Balancing Chemical Equations

Balance the chemical reaction:

 $___$ NaNO₃ + $___$ PbO \rightarrow $___$ Pb(NO₃)₂ + $___$ Na₂O

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Step 1. Write out coefficients

a
$$NaNO_3 + b PbO \rightarrow x Pb(NO_3)_2 + y Na_2O$$

Step 2. Construct the atom equations:

Na:
$$a = 2y$$

$$N: a = 2x$$

O:
$$3a + b = 6x + y$$

Pb:
$$b = x$$

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Step 3: Set an initial condition

Na: a = 2y, a = 2, then x = 1 and y = 1, finally b = 1

N: a = 2x

O: 3a + b = 6x + y

Pd: b = x

Therefore, the balanced equation is:

$$2 \text{ NaNO}_3 + \text{PbO} \rightarrow \text{Pb(NO}_3)_2 + \text{Na}_2\text{O}$$