1. An exothermic reaction:

   ☐ releases energy, so the surroundings get hotter

   ☐ absorbs energy, so the surroundings get colder

   ☐ has no energy change

   ☐ destroys energy

2. Why does a safety match not light by itself in the box?

   ☐ Matches contain no fuel

   ☐ The reaction needs activation energy from striking

   ☐ Burning is endothermic

   ☐ The box is cold

3. Breaking chemical bonds:

   ☐ has no energy change

   ☐ destroys atoms

   ☐ absorbs energy (endothermic)

   ☐ releases energy (exothermic)

4. An endothermic reaction makes the surroundings:

   ☐ hotter

   ☐ unchanged

   ☐ brighter

   ☐ colder

5. Activation energy is the minimum energy colliding particles need to react.

   ☐ True ☐ False

6. Bonds broken need 500 kJ; bonds made release 700 kJ. What is the energy change (kJ)?

   _____

7. Burning (combustion) is an example of a(n):

   ☐ endothermic reaction

   ☐ electrolysis

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   ☐ reaction with no energy change

8. Reactants 40 kJ, peak 150 kJ, products 90 kJ. What is the activation energy in kJ?

   _____

9. Making chemical bonds takes in energy.

   ☐ True ☐ False

10. In an exothermic reaction, the products are at a higher energy than the reactants.

    ☐ True ☐ False

1. **releases energy, so the surroundings get hotter**

   Exothermic reactions release energy.

2. **The reaction needs activation energy from striking**

   Friction provides the starting energy.

3. **absorbs energy (endothermic)**

   Breaking bonds takes energy in.

4. **colder**

   It absorbs energy, cooling the surroundings.

5. **True**

   The height of the energy hill.

6. **-200**

   $500 - 700 = -200$ kJ.

7. **exothermic reaction**

   Combustion releases heat – exothermic.

8. **110**

   $150 - 40$.

9. **False**

   False. Making bonds releases energy (exothermic); breaking bonds takes in energy (endothermic).

10. **False**

    False. In an exothermic reaction the products are at lower energy; the difference is released to the surroundings as heat.

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