SNC1D **Patterns in the Periodic Table** A

Part A (20 min)
You have been given 5 index cards.

- On the lined side of each card, write the name and standard atomic notation of each of the following five elements. The *mass number* (number of protons + neutrons) has been given with the symbol.

- On the other side of the card, draw the Bohr-Rutherford diagram for the element. You may choose to do the lazy version if you like.

K (39), Be (9), O (16), Si (28), Ne (20)

Part B (20 min)

- Join with a group so that each of you has a letter of a 4-letter word that is important in chemistry.

- In your groups, make sure you have a complete set of the first 20 elements and that the Bohr-Rutherford diagrams are correct. Make any corrections required.

- Place the cards diagram-side up, so the names are hidden. In what way are the cards the same? In what way are they different?

- Arrange the cards into rows, so that all the cards in one row are the same in one way but different in another way. State how you have arranged them.

- Then arrange the cards into columns, so that all the cards in one column are the same in one way but different in another way. State how you have arranged them.

- Keep moving the cards around until you are satisfied that you have the best possible table, with all the cards arranged in the most logical way.

- Flip over each card, without moving the card to a different position, so that you can see the name and symbol on the card. Compare your arrangement of the cards with the arrangement of the elements in the periodic table.

- If your cards do not match the periodic table, turn them over and repeat the previous steps. Once your cards match the periodic table, turn them over again so you can use the Bohr-Rutherford diagrams to answer the questions below.

SNC1D **Patterns in the Periodic Table** T

Part A (20 min)
You have been given 5 index cards.

- On the lined side of each card, write the name and standard atomic notation of each of the following five elements. The *mass number* (number of protons + neutrons) has been given with the symbol.

- On the other side of the card, draw the Bohr-Rutherford diagram for the element. You may choose to do the lazy version if you like.

P (31), N (14), Cl (35), F (19), Li (7)

Part B (20 min)

- Join with a group so that each of you has a letter of a 4-letter word that is important in chemistry.

- In your groups, make sure you have a complete set of the first 20 elements and that the Bohr-Rutherford diagrams are correct. Make any corrections required.

- Place the cards diagram-side up, so the names are hidden. In what way are the cards the same? In what way are they different?

- Arrange the cards into rows, so that all the cards in one row are the same in one way but different in another way. State how you have arranged them.

- Then arrange the cards into columns, so that all the cards in one column are the same in one way but different in another way. State how you have arranged them.

- Keep moving the cards around until you are satisfied that you have the best possible table, with all the cards arranged in the most logical way.

- Flip over each card, without moving the card to a different position, so that you can see the name and symbol on the card. Compare your arrangement of the cards with the arrangement of the elements in the periodic table.

- If your cards do not match the periodic table, turn them over and repeat the previous steps. Once your cards match the periodic table, turn them over again so you can use the Bohr-Rutherford diagrams to answer the questions below.

Patterns in the Periodic Table

O

Part A (20 min)

You have been given 5 index cards.

- On the lined side of each card, write the name and standard atomic notation of each of the following five elements. The *mass number* (number of protons + neutrons) has been given with the symbol.

- On the other side of the card, draw the Bohr-Rutherford diagram for the element. You may choose to do the lazy version if you like.

Na (23), Al (27), C (12), He (4), S (32)

Part B (20 min)

- Join with a group so that each of you has a letter of a 4-letter word that is important in chemistry.

- In your groups, make sure you have a complete set of the first 20 elements and that the Bohr-Rutherford diagrams are correct. Make any corrections required.

- Place the cards diagram-side up, so the names are hidden. In what way are the cards the same? In what way are they different?

- Arrange the cards into rows, so that all the cards in one row are the same in one way but different in another way. State how you have arranged them.

- Then arrange the cards into columns, so that all the cards in one column are the same in one way but different in another way. State how you have arranged them.

- Keep moving the cards around until you are satisfied that you have the best possible table, with all the cards arranged in the most logical way.

- Flip over each card, without moving the card to a different position, so that you can see the name and symbol on the card. Compare your arrangement of the cards with the arrangement of the elements in the periodic table.

- If your cards do not match the periodic table, turn them over and repeat the previous steps. Once your cards match the periodic table, turn them over again so you can use the Bohr-Rutherford diagrams to answer the questions below.

SNC1D **Patterns in the Periodic Table** M

Part A (20 min)
You have been given 5 index cards.

- On the lined side of each card, write the name and standard atomic notation of each of the following five elements. The *mass number* (number of protons + neutrons) has been given with the symbol.

- On the other side of the card, draw the Bohr-Rutherford diagram for the element. You may choose to do the lazy version if you like.

B (11), Ca (40), H (1), Ar (40), Mg (24)

Part B (20 min)

- Join with a group so that each of you has a letter of a 4-letter word that is important in chemistry.

- In your groups, make sure you have a complete set of the first 20 elements and that the Bohr-Rutherford diagrams are correct. Make any corrections required.

- Place the cards diagram-side up, so the names are hidden. In what way are the cards the same? In what way are they different?

- Arrange the cards into rows, so that all the cards in one row are the same in one way but different in another way. State how you have arranged them.

- Then arrange the cards into columns, so that all the cards in one column are the same in one way but different in another way. State how you have arranged them.

- Keep moving the cards around until you are satisfied that you have the best possible table, with all the cards arranged in the most logical way.

- Flip over each card, without moving the card to a different position, so that you can see the name and symbol on the card. Compare your arrangement of the cards with the arrangement of the elements in the periodic table.

- If your cards do not match the periodic table, turn them over and repeat the previous steps. Once your cards match the periodic table, turn them over again so you can use the Bohr-Rutherford diagrams to answer the questions below.

<u>Questions</u> (15 min)

1. Examine Row 2. How are the Bohr-Rutherford models the same across the whole row?

   How are they different?

2. Examine Column 2. How are the Bohr-Rutherford models the same as you read down the column?

   How are they different?

3. What features of the Bohr-Rutherford models do not follow an exactly logical pattern?

4. Which atoms have an outer energy level that is full?

Valence Electrons

Atoms in the same ______________________ in the periodic table have ______________________

____.

As a result, elements in a ________________ react in a _______________________ way.

valence electrons: ____

noble gases/inert gases: ____

During a chemical reaction, one atom can join with another atom by _____________________,

________________________, or ___________________________ __________________________.

What makes the noble gases special?

Having a ____________________ valence shell provides chemical _________________________.

Atomic Size

As you go down in a _____________ the atom gets ___________________ because of the

____.

Atoms in the same ______________________ in the periodic table have ______________________

____.

As you go across a _____________ the atom gets ___________________ because of the

____.

The ________________ the atom, the more ___________________ needed to keep it together.

Strong nuclear force: ____

____.