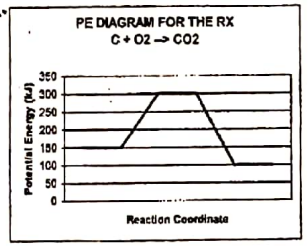
Name: Key Period: _____

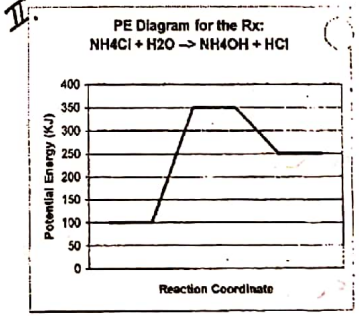
Specific Heat FunSheets

POTENTIAL ENERGY DIAGRAM WORKSHEET

I.



II.



6. How much energy did this reaction start with?

150 kJ

7. How much energy did this reaction finish with?

100 kJ

8. Did this reaction gain or lose energy? How much?

Lose, 50 kJ

9. Is the Q value positive or negative?

negative

10. Is this an endothermic or exothermic reaction?

exothermic

1. How much energy did this reaction start with?

100 kJ

2. How much energy did this reaction finish with?

250 kJ

3. Did this reaction gain or lose energy? How much?

Gain, 150 kJ

4. Is the Q value positive or negative?

positive

5. Is this an endothermic or exothermic reaction?

endothermic

Name: _____ Period: _____

Energy $Q = mc\Delta T$

BEWARE: *This funsheet gets heated.*

Name _____ **Class period** ____ **Date** ____

Substance	J/ g/°C or J/ g/K	cal/g/°C or cal/g/K
Water (0 °C to 100 °C)	4.184	1.000
Methyl Alcohol	2.549	0.609
Ice (-10 °C to 0 °C)	2.093	0.500
Steam (100 °C)	2.009	0.480
Benzene	1.750	0.418
Wood (typical)	1.674	0.400
Soil (typical)	1.046	0.250
Air (50 °C)	1.046	0.250
Aluminum	0.900	0.215
Marble	0.858	0.205
Glass (typical)	0.837	0.200
Iron Steel	0.452	0.108
Copper	0.387	0.0924
Silver	0.236	0.0564
Mercury	0.138	0.0330
Gold	0.130	0.0310
Lead	0.128	0.0305

1. Calculate the energy released (in Joules) when a 4.570 g piece of hot iron cools from 1000.° C to 20.0° C. Is this endothermic or exothermic?

$Q = (4.570)(0.452)(20.0 - 1000.) = -2020\ J$ exothermic

2. Calculate the energy needed to heat 60.0 g of aluminum from 100.° C to 250.° C. Is this endothermic or exothermic?

$Q = (60.0)(0.900)(250. - 100.) = 8100\ J$ endothermic

3. Calculate the final temperature of 295 g of water, initially at 30.0° C, if 4.500 joules are added. (THIS IS A CHALLENGE QUESTION)

$4.500 = (295)(4.184)(T_f - 30)$

$.00365 = T_f - 30$

$T_f = 30.0\ °C$

Name: _____ Period: _____

4. Using the specific heat values for lead, gold, mercury, and silver, which of these would require the smallest amount of heat to increase its temperature by 10°C (assume all samples have the same mass of 15 g)?

Pb - .128 Au - .130 Hg - .138 Ag - .236

lead

5. A 35.2 g sample of an unknown metal requires 1251 J of energy to heat the sample by 25.0° C (assume it is initially 0.00°C). Calculate the specific heat capacity of this metal and identify the metal.

$1251\ J = (35.2)\,C\,(25.0)$ $C = 1.42\ J/g°C$

6. If 7.24 kJ is applied to a 952-g block of metal, the temperature increases by 10.7° C. Calculate the specific heat capacity of the metal. $7.24\ kJ = 7240\ J$

$7240 = (952)\,C\,(10.7)$ $C = 0.711\ J/g°C$

7. How many joules of heat are given off when 5.0g of water cools from 75° C to 25°C?

$Q = (5.0)(4.184)(25-75)$ $Q = -1000\ J$

8. How many joules of heat are necessary to raise the temperature of 25.0 g of water from 10.0°C to 60.0°C?

$Q = (25.0)(4.184)(60-10)$ $Q = 5230\ J$

9. What is the specific heat of a substance if 25g of it absorbs 5000.J of heat when it warms from 40.°C to 50.°C?

$5000. = (25)\,C\,(50-40)$ $C = 20\ J/g°C$

10. How much heat is required to warm 350g of water from 20.°C to 80.°C?

$Q = (350)(4.184)(80-20)$ $Q = 88000\ J$

11. What is the specific heat of iron if 300.g of iron requires 54300 J to increase its temperature from 22.4°C to 62.6°C? How does your answer compare to the chart?

$54300 = (300.)\,C\,(62.6-22.4)$ $C = 4.50\ J/g°C$

12. The temperature of 250. g of water dropped from 90.0°C to 30.0°C. How much energy did the water lose?

$Q = (250.)(4.184)(30-90)$ $Q = -62800\ J$