

Teacher's Guide

Periodic Table of Elements Model Activity

Student's will:

- “analyze and interpret data to explain how the physical properties of elements and their reactivity have been used to produce the current model of the Periodic Table of Elements”.
- Students will review periodic table category information as well as information on certain elements to determine where they belong on the periodic table.

This is a great activity for students to work in groups!

You will need (and is provided in this resource):

- The Periodic Table of Elements - missing elements
- nine element clue cards
- nine element pieces
- nine category cards
- CER student sheet

Student Directions:

1. Read over the category cards to learn more about the categories of elements found in the periodic table.
2. Read over the element clue cards to learn more about each element.
3. Using this information, place the element pieces where they belong on the periodic table of elements.
4. Once you have each piece where it belongs, fill in the missing atomic number.
5. Complete the CER based on what you have learned.

CER Framework:

Students will use the CER framework to answer the question:

How have the physical properties of elements and their reactivity contributed to the development of the Periodic Table of Elements (current model)?

Encourage students to use evidence that they gathered from this activity.

The Periodic Table Activity - Student Instructions

You will need:

- The Periodic Table of Elements - missing elements
- nine element clue cards
- nine element pieces
- nine category cards
- CER student sheet

Directions:

- 1. Read over the category cards to learn more about the categories of elements found in the periodic table.**
- 2. Read over the element clue cards to learn more about each element.**
- 3. Using this information, place the element pieces where they belong on the periodic table of elements.**
- 4. Once you have each piece where it belongs, fill in the missing atomic number.**
- 5. Complete the CER based on what you have learned.**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1	1 H																		
2	3 Li	4 Be												6 C	7 N	8 O	9 F	10 Ne	
3		12 Mg												14 Si	15 P	16 S	17 Cl	18 Ar	
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr	
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe	
6	55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn	
7	87 Fr	88 Ra		104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Cn	113 Nh	114 Fl	115 Mc	116 Lv	117 Ts	118 Og	
				57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd		66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu	
				89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf		100 Fm	101 Md	102 No	103 Lr	

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Students are given a periodic table with missing elements from each category.

Na Ni Ba B Tb N Al He Es

Sodium
Na

- highly reactive
- low melting point (97.8°C)
- good conductor of heat and electricity
- highly ductile and malleable

Nickel
Ni

- hard, strong, and lustrous
- good conductor of heat and electricity
- high melting point
- less reactive than potassium (K)

Barium
Ba

- solid at room temperature
- metallic
- higher melting point (727°C); higher than lithium (Li)
- more reactive than zinc (Zn); less reactive than cesium (Cs)

Boron
B

- acts like a metal and a nonmetal
- brittle
- semi-metallic luster

Terbium
Tb

- strong magnetic properties
- somewhat rare
- high electronegativity
- high melting (1355°C) and boiling

Nitrogen
N

- brittle
- dull appearance
- poor conductivity
- highly stable
- gas at room temperature

Aluminum
Al

- shiny and malleable
- good conductor of electricity
- moderately reactive
- lower melting point than nickel
- softer than iron (Fe)

<p style="text-align: center;">Metalloids</p> <ul style="list-style-type: none"> has properties of metals and non-metals appears metal, but brittle can be solid conducts electricity <p style="font-size: small;">Examples: silicon (Si), germanium (Ge), arsenic (As), polonium (Po)</p> <p style="font-size: x-small; text-align: right;">© Bright in the Middle</p>	<p style="text-align: center;">Post-Transition Metals</p> <ul style="list-style-type: none"> generally softer than transition metals melting points lower than transition metals typically shiny and malleable reactivity is varied; typically lower <p style="font-size: small;">Examples: indium (In), thallium (Tl), tin (Sn), lead (Pb)</p> <p style="font-size: x-small; text-align: right;">© Bright in the Middle</p>
<p style="text-align: center;">Noble Gases</p> <ul style="list-style-type: none"> stable and unreactive does not react or combine with other elements tasteless and colorless low density <p style="font-size: small;">Examples: argon (Ar), xenon (Xe), neon (Ne), krypton (Kr)</p> <p style="font-size: x-small; text-align: right;">© Bright in the Middle</p>	<p style="text-align: center;">Lanthanides</p> <ul style="list-style-type: none"> rare Earth elements known for ability to form trivalent ions high electronegativity high melting and boiling points strong magnetic properties <p style="font-size: small;">Examples: lanthanum (La), cerium (Ce), promethium (Pm)</p> <p style="font-size: x-small; text-align: right;">© Bright in the Middle</p>

Students are also given nine element clue cards and nine category clue cards.

Students read through all clue cards to determine where the elements should be located on the periodic table.

C E R Name _____
Claim - Evidence - Reasoning Date _____

Question: How have the physical properties of elements and their reactivity contributed to the development of the Periodic Table of Elements (current model)?

Claim:

Evidence:

Reasoning:

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Students can complete a CER afterwards to answer the question: “How have the physical properties of elements and their reactivity contributed to the development of the Periodic Table of Elements (current model)?”.