P	S	Mg	Ga	K	Fe
Cu	Xe	In	Po	Bi	At	Sr	Sn	Rb
Rb	I	Te	Tl	Ba	Pb	Fe	Xe	Sb
Sn	Sr	Sb	Rn	Fe	Cs	Te	I	In
Ne	Li	C	Cr	Cl	S	As	Ga	Ca
O	B	Be	Si	Ar	P	K	Fe	Br
N	Zn	F	Mg	Na	Al	Ge	Se	Kr

Elemental Su Doku

In conventional Su Doku you are given a nine by nine grid with numbers in. You need to use logic to work out the numbers in the blank boxes to complete the grid. There are rules that determine how the numbers can be arranged.

In Elemental Su Doku You need to use logic to work out the elements in the blank squares. You will need to be able to see a Periodic Table.

Every row, column and 3x3 box contains an element from groups 1, 2, 3, 4, 5, 6, 7, 0 and a Transition metal.

Each box is based on a period so the elements in groups 1,2,3,4,5,6,7 and 0 in a 3x3 box come from the same period.

You can use any transition metal but Fe is used in the answer grid so you may find it easier to check your answers if you use Fe as well.
